



## 4<sup>th</sup> World Congress of International Federation of Head and Neck Oncologic Societies

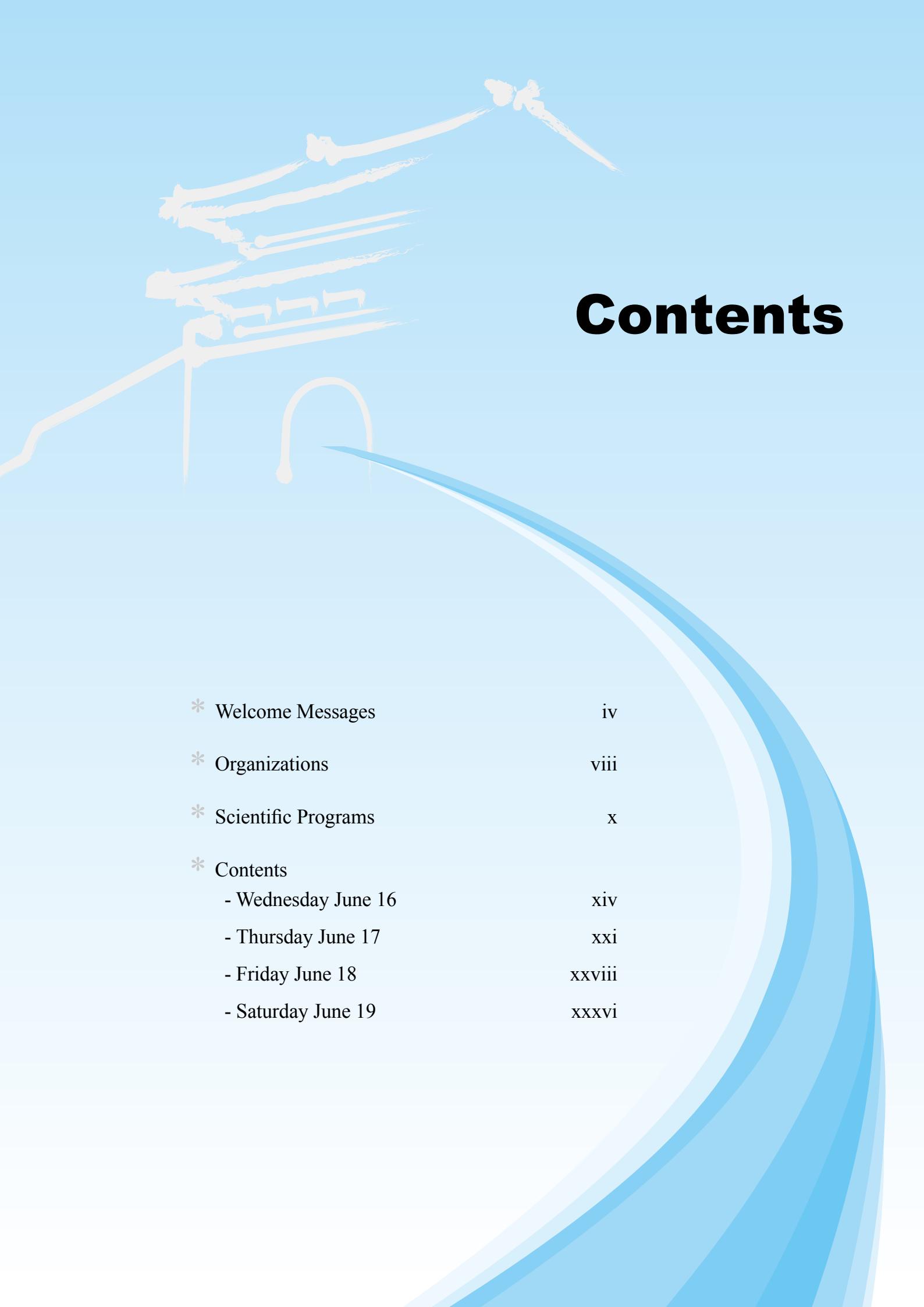
Abstract Book



***“Shifting Paradigms in  
Head and Neck Oncology”***

June 15 (Tue) - 19 (Sat), 2010  
Lotte Hotel Seoul, Korea





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## Welcome Message

### **From President of IFHNOS 2010 Seoul**



Dear Colleagues and Friends,

4 years have been passed since we met in Prague and we are gathering again here in Seoul for the 4th World Congress of IFHNOS under the theme of "Shifting Paradigms in Head and Neck Oncology".

It is really my great pleasure to meet you in Seoul after long period of preparation to make a great success of this congress.

The members of the local organizing committee really worked very hard and we can prepare excellent scientific program and social programs. I really appreciate for their effort to make the congress best one.

Now, we are ready and on behalf of the Local Organizing Committee of the 4th World Congress, I welcome you all to this beautiful city of Seoul where we can meet old and new. I wish all the foreign guests can enjoy the excellent scientific programs as well as wonderful hospitality of Koreans.

I am also greatly delighted to have more than 600 foreign participants from 58 countries and more than 300 domestic participants. Among them, there are many worldwide well known distinguished scholars who will bring glory to this congress.

I appreciate very much for the IFHNOS officers especially Dr. Shah, Dr. LeFebvre and Dr. Wei for their help and advice. I also appreciate very much for the members of the Korean Society for Head and Neck Oncology for their excellent support to make this congress successful. I also appreciate very much for the supports of industry partners regardless of recent strong government policy against sponsoring the congress. Without their help, this meeting would not be possible.

We are now faced to the excellent opportunity to learn most updated knowledge in managing head and neck cancers and also to see the wonderful culture of Korea.

Enjoy everything and have great fun.

A handwritten signature in black ink, appearing to read "Kwang Hyun Kim".

**Kwang Hyun Kim, M.D., Ph.D.**

President of the Congress

Department of Otolaryngology-Head and Neck Surgery

Seoul National University College of Medicine

Seoul National University Hospital

Seoul, Korea

## Welcome Message

### **From IFHNOS Director**

Dear Colleagues,

That is my privilege and my pleasure to welcome you all on behalf of IFHNOS to the 4the World Conference on Head and Neck Cancer entitled Shifting Paradigms in Head and Neck Oncology. Actually major advances have been achieved over the past decades. We permanently improve our knowledge of the biological signature of head and neck malignancies. Functional imaging is getting a major role in diagnosis as well as in treatment monitoring. The surgical armamentarium is permanently increasing from minimally invasive surgery to sophisticated reconstructive techniques after large resections . New radiotherapy technologies (IRMT, tomotherapy, cyberknife, hadrontherapy etc) allow highly precise irradiation reducing tremendously the irradiation of surrounding tissues. The recent developments in medical oncology in particular with new chemotherapy regimens and with molecular targeted therapies provide new treatment options for the initial treatment and for recurrent diseases as well. All these new tools have open a new era in head and neck cancer management shifting many paradigms. More than ever multidisciplinarity is a key for clinical decision when treating a patient or when designing research programs.

The 4th World conference aims to provide a picture of these recent changes and improvements in head and neck cancer patients care. The Scientific Committee has prepared an impressive program providing a large and detailed overview of the state of the art.

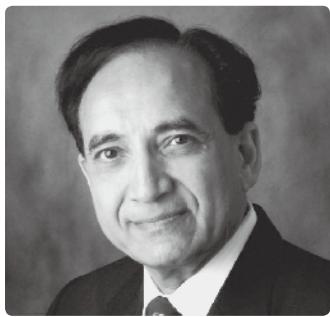
Enjoy the meeting and enjoy your stay in Seoul.



**Jean Louis LeFebvre**  
IFHNOS 2010 Director

## Welcome Message

### **From Founder of IFHNOS**



Dear Colleagues,

On behalf of the Officers and Councilors, I welcome you to Seoul, for the 4th World Congress of the International Federation of Head and Neck Oncologic Societies. This congress has proven to be yet another most successful educational event, with scientific contributions from around the globe. Each successive World Congress of IFHNOS has built upon the strength of the previous congresses, and this congress will prove to be the biggest so far.

This scientific assembly has gathered experts and specialists from all continents of the world, who will share their expertise, knowledge and new discoveries, thru keynote addresses, panel discussions and symposia with the attendees. Similarly, young and established clinicians and research scientists will present their most important works as podium presentations and posters, giving you a comprehensive coverage of the state of the art and science in the field of Head and Neck Surgery and Oncology.

The Congress this week will offer an opportunity to renew old friendships, make new friends, and foster camaraderie amongst physicians, scientists and allied specialists in the field of Head and Neck Oncology. Our Industry partners have supported this congress with enthusiasm and vigor, and will exhibit the newest technologies in our specialty.

Our hosts in Seoul, deserve our sincere appreciation for organizing a congress full of scientific contents and social activities, in this beautiful city. My heartiest welcome to each and every one of you.

A handwritten signature in black ink, appearing to read "Jatin P. Shah".

**Jatin P. Shah, MD, PhD (Hon.) FACS,  
(Hon.) FRCS, (Edin), Hon. FRACS, Hon. FDSRCS (Lond)**

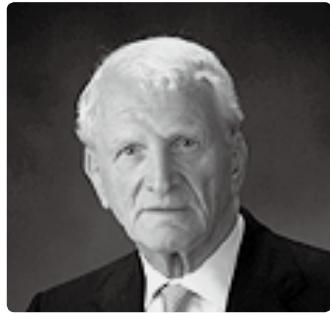
Professor of Surgery, Cornell University,  
EW Strong Chair in Head and Neck Oncology,  
Chief, Head and Neck Service  
Memorial Sloan-Kettering Cancer Center  
New York, USA

## Welcome Message

### **From Guest of Honor of IFHNOS 2010 Seoul**

Dear Colleagues,

Being the Guest of Honor for the 4th World Congress of the International Federation of Head and Neck Societies is thrilling in several ways and I thank the Organizing Committee for the honor. Over the years I have watched IFNOS develop from a concept into an important and prestigious organization so that being invited to be the Guest of Honor is a generous and unforgettable gesture on the part of my colleagues. The fact that the Congress is being held in Korea has special meaning to me because of the unique relationship we have with our Korean colleagues and friends. Many Korean doctors have studied in our Department at the University of Pittsburgh both in laboratory science and clinical areas especially Head and Neck and Cranial Base Surgery. Of course, we are very proud of these young academically oriented physicians, many of whom have joined the faculty of medical schools in Korea and have established successful academic careers.



I congratulate the Organizing Committee on their very creative Scientific Program with the theme of "Shifting Paradigms in Head and Neck Oncology". This information rich and stimulating program will introduce interesting new operative techniques, as well as non-operative treatments of head and neck cancer, many of which will be the products of scientific research in molecular biology. We are fortunate to have the opportunity to participate in this professionally and socially enriching program.

**Eugene N. Myers, M.D., FACS, FRCS Edin (Hon)**

Distinguished Professor and Emeritus Chair  
University of Pittsburgh School of Medicine

## Organizations

### IFHNOS



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Jean Louis Lefebvre



**Secretary General**  
William I. Wei



**Founder and CEO**  
Jatin Shah



**Treasurer**  
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**Vice President**  
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Chung-Hwan Baek



**Scientific  
Program Chair**  
Young Soo Rho



**Scientific  
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Kwan Ho Jo	Kyung Won Min	
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Jonas T. Johnson (Pittsburgh, USA)		

## Scientific Program

Wednesday, June 16

Time	CBR I+II	CBR III	SBR I	SBR II	SBR III	SBR IV
07:00-08:00			<b>Instruction Course 1</b> Surgery for Malignant Parotid Tumors	<b>Instruction Course 2</b> Shifting Paradigms - Can Sentinel Lymph Node Mapping be Standard of Care in Head and Neck?	<b>Instruction Course 3</b> Maxillary Swing Approach to Central Skull Base	<b>Instruction Course 4</b> The Integration of Chemotherapy in the Treatment of Locally Advanced Head and Neck Cancer
08:00-09:00	<b>Opening Ceremony</b>					
09:00-09:40	<b>Founder's Address</b> The Changing Nature of Our Specialty <u>Jatin Shah (USA)</u>					
09:40-10:00			<b>Coffee Break</b>			
10:00-10:40	<b>KSHNO Lecture</b> Novel Nanotechnology Based Therapeutics: An Emerging Treatment Modality for Head and Neck Cancer <u>Dong moon Shin (USA)</u>					
10:40-11:20	<b>Jatin Shah Lecture</b> Training of Head and Neck Surgeons; Shaping a Global Strategy <u>Jesus E. Medina (USA)</u>					
11:20-11:35						
11:35-13:00	<b>Luncheon Symposium</b> (MERCK Serono)			<b>Lunch</b>		<b>Brazilian Society Symposium</b> Difficult Decisions in Head and Neck Surgery in 2010
13:00-14:30	<b>P01</b> Human Papilloma Virus	<b>P02</b> Lymphoma in H&N	<b>001</b> QOL & Supportive Care (I)	<b>002</b> Imaging (I): PET	<b>003</b> Sarcoma / Melanoma / Others	<b>004</b> Surgery (I) : Conservation Laryngeal Surgery
14:30-16:00	<b>P03</b> Robotic Surgery in H&N Cancer	<b>P04</b> Precision Radiation Therapy for H&N Cancer	<b>005</b> Chemoradiation (I)	<b>006</b> Surgery (I), Larynx	<b>007</b> Basic Science (II) : Human Papilloma Virus / Others	<b>008</b> Reconstruction (I)
16:00-16:30	<b>Coffee Break</b>					
16:30-18:00	<b>P05</b> Targeted Therapy in H&N Cancer : Where are We?	<b>P06</b> Reconstruction in H&N Surgery: Aesthetic and Functional Perspectives		<b>009</b> Surgery (III) : Neck Metastases	<b>010</b> Basic Science (II) : P53 / Others	<b>011</b> Surgery (IV) : Larynx / Hypopharynx

**K:** Keynote Lectures   **P:** Panels / Symposia   **O:** Proffered Papers   **T:** Posters   **IC:** Instruction Courses

## Scientific Program

Thursday, June 17

Time	CBR I+II	CBR III	SBR I	SBR II	SBR III	SBR IV
07:00-08:00	<b>Instruction Course 5</b> Deep Lobe Parotidectomy- Indications and Technique	<b>Instruction Course 6</b> Transoral Laser Microsurgery for Laryngeal Carcinoma	<b>Instruction Course 7</b> Quality of Life in Head and Neck Cancer	<b>Instruction Course 8</b> Radiation Induced Oral Mucositis	<b>Instruction Course 9</b> Functional Palato-Maxillary Reconstruction	<b>Instruction Course 10</b> Positron Emission Tomography (PET) in Head and Neck Cancer Patients: What are the Indications?
08:00-09:30	<b>P07</b> <b>Christopher O'Brien Memorial Symposium:</b> Cutaneous Malignancy of the Head and Neck	<b>P08</b> Clinical Relevance of Concurrent Chemoradiotherapy	<b>O12</b> Reconstruction (II) : Free Flap	<b>O13</b> Salivary Gland	<b>O14</b> Imaging (II) : CT / PET	<b>O15</b> Oral Cavity (I)
09:30-10:00	<b>Coffee Break</b>					
10:00-10:20	<b>Guest of Honor's Address</b> The Role of the Head and Neck Surgeon in the Era of Chemoradiation <u>Eugene N. Myers (USA)</u>					
10:20-11:00	<b>Keynote Lecture 1</b> Management of Recurrent and/or Metastatic SCCHN <u>Jan Baptist Vermorken (Belgium)</u>					
11:00-11:40	<b>Keynote Lecture 2</b> Surgical Strategy for Removing Skull Base <u>Tumor Seiji Kishimoto (Japan)</u>					
11:40-12:20	<b>Keynote Lecture 3</b> Development of ICF Core Sets for Head and Neck Cancer- An Application of WHO's International Classification of Functioning, Disability and Health <u>Uta Tschiesner (Germany)</u>					
12:20-13:50						<b>Luncheon Symposium (Pharmalink)</b>
13:50-15:20	<b>P09</b> Revisiting Induction Chemotherapy	<b>P10</b> Recent Trends in Skull Base Surgery	<b>O16</b> Oral Cavity (II) : Neck / Others	<b>O17</b> Reconstruction (III)	<b>O18</b> Basic Science (III)	<b>O19</b> Oropharynx
15:20-15:50	<b>Coffee Break</b>					
15:50-17:20	<b>P11</b> Recent Progress in Management of Neck	<b>P12</b> Functional Outcome and QOL	<b>O20</b> Clinical (I) : Others	<b>O21</b> Nose & Paranasal	<b>O22</b> Clinical (II) : Others	<b>O23</b> Chemoradiation (II)
17:20-18:20			<b>Instruction Course 11</b> The Role of Partial Laryngectomy for Function Preservation	<b>Instruction Course 12</b> Comprehensive Management of Tongue Cancer	<b>Instruction Course 13</b> Recent Advances in Postlaryngectomy Comprehensive Rehabilitation	<b>Instruction Course 14</b> Comprehensive Management of Parotid Neoplasms
19:00-22:00	Gala Dinner					

**K:** Keynote Lectures   **P:** Panels / Symposia   **O:** Proffered Papers   **T:** Posters   **IC:** Instruction Courses

## Scientific Program

Friday, June 18

Time	CBR I+II	CBR III	SBR I	SBR II	SBR III	SBR IV
07:00-08:00	<b>Instruction Course 16</b> Risk Adapted Surgical Strategy for Cancer of the Thyroid Gland	<b>Instruction Course 17</b> Radiation Oncology of Head and Neck Cancer: The State and Reality of the Science	<b>Instruction Course 18</b> Optimal Treatment of Medullary Thyroid Carcinoma	<b>Instruction Course 19</b> Organ/Function Preservation by Interdisciplinary (Surgery +Brachytherapy) Approach in HNSCC	<b>Instruction Course 20</b> Thyroid Nodule Guidelines : Ultrasound and FNA	<b>Instruction Course 21</b> Endoscopic & Robotic Thyroidectomy
08:00-09:30	<b>P13</b> Salivary Gland Cancer	<b>P14</b> Molecular Biology in H&N Cancer	<b>O24</b> Reconstruction (IV)	<b>O25</b> Chemoradiation (III)	<b>O26</b> QOL & Supportive Care (II)	<b>O27</b> Thyroid Gland (I) : Node
09:30-10:00	<b>Coffee Break</b>					
10:00-10:40	<b>Keynote Lecture 4</b> Interrogation of Gene Expression Levels Using RNA Extracted from Formalin Fixed Paraffin Embedded Tissue Blocks <u>Soonmyung Paik (Korea)</u>					
10:40-11:20	<b>Keynote Lecture 5</b> How to Minimize Complications in Thyroid Surgery <u>Claudio Roberto Cernea (Brazil)</u>					
11:20-12:00	<b>Keynote Lecture 6</b> Evidence-based Treatment of Pharyngo-laryngeal Cancers <u>Vincent Grégoire (Belgium)</u>					
12:00-13:30	<b>Luncheon Symposium</b> (J&J)					<b>Indian Society Symposium</b> Symposia on Oral cancer
13:30-15:00	<b>P15</b> Recurrent Larynx Cancer	<b>P16</b> Oropharynx	<b>O28</b> Clinical (III) : Others	<b>O29</b> Radiotherapy (I) : Sequelae / Others	<b>O30</b> Basic Science (IV) : Thyroid	<b>O31</b> Thyroid (II) : Endoscopy / Robot
15:00-15:30	<b>Coffee Break</b>					
15:30-17:00	<b>P17</b> Advanced Oral Cavity Cancer	<b>P18</b> Thyroid Cancer: What's New?	<b>O32</b> Thyroid (III)	<b>O33</b> Skull Base	<b>O34</b> Reconstruction (V)	<b>O35</b> Thyroid (IV)
17:00-18:00	<b>Instruction Course 21</b> Management of the Neck in Thyroid Cancer	<b>Instruction Course 22</b> Changing Views in the Application of Neck Dissection	<b>Instruction Course 23</b> Management of Advanced Thyroid Cancer- the Multidisciplinary Approach	<b>Instruction Course 24</b> Thyroid Surgery with the Application of Neuromonitoring	<b>Instruction Course 25</b> Management of Papillary Thyroid Cancer	<b>Instruction Course 26</b> Robotic Thyroid Surgery

**K:** Keynote Lectures    **P:** Panels / Symposia    **O:** Proffered Papers    **T:** Posters    **IC:** Instruction Courses

## Scientific Program

Saturday, June 19

Time	CBR I+II	CBR III	SBR I	SBR II	SBR III	SBR IV
07:00-07:40	<b>Instruction Course 27</b> Larynx Preservation	<b>Instruction Course 28</b> Ablative and Reconstructive Surgery for Difficult Parotid Salivary Gland Carcinoma	<b>Instruction Course 29</b> Posterior Tibial Flap for Head and Neck Reconstruction	<b>Instruction Course 30</b> Biostatistics in Designing Clinical Trials for Head and Neck Cancer	<b>Instruction Course 31</b> Nasopharyngectomy Open vs Endoscopic	<b>Instruction Course 32</b> Practical Technique of TORS in Head and Neck Cancer
07:40-08:20	<b>Instruction Course 33</b> Selective Neck Dissection	<b>Instruction Course 34</b> Harmonic Scalpel Technology for Head Neck Surgery	<b>Instruction Course 35</b> Overview of Apoptosis Detection Methods in Head and Neck Tumors	<b>Instruction Course 36</b> Advanced Endoscopy: Narrowband World	<b>Instruction Course 37</b> Management of Nasopharyngeal Cancer	<b>Instruction Course 38</b> Targeted Therapeutics and Immunotherapy of Head and Neck Cancer
08:20-09:05	<b>P19</b> Sinonasal Malignancy	<b>P20</b> Approaches to Residual/ Recurrent Neck	<b>O36</b> Radiotherapy (II) : New Technology	<b>O37</b> Basic Science (V)	<b>O38</b> QOL & Supportive Care (III)	<b>Instruction Course 39</b> Stapler Use in Total Laryngectomy and Voice Rehabilitation
09:05-09:50						<b>Instruction Course 40</b> Management of the N0 Neck in Head and Neck Cancer
09:50-10:20	<b>Coffee Break</b>					
10:20-11:00	<b>Keynote Lecture 7</b> Complete Rehabilitation after Segmental Resection of the Mandible and the Maxilla <u>Fu-Chan Wei (Taiwan)</u>					
11:00-11:40	<b>Keynote Lecture 8</b> Personalizing Approaches to the Treatment of Head and Neck Cancer <u>Jeffrey N. Myers (USA)</u>					
11:40-12:10	<b>Closing Ceremony</b>					

**K:** Keynote Lectures   **P:** Panels / Symposia   **O:** Proffered Papers   **T:** Posters   **IC:** Instruction Courses

## Wednesday, June 16

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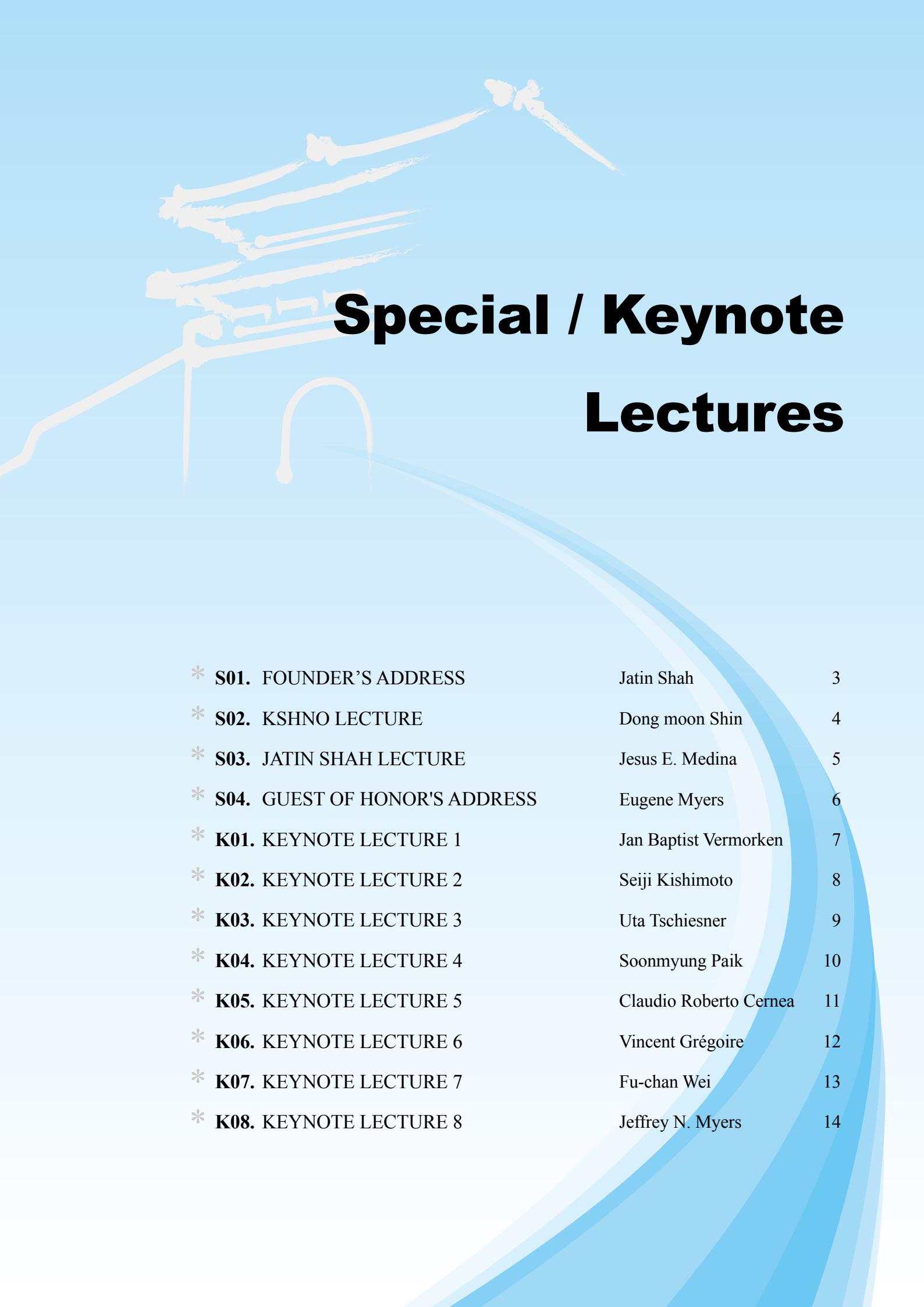
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# **Special / Keynote**

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## S01. FOUNDER'S ADDRESS

Chair : Chung-Hwan Baek (Korea)

09:00 - 09:40 CBR I + II + III

### The Changing Nature of Our Specialty

**Jatin Shah**

*Head and Neck Surgery, Memorial Sloan Kettering Cancer Center, USA*



**S02. KSHNO LECTURE****Chair : Kwang Hyun Kim (Korea)**

10:00 - 10:40 CBR I + II + III

## **Novel Nanotechnology Based Therapeutics: An Emerging Treatment Modality for Head and Neck Cancer**

**Dong moon Shin***Hematology and Medical Oncology, Emory University, USA*

Frequent challenges encountered by cytotoxic cancer drug delivery include non-specific systemic distribution, inadequate concentrations reaching the tumor cells, limited ability to monitor therapeutic responses and dose limiting toxicity. Introduction of nanotechnology-based drug delivery will potentially address such limitations of drug therapy. Therapeutic nanoparticles (TNPs) are particles that are comprised of therapeutic entities such as small molecule drugs, peptides, proteins and nucleic acids, assembled with carriers such as lipids, polymers, micelles and others to form nanoparticles. Such TNPs can have an enhanced anti-cancer effect compared with free-forms of drugs. This is due to their more specific targeting to tumor tissues through improved pharmacokinetics, pharmacodynamics and active intracellular delivery. It is thought that the diameter of TNPs for delivery to cancers should be in the range of 10 to 100 nm. TNPs can be delivered by either passive or active targeting, the latter requiring the addition of targeting ligands that provide specific nanoparticle-cell surface interaction and can play a critical role in the ultimate location of the nanoparticles. For instance, nanoparticles can be targeted to cancer cells if their surface contains moieties such as small molecules, peptides, proteins or antibodies that are able to bind with cancer cell surface receptor proteins, such as transferrin receptor, folate receptor, EGFR, interleukin-2 and others. Other unknown tumor-specific targeting ligands are yet to be discovered. There are also numerous efforts focused on combining imaging and therapeutic agents within the same nanoparticle. This simultaneous approach to imaging-therapy combination would allow personalized medicine in the sense that treatment does not have to occur until the target is known to exist in the patient. Also, follow-up imaging can be performed to verify that the target has been reached and that therapy is working. There is no doubt that TNPs with increasing multifunctionality will exist in the future. Although many challenges exist for the translation of nanoparticles that are currently research tools into approved products, we believe their potential advantages should drive their successful development, and the continuing emergence of a new class of anti-cancer therapies for patients.

**Keywords:** Nanotherapeutics, Drug Delivery, Head & Neck Cancer

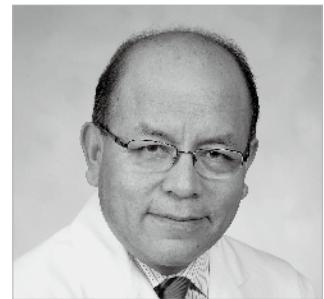
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**S03. JATIN SHAH LECTURE****Chair : Jean Louis Lefebvre (France)**

10:40 - 11:20 CBR I + II + III

**Training of Head and Neck Surgeons: Shaping A Global Strategy****Jesus E. Medina***Department of Otorhinolaryngology, University of Oklahoma Health Sciences Center, USA*

The premise of this Lecture is that it is necessary and timely to examine the training of Head and Neck surgeons as an international, global concern. This is a topic fitting for the Jatin Shah Lecture because of Dr. Shah's long lasting and well known interest and commitment to foster an international, global community of head and neck surgeons. It is also fitting because of the increasing global awareness epitomized by this gathering of head and neck surgeons from around the world. After presenting a discussion of the needs, attitudes and the new knowledge and skills our trainees are likely to face in the future, this address will outline what might be the beginning of a global strategy to address them.

**Keywords:** Head and Neck Surgery**Contact Information** Jesus E. Medina ([jesus-medina@ouhsc.edu](mailto:jesus-medina@ouhsc.edu))

Thursday, June 17

## S04. GUEST OF HONOR'S ADDRESS

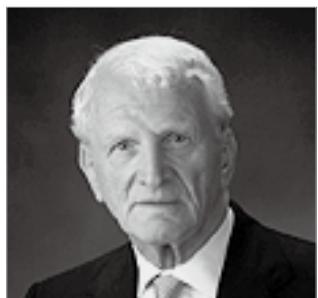
Chair : Kwang Hyun Kim (Korea)

10:00 - 10:20 CBR I + II + III

### The Role of the Head and Neck Surgeon in the Era of Chemoradiation

**Eugene Myers**

*Department of Otolaryngology, University of Pittsburgh School of Medicine and Medical Center, USA*



There are now more than 500,000 cases of cancer of the head and neck each year worldwide. Cancer of the head and neck has a high mortality rate and a significant impact on quality of life both in form and function. Surgical techniques for managing cancer of the head and neck were developed earlier than radiation therapy so that surgical management of cancer of the head and neck was used exclusively for many years.

The widespread use of chemoradiation began with the Veterans Affairs Laryngeal Cancer Study Group which demonstrated that the cure rate was the same whether the patient was treated with total laryngectomy followed by radiation or with induction chemotherapy followed by radiation. However, those patients treated with chemoradiation kept their voice.

Organ sparing nonsurgical treatment is now popular for laryngeal, hypopharyngeal, oropharyngeal and nasopharyngeal squamous cell carcinoma. The role of the Head and Neck Surgeon is to be the leader of the multidisciplinary treating team and to treat surgically patients who have early cancer of the larynx and oropharynx and all patients with cancer of the oral cavity. Patients with T4 cancer of the larynx with cartilage invasion are more likely to be cured with primary surgery. Since two thirds of the patients treated with organ sparing protocols are cured, the remaining one third will require salvage surgery. The same is necessary for hypopharyngeal and oropharyngeal cancer which is less amenable to cure with nonsurgical treatment. Patients with recurrence in the neck will require salvage neck dissection.

**Contact Information** Eugene N. Myers (myersen@upmc.edu)

**K01. KEYNOTE LECTURE 1****Chair : Jae Kyung Noh (Korea)**

10:20 - 11:00 CBR I + II + III

## **Management of Recurrent and/or Metastatic Squamous Cell Carcinoma of the Head and Neck (R/M- SCCHN)**

**Jan Baptist Vermorken***Department of Medical Oncology, Antwerp University Hospital, Edegem, Belgium*

Over 50% of newly diagnosed cases of SCCHN are not cured and will relapse locoregionally or at distant sites; 10% of newly diagnosed cases present with distant metastases. Once the disease has relapsed only a minority (10-15%) can be treated with salvage surgery or re-irradiation. All the others are candidates for either only best supportive care, or in addition, single agent chemotherapy or platinum-based combinations. The most extensively studied single agent is methotrexate and none of the newer single agents has outperformed that agent. Platinum-based combinations (cisplatin/5-FU [PF] being the gold standard) induce significantly more responses than single agents, at the cost of more toxicity, but with no significant impact on survival. Treatment selection is based on prior treatment, treatment interval, performance status, co-morbidities, patients' preferences and logistics.

Several biological therapies have been studied in head and neck cancer patients because of their different mechanism of action, greater selectivity and different toxicity profile. Targets of interest include growth factors and their receptors, extracellular matrix/angiogenic pathways, signal transduction pathways, cell survival pathways and protein production. Sofar, the only drug that has changed practice in R/M-SCCHN is cetuximab, a human-murine chimeric immunoglobulin G1 monoclonal antibody, which competitively binds to the extracellular domain of the Epidermal growth Factor Receptor (EGFR) and in addition has an immunologic effect . It has shown activity as a single agent in second line in platinum-refractory disease and for the first time survival benefit in the first-line setting when combined with PF in a direct comparison with PF alone. In that study, progression-free survival, response rate and disease control rate were all significantly improved also without excessive toxicity and no deterioration of quality of life.

Data from randomized trials with other monoclonal antibodies against EGFR, such as panitumumab and zalutumumab are expected this year. Moreover, a flux of other biological agents are becoming available to be tested either alone or in combination. This is a rapidly changing field.



**Contact Information** Jan Baptist Vermorken (jan.b.vermorken@uza.be)

**K02. KEYNOTE LECTURE 2****Chair : Young Soo Rho (Korea)**

11:00 - 11:40 CBR I + II + III

**Surgical Strategy for Removing Skull Base Tumours****Seiji Kishimoto***Department of Head and Neck Surgery, Tokyo Medical and Dental University, Japan*

The inferior aspect of the skull base, including the nose, paranasal sinus, nasopharynx, clivus, parapharyngeal spaces and infratemporal fossae, is located in the central part of the skull and is composed of many essential and complicated structures. Therefore, craniofacial approaches for extirpation of benign or malignant tumours involving these areas are difficult and sometimes result in severe cosmetic and functional problems.

Until now, numerous surgical approaches have been proposed for the central part of the skull. However, little attention has been paid to comparisons of these approaches. Furthermore, the indications and limitations of each approach have not yet been clarified.

To determine the most suitable surgical approach for individual patients with skull base tumours, we reviewed various surgical procedures for the removal of skull base tumours.

These surgical approaches are classified into two categories, namely incision of the skin and/or mucous membrane and osteotomy of the facial skeleton. Several possible combinations of these two procedures are considered prior to surgery. Then, the most appropriate combination is used for the patients taking various factors into consideration, such as pathologies, location, complications, age and social status of such patients.

A representative sample of possible skin procedures includes the following: coronal skin incision, lateral rhinotomy incision, Weber-Ferguson incision, facial dismasking flap, midfacial degloving and preauricular incision. Of these, the facial dismasking flap method was recently developed at our institute and enables wide exposure of the facial skeleton without leaving a large facial scar.

A representative sample of possible bone procedures includes the following: craniotomy, lateral rhinotomy, maxillectomy, facial translocation, orbitozygomatic approach, Le Fort I osteotomy, maxillary swing and mandibular swing.

Our strategy sheds light on these complicated surgical approaches available for the removal of skull base tumours. We investigated the usefulness of this strategy by using it for patients with skull base tumours for more than 10 years. This strategy also clarifies the merits and demerits of several combinations of surgical procedures, and thus helps select the most appropriate approach for individual patients.

**Keywords:** Skull Base Tumour, Surgical Strategy, Craniofacial Approach

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## K03. KEYNOTE LECTURE 3

Chair : Ernest Weymuller (USA)

11:40 - 12:20 CBR I + II + III

### Development of ICF Core Sets for Head and Neck Cancer- An Application of WHO's International Classification of Functioning, Disability and Health

**Uta Tschiesner**

*Department of Otorhinolaryngology, Head & Neck Surgery, Ludwig Maximilians University, Germany*

Health-related functional outcome and quality of life are frequent outcome measures in head and neck cancer (HNC) clinical trials. There are a variety of thoroughly validated outcome measures available. However, there is a lower degree of standardization and comparability among outcome measures and it seems difficult to fully translate the new insights on patient functioning into clinical routine.

The International Classification of Functioning, Disability and Health (ICF) was adopted by the World Health Organization and provides a useful framework for classifying the components of health and consequences of a disease in a holistic, multidimensional, interdisciplinary understanding and unified language.

The goal of the ICF Core Sets for HNC is to select sets of categories out of the whole classification that can serve as minimal standards for the assessment and documentation of functioning and health of patients with HNC in clinical studies, clinical encounters and multi-professional comprehensive assessment. The ICF Core Sets for HNC have been created in a multi-step, international and interdisciplinary process at two levels: A Brief ICF Core Set to define categories as minimal standards to assess and report on functioning and health in any patient with HNC and a Comprehensive ICF Core Set applicable to multi-disciplinary assessment.

The talk describes the development process for ICF Core sets for HNC, discusses its implications on every-day clinical work and gives an outlook on present activities to implement the Core Set in clinical, multi-disciplinary decision-making.

**Keywords:** Health-Related Quality of Life, Outcome Assessment

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**K04. KEYNOTE LECTURE 4****Chair : Euy Young Soh (Korea)**

10:00 - 10:40 CBR I + II + III

## **Interrogation of Gene Expression Levels Using RNA Extracted from Formalin Fixed Paraffin Embedded Tissue Blocks**

**Soonmyung Paik***Samsung Cancer Research Institute, Samsung Medical Center, Korea*

RNA extracted from formalin fixed paraffin embedded tissue blocks is heavily fragmented and chemically modified and therefore is not an ideal starting material for gene expression profiling studies. Usual methods for RNA expression profiling starts with cDNA synthesis using polyA as a template. Therefore resulting cDNA is often too short for downstream application.

This limitation can be overcome with several different approaches.

For transcriptome level interrogation for discovery, we have adopted Transplex whole transcriptome amplification method with sequential hybridization to two microarrays to overcome the problem of RNA fragmentation. Using this method, any microarray platform

can be used. We have used this method to successfully identify genes predictive of targeted therapies as well as prognostic genes in breast and colon cancer. WG-DASL assay from Illumina is a variation of whole transcriptome amplification method that works with fragmented RNA from formalin fixed paraffin embedded tissue blocks. More recently methods for transcriptome sequencing has been described.

For validation and clinical development of discovered genes, real time quantitative RT-PCR can be performed after synthesizing gene specific cDNA using gene specific primers for reverse transcription. This approach was used successfully to develop a first multi-gene based prognostic assay for breast cancer (OncotypeDx) which is now widely used in USA. QRT-PCR assay is limited by the number of genes that can be assayed. While studies involving screening of as many as 750 genes have been attempted, such studies require hefty financial resources and not practical.

nCounter assay is a novel non-enzyme based approach to interrogate as many as 500 genes in a single tube reaction. Since it does not require cDNA synthesis and almost completely automated, it shows a great promise as a clinical assay platform. However, a lot to lot variation of reagent synthesis needs to be resolved before nCounter assay can become a clinical platform.

In conclusion, it is now possible to interrogate gene expression levels of whole transcriptome using RNA extracted from formalin fixed paraffin embedded tissue with relative ease.

**Keywords:** Gene Expression, Formalin Fixed Paraffin Embedded Tissue, Microarray

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## K05. KEYNOTE LECTURE 5

Chair : Ashok Shaha (USA)

10:40 - 11:20 CBR I + II + III

### How to Minimize Complications in Thyroid Surgery

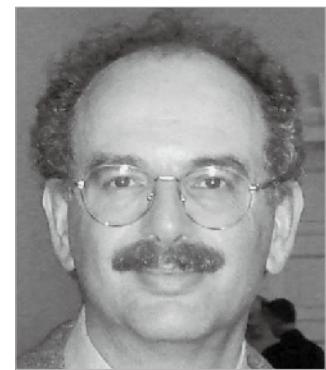
**Claudio Roberto Cernea**

*Department of Head and Neck Surgery, University of Sao Paulo Medical School, Brazil*

The technical principles of thyroid surgery have remained essentially unchanged since the advent of the procedure. On the other hand, the complication rates have been dramatically reduced to a very safe level. The main complications that can occur during or after a thyroidectomy are upper airway obstruction, non-esthetic scars, injuries to the laryngeal nerves, and hypoparathyroidism.

Upper airway obstruction may occur due to very large goiter, postoperative bilateral vocal fold paralysis, and hematoma. Intraoperatively, meticulous hemostasis is important to avoid hematoma, and it is imperative to secure adequate airway in rare instances where hematoma is detected. Non-esthetic scars can be minimized by placing the incision on a natural neck crease. In order to preserve the recurrent laryngeal nerves during surgery, the surgeon must be aware of the possible anatomic variations of the important structures adjacent to the thyroid gland. Special attention should be paid when operating near the Berry's ligament. Possibility of non-recurrent nerve should always be considered. A nerve monitor may be utilized for this purpose. Careful attention not to damage the external branch of the superior laryngeal nerve is especially important in voice professionals. Care should also be taken to preserve the parathyroid glands and its vitality must be checked intraoperatively. The possibility of an intra-thyroidal parathyroid gland must always be kept in mind. Calcium supplementation may be considered for all patients.

Thyroidectomy is a rather safe operation, as long as rigid technical principles are followed. In order to keep the complication rate in very low levels, it is essential to have a complete anatomic knowledge not only of the normal anatomy of the central visceral compartment of the neck, but also of the common variations of the laryngeal nerves and the position of the parathyroid glands. Also, it is of paramount importance to perform very careful hemostasis during the operation. Finally, the surgeon must be able to handle an eventual complication quickly and effectively, because some of them, like postoperative hematomas and bilateral vocal fold paralysis, are potentially life-threatening.



**Keywords:** Thyroid Surgery, Thyroidectomy, Complication

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**K06. KEYNOTE LECTURE 6****Chair : Kwan Ho Cho (Korea)**

11:20 - 12:00 CBR I + II + III

## **Evidence-Based Treatment with Radiation for Pharyngo-Laryngeal Squamous Cell Carcinoma: Where Are We Heading for?**

**Vincent Grégoire**

*Radiation Oncology Department, Université Catholique de Louvain, Belgium*



Over the last decade, tremendous improvements-validated with level 1-2 evidence- have been made in the non-surgical treatments of head and neck squamous cell carcinoma (HNSCC). The use of IMRT allowing a more conformed and tailored dose distribution has translated into improved tumor control and/or decrease treatment morbidity especially for xerostomia. The use of concomitant chemotherapy or targeted agents such as the inhibitors of EGFR has also resulted into significant improvements in loco-regional control probability translating into improvement in survival. Better systemic treatments have also been shown to translate into survival improvement for patients with recurrent or metastatic disease.

In this framework, the future of head and neck clinical research for non-metastatic patients will mainly focus on 4 directions. 1) progresses in target volume definition using biological imaging combined with IMRT could potentially allow further refinements in dose distribution allowing in turn dose escalation; 2) better integration between targeted agents and chemotherapy used concomitantly to radiotherapy could allow further improvement in loco-regional control translating into better survival; 3) molecular identification of subgroups of patients (e.g. HPV-positive) could allow more individualized treatments and dose prescription; and 4) better identification of patients that need surgery either as consolidation (e.g. neck dissection after concomitant chemo-radiotherapy) or as early salvage, could also translate into improved survival.

This lecture will summarize the state of the art treatments for non-metastatic HNSCC and elaborate on future clinical research directions aiming at improving overall survival and/or decreasing morbidity.

**Keywords:** Radiation Oncology, Evidence-Based Medicine, Pharyngo-Laryngeal Tumors

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**K07. KEYNOTE LECTURE 7****Chair : Hee Chang Ahn(Korea)**

10:20 - 11:00 CBR I + II + III

**Complete Rehabilitation After Segmental Resection of the Mandible and Maxilla****Fu-chan Wei***Department of Plastic and Reconstructive Surgery, Chang Gung Memorial Hospital, Taiwan*

Segmental mandibular and maxillary defects nowadays, can be effectively reconstructed with vascularized bone graft. Fibula osteoseptocutaneous flap is not only one of the most versatile composite tissue for this particular purpose, but also allow restoration of denture for complete rehabilitation.

This presentation shall highlight techniques related to osteointegration dental implantation in the fibula reconstructed mandible and maxilla either in a secondary setting or as a primary procedure. It shall demonstrate our long-term result.

**Keywords:** Osteointegration Dental Implantation, Fibula Reconstruction**Contact Information** Fu-chan Wei ([jill3355@adm.cgmh.org.tw](mailto:jill3355@adm.cgmh.org.tw))

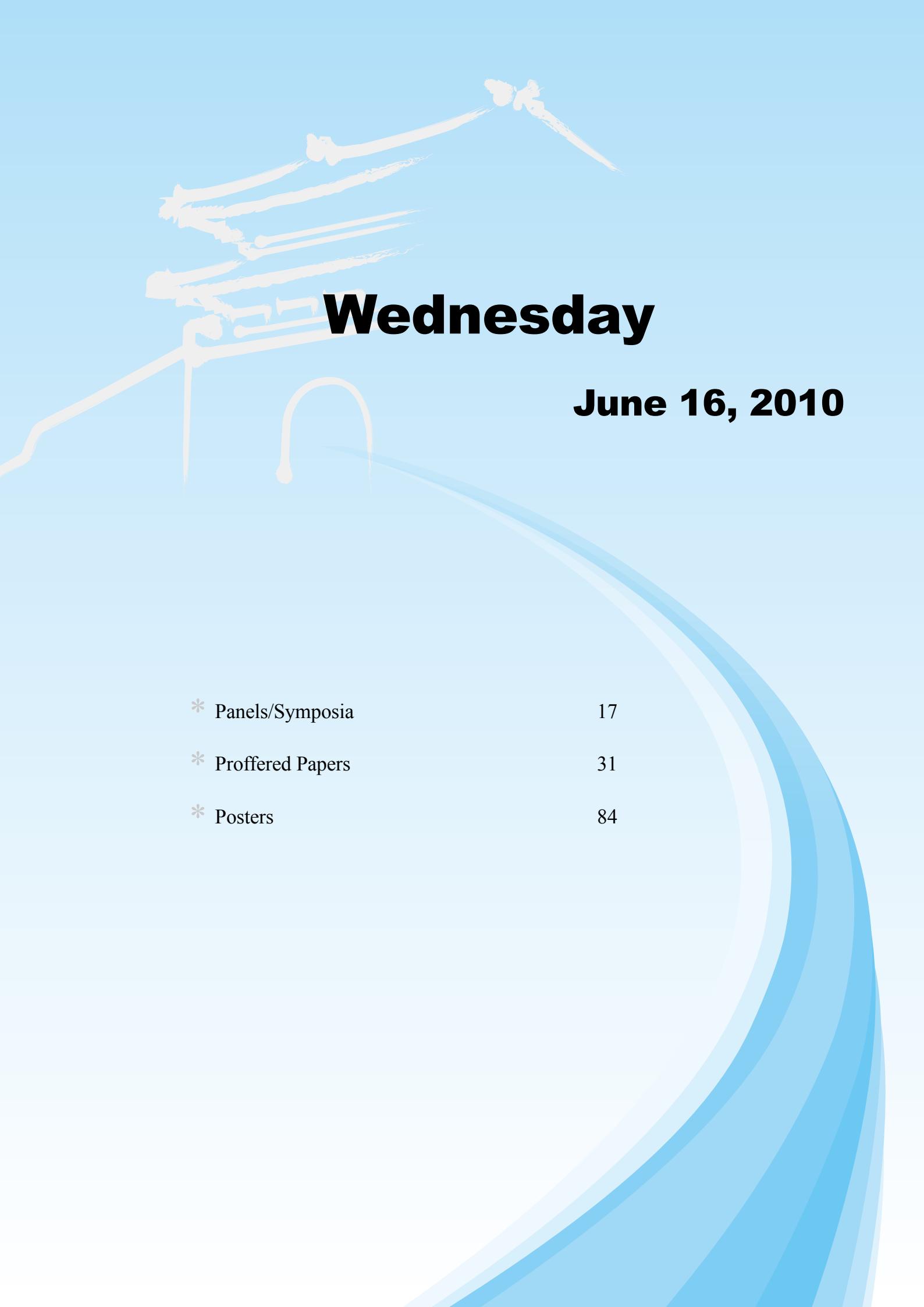
**K08. KEYNOTE LECTURE 8****Chair : Myung-Whun Sung (Korea)**

11:00 - 11:40 CBR I + II + III

**Personalizing Approaches to the Treatment of Head and Neck Cancer****Jeffrey N. Myers***Department of Head and Neck Surgery, M. D. Anderson Cancer Center, USA*

Head and Neck Squamous Cell Carcinoma (HNSCC) is a leading cause of cancer deaths world-wide and the incidence of this tumor type is increasing at some specific sites in the Head and neck. As the molecular pathogenesis of this disease becomes better understood, the opportunity to use specific molecular alterations or biomarkers to determine an individual patient's prognosis and/or likelihood of responding well to a specific treatment regimen becomes an attainable goal. Data from studies of molecular markers in breast cancer and brain tumors indicate that this type of personalized cancer therapy will soon be practiced for certain patients with certain cancer diagnoses. Several biomarkers have been identified for patients with HNSCC to have prognostic/predictive utility, and these markers include the level of expression of the Epidermal Growth Factor Receptor, EGF-R, the expression level of the cell cycle regulator, p16, the mutational status of the p53 tumor suppressor gene, and the presence or absence of DNA for the Human Papilloma Virus, HPV, high risk types 16 or 18. Recent progress in the use of these markers to prognosticate and predict outcomes for HNSCC patients will be summarized and opportunities for further studies needed to make personalized therapy of head and neck cancer a reality will be presented.

**Keywords:** Personalized Cancer Therapy, Biomarker, p53**Contact Information** Jeffrey N. Myers ([jmyers@mdanderson.org](mailto:jmyers@mdanderson.org))



# **Wednesday**

**June 16, 2010**

- |                    |    |
|--------------------|----|
| * Panels/Symposia  | 17 |
| * Proffered Papers | 31 |
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## P01. Human Papilloma Virus

**Chair : Marshall Posner (USA)**

**Moderator : Randal Weber (USA)**

13:00 - 14:30 CBR I + II

[P01-01]

### Changing Epidemiology and Response to Therapy in Advanced Head and Neck Cancer

Thomas Carey

*Otolaryngology - Head and Neck Surgery,  
University of Michigan, USA*

Evaluate incidence of HPV infection in advanced oropharyngeal and nasopharyngeal cancer and illustrate effects of HPV, smoking and biomarkers on response to therapy and outcome.

**Methods:** Evaluation of biomarkers in pretreatment biopsies and assessment of statistically significant associations of biomarkers and patient factors with response to treatment and progression free survival.

**Results:** The incidence of high risk HPV in advanced oropharyngeal cancers in Michigan has increased rapidly over a 15 year interval reaching 90% in the most recent cohort. Additionally, in the most recent cohort, all nasopharyngeal cancers arising in white North American patients were HPV positive and EBV negative. HPV positive oropharynx tumors respond better to treatment and are far less likely to recur than those that are HPV-negative. Elevated EGFR expression in HPV positive oropharynx tumors is associated with a higher risk of death from cancer and is associated with former or current tobacco use. Tobacco use as a single variable is associated with an increased probability of recurrence, second primary or distant metastasis among patients with HPV-positive oropharynx tumors.

**Conclusions:** Our findings are representative of trends being observed in Northern Europe and North America. These observations have led to the conclusion that there are three categories of oropharynx cancers: Low risk HPV positive tumors arising in never smokers; moderate risk HPV positive tumors arising in former or current smokers; and high risk HPV-negative tumors arising in current or former smokers. The recognition that these are three different disease entities has provoked the design of new therapeutic trials involving de-escalation of treatment intensity for the lowest risk HPV-positive tumors, specific targeting of tumor pathways, and selection of alternative treatments for those tumors least likely to respond to organ sparing therapies.

**Keywords:** Oropharynx Cancer, Nasopharynx, Biomarkers

**Contact Information** Thomas Carey (careyte@umich.edu)

[P01-02]

### The Prevalence Rate and Clinical Significance of HPV in Oropharyngeal Cancer

Chih-Yen Chien

*Department of Otolaryngology, Chang Gung Memorial Hospital-Kaohsiung Medical Center, Taiwan*

Squamous cell carcinoma of the head and neck regions (HNSCC) is a common worldwide malignancy. It is usually associated with alcohol and tobacco use. A subset of HNSCC, frequently occurring in young adults without the exposure history of alcohol and tobacco use, has been found to be associated with human papillomavirus (HPV) infection, especially HPV-16. Currently, HPV-positive oropharyngeal cancer could be considered to be sexual transmitted disorder.

In the recent reports, patients with HPV-positive oropharyngeal cancer responded well to treatment and showed good clinical outcomes. Many studies coming from western countries revealed that more than 40% of oropharyngeal cancer contained HPV genomes in the tumor cell nuclei. However, the data of the prevalence rate of HPV in oropharyngeal cancer is limited and remains to be explored in the developing area. The increasing prevalence rate of HPV in oropharyngeal cancer highlights the change of lifestyle in oral sexual behaviors. Furthermore, it might also reflect a higher responsive rate by organ preservation strategy for oropharyngeal cancer. The HPV vaccination strategy may reduce the burden of HPV related head and neck cancer in the future.

**Keywords:** Oropharyngeal Cancer, Human Papillomavirus, Prognosis

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[P01-03]

## Vaccine Strategies for HPV-Associated Head and Neck Cancers

**Sara Pai**

*Otolaryngology-Head and Neck Surgery,  
Johns Hopkins University, USA*

The association between high-risk types of the human papillomavirus (HPV) and a subset of head and neck squamous cell carcinomas (HNSCC) is well established. HPV DNA has been detected in the tumor nuclei of 20-25% of all head and neck cancers and up to 60-70% of those tumors localized to the oropharynx. Since the HPV viral oncoproteins, E6 and E7, are constitutively expressed in HPV-associated cancers, they represent ideal tumor antigens for the development of antigen-specific vaccines. In preclinical studies, we explored the linkage of calreticulin (CRT) to HPV-16 E7 for the development of a therapeutic DNA vaccine. We found that C57BL/6 mice vaccinated with CRT/E7 DNA generated significant levels of E7-specific CD8+ T cell precursors, which translated into robust antitumor immune responses against E7-expressing tumors *in vivo*. This vaccine has also been proved effective against E7-expressing murine tumors with down-regulated Major Histocompatibility Complex (MHC) class I molecules; an important finding, given a significant proportion of advanced stage HNSCC down-regulate MHC class I molecules as a means of immune evasion. Furthermore, we found that the administration of the CRT/E7 DNA vaccine using an intramuscular electroporation DNA vaccine delivery system resulted in enhanced anti-tumor effects, resulting in higher cure rates than that achieved with intramuscular needle injection or intradermal gene gun delivery. We also explored the combination of CRT/E7 DNA vaccination with chemoradiotherapy and found that they acted synergistically to enhance tumor-specific T cell immune responses, as well as enhance anti-tumor effects, resulting in a higher cure rate than either DNA vaccination or chemoradiotherapy alone. These findings have prompted us to investigate whether the administration of CRT/E7 DNA vaccine via electroporation in combination with chemoradiotherapy is safe and able to generate E7-specific CD8+ T cell immune responses in patients with advanced HPV-associated head and neck cancers.

**Keywords:** HPV, Head and Neck Cancer, Immunotherapy

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[P01-04]

## Potential Benefits and Pitfalls of De-Intensification, Including Radiotherapy Alone, for HPV-Associated Oropharyngeal Carcinoma

**Brian O'Sullivan**

*Department of Radiation Oncology and Department of Otolaryngology / Head and Neck Surgery, Princess Margaret Hospital / University of Toronto, Canada*

Patients with HPV-positive oropharyngeal cancer have more favorable outcome compared to differentiated keratinizing squamous cell carcinoma linked to smoking and alcohol. However HPV-positive patients who are smokers may retain some of the adverse profile of more traditional head and neck cancer; in addition HPV-associated oropharyngeal cancers may demonstrate rare behaviors that are atypical for traditional disease (eg brain metastases in addition to lung metastases or unexpected multifocal disease that renders radiotherapy targeting problematic notwithstanding high radiotherapy sensitivity). Examples of these patterns will be shown as evidence that we do not yet understand this disease completely. Retrospective data will also be shown that patients with intermediate stage HPV-positive oropharyngeal cancer (Stages II and III) are readily cured using radiotherapy alone and seem to have a similar outcome, including the same risk of distant metastases, in Stage IV compared to patients treated with chemo-radiotherapy; both approaches also fare much better than traditional keratinizing squamous cell carcinoma. Because of the favorable outcome in the HPV-positive cancers it is appropriate to consider approaches to reduce treatment intensity from conventional approaches. In this context, an emerging contradiction needing reconciliation is that recent randomized trial data involving radiotherapy alone seem to show that HPV-positive patients may still benefit from treatment intensification through altered fractionation. In essence our current state of knowledge is insufficient to permit firm recommendations and it is premature to provide clear guidelines since less intensive treatment may be inferior. Well designed prospective clinical trials are needed that address this group of patients specifically and that include stopping rules to address the potential risk of undertreatment. Correlative biology must also be emphasized for trials that address reduction in intensity. Thus trials that compare chemo-sparing strategies (eg bio-therapy with EGFR inhibition and radiotherapy) vs. chemoradiotherapy are active or in design and may provide clues to intensity reduction when the HPV-associated subset is analyzed separately. Examples of these trials will be discussed in addition to the methodological problems in designing non-inferiority or equivalence trials in a disease setting where prognosis is intrinsically favorable and events are very few.

**Keywords:** Human Papilloma Virus, Radiotherapy, De-intensification

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[P01-05]

## Is There Rational for De-escalation of Therapy in HPV+ Cancers?

**Bhvanesh Singh**

*Memorial Sloan Kettering Cancer Institute, USA*

HPV-associated head and neck squamous cell carcinomas (HNSCC) are divergent in their location, clinical course and response to treatment compared to non-HPV associated. The improved outcome of patients with HPV-associated HNSCC has lead to a consideration for de-escalation of treatment for these tumors. The talk will review the evidence that suggest that HPV-associated tumor have better outcomes and discuss the possibilities for less intensive treatment in these cases.

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**P02. Lymphoma in H&N****Chair : Joel Guigay (France)****Moderator : Vinay Sharma (South Africa)**

13:00 - 14:30 CBR III

[P02-01]

**Therapeutic Approach to Head and Neck Lymphoma****Won Seog Kim***Hematology-Oncology, Samsung Medical Center,  
Korea*

Malignant lymphoma is a heterogeneous group of disease. Each disease pursues different clinical course and prognosis. Therefore, the therapeutic approach should be different according to histologic subtypes and stage.

There are two major categories based on the clinical presentation. Diffuse large B-cell lymphoma(DLBCL), Hodgkin's lymphoma(HL), follicular lymphoma(FL), and nodal marginal lymphoma (N-MZL) are presented as nodal lymphoma in head and neck area which predominantly present with palpable cervical lump. Extranodal NK/T cell lymphoma(ENKL) and MALT lymphoma(MZL) are extra nodal diseases. ENKL usually presents with nasal obstruction. In case of MZL, ocular area is the most common involved site.

Although lymphoma can be detected as stage I or II disease in head and neck area, systemic involvement should be considered. Besides physical examination and routine blood tests, massive staging work-up including CT scan from neck to pelvis, PET/CT and bilateral bone marrow examination should be done to define the exact stage.

Chemotherapy or short course chemotherapy followed by radiation is standard therapy for limited stage DLBCL, HL, and FL. Through these approaches more than 80% of the patients can be cured. Local modality including radiation and surgery can be the best option for localized MZL. For ENKL, early radiation and chemotherapy should be recommended.

Based on the recent publications, through the adequate therapeutic approach, around 80% of the patients can achieve long term survival. Therefore, exact histologic diagnosis and staging work-up is necessary.

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[P02-02]

**Malignant Lymphoma in the Head and Neck Region:  
Diagnostic Approach and Pitfalls****Shih-Sung Chuang\****Pathology, Chi-Mei Medical Center and  
Taipei Medical University, Taiwan*

Head and neck regions are common presenting sites of malignant lymphoma (ML), especially in East Asia where nasal NK/T cell lymphomas are prevalent. Diagnostic approach for ML in these anatomical regions is essentially the same as that for other sites except that clinical parameters are very important for differential diagnoses. Histopathology is the foundation for diagnosis, and we start with low-power examination searching for necrosis, architectural alterations, and growth pattern. Patchy necrosis usually indicates reactive/inflammatory lesions, while coagulative, infarction type necrosis commonly heralds malignant lymphoma. An initial immunohistochemical panel (CD3, CD20, CD21 and Ki67) and detailed high-power examination will determine the additional antibodies to be used. In certain circumstance, ancillary studies such as *in situ* hybridization for Epstein-Barr virus, flow cytometric immunophenotyping, clonality study and fluorescence *in situ* hybridization might be necessary to reach a final diagnosis. There are a few common categories of diagnostic pitfalls including 1) non-hematopoietic lesions mistaken as lymphoma or vice versa, 2) benign lymphoproliferation misdiagnosed as lymphoma, 3) lymphoma with unusual/atypical morphology and/or immunophenotype causing diagnostic challenge, 4) common lymphoma type with unusual clinical presentation. Integration of clinical findings, laboratory and imaging findings, and pathological features with immunophenotyping, and sometimes, molecular data are mandatory to reach a correct diagnosis.

**Keywords:** Lymphoma, Diagnosis, Immunohistochemistry

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[P02-03]

## Hematologist Perspective: Development of Effective Chemotherapeutic Regimens for Extranodal NK/T-cell Lymphoma, Nasal Type

**Ritsuro Suzuki**

*Department of HSCT Data Management, Nagoya University, Japan*

Extranodal NK/T-cell lymphoma, nasal type (ENKL) is mostly endemic to East Asia. It predominantly occurs in the nasal or paranasal areas and less frequently in the skin. Prognosis of ENKL is poorer than that of other types of malignant lymphoma. Although ENKL is sensitive to radiotherapy, it shows less responsiveness to chemotherapeutic agents compared with other lymphomas due to expression of p-glycoprotein. P-glycoprotein actively exports doxorubicin and vincristine, which are the main components of CHOP chemotherapy. Radiotherapy remains effective but cannot prevent recurrence of the disease outside the radiation field. In the era of CHOP chemotherapy the 5-year overall survival rate of limited-stage ENKL was less than 50%. The prognosis of advanced stage extranodal NK/T-cell lymphoma, nasal type, as well as that of aggressive NK-cell leukemia, in this era was dismal, and only a few patients can achieve long-term survival. Therefore, new therapeutic approaches were indeed desired. For limited stage ENKL, concurrent chemo-radiotherapy was a candidate, and has achieved a great success, which was recently reported in Journal of Clinical Oncology as independent articles from Japan and Korea. For advanced stage ENKL, the NK-cell Tumor Study Group (NKTSG) has developed a new combination chemotherapy named SMILE (Steroid=dexamethasone, Methotrexate, Ifosfamide, L-asparaginase and Etoposide). In the SMILE regimen, methotrexate is initially administered on day 1 at a dose of 2,000 mg/m<sup>2</sup>, other 3 agents are used from day 2 to 4 (ifosfamide 1,500 mg/m<sup>2</sup>, etoposide 100 mg/m<sup>2</sup> and dexamethasone 40 mg/body), and L-asparaginase 6,000 IU/m<sup>2</sup> is supplementarily administered every other days from day 8 to day 20 (7 doses). Recent phase II study of SMILE for newly diagnosed stage IV or relapsed/refractory ENKL showed that overall response rate after 2 cycles of SMILE was 74%. In a total of 39 patients enrolled, 15 achieved complete response and 14 achieved partial response. Although the myelosuppressive toxicity was common and 2 patients died of febrile neutropenia, the SMILE regimen was concluded as effective for advanced ENKL. The excellent therapeutic effect of SMILE was resulted from a use of p-glycoprotein independent agents, particularly L-asparaginase, and scheduled use of methotrexate preceding to other drugs. On behalf of the NKTSG, I believe that these concepts are also helpful for the treatment of limited stage ENKL and other T-cell lymphomas. The NKTSG is now conducting a phase II study of SMILE chemotherapy for relapsed/refractory T-cell lymphoma, and planning other SMILE-strategy based clinical trials. This study group consists of researches from Japan, Korea, Hong Kong, Taiwan and mainland China, and is eagerly working on the clinical issues of NK-cell and related T-cell lymphomas. Any clinicians who are interested in these lymphomas are welcomed to participate, and can contact us.

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[P02-04]

## Radiotherapy for Head and Neck Lymphoma

**Dora Kwong**

*Clinical Oncology, The University of Hong Kong, Hong Kong*

The lymphomas are a large and heterogeneous group of disease. Radiotherapy is useful for treatment of both Hodgkin's disease and Non-Hodgkin lymphomas. Radiotherapy treatment for lymphoma has evolved over time. In the 1990s, subtotal lymphoid irradiation or total lymphoid irradiation techniques were standard. With the use of combined modality treatment, lesser extent and dose of radiotherapy was found to be as effective when used with intensive chemotherapy. In the past, mantle irradiation or inverted Y irradiation with anterior-posterior fields were standard. Now involved field or even involved nodal irradiation with conformal radiotherapy is used. Radiation dose used to be 36-44Gy but is now reduced to 20-36Gy and may be customized according to early response to chemotherapy. Precision radiotherapy is used instead of wide field irradiation to reduce normal tissue irradiation. Since lymphoma patients are usually young and have a good chance of survival, late sequel from radiotherapy is a concern and efforts to limit radiation to organs and reduce risk of second malignancy are important. PET scan is increasingly being used to select lymphoma patients for radiotherapy and to delineate radiotherapy fields. FDG-PET is significantly more accurate in both staging and treatment response assessment for both Hodgkin and non-Hodgkin lymphomas than conventional structural imaging. PET scan information is increasingly being incorporated into radiotherapy planning. Interim response assessment by PET scan after 1-3 cycles of chemotherapy will select patients with persistent uptake for more intensive treatment as these patients will have poor prognosis. Baseline PET scans may help determine what sites will require consolidation radiotherapy.

**Keywords:** Lymphoma, Radiotherapy

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## P03. Robotic Surgery in H&N Cancer

**Chair : Ashok Shaha (USA)**

**Moderator : Kerry Olsen (USA)**

14:30 - 16:00 CBR I + II

[P03]

### Robotic Surgery in Head and Neck Cancer

**Ashok Shaha**

*Head and Neck Service, Department. of Surgery,  
Memorial Sloan-Kettering Cancer Center, USA*

There has been a paradigm shift in surgical approaches to tumors of the head and neck. This is directly related to the interest in minimally invasive surgery and application of technology. We have seen the role of minimally invasive surgery in thyroid and parathyroid and skull base surgery.

There is enormous interest in the application of robotic surgery in the head and neck practice. Robotic surgery has already become extremely popular in urologic (prostate) surgery and gynecologic oncologic surgery. It is also finding its way in thoracic surgery. Its application in head and neck tumor management has been explored in recent years. The major application of robotics is in thyroid surgery, mainly transaxillary thyroid surgery popularized in Korea, and management of cancer of the oropharynx, especially cancer of the tonsil and base of the tongue. Resection of base of the tongue, which is technically demanding by mandibulotomy, mandibulectomy, tracheostomy, etc., can essentially be overridden with the use of robotics. Oropharyngeal tumors can be easily resected with robotics and postoperative radiation therapy can be used in selected patients. There is always a controversy as to whether robotic surgery was most helpful or radiation therapy was helpful. However, a randomized prospective trial may be the answer to some of these controversial questions. Robotics is also being tried in advanced recurrent nasopharyngeal tumors where, again, access is a major issue.

Clearly robotic instrumentation will allow head and neck surgeons access in difficult areas. Whether its application will find its way in day-to-day clinical practice remains to be seen. The issue of cost-effectiveness, volume of cases, and training of a surgeon are other important considerations. At this time, robotics represents a technological advance and its clinical application in the head and neck needs to be critically evaluated.

**Keywords:** Robotics, Head and Neck Cancer, Minimally Invasive surgery

**Contact Information** Ashok Shaha ([shahaa@mskcc.org](mailto:shahaa@mskcc.org))

[P03-01]

### Robotic Surgery and Oropharyngeal Cancer: The Indications and Results

**Kerry Olsen**

*Otolaryngology Head and Neck Surgery, Mayo Clinic, USA*

Robotic surgery is a new surgical tool that is now regularly used to augment decades of experience removing oropharyngeal malignancies via the transoral route. Prior excision was done with cold knife and scissors, cautery, or lasers. If basic surgical principles are followed, the oncologic and functional results should be the same regardless of the device used. Transoral removal of oropharyngeal cancer remains an effective procedure, from both an oncologic and functional standpoint. It is also very cost effective. Transoral robotic surgery (TORS), introduces a new surgical modality that does provide superior visualization, rapid safe removal, and improved ability to treat more oropharyngeal tumors than with other surgical modalities.

The ability to resect a tumor in multiple directions can lead to less removal of normal tissue and better functional results. Frozen section pathology is essential. TORS has been used at our institution in more than 150 oropharyngeal cancers. Our current results show no major complications, minimal blood loss, and the performance of a synchronous neck dissection either before or after TORS to maximize vessel isolation and optimize safety. The operator can use either laser or cautery. Single modality treatment is done in about 25% of the cases. Adjunctive therapy is usually reserved for high risk necks. We obtain free surgical margins in all patients.

In our initial group, for which two year follow-up was available, overall survival and local control was 97.7%, average hospitalization was 3.8 days, and no patient had a permanent PEG. Our cases were evenly divided between tonsil and tongue base primary sites.

We believe TORS has enough advantages over other surgical techniques to warrant our continued use in both early and select advanced oropharyngeal neoplasms.

**Keyword:** TORS

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[P03-02]

## Perspectives of Robot Assisted Thyroidectomy in the Management of Thyroid Carcinoma

**Woong Youn Chung**

*Department of Surgery, Yonsei University College of Medicine, Korea*

**Purpose:** With the dexterity of robotics, recent introduction of robotic surgical system have been the most innovative roles in the various surgical area for the promotion of minimally invasive techniques. Robotic technology also has been applied to the thyroid surgery using several approaching routes. We have introduced our novel robotic surgical method for thyroid using gasless, transaxillary approach (TAA) and serially reported technical feasibility and safety. In this study, we will report our experience of consecutive 1000 cases of robotic thyroidectomy and demonstrate its utility in the surgical management of thyroid cancer.

**Patients and Methods:** From Oct. 2007 to Nov. 2009, 1000 patients with well-differentiated thyroid cancer underwent robot-assisted endoscopic thyroid surgery using a gasless TAA. All the patients were selected according to the inclusion criteria after consideration of their risk stratifications. We analyzed the patient's clinico-pathologic characteristics, operation type, operation time, numbers of retrieved L/N, post operative hospital stay, complications, and short-term follow-up results.

**Results:** The mean age of the patients was  $39.1 \pm 9.6$  years (range 15~70) and male to female ratio was 1:12.6 (73:927). Six hundred and twenty-four patients underwent less-than total and 376 underwent bilateral total thyroidectomies. We conducted ipsilateral central compartment node dissection in all cases and lateral neck node dissection in 34 patients additionally. Mean operation time was  $136.7 \pm 44.4$  min. (69~347 min.) and mean post operative hospital stay was  $3.0 \pm 0.45$  days (2~7). There was no serious post operative complication except 3 cases of RLN injury, and 1 Horner syndrome. The mean tumor size was  $0.79 \pm 0.6$  cm and PTMC was in 771 cases (77%). The mean number of retrieved central L/Ns was  $5.04 \pm 3.56$  (1~28) and central neck L/N metastasis occurred in 368 (36.8%) and lateral neck L/N metastasis was in 34 cases (3.4%).

**Conclusions:** Through our enormous experiences, we can conclude that robotic thyroidectomy using a gasless TAA is a feasible, safe, and promising surgical alternative, currently for the selected patients with early thyroid cancer. The inclusion criteria of this technique could be gradually extended to the advanced thyroid cancer with experience and the developments of robotic system or instruments in the near future.

**Keywords:** Robotic Procedure, Well-Differentiated Thyroid Cancer, Gasless, Transaxillary Approach

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[P03-03]

## Transoral Robotic Resection of Recurrent Nasopharyngeal Carcinoma

**William I. Wei**

*Surgery, The University of Hong Kong, China*

For nasopharyngeal carcinoma (NPC), local tumour control rate is high with concomitant chemoradiation. A few patients however still develop recurrence and surgical salvage is the logical option. Various approaches have been described to get an adequate exposure of the nasopharynx for an oncologic resection. All these have external incisions with associated morbidities.

The efficacy of transoral robotic surgery in head and neck cancer has been documented. We have employed the robot to resect a recurrent nasopharyngeal carcinoma.

**Methods:** A 68 years old Chinese female patient developed a recurrent NPC 2 year after radical radiotherapy. Imaging studies showed that tumor in the left posterolateral nasopharynx.

Surgical resection with the Robot was performed under general anaesthesia, the Dingman mouth gag was used. The soft palate was incised in the midline and retracted laterally. The da Vinci surgical robot, model S (Intuitive Surgical Inc., Sunnyvale, CA) was docked from the head end. The  $0^\circ$  dual-channel camera was introduced transorally. The left robotic arm carried the 5 mm Maryland grasping forceps and the right robotic arm carried the 8 mm scissors with monopolar diathermy. The diathermy marked the incision around the tumor and the cut went through mucosa, prevertebral muscle and opening of the Eustachian tube between the two cartilaginous crura. The robotic arm with the dissector lifted soft tissue off bone and the entire tumor was removed en bloc. Frozen section of all margins was free.

**Results:** The whole operation lasted less than 3 hour with minimal blood loss. She resumed oral intake on the 4th postoperative day and was discharged.

The location and size of the recurrent NPC determine the choice of surgical approach. To remove large tumors that extend laterally, the maxillary swing approach nasopharyngectomy should be used. To manage small tumors located in the posterior wall, endoscopic assisted resection is appropriate. For lesions located over the lateral wall, the fossa of Rosenmüller and not extending laterally, transoral robotic surgical resection is applicable. The robot provides extra dexterity and magnified views during resection.

**Keywords:** Robotic, Salvage, Nasopharyngectomy

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[P03-04]

## Robotic Thyroidectomy: The First Step Toward Comprehensive Endoscopic Management of the Neck

**Chris Holsinger**

*Dept of Head & Neck Surgery, UT M D Anderson Cancer Center,  
Unit 1445, USA*

Endoscopic and minimally invasive techniques represent a natural evolution for the discipline of head and neck surgery. Endoscopic head and neck surgery (eHNS) encompasses transoral laser microsurgery, transoral robotic surgery, as well as video-assisted and robotic surgery of the neck and thyroid. In the neck, minimally invasive video-assisted techniques are now an important part of thyroid and parathyroid surgery. More recently, robotic thyroidectomy represents not only a revolutionary new approach to the thyroid, but also a stepping stone to more complex operations of the neck.

Minimally invasive transcervical surgery can trace its origins to the first endoscopic parathyroidectomy performed in 1996. This innovation saw the use of 5mm laparoscopic instruments placed between the platysma and strap muscles in a workspace maintained between the by constant CO<sub>2</sub> insufflation. Following these initial experiences a variety of minimally invasive video-assisted thyroidectomy approaches have evolved. With these techniques the thyroid gland is removed with or without gas insufflation via cervical, anterior chest wall and trans-axillary approaches.

Chung et al. from Seoul have reported on 200 patients that have undergone transaxillary robotic thyroidectomy incorporating the daVinci Surgical System. This convergence of techniques in minimally invasive thyroid surgery and robotics may provide several distinct advantages and unique opportunities for the endoscopic head and neck surgeon.

As the radical neck dissection has been replaced by functional and selective neck dissection without compromising oncologic outcomes, the extent and morbidity of neck dissection has steadily diminished. Authors have proposed minimally invasive endo-robotic and/or endoscopic neck surgery in human cadaver models. But Werner et al. were the first to demonstrate successful management of cervical lymphadenopathy via endoscopic approach for squamous carcinoma in the setting of sentinel lymph node biopsy. Chung and colleagues have already demonstrated the feasibility of robotic neck dissection for well-differentiated thyroid cancer.

With the systemic application of endoscopic and robotic technology to the thyroid, surgical technique for the comprehensive management of the neck will be developed in the next 5 years using robotics.

**Keywords:** Robotic Thyroidectomy, Neck Dissection, Endoscopic Head and Neck Surgery

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[P03-05]

## Transoral Robotic Surgery- Outcomes and Future Directions

**Eric Genden**

*Head and Neck Surgery and Neurosurgery,  
Mount Sinai Medical Center, USA*

**Objectives:** To evaluate the patterns of failure, survival and functional outcomes for patients treated with TORS.

**Methods:** Between 4/07 and 4/09, 153 patients underwent transoral robotic surgery. In this study we prospectively studied 30 patients with head and neck squamous cell carcinoma treated with primary TORS on an IRB approved protocol. Patients were evaluated immediately before treatment, two weeks after treatment and at subsequent 3 month intervals after completing treatment to determine their disease and head and neck-specific functional status using the Performance Status Scale for Head & Neck Cancer (PSS-HN) and the Functional Oral Intake Score (FOIS). Functional scores were compared to matched group of head and neck patients treated with primary chemoradiation (CRT). The TORS patient population included 90% oropharyngeal cancers, 73% stage III-IV, 23% non-smokers. The median age was 59 and the median follow-up was 16 months (range 11 to 36 months).

**Results:** The 18 month locoregional control, distant control, disease-free survival and overall survival were 86%, 93%, 74% and 90% respectively. To date, there have been 2 local failures, 2 distant failure, 1 second primary failure and 1 co-morbid death. Compared to the primary CRT group, TORS was associated with better short term eating ability (72% vs. 53%, *P*=0.004), diet (43% vs. 25%, *P*=0.006) and FIOS score (5.4 vs. 3.3, *P*<0.001) at 2 weeks after completion of treatment. However, at 3, 6, 9 and 12 months both TORS and chemoradiation patients demonstrated similar function outcomes with scores returning baseline within 9 months. No patients were PEG dependant one year post-surgery.

**Conclusions:** Our early experience with that TORS is associated with excellent oncologic and functional outcomes. Further study of this promising approach is warranted.

**Keywords:** Robot, Head and Neck Surgery, Outcomes

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**P04. Precision Radiation Therapy for H&N Cancer****Chair : Kwan Ho Cho (Korea)****Moderator : Kie-Kian Ang (USA)**

14:30 - 16:00 CBR III

[P04-01]

**IMRT for Head and Neck Cancer:  
What It Can, and Can Not, Achieve****Avraham Eisbruch***Department of Radiation Oncology,  
University of Michigan Hospital, USA*

[P04-02]

**Image-Guided Radiotherapy for  
Head and Neck Cancer: Is what you  
plan, what's actually delivered?****Allen Chen***Department of Radiation Oncology, University of California Davis  
Comprehensive Cancer Center, USA*

The development, validation, and translation of image-guided radiotherapy (IGRT) strategies in the radiotherapeutic management of head and neck cancer to clinical practice are occurring rapidly. While IGRT has allowed for changes in tumor position, size, and shape to be measured during the course of treatment, the introduction of this advanced technology has also resulted in many unanswered questions and has introduced new decision-making in the management of head and neck cancer. Although IGRT has the potential to improve tumor control and to reduce the probability of toxicity, the data reporting on its use is still preliminary. Moreover, questions regarding the optimal method and frequency by which IGRT should be applied persist. At the University of California, Davis, School of Medicine, over 200 head and neck cancer patients have been treated with daily IGRT using volumetric imaging for dose verification. The purpose of this review is to familiarize the audience with many of the technical challenges associated with optimizing the use of IGRT in the setting of a busy clinical practice.

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[P04-03]

## The Potential of Integrating Biological Imaging in Radiotherapy

**Dora Kwong**

*Clinical Oncology, The University of Hong Kong, Hong Kong*

Modern radiotherapy like 3-dimensional conformal radiotherapy or intensity modulated radiotherapy requires accurate localization of targets, thus high-quality medical imaging is a pre-requisite for radiotherapy planning. Computed tomography (CT) and magnetic resonance imaging (MRI) are the standard imaging used in diagnosis, staging and radiotherapy planning for head and neck cancers. Both CT and MRI are anatomic imaging. Positron emission tomography (PET) provides a means of non-invasive, *in vivo*, biologic imaging and can be complementary to anatomic imaging. The functional information possibly augments accurate delineation and treatment of the tumor and its extensions while reducing the dose to surrounding healthy tissues. <sup>18</sup>F-FDG is the most commonly used radiotracer and reflect metabolic activity within tumor. Other radiotracer are available or in development and may be used to monitor other features of tumor biology like tumor hypoxia, cell proliferation, blood perfusion and protein synthesis. Another potential advantage of including PET in the planning might be to reduce variability between users and making gross tumor volume (GTV) definition more standard over a wide range of physicians and institutions. Auto-contouring of GTV may be possible with development of algorithm that is based on quantitative measurement of uptake of radioactivity and thus will save time and reduce error in GTV delineation. When requesting PET scans, physicians should be aware of their potential in radiotherapy planning. The best approach is to acquire integrated PET/CT image with a dual scanner in the radiotherapy treatment position. While most radiotherapy planning system now can incorporate PET scan images, there are still controversies and uncertainties as to how to make best use of this information in radiotherapy treatment of head and neck cancers. The potentials and challenges of using PET in radiotherapy planning will be discussed.

**Keywords:** PET, Radiotherapy

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[P04-04]

## CyberKnife Treatment for External Auditory Canal Carcinoma

**Kengo Sato**

*Neurosurgery, Yokohama CyberKnife Center, Japan*

**Purpose:** This is a retrospective study to evaluate the outcomes of external auditory canal carcinoma (EACC) treated with CyberKnife (CK) alone.

**Materials and Methods:** Between May 2005 and June 2009, 24 patients (12 male, 12 female) with EACC were treated at Yokohama CK Center, Japan. According to Stell classification, 4 patients were Stage I, 8 patients were Stage II, and 12 patients were Stage III. Age was ranging 47 years to 89 years, median 61 years. Tumor volume was ranging 7.2ml to 105.6ml, median 42.6ml. The subscribed marginal dose (D95) was 28.0Gy to 42.5Gy (median 35.0Gy) with 3 to 5 stereotactic radiotherapy (SRT).

**Results:** Follow up periods is ranging one to 17 months, median 12 months.

The control rate of Stell I, II and III was 75%, 62% and 75%, respectively. Patient with Stell III was showing cerebella abscess three months after CK treatment. This patient was showing dural invasion at CT treatment. There is no direct radiation injury observed at present.

**Conclusions:** Surgical approach to EACC is invasive and results in mal function of facial movement and mandible. Our data is preliminary; however showing CK treatment is feasible for EACC. CK treatment is less invasive and able to maintain function.

**Keywords:** Cyberknife, Radiation, External Auditory Canal Carcinoma

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## P05. Targeted Therapy in H&N Cancer: Where are We?

**Chair : Gregory T. Wolf (USA)**

**Moderator : Jeffrey N. Myers (USA)**

16:30 - 18:00 CBR I + II

[P05-01]

### Targeted Therapy in Head and Neck Cancer: Where are we?

**Jan Baptist Vermorken**

*MD, PhD. Department of Medical Oncology, Antwerp University Hospital, Edegem, Belgium*

Recurrent and/or metastatic squamous cell carcinoma of the head and neck (R/M-SCCHN) still carries a dismal prognosis. In 2008, for the first time, a change in outcome was observed when combining targeted therapy with chemotherapy in this disease setting. In the EXTREME study, use was made of cetuximab, a chimeric monoclonal antibody (MoAb) directed against the Epidermal growth Factor Receptor (EGFR), an important target in SCCHN. The addition of cetuximab (Erbitux®) to standard platinum/infusional 5-fluorouracil (PF) significantly improved overall survival, progression-free survival, response rate and disease control rate, together with better symptom control and without a negative effect on quality of life, despite a slight increase in toxicity. This year, randomized phase III trials of two other MoAbs against EGFR, i.e. zalutumumab (a humanized IgG1 MoAb) in second-line and panitumumab (a fully human IgG2 MoAb) in first-line R/M-SCCHN will be reported. In general, the results with oral tyrosine kinase inhibitors (TKIs) have been disappointing. Two randomized trials with gefitinib (an EGFR TKI) did not show a survival benefit. Negative studies were also reported with IONAFARNIB, dasatinib, ispinisib, vorinostat and bortezomib. The multitargeted TKI sunitinib induces a high incidence of fatal and non-fatal hemorrhagic complications and careful patient selection in future trials is therefore warranted. Both preclinical and clinical data suggest further improvement with novel targeted agents, either as single agents or in combination with other targeted agents or cytotoxics. Targeted therapy in SCCHN is one the move.

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[P05-02]

### The Use of Anti-EGFr Therapies to Enhance Conventional Treatments in Head and Neck Cancer

**James Bonner**

*Department of Radiation Oncology, The University of Alabama at Birmingham, USA*

#### **Topic of Interest:**

Targeted therapies in head and neck cancer.

**Methods:** Squamous cell carcinomas of the head and neck show high levels of epidermal growth factor receptor (EGFr) expression. Anti-EGFr treatments have shown enhancement of radiation-induced and chemotherapy-induced toxicity in preclinical studies. Therefore, several investigations have explored the efficacy of combining anti-EGFr treatments with radiotherapy, chemotherapy or chemoradiotherapy regimens. These regimens will be reviewed with a focus on the anti-EGFr agent, cetuximab.

**Results:** Cetuximab is a monoclonal antibody that targets the external binding domain of EGFr and inhibits EGFr signaling. Early phase I/II studies combined cetuximab with radiotherapy in locoregionally advanced head and neck carcinoma and showed promising results. Likewise, combinations of cetuximab and chemotherapy showed promising results in early phase I/II investigations. Following these initial evaluations of cetuximab in combination with conventional treatments for head and neck carcinomas, phase III evaluations were undertaken. The addition of cetuximab to radiotherapy demonstrated locoregional control and survival benefits in locoregionally advanced head and neck cancer, compared to radiotherapy alone. Also, the addition of cetuximab to chemotherapy demonstrated a survival advantage for patients with recurrent or metastatic head and neck cancer compared to chemotherapy alone. These exciting results have led to increased exploration of other anti-EGFr agents in head and neck cancer. The anti-EGFr agents are currently being explored in combination with chemoradiotherapy regimens for locoregionally advanced disease. The use of maintenance anti-EGFr treatment has also been explored. These concepts and studies will be reviewed.

**Conclusions:** Over the last five years, anti-EGFr agents have become important agents in the treatment of locoregionally advanced, recurrent and metastatic head and neck carcinomas. Ongoing studies of new regimens employing various combinations of anti-EGFr agents and conventional treatments are exciting endeavors.

**Keyword:** Head and Neck Cancer

**Contact Information** James Bonner ([gesims@uabmc.edu](mailto:gesims@uabmc.edu))

[P05-03]

## **Erbitux, Cisplatin and 5-FU Neo-adjuvant Chemotherapy in Locally Advanced Squamous Cell Carcinoma of the Oral Cavity**

**Pei-Jen Lou**

*Otolaryngology, National Taiwan University Hospital,  
Taiwan*

The incidence of squamous cell carcinoma of the oral cavity (OSCC) is high in certain Asian countries including Taiwan. However, survival of patients with locally advanced OSCC is generally poor. Up to date, the ideal treatment strategy for locally advanced OSCC remained undefined. The promising clinical efficacy data and the manageable toxicities of concurrent cetuximab with chemotherapy or with radiotherapy in the treatment of squamous cell carcinoma of the head and neck (SCCHN) provide the opportunity to further explore cetuximab in other clinical settings for treatment in OSCC. The aim of this study is to explore the potential impact of cetuximab on the tumor response when it is combined with cisplatin and 5-FU as induction therapy, followed by surgery and adjuvant cetuximab plus cisplatin and radiotherapy in stage IV OSCC. Patients with T4 (including T4a and T4b) or N2b/c or N3 OSCC were enrolled in this study. Cetuximab (400 mg/m<sup>2</sup> loading dose, followed by 250 mg/m<sup>2</sup> weekly for a total of 6 weeks) was combined with two 3-weekly cycles of cisplatin (100 mg/m<sup>2</sup>) and 5-FU (1000 mg/m<sup>2</sup> × 3 days) as the neo-adjuvant therapy. Radical surgery was performed after the induction bio-chemotherapy, and adjuvant therapy with weekly cetuximab (250 mg/m<sup>2</sup>) and cisplatin (30 mg/m<sup>2</sup>) plus radiotherapy was conducted within 4-6 weeks after the operation. Preliminary results are encouraging. Tumor response, toxicity, and survival of the patients will be presented. We concluded that adding cetuximab to induction chemotherapy and adjuvant chemo-radiotherapy in advanced stage disease offers an opportunity to further increase tumor control, improve resectability (in T4b cases), reduce distant failures (in N2b/c and N3 cases), and improve survival without enhancing acute and late toxicity.

**Keywords:** Oral Squamous Cell Carcinoma, Molecular Targeted Therapy, Cetuximab

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[P05-04]

## **Targeting Glycolysis in Head and Neck Squamous Cell Carcinoma (HNSCC) in Order to Improve Therapeutic Outcomes**

**Jeffrey N. Myers\*, Vlad Sandulache**

*Department of Head and Neck Surgery, M. D.  
Anderson Cancer Center; USA*

Anti-metabolic strategies, predicated on the altered metabolism of tumor cells, can provide a therapeutic benefit when combined with conventional agents in various tumor models. We hypothesized that HNSCC cell lines display an elevated glycolytic rate, rendering them susceptible to combinations of anti-glycolytic agents with conventional treatment strategies. 15 STR authenticated HNSCC cell lines were chosen from an existing cell bank for analysis. Drug studies were conducted using a high throughput multi-well method, clonogenic survival and soft agar colony formation assays. Metabolic studies were performed using a mass spectrometry (MS)-liquid chromatography (LC) platform, combined with individual assays targeted to intra-cellular reducing potential, ATP and lactate production. HNSCC cell lines exhibited a significant dependence on glycolysis for generation of energy and reducing potential, survival and proliferation. Treatment with hexokinase inhibitors triggered decreased glycolytic and Krebs cycle activity, lower energy and reducing potential levels, shunting into secondary energetic pathways and altered nucleotide synthesis, each a potential mechanism of synergy with traditional DNA damaging agents. 2-deoxyglucose induced a cytostatic/cytotoxic effect in tested HNSCC cell lines via G1 arrest, with IC<sub>50</sub> values <5 mM. Addition of 2-deoxyglucose or its fluorinated analog increased cisplatin effectiveness in HNSCC cell lines in standard in vitro conditions and inhibited soft agar colony formation. We conclude that HNSCC cell lines are predominantly glycolytic, displaying significant sensitivity to 2-DG. The global metabolic effects, induction of arrest and potentiation of cisplatin toxicity by 2-DG suggest that anti-glycolytic strategies may hold promise in the treatment of HNSCC.

**Keywords:** Targeted Therapy, Glycolysis, 2-deoxyglucose

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## P06. Reconstruction in H&N Surgery: Aesthetic and Functional Perspectives

Chair : Alexander Rapidis (Greece)

Moderator : Fu-chan Wei (Taiwan)

16:30 - 18:00 CBR III

[P06-01]

### Osteomyocutaneous Peroneal Artery-Based Combined Flap for Reconstruction Of Composite And En Bloc Mandibular Defects

Ming-huei Cheng

*Reconstructive Microsurgery,  
Chang Gung Memorial Hospital, Taiwan*

The osteomyocutaneous peroneal artery-based combined (OPAC) flap is a refinement of fibula osteoseptocutaneous flap, with the inclusion of partial soleus muscle based on an independent myocutaneous perforator.

**Methods:** Seventeen men underwent composite oromandibular reconstruction using an OPAC flap. Flaps were raised with 1 or 2 skin paddles and 2 to 3 bone segments. In 8 cases, a portion of soleus muscle was included.

**Results:** All flaps survived, but partial failure occurred in 2 cases (11.7%). At a mean follow-up of 25.3 6 19.4 months, 6 of 12 patients tolerated a regular diet, 5 a soft diet, and 1 a liquid diet. Speech was normal in 2 patients, intelligible in 4, and slurred in 6.

**Conclusions:** Advantages of the OPAC flap include a single donor site, 1 pair of recipient vessels, versatile 3-dimensional inset, adequate soft tissue augmentation, and better aesthetic and functional outcomes.

**Keywords:** Osteomyocutaneous, OPAC Flap

**Contact Information** Ming-huei Cheng (micro.cgmh@gmail.com)

[P06-02]

### Lateral Skull Base and Facial Reconstruction

John Yoo

*Otolaryngology-Head and Neck Surgery,  
University of Western Ontario, Canada*

Addressing defects of the lateral skull base and face require consideration of several factors that may include skin surface reconstruction, volume restoration, intracranial protection, and facial function. In order to achieve optimal outcomes, various tissue grafts or free flaps may need to be employed either individually or in combination. A comprehensive and systematic approach to a broad spectrum of situations is detailed. With respect to "Aesthetic and Functional Perspectives", the facial nerve is of particular relevance. The management of facial paralysis in the context of ablative surgery will be highlighted with specific examples.

[P06-03]

## The Use of Microvascular Free Flap after Maxillary Swing Nasopharyngectomy

**Yu-wai Chan**

*Surgery, Queen Mary Hospital,  
University of Hong Kong, Hong Kong*

**Objective:** To study the application of microvascular free flap in patients after nasopharyngectomy via the Maxillary Swing approach.

**Methods:** Between January 2000 and May 2010, we recruited patients, with history of nasopharyngeal carcinoma and previous radiotherapy, requiring free flap coverage of the nasopharyngeal region after Maxillary Swing operation. Medical records were traced and information including patient demographics, indication for free flap coverage, types of flap used, and the subsequent surgical outcomes were analyzed.

**Results:** Fourteen patients were recruited during the study period. Two patients had extensive osteoradionecrosis of the skull base as a result of previous radiotherapy complicated by recurrent bleeding, requiring surgical debridement and free flap repair. Twelve patients had resection of their recurrent nasopharyngeal carcinoma, and after surgery, the segment of the internal carotid artery at the petrous part of the temporal bone was exposed, necessitating the use of flap coverage to prevent fatal complications like carotid artery blow out. Free rectus abdominis muscle flap was used in 2 patients, free posterior tibial flap was used in 1 patient, and free vastus lateralis muscle flap was used in the remaining 11 patients. The mean follow up period was 38 months. All flaps survived and complete coverage of exposed bone and carotid artery was achieved in all patients. There was no recurrence of bleeding from the osteoradionecrosis or carotid artery blowout during follow up.

**Conclusions:** Microvascular free flap reconstruction is indicated after Maxillary Swing operation in situations where skull base coverage or carotid artery protection is necessary.

**Keywords:** Free Flap, Maxillary Swing

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[P06-04]

## Reconstructive Options for Defects in the Hypopharynx

**Richard E. Hayden**

*Department of Otolaryngology/Head and Neck Surgery,  
Mayo Clinic Scottsdale, USA*

This paper presents the evolution of reconstructive surgical techniques for repair of the total laryngopharyngectomy defect over the past 30 years.

Techniques utilizing different free fasciocutaneous flaps are compared and contrasted with each other and with those techniques utilizing free visceral flaps. The historic and currently limited role of gastric transposition is covered. The largely historic role of pedicled cutaneous and musculocutaneous flaps is also presented.

An algorithm for choosing the optimal reconstructive tool is highlighted.

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## O01. QOL & Supportive Care 1

**Chairs : Georges Lawson (Belgium)**  
**Bevan Yueh (USA)**

13:00 - 14:30 SBR I

[O01-01]

### Korean Validation of the University of Washington Quality of Life Questionnaire for Patients with Head and Neck Cancer

**Moon Young Chang, Donghwan Roh, Ik Joon Choi,  
J. Hun Hah, Myung-Whun Sung, Kwang Hyun Kim,  
Tack-Kyun Kwon\***

*Department of Otorhinolaryngology, Seoul National University Hospital/Seoul National University College of Medicine, Korea*

**Objective:** QOL is essential in the head and neck cancer patients. The University of Washington Quality of Life questionnaire (UW-QOL) is one of the most commonly used questionnaires in clinical practice. It is constructed in English culture, thus to use it in non English culture, translation and psychometric validation should be performed. The objective of this study is to translate UW-QOL questionnaire into Korean and perform psychometric validation.

**Method(s):** According to internationally accepted guidelines, UW-QOL questionnaire was translated and culturally adapted into the Korean language. A prospective validation was performed with UW-QOL, Korean version. 56 patients with at least 1 year of disease-free survival after treatment for head and neck cancer were enrolled. This study was performed from March 2009 to September 2009 at a tertiary cancer center hospital. Patients completed the Korean version of the UW-QOL questionnaire during routine clinical consultation. They also completed a validated Korean version of the WHO QOL (World Health Organization Quality of Life)-BREF, and the Beck Depression Inventory (BDI).

**Result(s):** It demonstrated good reliability (a Cronbach's  $\alpha$  of 0.725). Validity was established by assuring construct validity, as the physical and social function scores of UW-QOL, Korean version showed strong correlations with global question scores of UW-QOL, Beck Depression Inventory questionnaire scores, and WHO QOL-BREF scores.

**Conclusion(s):** The Korean version of the UW-QOL questionnaire is reliable and valid in the assessment of QOL of Korean patients with head and neck cancer.

**Keywords:** Quality of Life Questionnaire, Head and Neck Cancer, Korean

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[O01-02]

### Distress is associated with Personality, Choice of Coping, Quality of Life Scores and Neck Treatment Level as well as Prediction of Survival in Former Head and Neck Cancer Patients

**Anne Aarstad, Hans Aarstad\*, Aril Osthus,  
Elisabeth Beisland, Jan Olofsson**

*Department of Otorhinolaryngology/Head & Neck Surgery,  
Haukeland University Hospital, Norway*

**Objective:** To investigate if distress is associated with personality, choice of coping, quality of life (QoL) and prognosis in successfully treated Head and Neck Squamous Cell Carcinoma (HNSCC) patients.

**Method(s):** We determined clinical information, General Health Questionnaire (GHQ) scores, the European Organization for Research and Treatment of Cancer QoL Questionnaire (EORTC-QLQ) C30/H&N35, personality by the Eysenck Personality Inventory and coping by the COPE questionnaire. All patients under 79 years diagnosed with HNSCC in Western Norway in the period from 1992 to 2001, and survived until the end of 2002, were identified. Included were 140 patients (90% response rate). Total survival was determined by June 2009.

**Result(s):** N stage, whether neck treated by surgery and/or radiation therapy, but not kind of treatment against primary tumor, were associated with the GHQ scores (Common variance [CV]=2.9-5.8%). High neuroticism (CV=25%) was associated with the GHQ scores. Avoidance focused coping (CV=26%) was associated with high GHQ scores. GHQ correlated with the EORTC C30/H&N35 QLQ scores (CV=21-31%). The highest scoring quartile of the GHQ had poorer prognosis than the other patients ( $P<0.05$ ).

**Conclusion(s):** A high N stage, treatment of the neck, high neuroticism and reported use of avoidance coping were associated with high GHQ scores. High GHQ values predict poorer prognosis.

**Keywords:** Quality of Life, Coping and Personality, Survival

**Corresponding Author** Hans Aarstad (hans.aarstad@kir.uib.no)

[O01-03]

## Comparison of Quality of Life in Advanced Laryngeal Cancer Patients after Concurrent Chemoradiotherapy vs. Total Laryngectomy

**Nirav Trivedi<sup>1,\*</sup>, Moni Abraham Kuriakose<sup>1</sup>,  
Vikram Kekatpure<sup>1</sup>, Subramania Iyer<sup>2</sup>**

<sup>1</sup>Head and Neck, Mazumdar Shaw Cancer Center & NH, India

<sup>2</sup>Head and Neck, AIMS, Kochi, India

**Objective:** To compare quality of life (QOL) of patients with advanced laryngeal cancers treated by total laryngectomy with those who received concurrent chemoradiotherapy.

**Method(s):** This is a cross-sectional study of the patients treated in our institution who have completed one year of follow-up and were disease-free at the time of evaluation. Forty patients treated for advanced cancer of the larynx (stage III/IV), either by concurrent chemoradiation (11) or total laryngectomy and postoperative radiation (29), have been included in this study. The Functional Assessment of Cancer Therapy–Head and Neck (FACT–H&N) version 4 questionnaire was used.

**Result(s):** Total scores for overall QOL are equal in both treatment groups ( $P=0.69$ ). Scores for individual components are similar in both treatment groups. However, dryness of mouth is significantly worse in the chemoradiotherapy group ( $P=0.01$ ) and ability to communicate with others is poorer in the laryngectomy group ( $P=0.03$ ).

**Conclusion(s):** Long-term overall QOL remains similar in all the patients treated for advanced carcinoma of the larynx irrespective of treatment modality.

**Keywords:** Quality of Life, Larynx, Chemoradiation

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[O01-04]

## First Report on the Development and Validation of the “GAAIN-R” Scale for Perceptual Speech Evaluation in Head and Neck Cancer Patients

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Cyrus Kerawala, Peter Clarke, Christopher Nutting,  
Peter Rhys-Evans, Kevin Harrington, Rehan Kazi**

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**Objective:** The objective was to develop and validate first ever speech-specific scale for perceptual evaluation of speech in Head-neck cancer (HNC) patients.

**Method(s):** Based on an extensive literature review and discussion in a multidisciplinary setting 5 speech parameters (intelligibility, articulation, speech rate, nasality and asthenia) and overall grade of speech impairment were selected and evaluated for the development and validation of this scale. Speech samples of 117 subjects (65 consecutive follow-up oral and oropharyngeal cancer patients and 52 healthy volunteers) were recorded on the Electroglossograph (EGG) equipment, using a standard protocol consisting reciting 3 words and a standard text passage at a comfortable pitch and loudness. All samples were independently judged and rated by 3 experienced speech and language therapists and were re-rated 12 weeks apart for establishing test-retest reliability. Internal consistency reliability, intra-rater-reliability and Inter-rater reliability of different parameters of this scale and overall grade were determined using Cronbach's alpha and Spearman's rank correlation coefficients. Construct validity and group validity were tested by Spearman's rank correlation coefficients and Mann-Whitney U-test.

**Result(s):** The Cronbach's alpha coefficients for internal consistency ranged from 0.87-0.90 for connected speech and 0.79-0.84 for words for all raters. The Spearman's correlation coefficients for intra-rater reliability of these parameters for connected speech varied between 0.38-0.87 while for words the values ranged between 0.50-0.71. The coefficients for inter-rater reliability for connected speech were between 0.55-0.99, while for words they ranged between 0.40-0.57. The Spearman's correlation coefficient between overall grade of connected speech and overall speech question of Speech Handicap Index and speech question of UWQOL ranged between 0.35-0.47, while for words these values ranged between 0.42-0.55.

**Conclusion(s):** GAAIN-R scale is a reliable and valid tool for speech evaluation in HNC patients. This scale may also be used in neurological patients having speech problems.

**Keywords:** GAAIN-R Speech scale, Head-Neck Cancer, Validation

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[O01-05]

## Quality of Life Outcome for Nasopharyngeal Carcinoma Patients after Treatment-the Effect Size of Intensity Modulated Radiotherapy

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**Objective:** With advances in radiotherapy (RT) and chemotherapy, many patients with nasopharyngeal carcinoma (NPC) can be effectively cured, and their quality of life (QoL) has become an important issue.

**Method(s):** A cross-sectional investigation was conducted to assess the QoL of 356 NPC patients with cancer-free survival of more than 2 years. Among them, 106 patients were treated by two-dimensional RT (2DRT), 108 by 2DRT plus three-dimensional conformal RT (3DCRT) boost, 58 by 3DCRT alone, and 84 by intensity-modulated RT (IMRT). The QoL was assessed by the EORTC QLQ-C30 questionnaire and QLQ-H&N35 module. A general linear model multivariate analysis of variance was used to analyze correlations among the factors. The clinical difference of QoL scores between groups was calculated using Cohen's D coefficient.

**Result(s):** We found that education level, annual family income, and RT techniques were independent predictors of QoL. NPC survivors who had higher education level and annual family income and who had received more advanced RT treatments had better QoL outcomes. Compared with 2DRT, the impact of 3DCRT was small on most scales and moderate (Cohen's D: 0.53-0.67) on emotional functioning, pain, and mouth opening; the impact of IMRT was moderate on nine scales and large (Cohen's D: 0.80-0.88) on swallowing, social eating, teeth, and mouth opening.

**Conclusion(s):** In addition to socioeconomic levels, advances in RT technique played a significant role in improving QoL of NPC patients. The therapeutic benefit of IMRT over 2DRT, especially on swallowing-related QoL scales, needs to be further explored.

**Keywords:** Nasopharyngeal Carcinoma, Quality of Life, Intensity-Modulated Radiotherapy

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[O01-06]

## Assessment of Shoulder Dysfunction in Patients with Head and Neck Cancers after Neck Dissection

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**Objective:** This study is designed to analyse the shoulder disabilities and their impact on quality of life in our patients undergoing various forms of neck dissections. It also identifies the potential risk factors that lead to shoulder dysfunctions and their prevention.

**Method(s):** All eligible patients who undergo different forms of neck dissections for head and neck cancers were screened and baseline information obtained.

Subjective assessment: QoL questionnaires: 1. RAND-36 2. DASH 3. Pain Scale VAS.

Objective assessment: 1. Goniometric Measurements of arm shoulder movements 2. Surface EMG of trapezius muscle. follow up for 8 weeks.

**Result(s):** Significant morbidity in patients with neck dissection who have undergone level II and Level V nodal dissection. Pectoralis Major flap reconstruction added to the morbidity. Aggressive early post operative shoulder physiotherapy was significantly associated with reduced morbidity. Persistent shoulder morbidity after 4 weeks was not associated with improvement at 8 weeks.

**Conclusion(s):** Shoulder morbidity is an important factor to be considered in head and neck surgical procedures which involve neck dissection. It has a significant impact on the prognosis as it affects the health related quality of life. Neck dissection involving level II and V are associated with shoulder dysfunction. Whenever it is oncologically safe, extensive dissection in level IIB area and overhandling of spinal accessory nerve should be avoided.

**Keywords:** Neck Dissection, Shoulder Dysfunction, Spinal Accessory Nerve

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[O01-07]

## Validation of a New Swallow Specific Tool “Sydney Swallow Questionnaire (SSQ)” in a Cohort of Head-Neck Cancer (HNC) Patients

**Raghav Dwivedi\***, Suzanne St. Rose, Justin Roe, Afroze Khan, Peter Clarke, Cyrus Kerawala, Christopher Nutting, Peter Rhys-Evans, Kevin Harrington, Rehan Kazi

*Head-Neck Unit, Royal Marsden Hospital, UK*

**Objective:** Swallowing impairment is seen 50–75% of head and neck cancer (HNC) survivors. Although there are numerous validated swallowing-specific questionnaires, but they focus more on the evaluation of swallowing-related quality of life (QOL) rather than swallowing as a specific function. The aim of this study was to validate the SSQ (using MDADI) as a swallowing-specific instrument in HNC patients.

**Method(s):** Sixty-two consecutive patients in follow-up for oral/oropharyngeal cancers were recruited. Both the questionnaires (SSQ and MDADI) were given to the patients in the outpatient for returning via post. Randomly selected 31 patients were asked to complete both the questionnaires again after four weeks to assess test-retest reliability. Internal consistency and test-retest reliability was assessed using Cronbach's alpha and Spearman's correlation coefficient, respectively. Construct (by MDADI) and group validity were determined using Spearman's correlation coefficient and Mann-Whitney U-test respectively.

**Result(s):** The internal consistency reliability for Total SSQ as calculated by Cronbach's alpha was 0.95. Test-retest reliability of Total SSQ and General SSQ as calculated by Spearman's rank correlation coefficient were 0.83 and 0.73 respectively. For SSQ-QOL the coefficient was 0.71. For construct validity we compared Total SSQ scores and scores of General SSQ and QOL-SSQ with Global and Physical domains of MDADI using Spearman's rank correlation coefficients. The correlation coefficients between Total SSQ, the General SSQ and QOL-SSQ scores and Global MDADI scores were 0.72, 0.64 and 0.78, respectively. Similarly the correlation coefficients for Total SSQ and General SSQ with the Physical domain of MDADI were found to be 0.83 and 0.71, respectively. Direct correlations between similar questions of both the questionnaires revealed strong correlations.

**Conclusion(s):** We were able to demonstrate the reliability and validity of the SSQ in HNC patients. The SSQ is a precise, reliable and valid tool for assessing swallow in this patient group.

**Keywords:** Sydney Swallow Questionnaire (SSQ), Head-Neck Cancer, Validation

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[O01-08]

## Vocal Range Profile in Evaluation of Decreased High Pitch after Thyroidectomy

**Sung Won Kim, Dae Hyoung Kang, Hyo Sang Park, Kyoung A Kim, Hyoung Shin Lee, Kang Dae Lee\***

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Kosin University College of Medicine, Korea*

**Objective:** Decreased high pitch after thyroidectomy due to injury of the external branch of superior laryngeal nerve (EBSLN) may be a critical complication. However it may be difficult to detect or evaluate the degree of the paralysis through the videostroboscopy. The author studied the usefulness of VRP (voice range profile) and MDVP (multi-dimensional voice program) to evaluate patients who have decreased high pitch after thyroidectomy.

**Method(s):** A prospective study was performed with 67 patients who underwent voice assessment preoperatively, 1 week and 3 months after the thyroidectomy between January 2008 and June 2009. The patients included 58 females and 9 males. 6 female patients showed high pitch dysphonia. The patients were classified as the group of female with no decreased high pitch (group A, n=52), the group of female with decreased high pitch (group B, n=6) and the group of male (group C, n=9). VRP was performed to identify the frequency range and the intensity range, and MDVP was performed to evaluate the Jitter, Shimmer, noise-to-harmonic ratio (NHR) and fundamental frequency (F0). Maximal phonation time (MPT) was also evaluated. Laryngeal electromyogram (EMG) was performed in group B.

**Result(s):** The result of VRP showed frequency range of  $352.37 \pm 138.57$  Hz,  $331.53 \pm 116.84$  Hz,  $388.72 \pm 142.97$  Hz, and the intensity range was  $17.14 \pm 4.03$  dB,  $14.10 \pm 4.73$  dB,  $15.88 \pm 5.73$  dB, respectively in group A showing no significant difference. In Group B, the frequency range was  $443.11 \pm 83.97$  Hz,  $246.67 \pm 49.41$  Hz,  $181.37 \pm 80.13$  Hz showing significant decrease after the surgery compared to that of the preoperative result. In addition, the intensity range was  $22.25 \pm 2.87$  dB,  $15.25 \pm 2.22$  dB,  $16.25 \pm 2.63$  dB respectively showing significant postoperative decrease. Electromyogram of the cricothyroid muscle of group B showed decreased potential with 3 patients, normal potential in 2, and the other patient refused to take the exam.

**Conclusion(s):** VRP is a noninvasive, easy, quick, and practical test to demonstrate decreased frequency range visually and helps to evaluate EBSLN injury in patient with decreased high pitch after thyroidectomy.

**Keywords:** Thyroidectomy, Voice Disorders, Superior Laryngeal Nerve

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[O01-09]

## Does the Post-Thyroidectomy Syndrome Really Exist Following Thyroidectomy? Prospective Comparative Analysis of Open vs. Endoscopic Thyroidectomy

Seung Won Lee\*, Jae Wook Kim,  
Yoon Woo Koh, Hyuck Soon Chang

*Department. of Otolaryngology-Head and Neck Surgery,  
SoonChunHyang University Hospital, Korea*

**Objective:** This study prospectively evaluated post-thyroidectomy syndrome (PTS) through subjective and objective analyses of conventional open thyroidectomy vs. endoscopic thyroidectomy.

**Method(s):** A prospective nonrandomized clinical trial compared consecutive conventional open thyroidectomy (OPEN group) with endoscopic thyroidectomy (ENDO group) from Jan., 2008, to June, 2009. Of the 210 patients, 75 patients completed the subjective and objective evaluation before, and 1 and 6 months after surgery. Subjective parameters included perceptual analysis (GRBAS scale), stroboscopic or flexible fiberscopic analysis, voice handicap index, and five-point visual analog scales for vocal fatigue, singing difficulty, high pitch phonation difficulty, swallowing difficulty, neck discomfort, and hypesthesia. Objective parameters included acoustic and aerodynamic analysis (maximal phonation time, jitter, shimmer, harmonics to noise ratio, maximal fundamental frequency, minimal fundamental frequency) and the contact quotient of the electroglottography (EGG).

**Result(s):** For the ENDO group (n=36), the operating and recovery times for PTS duration were significantly longer than in the OPEN group (n=39) ( $P<0.01$ ). However, the presence of PTS was not related to the size of the tumor, operating time, T stage, radioactive iodine (RAI) therapy, and operative technique ( $P>0.05$ ). For the OPEN group, two objective and five subjective parameters were worse 1 month postoperatively; of these, two subjective parameters persisted until 6 months postoperatively ( $P<0.05$ ). For the ENDO group, three objective and six subjective parameters were worse 1 month postoperatively, and three of the subjective parameters persisted until 6 months postoperatively ( $P<0.05$ ).

**Conclusion(s):** PTS really exists following simple thyroidectomy and is very common for both open and endoscopic thyroidectomy. Most of the parameters improved gradually over time. However, some subjective changes persisted until 6 months postoperatively, especially difficulty singing and using a high pitched voice.

**Keywords:** Thyroidectomy, Voice Disorder, Cervical Hypesthesia

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## O02. Imaging / PET

**Chairs : Sang-Yoon Kim (Korea)**  
**David W. Eisele (USA)**

13:00 - 14:30 SBR II

[O02-01]

### Prediction of Surgical Outcome Using Plasma Epstein-Barr Virus DNA and 18F-FDG PET Scan in Recurrent Nasopharyngeal Carcinoma

**Yu-wai Chan\*, Ambrose Ho, William I. Wei**

*Surgery, Queen Mary Hospital, Hong Kong*

**Objective:** To determine the role of plasma Epstein-Barr Virus (pEBV) DNA and 18F-FDG PET scan in predicting the outcome of nasopharyngectomy in patients with recurrent nasopharyngeal carcinoma.

**Method(s):** Between September 2007 and September 2009, we recruited patients requiring salvage surgery for recurrent nasopharyngeal carcinoma after radiotherapy. Pre-operative pEBV-DNA level, MRI and 18F-FDG PET scan assessment was performed. Net tumour volume was quantified on MRI. 18F-FDG uptake was expressed as the maximum standardized uptake value (SUVmax). Nasopharyngectomy via Maxillary Swing approach was subsequently performed with curative intent. Resected specimens were sent for histological confirmation and assessment of margins. Relationship between pre-operative pEBV-DNA level, tumour volume, SUVmax and surgical outcome was analyzed. The receiver operating characteristic (ROC) curve determined the optimal cut-off value for pEBV-DNA and SUVmax to predict surgical outcome with the best trade-off between sensitivity and specificity.

**Result(s):** Forty-two patients were recruited. The median age was 53 years. The median pEBV DNA level, tumour size and SUVmax were 348 copies, 3.2cm<sup>3</sup> and 4.7, respectively. In 35 (83.3%) patients, curative resection was achieved. In the remaining 7 patients, resection margins were involved by tumour and the surgery was considered palliative. In patients with curative resection, both the median log-pEBV DNA and the SUVmax were significantly lower than those with palliative resection (2.2 vs. 3.0,  $P=0.013$ , and 4.3 vs. 6.9,  $P=0.009$ ). We observed no correlation between tumour volume and the chance of curative surgery. The cutoff pEBV-DNA and SUVmax that predicted surgical outcome was 5.8 and 425 copies, respectively.

**Conclusion(s):** In comparison with MRI, 18F-FDG PET scan and pre-operative pEBV-DNA level reliably predict surgical outcome for patients with recurrent nasopharyngeal carcinoma. Our findings suggest that pre-operative tumour SUVmax of 5.8 or above or pEBV-DNA of 425 copies or higher are associated with significantly higher chance of palliative resection. These patients may warrant further post-operative adjuvant therapy.

**Keywords:** pEBV-DNA, 18F-FDG PET scan, Recurrent Nasopharyngeal Carcinoma

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[O02-02]

### PET to Avoid Futile Laryngoscopies in Patients with Suspicion of Recurrent Laryngeal Carcinoma after Radiotherapy

**Remco de Bree<sup>1\*</sup>, Lisa Van der Putten<sup>1</sup>, Otto S. Hoekstra<sup>2</sup>,  
Dirk J. Kuik<sup>3</sup>, Emile F.I. Comans<sup>2</sup>, C. René Leemans<sup>1</sup>**

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<sup>2</sup>*Nuclear Medicine & PET Research,  
VU University Medical Center, Netherlands*

<sup>3</sup>*Clinical Epidemiology and Biostatistics,  
VU University Medical Center, Netherlands*

**Objective:** To determine whether FDG-PET is of value in the selection of patients for direct laryngoscopy under general anesthesia in patients with suspicion of recurrent laryngeal carcinoma after radiotherapy.

**Method(s):** Eleven experienced nuclear physicians from 8 centers assessed 30 FDG-PET scans on the appearance of local recurrence (negative-equivocal/positive). Conservative (equivocal analysed as negative) and sensitive (equivocal analysed as positive) assessment strategies were compared to the reference standard (recurrence within 6 months after PET). Further, a prospective randomized multicenter controlled clinical trial (RELAPS) was performed in which the current diagnostic practice, i.e. all patients undergo direct laryngoscopy, is compared to a strategy in which FDG-PET selects the patients for laryngoscopy. The primary efficacy endpoint is the difference in the number of futile indications for direct laryngoscopy between the conventional diagnostic arm and the FDG-PET based diagnostic arm. Resectability of recurrent tumor and tumor negative surgical margins after total laryngectomy will be used as proxy endpoints for safety.

**Result(s):** Seven patients had proven recurrences. For the conservative and sensitive strategy the mean sensitivity was 87% and 97%, specificity 81% and 63%, positive predictive value 61% and 46% and negative predictive value 96% and 99%, respectively. Interobserver variability showed a reasonable relation in comparison to the reference standard ( $\kappa=0.55$ ). 150 patients are included in the RELAPS study. Follow-up has to be completed for final analysis. Available results of the RELAPS study will be presented.

**Conclusion(s):** FDG-PET has acceptable interobserver agreement and yields good negative predictive value for detection of recurrent laryngeal carcinoma. It could therefore be used as first diagnostic step and may reduce futile invasive diagnostics. The definitive results of the RELAPS study should be waited for.

**Keywords:** FDG-PET, Laryngeal Carcinoma, Recurrence

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[O02-03]

## Screening for Distant Metastases in Head and Neck Cancer Patients by FDG-PET(-CT) to Avoid Futile Treatments

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<sup>4</sup>Radiology, VU University Medical Center, Netherlands

**Objective:** The aim of the study was to define the value of whole body FDG-PET(-CT) in screening for distant metastases in patients with head and neck squamous cell carcinoma and high risk factors.

**Method(s):** In a multi-center prospective study between 1998 and 2003, 145 consecutive HNSCC patients with risk factors for distant metastases underwent chest CT and whole body FDG-PET for screening of distant metastases pretreatment. The data of 92 evaluable patients who developed distant metastases or who had a follow-up of at least 12 months were analyzed. Besides their performance in clinical practice, the operational characteristics of PET and CT using ROC analyses were investigated. The optimal test criteria found in the aforementioned study were validated in a similar study of 47 patients. Furthermore, 29 patients underwent integrated FDG-PET-CT in a comparable prospective study.

**Result(s):** Pretreatment screening identified distant metastases in 19 patients (21%). FDG-PET had a higher sensitivity (53% vs. 37%) and negative predictive value (80% vs. 75%) than CT. The combination of CT and FDG-PET (visual correlation) had the highest sensitivity (63%). The ROC-analyses of the five point ordinal scales revealed that the “area under the curve” (AUC) of FDG-PET was significantly higher as compared to CT. In the validation study a PET and CT both showed a sensitivity of 50% and a negative predictive value of 84%, while the combination of PET and CT revealed a sensitivity of 67% and a negative predictive value of 89%. PET-CT showed a sensitivity of 38% and a negative predictive value of 78%.

**Conclusion(s):** In HNSCC patients with high risk factors pretreatment FDG-PET-CT is currently the best routine diagnostic technique to avoid futile extensive treatments. Since a substantial percentage of distant metastases are missed by FDG-PET-CT, room for improvement remains.

**Keywords:** FDG-PET, Distant Metastases, Screening

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[O02-04]

## Diagnostic Value of Only 18F-FDG PET/CT-Positive Lymph Node without Positive Findings on Conventional Imaging Modalities in Head and Neck Squamous Cell Carcinoma

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<sup>3</sup>Department of Radiology, Hallym University Medical Center, Korea

**Objective:** 18F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/computed tomography (CT) plays an increasing role in diagnosis and management planning of head and neck squamous cell carcinoma (HNSCC). However, its role in only PET/CT-positive lymph node is not well elucidated yet. This study was performed to evaluate the diagnostic value of only PET/CT-positive lymph node without correlating positive findings on conventional imaging modalities (CT, MRI and US) in HNSCC.

**Method(s):** From January 2006 to September 2009, 114 patients with HNSCC who were underwent CT, MRI, US and PET/CT before definitive surgery with neck dissection were reviewed. All imaging tests were interpreted on imaging based nodal classification and were compared with histopathological findings, which served as the standard of reference.

**Result(s):** Neck dissections (55 unilateral, 59 bilateral; total of 173 neck sides) involving 834 nodal levels were performed. Histopathology revealed nodal metastases 78 of 173 neck sides and 146 of 834 nodal levels. Lymph nodes which exhibited as positive only on PET/CT but negative on other conventional imaging modalities were found in 46 nodal levels in 33 patients. Along with the histopathologic examination, 13/46 (28%) nodal levels were true positive (TP), and 33/46 (72%) were false positive (FP). Among the 46 only PET/CT-positive nodal levels, 13 nodal levels were included on N+ neck and 33 were included on N0 neck. In N+ neck, TP was significantly higher than FP as 7 to 6, and in N0 necks, FP was significantly higher than TP as 27 to 6 ( $P=0.028$ ). There was no significant difference in maximum standard uptake value (SUV) between TP and FP.

**Conclusion(s):** Only PET/CT-positive lymph node without correlating positive findings on conventional imaging modalities can frequently be found and does not predict lymph node metastasis. Combined use of conventional imaging modalities would be recommended for HNSCC to detect lymph node metastases.

**Keywords:** PET/CT, Head and Neck, Lymph Node

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[O02-05]

## **FDG PET as Prognostic Factors and Assessment Tool for Treatment Recurrence in Locally Advanced Head and Neck Squamous Cell Carcinoma (HNSCC) Post-Operative Concurrent CCRT or RT**

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**Objective:** To evaluate the prognostic value of metabolic tumor volume (MTV) and pSUV on PET-CT and investigate clinical value of pSUV for early detection of locoregional recurrent disease after Post-operative RT or CCRT in locally advanced HNSCC patients.

**Method(s):** Sixty nine patients of stage III/IV HNSCC treated from December 2003 through April 2009 were evaluated. Their pSUV and metabolic tumor volume assessed in the primary site and nodal area by H&N specialized nuclear medicine doctor. For determination of metabolic tumor volume, automatically contoured (SUV $>2.5$ ) sum of metabolic volume of primary tumor and neck node were calculated in software of PET-CT machine. Another 81 patients whose F-U PET-T scan were available after Post-op CCRT or RT were evaluated with pSUV value in primary tumor bed and nodal area and correlated for locoregional recurrence. For determining threshold value of pSUV to suspect recurrence, receiver operating characteristic curve were generated.

**Result(s):** Metabolic tumor volume is negative prognostic factor for treatment outcome. Metabolic tumor volume at the value of 42.5 ml negatively correlated with disease free survival ( $P=0.032$ ). However, in case of pSUV, we could not find out prognostic implication in OS or DFS. pSUV in postoperative FU PET-CT scan statistically significantly correlated with locoregional recurrence probability (odds ratio:1.74  $P<0.0001$ ). Above than 5.38 value of pSUV, we can suspect disease recurrence of Post-op irradiated HNSCC. Postoperative serial PET-CT may enhance early detection of locoregional recurrence.

**Conclusion(s):** FDG-PET has been usually reported high false positive rate in the postoperative irradiated head and neck cancer patients. However serial F-U FDG-PET/CT was useful tool for detection of locoregional recurrence. We can expect more confident results through further prospective study and comparison with other imaging modalities.

**Keywords:** FDG PET-CT, Recurrence, Head and Neck Cancer

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[O02-06]

## **Comparison of 18F-FLT PET and 18F-FDG PET for Visualization and Staging of Head and Neck Squamous Cell Cancers**

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**Objective:** The aim of this study was to investigate the feasibility of using FLT PET to detect head and neck squamous cell cancer(HNSCC), and to compare the diagnostic efficacy with that of 2-deoxy-2-18F-fluoro-D-glucose (FDG) PET in evaluation of the nodal and distant metastatic staging.

**Method(s):** A total of 44 cases with histopathologically proven HNSCC were enrolled in the study. The PET images were evaluated qualitatively for regions of focally increased metabolism and for semiquantitative analysis the maximum standardized uptake value (SUV) was calculated.

**Result(s):** For depiction of primary tumours, the sensitivity of both approaches was 100%. The mean ( $\pm SD$ ) SUV for FLT ( $5.85\pm3.2$ ) was significantly lower than that for FDG ( $11.16\pm5.14$ ;  $P<0.0001$ ). No significant differences were found for the T category. However, the mean ( $\pm SD$ ) FLT SUV was significantly higher in poorly than in well differentiated tumours ( $6.49\pm3.13$  vs.  $4.2\pm2.08$ ;  $P<0.04$ ). Similarly, FDG SUVs in poorly and moderately differentiated tumours ( $12.72\pm4.8$  and  $11.46\pm4.64$ ) were significantly higher than in well differentiated tumours ( $7.45\pm3.51$ ;  $P<0.004$  and  $P<0.02$ ). Sensitivity, specificity, positive predictive value, negative predictive value, and accuracy for lymph node staging on a per-patient basis were 78, 95, 95, 80, and 86%, respectively, with FLT PET and 87, 90, 91, 86, and 89%, respectively, with FDG PET ( $P>0.1$  for all comparisons). Six of 8 distant metastases was detected with FLT and FDG PET. Although FLT PET had no false-positive result for M staging, FDG PET showed 5 false-positive results owing to physiological bowel activity and/or inflammation.

**Conclusion(s):** With HNSCCs, FLT PET was found to have high sensitivity for depiction of primary tumors despite a lower FLT SUV than with FDG. FLT PET showed better (although not statistically significant) specificity and positive predictive values for N staging than FDG PET.

**Keywords:** 18F-FLT, 18F-FDG, PET

**Corresponding Author** Hiroshi Hoshikawa (hiro@med.kagawa-u.ac.jp)

[O02-07]

## Usefulness of Interim FDG-PET after Induction Chemotherapy in Patients with Locally Advanced Squamous Cell Carcinoma of the Head and Neck Receiving Sequential Induction Chemotherapy Followed by CCRT

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**Objective:** Induction chemotherapy (ICT) has been used to select patients for organ preservation and determine subsequent treatments in patients with locally advanced squamous cell carcinoma of the head and neck (LASCCHN). Still, the clinical outcomes of LASCCHN patients who showed response to ICT are heterogeneous. We evaluated the efficacy of interim 18-fluoro-2-deoxy-glucose positron emission tomography (FDG-PET) after ICT in this specific subgroup of LASCCHN patients who achieved partial response (PR) or complete response (CR) after ICT to predict clinical outcomes following concurrent chemoradiotherapy (CCRT).

**Method(s):** Twenty one patients with LASCCHN who showed at least PR to ICT by RECIST prior to definitive CCRT were chosen in this retrospective analysis. FDG-PET was performed before and 2 to 4 weeks after ICT to assess the extent of disease at baseline and the metabolic response to ICT, respectively. We examined the correlation of the metabolic response by the percentage decrease of maximum standardized uptake value (SUVmax) of the primary tumor or lymph node after ICT or a specific threshold of SUVmax on interim FDG-PET with clinical outcomes including CR rate to CCRT, progression-free survival (PFS) and overall survival (OS).

**Result(s):** A SUVmax of 4.8 on interim FDG-PET could predict clinical CR following CCRT (100% vs. 20%,  $P=0.001$ ), PFS (median, not reached vs. 8.5 mo,  $P<0.001$ ) and OS (median, not reached vs. 12.0 mo,  $P=0.001$ ) with a median follow-up of 20.3 mo in surviving patients. A 65 percent decrease in SUVmax after ICT from baseline also could predict clinical CR following CCRT (100% vs. 33.3%,  $P=0.003$ ), PFS (median, not reached vs. 8.9 mo,  $P<0.001$ ) and OS (median, not reached vs. 24.4 mo,  $P=0.001$ ) of the patients.

**Conclusion(s):** These data suggest that interim FDG-PET after ICT might be a useful determinant to predict clinical outcomes in patients with LASCCHN receiving sequential ICT followed by CCRT.

**Keywords:** Head and Neck Cancer, Induction Chemotherapy, FDG-PET

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[O02-08]

## Role of 18F-FDG PET/CT in Preoperative Evaluation of Papillary Thyroid Carcinoma

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**Objective:** The role of 18F-FDG PET/CT in the diagnosis of thyroid cancer has not been determined yet. So, we have performed this study to evaluate the possible role of 18F-FDG PET/CT in the diagnosis of papillary thyroid carcinoma.

**Method(s):** We have analyzed 105 patients with papillary carcinoma who underwent thyroidectomy and 18F-FDG PET/CT (88 females, 17 males, mean age 52.67 years). 41 patients with incidental benign nodular hyperplasia in 18F-FDG PET/CT were also evaluated (29 females, 12 males, mean age 59.73 years). 18F-FDG PET/CT was done for periodic health examination in nodular hyperplasia group, and incidentaloma was confirmed as benign by fine needle aspiration cytology. The volume of tumor was measured by ultrasonography and SUVmax of 18F-FDG PET/CT were analyzed and compared between benign and papillary thyroid carcinoma. A total 201 nodules in papillary thyroid carcinoma group and 60 nodules of nodular hyperplasia were evaluated.

**Result(s):** SUVmax of papillary thyroid carcinoma group was significantly higher than nodular hyperplasia group (mean SUVmax 3.15 vs. 2.01;  $P<0.05$ ). The tumor volume was not different between two groups (5.62 cc vs. 13.22;  $P>0.05$ ). SUVmax was analyzed in subgroup according to tumor volume ( $\geq 1$  cc or  $< 1$  cc). There was no significant difference of SUVmax in subgroup of tumor volume of  $< 1$  cc (mean SUVmax 1.14 in malignant group vs 1.00 in benign group;  $P>0.05$ ). But a significant difference was detected in subgroup of tumor volume of  $\geq 1$  cc (mean SUVmax 5.78 vs. 2.55;  $P<0.05$ ). Correlation coefficient between tumor volume and SUVmax in papillary thyroid carcinoma group was meaningless (Pearson correlation coefficient=0.03). SUVmax of positive lymph node group was significantly higher than node negative group in papillary thyroid carcinoma group (positive group 4.56 vs. negative group 2.13;  $P<0.05$ ).

**Conclusion(s):** Based on this results, 18F-FDG PET/CT can be a useful tool for the diagnosis of papillary thyroid carcinoma in subgroup of tumor volume of  $\geq 1$  cc.

**Keywords:** Thyroid Cancer, PET CT, Papillary Carcinoma

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**O03. Sarcoma / Melanoma / Others****Chairs: Meijin Nakayama (Japan)****Sandro Stoeckli (Switzerland)**

13:00 - 14:30 SBR III

[O03-01]

**Radiation-Induced Sarcomas of the Head and Neck, A Ten-Year Experience**

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**Objective:** Radiation-induced sarcoma (RIS) is a well known complication of radiotherapy. Radical surgery is the treatment of choice, but prognosis after surgery is poor. We aim to review our centre's experience with patients with radiation-induced sarcoma of the head & neck region in period 1999 to 2009, and aim to investigate whether radical surgery is beneficial.

**Method(s):** Patients who were treated at Queen Mary Hospital, Hong Kong, in the period 1999-2009 were recruited to the study. Inclusion criteria included previous radiotherapy for head and neck malignancy, sarcoma arising within radiation field, and histological confirmation of sarcoma.

**Result(s):** A total of 16 patients were recruited. They all had radiotherapy for the treatment of nasopharyngeal carcinoma. Eight were male and eight were female. The median latency period for sarcoma to develop was 10.6 years (range 5.3-25.1 years). The most common site of sarcoma was the neck (n=8), followed by the nasal cavity and nasopharynx (n=2 each). Other sites included the mandible and maxilla. The most common histology was undifferentiated sarcoma (n=5), followed by osteosarcoma (n=4) and rhabdomyosarcoma (n=2). Eleven patients underwent surgical resection of the sarcoma with or without reconstruction. Eight patients received adjuvant therapy in the form of chemotherapy (n=4) or brachytherapy (n=4). Median survival from diagnosis of sarcoma after resection was 1.58 years (range 0.42-5.42 years). Of the 16 patients, 9 died of disease while 2 died due to complications of adjuvant chemotherapy and 2 due to unrelated causes. Three patients remain disease free to date.

**Conclusion(s):** Radiation-induced sarcoma is an aggressive complication arising from radiotherapy. The proximity of these head and neck sarcomas to critical structures often limits curative resection, and the prognosis is often poor. However, palliative surgery may allow improved quality of life, especially if disfiguring tumor growths and large ulcerating wounds can be tackled.

**Keywords:** Radiation-Induced Sarcoma, Head and Neck Tumors

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[O03-02]

**Combined Therapy Parameningeal Rhabdomyosarcoma in Children**

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Vladimir Polyakov<sup>3</sup>, Ali Mudunov<sup>4</sup>, Evgenii Matyakin<sup>4</sup>**

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**Objective:** To estimate efficiency of treatment children with parameningeal rhabdomyosarcoma.

**Method(s):** 16 children have entered into research. 2 children (13%) had 2 stage of disease, 9 (56%) - 3 stage, 1 (6%) 4 stage, 4 (25%) with relapse. The most frequently tumors localized in fossa infratemporalis - 12 patients, in 3 cases primary tumor was localized in middle ear, in one- paranasal sinuses. At the time of diagnosis most tumors were greater than 5 cm (category b), takes 2, 3 or more topographo-anatomic zones (T2). The scheme of treatment patients of this group implies in the first step 4 courses of induction chemotherapy with evaluation effect and decision question of surgical treatment. After surgical treatment patient receive radiation therapy to tumor bed on the primary size before treatment in the dose 45-50 Gray. Then patient receive another 4 courses of chemotherapy.

**Result(s):** After 3-4 courses at 6 (38%) patients observed positive dynamics. Further they received radiation therapy-45,6 Gr and then 4 courses chemotherapy under the previous scheme. Three (50%) are live. One patient (17%) had relapse in 2 years after the end of treatment. At 5 (31%)- stabilization of disease. Then operative treatment was performed with further radiation therapy. The further chemotherapy was defined by degree of medical patomorphose. 4 (80%) live without disease. One (20%) with relapse has died in six months after the treatment. One (17%) with relapse operated on progression of disease and progression in early postoperative terms was observed. Second-look operations were performed in 3 children (19%). All patients are live. 2 (33%) 1. died from complication.

**Conclusion(s):** Surgery is a treatment of choice in patient with stabilization of disease and as a second-look operation that can improve survival.

**Keywords:** Children, Rhabdomyosarcoma, Parameningeal

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[O03-03]

## Clinical and Histological Findings of Oral Malignant Melanoma in KOREA:SNUDH Experiences

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<sup>2</sup>Department of Oral Pathology, School of Dentistry,  
Seoul National University, Korea

**Objective:** Oral malignant melanoma (OMM) is a rare neoplasm, only about 1% of all melanomas and these accounts for 0.5% of all oral malignancies. The prognosis of OMM is worse than that of skin melanoma where 5-year survival rate of 15-40% has been reported. Up to date, there was no affordable data about OMM in KOREA, therefore this presentation will focus 39 cases and review our experiences in Seoul National University Dental Hospital (SNUDH).

**Method(s):** We surveyed 39 patients who were diagnosed as OMM in the department of oral and maxillofacial surgery, SNUDH during last 16 years from 1993 to 2009. Several parameters were investigated, such as individual's symptoms and their clinical signs, clinical staging, histological classification, treatment methods, recurrence and metastasis, and 5-year survival rate. The pathologic findings were also classified according to histological subtype, depth of invasion, and immunohistochemical results after using S-100 and gp 100 (HMB-45) protein.

**Result(s):** The ratio for male and female didn't make any significant difference. The age of patients ranged from 28 to 81 years with median 57.8 years. 62% of the cases were localized in the palate. Among the 14 patients who had at least 3 years of postoperative period, there was local recurrence in 7.1% (1/14). Regional lymph node metastasis was occurred 9 out of 14 patients (64.2%). Distant metastasis was present in 14.2% (2/14). Of the 9 patients who qualified for evaluation of the 5-year survival rate, 5 patients were alive without evidence of disease, resulting in survival rate of 58%.

**Conclusion(s):** OMM had a poor prognosis compared to other malignancies in oral cavity. In 5-year survival rate, it has different results according to clinical staging, histological subtype, depth of invasion, whether the patients had been operated or not. Therefore, clinicians have to consider surgery as treatment of choice, and adjuvant therapy based on clinical and histological features.

**Keywords:** Oral Malignant Melanoma, Survival Rate, S-100

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[O03-04]

## Management and Subsite Variations of Head and Neck Mucosal Malignant Melanoma

**Sadi Husain\*, Annabel Kesterton, Michael Lee**

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**Objective:** To study mucosal malignant melanoma in different head and neck subsites and assess treatment outcomes.

**Method(s):** Retrospective case note analysis of patients with histological diagnosis of head and neck mucosal malignant melanoma (HNMM) between 2000 and 2010.

**Result(s):** 11 patients (4 male, 7 female, mean age 68 years) were identified with HNMM. There were 7 sinonal and 4 non-sinonal (2 gingiva, 1 soft palate, 1 nasopharynx) tumours. Mean follow up was 2 years (range 5 weeks to 7 years). None had regional or distant metastases at presentation. 5 patients initially treated with surgery and post-operative adjuvant radiotherapy, achieving 100% local disease control at 2 years. 3 patients treated with surgery alone, achieving 33% local disease control at 2 years. 2 patients (50%) with non-sinonal (1 soft palate, 1 gingiva) and 1 patient (14%) with sinonal disease developed levels I and II neck node metastases. 5 patients (3 sinonal, 2 non-sinonal) developed multiple distant metastases in brain, thorax, abdomen, bone and skin. Disease-free survival rates in surgery alone and surgery with adjuvant radiotherapy groups at 1 year and 2 years were 66% and 50%, and 33% and 25%, respectively. The overall survival rates for treated sinonal and non-sinonal tumours at 1, 2 and 3 years were 80% and 100%, 60% and 100%, and 40% and 33%, respectively. Overall survival rates for patients receiving treatment with curative intent at 1, 2 and 3 years were 88%, 75% and 38%, respectively. 3 patients receiving no curative treatment survived for a mean period of <1 year.

**Conclusion(s):** Surgery and post-operative adjuvant radiotherapy achieved better local disease control than surgery alone. Non-sinonal HNMM has higher preponderance of cervical nodal metastasis. Prophylactic treatment of the neck should be considered in management of non-sinonal disease. Whole body radiological imaging should be used for staging and investigation of distant metastasis.

**Keywords:** Mucosal, Melanoma, Management

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[O03-05]

## Mucosal Melanoma of the Head and Neck

**Richie Chan<sup>1\*</sup>, Yu-wai Chan<sup>2</sup>, William Ignace Wei<sup>2</sup>**

<sup>1</sup>Surgery, Queen Mary Hospital, Hong Kong

<sup>2</sup>Department of Surgery, Queen Mary Hospital, Hong Kong

**Objective:** Primary mucosal melanoma of the head and neck region is a rare entity. Current research data is largely based on western population. Our study aims to review our experience in this group of patients managed in Queen Mary Hospital over a 32-year period.

**Method(s):** The patients who presented with primary mucosal melanoma in the Head and Neck region between January 1978 and September 2009 at Department of Surgery, Queen Mary Hospital, were reviewed. Demographic data, baseline characteristics, treatments, recurrence, and survival data were retrieved and retrospectively analyzed.

**Result(s):** There were 14 women and 21 men in our study. Their age ranged from 27-89 years with a median of 66 years. The tumours were most frequently found in the nasal cavity (37%), oral cavity (23%) and maxillary sinus (20%). Most patients have stage I (76%) and stage II (21%) diseases at initial presentation. Only 1 patient presented with stage III disease. Twenty four patients were treated with surgery and 7 of them had adjuvant radiotherapy. One of them had debulking surgery for symptomatic control. Six patients received radiotherapy. One patient refused all conventional treatment and opted for traditional Chinese medicine. The overall survival ranged from 3 to 161 months (median, 22 months). The 1- and 5-year outcomes are as followed: overall survival, 85% and 41%; local control, 42% and 32%; regional control, 65% and 36%; locoregional control, 42% and 32%; distant metastasis-free survival, 69% and 41%; and disease-free survival, 42% and 32%, respectively. Stage I disease has significantly better 1-year and 5-year survival rates compared with stage II disease.

**Conclusion(s):** Primary mucosal melanoma of the head and neck carries a poor prognosis. Recurrence is common and nearly half of them recurred with distant metastasis. Approximately one fourth of patients survived at 5 years. Unresectable diseases may be controlled with radiotherapy.

**Keywords:** Mucosal Melanoma, Head and Neck Mucosal Melanoma, Head and Neck Melanoma

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[O03-06]

## Outcomes of Head & Neck Cancers in Haemic Malignancy Patients

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Yu-wai Chan, Wai-Kuen Ho, William I. Wei**

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**Objective:** Contemporary treatment of haemic malignancy improves survival, yet poses the risk of secondary neoplasm, including head & neck region. This study is to present the clinical characteristics and surgical outcomes of secondary head & neck cancers in haemic malignancy patients.

**Method(s):** Retrospective chart review was performed for head & neck cancer patients who had underlying haemic malignancy from 2000 to 2009. Demographic data, time interval and clinical outcome of these secondary head & neck cancers were collected and evaluated.

**Result(s):** There was total of 10 patients, 6 males and 4 females, had head and neck cancers after treatment of haemic malignancy. The mean age at diagnosis was 45.8 years old. Most of these patients were non-smoker and non-drinker. Seven patients received bone marrow transplantation (BMT) and subsequent developed chronic graft versus host disease (cGVHD) requiring long-term immunosuppressive drugs. The sites of tumours were, in descending order, tongue (100%), skin (30%), buccal mucosa (20%) and hypopharynx (10%). The interval between treatment of haemic malignancy and head & neck cancers was 2.33 to 26.83 years with a mean time of 10.37 years. Among nine patients who received surgical interventions, six were still alive and disease-free. The mean follow up time was 3 years and two patients had over 5 years follow up period. One-third (3/9 patients) developed local recurrence, one survived after salvage surgery and 33.3% have metachronous head & neck tumours occurrence.

**Conclusion(s):** In this distinct group of patients with history of haemic malignancy, the risk factors are different from ordinary head & neck cancer patients— younger age, non-smoker, non-drinker, cGVHD over mucosa after BMT. The interval of development since treatment of haemic malignancy may be as long as decades. Close surveillance is suggested in this group of patients because of the risk of local-regional recurrences and metachronous head & neck neoplasm development.

**Keywords:** Head and Neck Cancer, Haemic Malignancy, Bone Marrow Transplantation

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[O03-07]

## Basal Cell Carcinoma of The Head and Neck Region (HNBCC) – A 10 year Experience

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**Objective:** This study aims to report our experience in the management of HNBCC patients between 1999 and 2009.

**Method(s):** A retrospective review of all HNBCC patients treated in our centre from 1999 to 2009. Outcome measures included patient demographics, tumour characteristics, surgical management, management of patients with involved and close skin margins, and recurrence rates. Literature review was conducted to compare patient demographics and tumour characteristics between Chinese and Caucasian populations; treatment outcome between Mohs and non-Mohs surgery.

**Result(s):** A total of 226 HNBCC patients were treated in our centre from 1999 to 2009. Mean age was 73.1 years. Male to female ratio was 0.7. Twenty five patients had multiple BCC. There were a total of 273 HNBCC lesions. Common presentations included a pigmented skin lesion (76.2%), in the form of ulceration (64.8%) over the cheek (16.5%) and nasal ala (13.6%). One patient with solitary HNBCC refused treatment. All others underwent surgical excision +/- frozen section depending on clinical suspicion. Median skin margin taken on tumour excision was 2.0 mm. Primary skin closure was achieved in 51.8%. Skin margins were uninvolved, involved and close in 75.4%, 15.4% and 9.2% respectively. Most patients with involved margins (76.2%) underwent re-excision. One developed local recurrence 2 years later. The majority of those with close margins (92.0%) opted for observation. Four developed local recurrence thereafter. Overall recurrence rate was 5.5%.

**Conclusion(s):** HNBCC commonly presents as pigmented ulcers over the cheek and nose of elderly patients in our locality. This corroborates with large scale studies conducted in Caucasian populations. Mohs surgery conveys better local tumour control with lower recurrence rate. Various reconstructive techniques can be adopted for skin closure. Re-excision of those with involved and close skin margins improves local tumour control.

**Keywords:** Basal Cell Carcinoma, Head and Neck Region, Hong Kong

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[O03-08]

## Value of Fine Needle Aspiration Cytology in Head and Neck Lymphoma: Experience in a Head and Neck Cancer Unit in the United Kingdom

**Irumeepai<sup>1\*</sup>, Ashley Hay<sup>1</sup>, Lisa Pitkin<sup>2</sup>, Peter Williamson<sup>1</sup>, Philip Wilson<sup>3</sup>, Alastair Deery<sup>3</sup>**

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<sup>3</sup>Department of Histopathology, St. George's Hospital, UK

**Objective:** Lymphoma commonly presents to otolaryngologists and it is therefore crucial to establish a robust investigation protocol and an efficient care pathway. The aim of our study was to evaluate the diagnostic accuracy of fine needle aspiration cytology (FNAC) in lymphoma presenting primarily as a neck mass and to review the impact it had on shaping the management protocols at the head and neck cancer unit at St. George's Hospital, London.

**Method(s):** Data was collected retrospectively from the pathology database over a five-year period between 2003 and 2007. Separate searches were run for cytological diagnosis of lymphoma and histopathological diagnosis of lymphoma confirmed on cervical lymph node biopsy, and results cross-referenced. Immunocytochemistry stains used for diagnosis were recorded. All FNAC had been performed by an experienced consultant cytopathologist.

**Result(s):** 121 cases that met the inclusion criteria were identified. The initial FNAC diagnosis of lymphoma was confirmed to be correct on subsequent lymph node biopsy in 70.2% (85/121). 16 cases (13.2%) showed a false-negative result ("benign") and 1 case false-positive (0.8%). In 2 patients, biopsy showed other malignancies (1 thyroid and 1 neuroendocrine). In the remaining 17 cases of non-diagnostic FNAC (14.0%), 11 were due to inadequate sampling and 6 were non-diagnostic but suspicious of or diagnostic of malignancy. In 16 out of 20 cases (80.0%) of wrong diagnosis on the initial FNAC, immunocytochemistry had not been performed.

**Conclusion(s):** FNAC for lymphoma presenting primarily as a neck mass is highly valuable in our experience, especially when combined with immunocytochemistry. In our unit, it is the first line investigation in all suspected cases of head and neck lymphoma and we will also outline the rest of the investigation and management pathway within a multi-disciplinary setting.

**Keywords:** Lymphoma, Neck Mass, Fine Needle Aspiration Cytology

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[O03-09]

## Managing Carotid Body Paragangliomas: Single Institute Experience

**Vishal U s, Ashok Shenoy\***

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India*

**Objective:** Carotid body tumors are lesions that arise from the baroreceptors in and around the bifurcation of the carotid artery into External Carotid artery (ECA) and Internal Carotid artery( ICA). It belongs to the paraganglioma group of neoplasms. The decision making in the management of carotid body tumors depends on the age of the patient, the size of the neoplasm at presentation and the rate of growth of the tumor.

This study is a retrospective analysis of two surgeons' experience over a 15 year period with 30 carotid body tumors with the following aims and objectives:

1. Presentation of the tumor
2. Intraoperative highpoints with respect to management of the vasculature in the neck as well as the cranial nerves
3. Complications and morbidity associated with surgical excision
4. Successful extirpation of the tumor

**Method(s):** The patient population comprised of 20 females and 11 males in the age group of 17-45 years . Two individuals who were siblings (brother and sister) represented the familial form of this disease. The work up comprised of clinical examination with special focus on evaluation of cranial nerves, cross sectional radiography complemented with digital subtraction angiography in the early part of the study and now substituted by MR dynamic angiography which is a non invasive method of making the diagnosis. An ultrasound abdomen and urinary catecholamines completed the investigative workup. Pre op embolisation was attempted in one case.

**Result(s):** All patients except one underwent a successful carotid body excision. Based on the intraoperative shambhims classification Group A comprised of 7 tumors, group B-23tumors and group C necessitating sacrifice of the Internal Carotid Artery comprised of 1 case.

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## O04. Surgery (I) : Conservation Laryngeal Surgery

**Chairs : Kwang-Moon Kim (Korea)**

**Alfredo Pontejos (Philippines)**

13:00 - 14:30 SBR IV

[O04-01]

### Supracricoid Laryngectomy: Oncologic Validity and Functional Safety

**Kwang-Jae Cho, Young-Hoon Joo, Dong-Il Sun,  
Young-Hak Park, Seung-Ho Cho, Min-Sik Kim\***

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**Objective:** To elucidate the oncologic validity of supracricoid partial laryngectomy (SCPL) for advanced-stage endolaryngeal cancers and as a salvage procedure and verify its safety in maintaining laryngeal physiology.

**Method(s):** The medical records of 114 patients who underwent SCPL were retrospectively reviewed. We examined if the extended procedures, salvage procedure, adjuvant treatment, and type of reconstruction affect the survival and the mean time to decannulation and nasogastric tube removal. Five-year overall and disease-specific survival rate was calculated and postoperative complications were investigated as well.

**Result(s):** The local control rate was 89%. The five-year overall and disease-specific survival rate was 78% and 82% respectively. There was no significant difference in survival according to the extent of the resection of primary tumors and the presence or absence of previous treatment. However, the survival of the patients who received radiation or CCRT after SCPL was significantly lower than that of those without any adjuvant treatment. Decannulation and nasogastric tube removal was possible for all except for two patients and the mean time spent was 18.4 and 26.1 days, respectively. It took longer time significantly in cases of CHP, extended procedure, and salvage surgery rather than those of counterparts. Pulmonary complications, particularly aspiration pneumonia were the most common postoperative complications.

**Conclusion(s):** Our results suggested SCPL was feasible for advanced-staged laryngeal cancers and as a salvage procedure. Active and efficient postoperative rehabilitation, particularly for the cases of CHP, extended procedure, and salvage surgery, was demanded to prevent aspiration pneumonia.

**Keywords:** Supracricoid Laryngectomy, Oncologic, Functional

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[O04-02]

### Oncological Outcomes after Supracricoid Partial Laryngectomy

**Isabel Sanchez-Cuadrado, Alejandro Castro\*,  
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**Objective:** To review the oncological outcomes of supracricoid partial laryngectomy at our Department.

**Method(s):** Retrospective review of clinical records of patients that underwent supracricoid partial laryngectomy at our institution. Forty-one patients with glottic or supraglottic squamous cell carcinoma were identified. Data concerning patient and tumor characteristics, surgery, postoperative period, and follow-up were collected.

**Result(s):** All patients were male, with a mean age of 56 years (range 38-71 years old). Thirty-seven percent of tumors were classified as locally advanced carcinomas (T3-T4). Thirty-three patients (80%) underwent supracricoid laryngectomy with crico-hyoido-epiglottopexy (CHEP). Epiglottis was resected in the other 8 patients. One patient died in the immediate postoperative period because of cardiac tamponade, six developed pneumonia, two had a postoperative bleeding that required reintervention and other two developed pharyngo-cutaneous fistula. The median follow-up period was 38 months. More than 85% of the patients completed more than 2 years of follow up. Five-year actual local control rate was 80%, being 91% for T1-T2 tumors and 61% for locally advanced tumors. Thirty-five patients (85%) preserved their larynx. The 6 patients that underwent total laryngectomy had a local recurrence or a regional recurrence that infiltrated the larynx. No laryngectomy was performed for functional reasons.

**Conclusion(s):** Supracricoid partial laryngectomy is an oncologically safe procedure to preserve laryngeal functions in selected patients with glottic and supraglottic carcinomas. Our results are comparable to those reported in the literature.

**Keywords:** Laryngeal Cancer, Partial Laryngectomy

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[O04-03]

## Oncologic and Functional Outcomes of Primary versus Salvage Transoral Laser Microsurgery for Supraglottic Carcinoma

**Kitti Jantharapattana<sup>1\*</sup>, Katherine Hutcheson<sup>2</sup>,  
Denise Barringer<sup>2</sup>, David Grant<sup>2</sup>, Dianna Roberts<sup>2</sup>,  
Jan Lewin<sup>2</sup>, Christopher Holsinger<sup>2</sup>**

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<sup>2</sup>*Head and Neck Surgery, MD Anderson Cancer Center, USA*

**Objective:** To assess feasibility, disease control, and functional outcomes using transoral laser microsurgery (TLM) for primary and salvage treatment of supraglottic carcinoma.

**Method(s):** Retrospective case-control from a single academic tertiary care institution. Ten patients underwent TLM for supraglottic laryngeal carcinoma (01/2004-09/2009). Outcomes were stratified by radiation exposure. Rates of disease control were evaluated. Modified barium swallow (MBS) study and Performance Status Scale-Head and Neck (PSS-HN) data were prospectively collected. Functional outcomes were analyzed in the preoperative, immediate (<1 week) postoperative, and final periods.

**Result(s):** Five previously radiated patients underwent salvage TLM for local failure and 5 underwent TLM for stage I-III (T1-3N0M0) previously untreated disease. All tumors was visualized and resected without positive margins. No patient required tracheostomy. One of five salvage patients developed recurrence at the primary site and was treated with TLM. There was no recurrence (local or regional) for any patient undergoing TLM as primary therapy; furthermore, none required radiotherapy. Baseline MBS studies documented impaired airway protection in 4/5 salvage patients; no previously untreated patient had impairment. All salvage patients (5/5) aspirated in the immediate and final postoperative periods. Two salvage patients remained feeding tube dependent at last follow-up due to aspiration. Aspiration was documented in 3 previously untreated patients in the immediate postoperative period; however, none were feeding tube dependent at last follow-up. Median PSS-HN Understandability of Speech scores were 75 ("usually understandable") in the salvage group compared with 100 ("always understandable") in the previously untreated group.

**Conclusion(s):** Although disease control was equivalent for both groups having TLM, postoperative speech and swallow function were superior in previously un-radiated patients. Our findings suggest that TLM should be considered as a primary therapeutic modality for selected patients with supraglottic carcinoma.

**Keywords:** Supraglottic Carcinoma, Transoral Laser Surgery, Primary Versus Salvage

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[O04-04]

## Extended Supracricoid Partial Laryngectomies as an Alternative to Organ Preservation Protocols: Oncologic and Functional Outcomes

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**Objective:** Extended supracricoid partial laryngectomies (ESCPs) are defined as SCPL including the removal of the cricoid arch and first tracheal rings with or without half of the cricoid plate and corresponding arytenoid. Reconstruction can be performed either by tracheo-hyoidopexy (THP), tracheo-hyoido-epiglottopexy (THEP), tracheo-crico-hyoidopexy (TCHP), and tracheo-crico-hyoido-epiglottopexy (TCHEP). Aim of this paper is to retrospectively analyze oncologic and functional outcomes of these surgical options.

**Method(s):** Between December 2001 and January 2009, 22 patients affected by T3 (n=13) or T4 (n=9) laryngeal cancer were treated by ESCPL at our Institution. Oncologic outcomes were calculated according to the Kaplan-Meier curves (minimum follow-up, 12 months; mean, 35). Functional outcomes were analyzed in a subset of 11 patients by Voice Handicap Index, GRBAS scale, Multi Dimensional Voice Program, MD Anderson Dysphagia Inventory questionnaire, videoendoscopy of swallow, and videofluoroscopy. Functional outcomes of ESCPs were compared with those of 14 patients treated by standard SCPLs.

**Result(s):** Four patients (18%) had local persistences or recurrences and were treated by total laryngectomy and radiotherapy, 3 (14%) developed a second lung tumor, 3 (14%) died for unrelated causes, and 1 (4%) for the disease. Overall, determinate survivals, and organ preservation rate were 77.1%, 95.5%, and 76%, respectively. Perioperative complications occurred in 6 (26%) patients: only one of these required surgical revision. Comparison of functional outcomes between ESCPL and standard SCPL in terms of speech, swallowing, hospitalization time and removal of tracheostomic cannula and nasogastric feeding tube did not show statistically significant differences.

**Conclusion(s):** In our experience, ESCPs seem to be valuable alternatives to organ preservation protocols and total laryngectomy for treatment of T3-T4 laryngeal tumors. Oncologic outcomes are comparable to those reported in the literature for the above mentioned therapeutic modalities. Functional results do not significantly differ from those of standard SCPLs.

**Keywords:** Laryngeal Cancer, Partial Laryngectomy, Organ Preservation

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[O04-05]

## Laryngeal Function Preservation Following Supracricoid Partial Laryngectomy

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**Objective:** To analyze the functional outcomes of supracricoid partial laryngectomy at our Department.

**Method(s):** Forty-one patients with glottic and supraglottic carcinomas underwent supracricoid partial laryngectomy at our institution since it was introduced in 1998. Data concerning time to decannulation and oral intake were collected from the clinical records. Twenty-seven patients were alive, preserved their larynx and had a minimum follow-up of 3 months at the time of this survey. All but one accepted participation in a functional evaluation that includes a voice questionnaire (Voice Handicap Index), a swallowing questionnaire (M.D. Anderson Dysphagia Inventory) and objective measurements of voice quality (maximum phonation time and maximum intensity).

**Result(s):** Ninety-eight percent of the patients were decannulated, with a median time to decannulation of 14 days. Every patient achieved oral intake, at a median time of 18 days after surgery. Median Voice Handicap Index (VHI) score was 26, with 75% of patients scoring less than 40 (the VHI score ranges from 0 to 120: lower scores represent less subjective handicap). Median M.D. Anderson Dysphagia Inventory (MDADI) score was 92, with 75% of patients scoring 80 or over (the MDADI score ranges from 20 to 100: higher scores correspond to better swallowing function). Median maximum phonation time was 12 seconds (Q1=8 sec; Q3=14 sec). Median maximum intensity was 99 dB (Q1=95 dB; Q3=100 dB).

**Conclusion(s):** Laryngeal function can be preserved with supracricoid partial laryngectomy in selected patients with glottic and supraglottic carcinomas. Quality of life measurements demonstrate excellent voice and swallowing following this procedure.

**Keywords:** Partial Laryngectomy, Function Preservation, Laryngeal Cancer

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[O04-06]

## Conservation Surgical Management of Intermediate-Advanced Stage Laryngeal Cancer

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**Objective:** To report the oncologic and functional outcomes of conservation laryngeal surgery in the treatment of laryngeal cancer.

**Method(s):** A total of 63 patients with T1b to T4 lesions treated with either transoral laser microsurgery (TLM) (n=31) or supracricoid partial laryngectomy (SCL) (n=32) were retrospectively reviewed from January 1998 to September 2008. Median follow-up time was 21 months.

**Result(s):** The 2-year overall survival (OS) and disease-free survival (DFS) for the entire cohort were 85% and 71%, respectively. The 2-year OS and DFS were 81% and 55% after SCL, and 84% and 92% after TLM, respectively. The majority of patients had T2 or T3 lesions (88.9%). There were 28 patients (44.4%) with glottic lesions, 28 (44.4%) with supraglottic, and 7 (11.2%) with transglottic tumors. Sixteen patients (25%) received adjuvant therapy based on adverse histologic features. Speech and swallowing were good postoperatively, with median FOSS and CS scores of 1 and 2 for SCL patients, and 1 for TLM patients. Overall, 54 patients (86%) were alive with an intact larynx at last follow-up. One patient was tracheotomy dependent while 4 patients were feeding tube dependent. Four required subsequent total laryngectomy for oncologic or functional reasons.

**Conclusion(s):** In patients with intermediate to advanced laryngeal cancer, conservation surgery supplemented with adjuvant therapy based on aggressive histologic features in a minority (25%) of patients, is a valid treatment option for organ preservation. Excellent oncologic, speech and swallowing functional outcomes can be attained, making this a viable therapeutic option.

**Keywords:** Laryngeal Cancer, Conservation Surgery, Endoscopic

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[O04-07]

## Role of Conservative Surgery in Resectable Advanced Pathological Stage III-IVA Laryngeal Cancer

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**Objective:** To evaluate the role of conservative surgery in patients with advanced stage III and IV laryngeal squamous cell carcinoma (SCC) treated at European Institute of Oncology.

**Method(s):** Between June 1999 and December 2008, 54 consecutive previously untreated advanced stage laryngeal cancer patients received conservative surgery with or without adjuvant therapies. Inclusion criteria were any resectable stage III-IV glottis and supraglottis SCC, no contraindications to conservative surgery, and signed consent. Surgical techniques were open neck conservative surgery or endoscopic laser surgery with concomitant neck dissection. Based on pathological findings patients with pT4 and/or more than 2 positive lymph nodes and/or extracapsular extension of lymph node disease and/or positive surgical margins underwent adjuvant radiotherapy with or without concomitant chemotherapy.

**Result(s):** Fifty-four patients, (19 stage III, and 35 stage IV) were included. After conservative surgery, 20 (37%) patients had no further treatment while 20 (37%) patients received adjuvant radiotherapy and 14 patients (26%) received adjuvant concomitant chemoradiotherapy. Local recurrence, regional recurrence and distant metastasis occurred in 6, 2 and 2 patients, respectively. Major surgical complications were: 1 postoperative death and 3 bleeding. Median follow up was 32 months (range 1-126 months). 5-year Overall Survival, Disease Free Survival and Organ Preservation rate were respectively 80%, 75% and 91%.

**Conclusion(s):** These results support that primary conservative surgery could be offered to resectable advanced pathological stage III and IV laryngeal cancer patients. About one third of patients did not require further treatments. Preliminary data showed that 5-years overall survival was higher compared to literature data related to non-surgical strategies for advanced stage laryngeal cancer patients. These data suggest that there is a need to review the criteria for non surgical strategies and to re-evaluate the role of primary conservative surgery in advanced laryngeal cancer.

**Keywords:** Larynx, Advanced Stage Tumor, Conservative Surgery

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[O04-08]

## Organ Preservation Program in Laryngeal Cancer-Surgical Option

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**Objective:** Despite the development of laser surgery and radiotherapy in recent years, open surgery in laryngeal cancer is still practiced. It seems that ceasing this method of treatment is connected with a lack of appropriate training of resident in this area. The appropriate classification of patients for partial surgery allows us to ensure the patient a natural way of breathing, the possibility to communicate, and correct swallowing. When deciding on this method of treatment we avoid radiotherapy, which in the long term brings certain consequences for the patient's health. The aim of this paper is to evaluate indications for the applied surgical method, survival and quality of life of patients after partial surgery for laryngeal cancer.

**Method(s):** The material comprises 46 patients treated during 2007–2009 for laryngeal cancer. All patients were qualified based on TNM classification, clinical staging and imaging tests for partial surgery.

The following operations were performed:

1. fronto-lateral laryngectomies 26
2. horizontal laryngectomies 6
3. supraglottic laryngectomies 14

**Result(s):** In the study material in all patients it was possible to achieve the intended aim of retaining the natural way of breathing, swallowing and communicating. The operations were only performed in stages T2 and T3. In 25 patients selective lymphadenectomy was also performed. Three-year survival in the studied group of patients is 80%.

**Conclusion(s):** The surgical method based on partial laryngectomy is still practiced and ensures the patient a good quality of life and survival when compared with alternative methods.

**Keywords:** Organ Preservation Program, Surgical Option, Laryngeal Cancer

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**O05. Chemoradiation (I)****Chairs : Keunchil Park (Korea)****Luiz Paulo Kowalski (Brazil)**

14:30 - 16:00 SBR I

[O05-01]

## **Evolution, Progress and Current Practice of Organ Preservation with Chemoradiation Protocols – Have We Reached a Consensus?**

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**Objective:** In 1990's there was sea change in the management of locally advanced HNSCC ablative surgery with adjuvant post operative external beam radiotherapy (EBRT) giving way to non surgical protocols of neoadjuvant chemotherapy+EBRT in those showing a 'response' (Viz .the VALSEC and the EORTC studies). While there was organ preservation in in 66% of Larynges, there was no evidence of any survival advantage between the test and controls.

**Method(s):** So against this background we recount our experience over 2 decades with 583 locally advanced HNSCC lesions starting in 1989 with simple strategies with different schedules incorporating various chemotherapeutic drugs, starting with neoadjuvant methotrexate and 5FU followed by EBRT after evaluating different drug schedules we now recommend EBRT (66-70 gray with LINAC / IMRT)/ accelerated fractionation with concomitant boost+Concurrent CT (Weekly schedule of CDDP@50 mg/m<sup>2</sup>)+ anti EGFR targeted therapy with Nimotuzumab which we believe will emerge as standard of care owing to their reduced toxicities both acute and delayed with equivalent levels of organ preservation.

**Result(s):** It is evident feel that exclusion of 5 fluoro-uracil from the chemotherapeutic regimen will prevent both acute and chronic toxicities of mucositis and subsequent fibrotic stricture formation and lead to more optimal organ preservation.

**Conclusion(s):** For successful OP careful case selection is important: the performance and nutritional status of the patient emerged as important aspects of inclusion criteria with special attention to pre-treatment functional status of the organ to be preserved. The survival advantage though small was evident without overt statistical significance owing to dropout in follow up after 3 years.

**Keywords:** Pre-operative Function, Exclusion of 5 Fluoro-Uracil, Anti-Egfr Targetting

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[O05-02]

## **Role of Neoadjuvant Chemotherapy in Locally Advanced Squamous Cell Carcinoma of the Maxillary Sinus**

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**Objective:** The purpose of this study is to assess the efficacy of neoadjuvant systemic chemotherapy (NAC) for locally advanced squamous cell carcinoma (SCC) of the maxillary sinus.

**Method(s):** Seventy-four patients with locally advanced SCC (T3 or T4a) without distant metastasis between 1984 and 2008 were analyzed. Thirty-four patients were treated surgically or by radiotherapy (Group1), and 40 patients underwent NAC, followed by surgery and/or radiotherapy (Group 2).

**Result(s):** There were significant differences between the Group 1 and 2 in terms of 5-year overall survival (73.2% vs. 49.0%, *P*=0.034) or 5-year disease free survival rates (52.6% vs. 20.2%, *P*=0.006). However, the primary lesions in Group 2 (6 cases in T3 and 34 cases in T4a) were more advanced than those in Group 1 (18 cases in T3 and 16 cases in T4a). In addition, no significant differences in 5-year overall survival or disease free survival rates were observed between 2 groups in same T stage. The overall response rate to NAC was 57.5%. The responders to NAC had a tendency to have higher 5-year overall survival rates than the non-responders (75.2% vs. 25.0%, *P*=0.064). However, local control rates were not improved significantly by the addition of NAC. The orbit was more frequently preserved in Group 2 (95.8% vs. 14.3%) without a decrease in survival rate.

**Conclusion(s):** NAC does not improve overall survival although it appears to be effective in preserving the orbit. The parameters which can predict the responsiveness to NAC are required.

**Keywords:** Maxillary Sinus Carcinoma, Neoadjuvant Chemotherapy, Orbital Invasion

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[O05-03]

## Induction Chemotherapy with Docetaxel, Cisplatin, and 5-Fluorouracil (TPF) Followed by Concurrent Cisplatin-Radiotherapy (CRT) or Cetuximab-Radiotherapy (ERT) in Loco-Regionally Advanced Squamous Cell Carcinoma

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**Objective:** Assessing the feasibility of induction chemotherapy with TPF followed by CRT or ERT in advanced HNSCC.

**Method(s):** Forty two patients with advanced SCCHN were recruited to receive induction chemotherapy every 3 weeks, followed by CRT or ERT. At the time of analysis 38 patients completed the whole treatment plan. Of these, 6 (15.8%) received radiotherapy (RT), 20 (52.6%) received CRT and 12 (31.6%) received ERT. Response rate and toxicity of induction (42 patients) and concomitant or radiation therapy (38 patients) were analyzed. The NCI Common Toxicity Criteria were used to classify adverse events.

**Result(s):** Mean age was 60.2±10.1, M:F ratio was 31:11. Sixteen patients (38.1%) had oral cavity cancer, 15 patients (35.7%) had larynx-hypopharynx, 7 patients (16.7%) oropharynx and 4 patients (9.5%) had other sites cancer. Eighty-eight percents had advanced T-stage and 52% had N2/3 disease. More than 90% of patients received 2 or more cycles of TPF. During the induction phase, 21 patients (50%) had one or more grade 3-4 toxicity which included: mucositis (21%); diarrhea (17%); neutropenia (21%); fatigue (24%); neutropenic fever (14%). Dose reduction was required in 45% of patients. Response rate following induction chemotherapy was: CR: 48%; PR: 45%; MR or stable disease: 7%. Median number of concurrent chemo- or bio-RT cycles was 3 for CRT and 5.5 for ERT. Forty percents of patients treated with CRT received 4 cycles of chemotherapy or more, compared to 80% of patients on ERT. At a mean follow-up of 12.2 months for patients who completed the treatment plan, 24 (63%) patients are alive NED, 7 (18%) patients were DOD, 6 patients (16%) are AWD, and one patient DWOD.

**Conclusion(s):** Induction chemotherapy by TPF is effective in patients with advanced SCCHN with a high response rate. Toxicity is relatively high, but manageable. Both CRT and ERT following induction TPF are feasible; however, ERT is more tolerable.

**Keywords:** Cetuximab, Induction Chemotherapy, Docetaxel, Cisplatin, 5-Fluorouracil

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[O05-04]

## Preliminary Results of an Uncontrolled, Phase II Trial of Induction Chemotherapy (ICT) with Cetuximab and Docetaxel-Cisplatin-5FU (TPF) Followed by Cetuximab+Radiotherapy in the Responders

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**Objective:** Efficacy and safety of adding cetuximab to the standard TPF ICT, administered with the aim of selecting patients for organ preservation.

**Method(s):** 37 patients with untreated, Stage III, IV, resectable SCCHN: oral cavity (8 patients:21.6%), oropharynx (12 patients:32.5%), hypopharynx (11 patients:29.7%), larynx (6 patients:16.2%) were enrolled; 31/6 men/women, median age:57 years, Karnofsky PS: 100%. Treatment: 2 cycles of 75-75 mg/m<sup>2</sup> docetaxel and cisplatin (d1,d22), 750 mg/m<sup>2</sup> 5-fluorouracil/day in continuous infusion (d1-5, d22-26), and cetuximab (400 mg/m<sup>2</sup> loading, then 250 mg/m<sup>2</sup> weekly). Complete (CR) or partial (PR) responders were treated with 70 Gy radiotherapy (RT) (2 Gy/day) with weekly cetuximab. Tumor assessment (CT/MRI): before treatment, end of ICT, three months after radiotherapy.

**Result(s):** Response rates (RR) to ICT: 24/37 patients:64.9% (PR), 7/37 patients:18.9% stable disease (SD), 2 pts:5.4% lost for measurement, 4 patients:10.8% not assessed yet. Primary site of 4/7 SD patients was oral cavity. 19/24 ICT-responders were treated with RT+cetuximab. RR to radiotherapy: 15/19 CR, 1/19 PR, 3/19 patients not assessed for response yet. Grade 3,4 adverse events (AEs) during ICT: 9 hematological (2 febrile neutropenia), non-hematological: 2 hypersensitivity reactions, 2 liver enzyme elevations, 5 low ion levels. Grade3,4 AEs during RT: non-hematological only: mucositis: 4/19, skin reaction 2/19, 1 patient died of pneumonia and hepatic insufficiency after the end of radiotherapy. An updated analysis of the final RR and AE data will be presented at the Congress.

**Conclusion(s):** High RR to ICT in all but oral cavity cancers was observed. Most of the ICT responders had CR after RT. Gr3,4 AEs were not more common than expected.

**Keywords:** Induction Chemotherapy with Cetuximab, Organ Sparing, Radiotherapy With Cetuximab

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[O05-05]

## Phase II Study of Concurrent Chemoradiotherapy with Capecitabine and Oxaliplatin in Patients with Locally Advanced Squamous Cell Carcinoma of the Head and Neck

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**Objective:** The aim of the trial was to evaluate the efficacy and safety of concurrent chemoradiotherapy with capecitabine and oxaliplatin in patients with locally advanced squamous cell carcinoma of the head and neck (SCCHN).

**Method(s):** In total, 41 patients with stage III or IV SCC of the oral cavity ? 19 patients and larynx ? 22 patients were enrolled. The chemotherapy consisted of two cycles of intravenous oxaliplatin of 130 mg/m<sup>2</sup> on day 1 and oral capecitabine 2000 mg/m<sup>2</sup> daily from day 1 to day 14 at 3-week intervals. The radiotherapy concurrently was delivered to the primary tumor site and neck.

**Result(s):** After the chemoradiotherapy, in oral cavity patients 63.1% complete responses and 36.9% partial responses were achieved. In larynx cancer patients 72.7% complete responses and 27.3% partial responses were achieved. The most common toxicities were - mucositis occurred in 73.7% patients, nausea and vomiting in 65% patients. At a median follow-up duration of 12.8 months, the overall survival rate at 1-year was 90.2%.

**Conclusion(s):** Concurrent chemoradiotherapy with capecitabine and oxaliplatin was found to be well tolerated and effective in patients with locally advanced SCC of the oral cavity and larynx.

**Keywords:** Concurrent Chemoradiotherapy, Capecitabine and Oxaliplatin

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[O05-06]

## The Comparison between Two Dosing Schedules of Cisplatin and 5-FU as the Regimen of Concurrent Chemoradiotherapy in Treating Locally Advanced Squamous Cell Carcinoma of Head and Neck (SCCHN)

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**Objective:** Cisplatin-based concurrent chemoradiotherapy (CCRT) is the cornerstone of treatment for locally advanced head and neck squamous cell carcinoma (HNSCC). The dosage of cisplatin and 5-FU used in concurrent chemotherapy was usually 60-75% of that used as standard systemic chemotherapy. However, the optimal schedule was not known. We reported our single institution experience in using two dosing schedules of cisplatin plus 5-FU (higher dose vs. lower dose) as the concurrent chemotherapy in CCRT in treating locally advanced HNSCC.

**Method(s):** Patients with locally advanced non-nasopharyngeal HNSCC (stage III, IVA, IVB) and CCRT as either primary treatment or adjuvant therapy postoperatively, nonrandomly received 2 dosing schedules of concurrent chemotherapy. The higher dose concurrent chemotherapy was cisplatin 15 mg/m<sup>2</sup>+5-FU 750 mg/m<sup>2</sup> daily continuous infusion from day 1 to 5 and day 21 to 25 of radiotherapy. The lower dose was cisplatin 12 mg/m<sup>2</sup>+5-FU 600 mg/m<sup>2</sup>. All patients were treated with conventional fractionation of 2 Gy per fraction, 5 daily fractions per week to a total dose 66 Gy. We retrospectively reviewed charts and reported the response, survival and toxicities between the 2 groups.

**Result(s):** 168 patients (73 lower dose; 95 higher dose) were enrolled and treated between Jan 2002 to Dec 2006. Stage distribution (III/IVA/IVB) within each group was 21/45/7 (lower dose) and 22/57/16 (higher dose). At a median follow-up of 44 months, the higher dose chemotherapy did not provide survival benefit (3-year survival rate 55.8% vs. 46.6%, P=0.235). Patients receiving higher dose chemotherapy had more grade 3/4 neutropenia (31.5% vs. 10.9%, P=0.003) but the incidence of grade 3/4 mucositis was not statistically significant (62.1% vs. 49.3%, P=0.066).

**Conclusion(s):** In this retrospective review, higher dose Cisplatin+5-FU as the concurrent chemotherapy regimen in CCRT did not provide survival benefit with significant higher grade 3/4 neutropenia compared to the lower dosing schedule.

**Keywords:** Locally Advanced Head and Neck Cancer, Ccrt, Cisplatin Plus 5-FU

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[O05-07]

## Monoclonal Antibody Drugs Usage Experience at Patients with Squamous Cell of Head and Neck Cancer

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*Microsurgery, Research Oncology Institute after P.A.Hertzen,  
Russian Federation*

**Objective:** Monoclonal antibody drug clinical effectiveness study at patients group with squamous cell of head and neck cancer in combination with best supportive care compared with patients who got only best supportive care.

**Method(s):** Study was performed as a part of international protocol in Moscow Research Oncology Institute after P.A.Hertzen microsurgery department. Randomized patients number was 10. They were randomly separated in two equal groups. Next patient inclusion criteria were used: morphologically approved squamous cell presence; no effect from previous treatment and 2 obligatory chemical therapy courses with platinum medicines; approximately stable somatic status (WHO≤2); tumor progression not less than 20%. First group (5 patients) got investigated drug with best supportive care, second group (5 patients) only best supportive care. Best supportive care (BSC) included nutrient support, pain-relieving and supportive care. The drug is a humanized monoclonal antibody. First group patients got the drug by recommended schema, with one week interval, intravenous, with doze titration depending on the drug side effect, including skin rash of different degree).

**Result(s):** Good shipping was noticed in first group during clinical effectiveness evaluation (all patients had skin rash less than was allowed for investigation continuation); primary tumor process stabilization from 8 to 46 weeks (confirmed by CT/MRI results); fibrosis of pulmonary metastasis (if were) on 10-18th week, CT-confirmed; bone metastasis progression (if were), despite the therapy. Fast tumor process progression causing patient death was noticed in control group. Result of patient life length evaluation in first group was 25 weeks (in range from 7 to 54), in second group 4 weeks (in range from 2 to 14).

**Conclusion(s):** Investigated drug showed very high clinical effectiveness on complicated group of patients (process stabilization, forming pulmonary fibrosis from metastasis), good shipping, confirmed longer patients life compared with control group.

**Keywords:** Monoclonal Antibody, Biotherapies, Clinical Trials

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[O05-08]

## Betel Quid Extract Promotes Oral Cancer Cell Migration by Activating a Muscarinic M4 Receptor-Mediated Signaling Cascade Involving ERK1/2 and SFKs

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**Objective:** Betel quid (BQ) chewing is a largely accepted etiological factor for oral squamous cell carcinoma (OSCC) in Southeast Asia. However, how chewing BQ may lead to oral carcinogenesis remains to be elucidated. We have previously demonstrated that the activation of Src family kinases (SFKs) is a critical signaling event for BQ-induced oral cancer cell migration and invasion. Here we investigate whether this biological effect is mediated by specific membrane receptors.

**Method(s):** The respective antagonists of G protein-coupled receptors (GPCRs), muscarinic receptor family and muscarinic M4 receptor, together with migration assay and competitive ligand-binding assay were used to examine the role of muscarinic M4 receptor in BQ-induced oral cancer cell migration.

**Result(s):** We found that BQ-induced activation of extracellular signal-regulated kinase 1/2 (ERK1/2) and migration in oral cancer cells were inhibited by both pertussis toxin (PTX) and atropine, suggesting the involvement of the muscarinic receptor family. The activation of ERK1/2 and the enhanced migration ability were significantly counteracted by PD102807, the selective antagonist of muscarinic M4 receptor. In addition, cold BQ extract effectively competed with a known ligand, (3H) N-methyl scopolamine ([3H]-NMS), for binding to muscarinic M4 receptor in vitro, thus indicating that BQ could stimulate the activation of motility-promoting signaling through direct interaction with the receptor. Remarkably, ectopic over-expression of M4 receptor significantly increased BQ-induced cell migration. Furthermore, SFKs acted downstream of muscarinic M4 receptor but upstream of ERK1/2 in the signaling of BQ-induced cell migration.

**Conclusion(s):** In this study we have presented the first evidence that BQ can trigger the activation of cellular signaling via a specific membrane receptor, i.e., the muscarinic M4 receptor, in oral cancer cells. Antagonists or inhibitors targeting to this receptor or the pathway may provide a mechanistic basis for drug development and clinical therapeutics of BQ-related oral cancer.

**Keywords:** Betel Quid, Oral Squamous Cell Carcinoma, Muscarinic M4 Receptor

**Corresponding Author** Jeff Yi-Fu Chen (yifuc@kmu.edu.tw)

[O05-09]

## Pilot Study of Target Therapy with EGFR Antibody (Nimotuzumab) in Patients with Advanced Head and Neck Cancer

**Wei Guo\***

*Department. of Oral and Maxillo.Sur; 9th People's Hospital, China*

**Objective:** To explore the efficacy of the combination of biological target therapy and chemotherapy.

**Method(s):** Seventy one patients (54 men and 17 women aged from 30 to 83 years; mean 60) with local advanced oralmaxillofacial & head and neck tumors (no indication for surgery, radiotherapy) confirmed by histology and radiology, having indication of biochemotherapy, were enrolled in this study. The chemotherapy regimen is CDDP 75 mg/m<sup>2</sup> d1,TAX 75 mg/m<sup>2</sup> d1, 5-Fu 750 mg/ m<sup>2</sup> d1-5 and Nimotuzumab 100 mg/m<sup>2</sup>/w.

**Result(s):** The patients completed chemotherapy 2 to 4 cycles, mean 2.2 cycles; Nimotuzumab were used 2 to 8 times, mean 4.3 times. The prognosis was as follows: CR 4 cases, PR 39 cases, SD 18cases, PD 3 casesand 7 cases can not evaluated. The total effective rate which was calculated by PR plus CR was 61%. No serious adverse reaction was found during the course of the treatment, only one case with slight rash.

**Conclusion(s):** Nimotuzumab was equally effective in the increase of chemosensitivity and good tolerability profiles.

**Keywords:** Target Therapy, Egfr Antibody, Nimotuzumab, Head and Neck Cancer

**Corresponding Author** Wei Guo (guoweicn@yahoo.com)

**O06. Surgery (II) : Larynx****Chairs : Hyun taik Cho (Korea)****Jan Betka (Czech Republic)**

14:30 - 16:00 SBR II

[O06-01]

**Supracricoid Partial Laryngectomy****Alfredo Pontejos\****ORL, UP-PGH, Philippines*

**Objective:** To present my experience with supracricoid partial laryngectomy in early and advanced cases of laryngeal cancer.

**Method(s):** A total of 31 cases of laryngeal cancer were reviewed in 2 different hospitals where the author is affiliated. The cases were classified as to age, sex, stage. The outcome of the procedure was noted.

**Result(s):** 3/31 failed decannulation. 2 were converted to total laryngectomy. All were able to swallow and feed. 2 had recurrence in the neck. All are speaking although the voice is breathy. Minimal aspiration if at all is noted in some cases. 83% are alive and well after 3 years.

**Conclusion(s):** Supracricoid partial laryngectomy is a good alternative to laser surgery and chemoradiation in early and advanced cases. Patients have no permanent stoma and deglutition is good.

**Keywords:** Supracricoid Partial Laryngectomy

**Corresponding Author** Alfredo Pontejos (docpontejosjr@yahoo.com)

[O06-02]

**Complications of Endoscopic CO<sub>2</sub> Laser Surgery for Laryngeal Tumor****Drago Prgomet<sup>1</sup>\*, Ratko Prstacic<sup>1</sup>, Davorin Djanic<sup>2</sup>**<sup>1</sup>ENT, University Hospital Center Zagreb, Croatia<sup>2</sup>ENT, General Hospital Slavonski Brod, Croatia

**Objective:** The main advantages of a CO<sub>2</sub> laser endoscopic approach in treatment of laryngeal carcinoma are good oncologic results with low incidence of complications. But although rare some complications following endoscopic CO<sub>2</sub> laser surgery can be very serious, even with lethal outcome. The authors wanted to highlight complications of an endoscopic surgery for laryngeal and hypopharyngeal carcinoma.

**Method(s):** We have included in our study 212 patients in the period from 1988 to 2008, 132 of them with glottic carcinoma, 71 with supraglottic carcinoma and 9 with hypopharyngeal carcinoma. All patients had T1 and T2 tumors. We have analyzed retrospectively all early and late postoperative complications and their impact on functional outcome.

**Result(s):** In 37 patients (18 %) postoperative complications were registered. As different types of complications we have revealed: 4 cases of perichondritis in local infections, emphysema in 5 patients following resection of anterior commissure and preepiglottic space, postoperative mucosal edema in 7 patients which necessitated tracheostomy performance in two patients. Postoperative hemorrhage was presented in 13 patients, eight of them needed revision in the operating room. One patient with supraglottic carcinoma died on the ninth postoperative day due to late bleeding. 17 patients with supraglottic carcinoma have experienced postoperative aspiration, 4 of them have developed postoperative pneumonia. In one patient due to prominent aspiration and recurrent pneumonia total laryngectomy was performed. Following endoscopic resection of glottic carcinoma we have revealed granulomas in 10 patients and synechiae in 7 patients. Seven patients had more than one complication.

**Conclusion(s):** The authors have defined a small number of complications following laser surgery comparable to former investigations. The complications are rarer than in open procedures but that can be explained by treating only early laryngeal tumors. We have noticed that complications are more prevalent following treatment of supraglottic lesions in comparison with glottic lesions.

**Keywords:** Laser Surgery, Complications, Laryngeal Tumor

**Corresponding Author** Drago Prgomet (drago.prgomet@zg.t-com.hr)

[O06-03]

## Salvage Surgery (SS) for Laryngeal Squamous Cell Cancer (SCC) after Failure of Different Organ Preservation Strategies

**Cesare Piazza<sup>1\*</sup>, Giorgio Peretti<sup>2</sup>, Francesca Del Bon<sup>1</sup>, Stefano Mangili<sup>2</sup>, Daniela Cocco<sup>1</sup>, Luca Oscar Redaelli De Zinis<sup>2</sup>, Piero Nicolai<sup>1</sup>**

<sup>1</sup>Otolaryngology - Head and Neck Surgery,

University of Brescia, Italy

<sup>2</sup>Otolaryngology - Head and Neck Surgery, Italy

**Objective:** SS for persistent/recurrent laryngeal SCC is the last parachutes after failures of surgical and non-surgical organ preservation strategies. Aim of this study is to retrospectively analyze patients treated for persistent/recurrent laryngeal SCC, proposing a therapeutic algorithm based on staging of the index tumor, its primary treatment, and staging of recurrence.

**Method(s):** 297 patients affected by recurrent/persistent laryngeal SCC were treated by SS at our Institution between 1986 and 2007. Patients had been previously managed by radiotherapy or chemoradiotherapy (RT/CRT) in 92 cases (Group A), transoral laser surgery (TLS) in 191 (Group B), and open-neck conservative surgery (ONCS) in 14 (Group C). Last consultation was obtained in November 2009 (mean follow-up, 90 months; range, 24-269).

**Result(s):** Recurrences of Group A was staged as 42 rT1-rT2 and 50 rT3-rT4 and were treated by TLS in 25%, ONCS in 16%, and TL with/without partial pharyngectomy in 59%. Staging of recurrences in Group B was 147 rTis-rT2 and 44 rT3-rT4. SS included TLS in 64%, RT in 1.5%, ONCS with/without RT in 12.5%, and TL with/without partial pharyngectomy and RT/CRT in 22%. Staging of recurrences in Group C was 10 rTis-rT2 and 4 rT3-rT4. SS encompassed TLS in 21% and TL with/without partial pharyngectomy with/without RT/CRT in 79%. Postoperative complications requiring surgical revision were encountered in 29.3% of patients in Group A and 7.3% in Group B and C. Five-year overall, determinate survivals, and organ preservation rate were, respectively, 69.5%, 75.3%, and 55.5% for Group A, and 89.1%, 93.5%, and 83.8% for Group B and C ( $P=0.0001$ ). Also the difference between complication rates turned out to be statistically significant ( $P=0.001$ ).

**Conclusion(s):** SS can be accomplished by the same tools of primary treatment according to an algorithm taking into account different variables such as index tumor and recurrence staging, type of treatment previously failed, and patient's characteristics.

**Keywords:** Larynx, Cancer, Salvage Surgery

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[O06-04]

## Delayed Wound Infection after Supracricoid Laryngectomy Following Failure of High Dose Radiation

**Meijin Nakayama\*, Makito Okamoto, Yutomo Seino, Shunsuke Miyamoto, Seiichi Hayashi, Takashi Matsuki, Akiko Ogawa**

*Otorhinolaryngology, Kitasato University School of Medicine, Japan*

**Objective:** Past radiation therapy is known as a risk factor for postoperative wound infection following supracricoid laryngectomy (SCL). Risk may further increase following failure of high dose radiation (>65 Gy); in these patients, wound infection may become evident more than one month after surgery. By defining this complication as "Delayed Infection" and reviewing the clinical features, we investigated the incidence of delayed post-SCL wound infection after failure of high dose radiation.

**Method(s):** Between 1997 and 2009, 60 patients with laryngeal tumor underwent SCL (CHEP in 56 and CHP in 4 patients). Among 60 patients, 26 had received radiation before SCL. The postoperative course was analyzed by comparing patient groups receiving a radiation doses above 65 Gy or below 64 Gy.

**Result(s):** Of these 60 patients, post-SCL wound infection occurred in 14 of 26 (54%) and 6 of 34 (18%) patients with and without irradiation, respectively ( $P<0.01$ ). All 5 patients receiving radiation doses below 64 Gy manifested wound infection in the early stage. In the 9 patients receiving radiation doses exceeding 65 Gy, 5 showed early and 4 exhibited delayed infection. In the four patients with delayed infection, the radiation doses were 66, 68, 70, and 76.8 Gy (avg. 70.2 Gy), respectively. Blood data, such as WBC and CRP, showed slight elevation before the delayed infection become evident.

**Conclusion(s):** Delayed infection is a complication that should be anticipated when performing SCL in patients after failure of high dose radiation (>65 Gy). Wound infection often becomes evident more than one month after an uneventful post-SCL course. Delayed reepithelialization of the cricothyroid gap is the main etiology of this complication. Close follow-up of blood data along with frequent endoscopic observation is the key to early detection. Early initiation of antibiotics and hyperbaric oxygen therapy are effective for rapid recovery from delayed infection.

**Keywords:** Supracricoid Laryngectomy, Laryngeal Cancer, Infection

**Corresponding Author** Meijin Nakayama (meijin@med.kitasato-u.ac.jp)

[O06-05]

## Angiogenesis, Lymphangiogenesis in Early-Stage Laryngeal Carcinoma

**Andrea Bolzoni villaret<sup>1\*</sup>, Diego Barbieri<sup>1</sup>, Alberto Schreiber<sup>1</sup>, Daniela Cocco<sup>1</sup>, Giorgio Peretti<sup>1</sup>, Laura Butta<sup>1</sup>, Simona Fisogni<sup>2</sup>, Silvia Lonardi<sup>2</sup>, Fabio Facchetti<sup>2</sup>, Piero Nicolai<sup>1</sup>**

<sup>1</sup>ENT, University of Brescia, Italy

<sup>2</sup>Pathology, University of Brescia, Italy

**Objective:** Recently, many studies have emphasized the impact of tumor angiogenesis and lymphangiogenesis in recurrence and in regional/distant spread of disease. Although early-stage laryngeal cancer generally has a favorable oncologic outcome, we observed a group of patients with poor prognosis in terms of locoregional relapse, organ preservation, and survival. The aim of our study was to evaluate the immunohistochemical (IHC) expression of CD31 and podoplanin to define the angiogenetic and lymphangiogenetic patterns and their possible prognostic role in previously untreated T1-T2 glottic squamous cell carcinomas.

**Method(s):** Between January 1994 and December 2007, 428 patients with early-stage laryngeal cancer underwent CO2 laser surgical resection. Twenty-seven cases with poor outcome were identified and compared in a case-matched fashion with a selected sample of 28 patients with favorable prognosis. All patients were males and their mean age was 62 years. Patients were followed until death or for at least 24 months after treatment. Three µm sections were obtained from formalin-fixed and paraffin-embedded tumoral tissues and IHC evaluation was performed. Monoclonal antibodies against CD31 and podoplanin were used for the detection of blood and lymphatic vessels, respectively. A morphometric measurement was used for the analysis of angiogenesis, while lymphangiogenesis was studied with a semi-quantitative technique. Data were analyzed using chi-square and Mann-Whitney tests. All p-values were considered significant when <0.05.

**Result(s):** An increased tumor angiogenesis correlated with local ( $P=0.01$ ) and locoregional relapse ( $P=0.01$ ) other than death of disease ( $P=0.03$ ). The presence of lymphatic vessels in peritumoral fields affected local ( $P=0.004$ ) and locoregional recurrence ( $P=0.01$ ).

**Conclusion(s):** Evaluation of angiogenesis and lymphangiogenesis in early-stage laryngeal cancer may be useful to identify patients with a high risk of recurrence in order to properly modulate treatment and follow-up strategies.

**Keywords:** Laryngeal Cancer, Angiogenesis, Lymphangiogenesis

**Corresponding Author** Andrea Bolzoni villaret (dr.bolton@libero.it)

[O06-06]

## Role of Pectoralis Major Myocutaneous Flap in Salvage Laryngeal Surgery for Prevention of Pharyngocutaneous Fistula and Reconstruction of Skin Defect

**Hisham Anwar<sup>1</sup>, Ali Meebed<sup>1</sup>, Tarek Khairy<sup>1\*</sup>, Mohammed El-Zohairy<sup>1</sup>, Mohamed Lotaif<sup>2</sup>**

<sup>1</sup>Department of Surgical Oncology, National Cancer Institute, Cairo University, Egypt

<sup>2</sup>Department of Radio-therapy, National Cancer Institute, Cairo University, Egypt

**Objective:** To Study the Role of Pectoralis Major Myocutaneous Flap in Salvage Laryngeal Surgery in Prevention of Pharyngocutaneous Fistula and Reconstruction of Skin Defect. This study was carried out to minimize the incidence of pharyngocutaneous fistula (PCF) following salvage laryngeal surgery using pedicled pectoralis major myocutaneous flap (PMMC) for enhancing wound healing, rapid onset of oral feeding, reconstruction of desquamated irradiated skin.

**Method(s):** This prospective case series study was done in the department of surgical oncology, national cancer institute, cairo university from May 2005 till July 2009, when we started to apply PMMC flap in salvage laryngeal surgery especially for patients with high risk to develop complications.

**Result(s):** Flaps survived in all cases, PCF developed in 2 cases (12.5%) with wound infection which healed conservatively within 2-3 weeks without vascular complications. Dropped shoulder occurred in 3 cases (18.75%) which was treated with physiotherapy. Mild to moderate postoperative chest infection developed in 7 cases (36.84%) improved by broad spectrum antibiotics and chest physiotherapy.

**Conclusion(s):** Routine use of pectoralis major myocutaneous flap in salvage laryngeal surgery is of great help in such high risk patients to minimize incidence of pharyngocutaneous fistula and allow primary skin wound healing.

**Keywords:** Pectoralis Major Myocutaneous Flap, Prevention of Pharyngocutaneous Fistula, Salvage Laryngectomy

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[O06-07]

## Bacteriology and Antibiotic Sensitivity of Wound Infection after Laryngectomy

**Ching-Ping Wang<sup>1\*</sup>, E-lin Shei<sup>1</sup>, Jeh-An Tsai<sup>2</sup>,  
Chen-Chi Wang<sup>1</sup>, Shih-An Liu<sup>1</sup>**

<sup>1</sup>Otolaryngology, Taichung General Veterans Hospital, Taiwan

<sup>2</sup>Infection Diseases, Taichung General Veterans Hospital, Taiwan

**Objective:** The incidence of wound infection rate after laryngectomy reported varies from 4% to 65%. The risk factors of wounds infection were still investigated. For infected laryngectommes, we usually prescribed 1st/2nd line antibiotics before wound culture results available, but they are not effective in some cases. We designed the following study to understand the bacteriology and antibiotic sensitivity in infective laryngectomees, for better prescriptions of antibiotics before their wound culture available.

**Method(s):** We retrospective reviewed the medical charts for laryngectomy (including partial, or total laryngectomy, laryngopharyngectomy) from 2003-2008 in Taichung General Veterans. The patients whose wound specimen send for cultures were included. We collected and analyzed the data of wound cultures and antibiotic sensitivity tests from database of Bacteriology Department. The risk factors of wound infections for larygectomy were also studied.

**Result(s):** There were 92 laryngectomees (9 partial, 83 total laryngectomy) in our department. 50 cases suffered from wound infections and were included in this study. The wound infection rates between fresh vs. salvaged laryngectomy, and primary closure vs. flap reconstruction groups were not significant. We collected 295 cultures were (169 aerobic, 126 anaerobic) from them and 59% (176/295) cultures revealed positive data. The incidence of common bacteriology revealed *Pseudomonas aeruginosa* (14%), *Klabsiella pneumonia* (13%), *E. coli* (9%), *Acinetobacter baumannii* (7%) and *Staphylococcus aureus* (6%). According the results of antibiotics sensitivity test. The sensitivity rate of 1st line antibiotics varied from 20%-60%, but for 2nd line antibiotics varied from 58-83%.

**Conclusion(s):** The infection rates are not significant between fresh vs. neither salvaged laryngectomy nor primary closure and flap reconstructions patients. For infected patients after laryngectomy, 2nd line antibiotics, especially which can cover pseudomonas may be indicated before the wound culture results available.

**Keywords:** Bacteriology, Laryngectomy, Antibiotics

**Corresponding Author** Ching-ping Wang (entcpw@gmail.com)

[O06-08]

## Additional Dexmedetomidine Infusion Can Provide Excellent Surgical Condition for the Conduct of Subglottic Laryngeal Closure under Local Anesthesia

**Naritomo Miyake<sup>1\*</sup>, Katuyuki Kawamoto<sup>2</sup>,  
Kazunori Fujiwara<sup>1</sup>, Yuji Hasegawa<sup>2</sup>, Hiroya Kitano<sup>1</sup>**

<sup>1</sup>Otolaryngology, Faculty of Medicine Tottori University, Japan

<sup>2</sup>Head and Neck Surgery, Faculty of Medicine Tottori University, Japan

**Objective:** Patients with recurrent aspiration pneumonia are not likely to be given general anesthesia due to poor general condition and troubles in lower airway. We performed subglottic laryngeal closure under local anesthesia, but patients have pain especially when their thyroid cartilage and cricoid cartilage were removed. Therefore, we thought of dexmedetomidine as an additional drug with both sedative and analgesic properties. Dexmedetomidine brings to patients without respiratory depression. The objective of our study was to assess the efficacy and safety of dexmedetomidine administered as an adjuvant to local anesthesia in subglottic laryngeal closure cases.

**Method(s):** From 2008 to 2010, 12 adults with intractable aspiration underwent a subglottic laryngeal closure under local anesthesia with dexmedetomidine infusion at the Tottori university hospital, Japan. Dexmedetomidine was started with 6 µg/kg/hr over 10 minutes and then maintained with 0.4 µg/kg/hr until the end of the operation. All patients had undergone tracheostomy before operation to convert to general anesthesia if an emergent situation arose. Clinical end-points are follows: heart rate, blood pressure, SpO<sub>2</sub>, degree of sedation by Ramsey's sedation score and BIS monitor (Aspect Medical Systems, Newton, MA, USA). We also checked for any adverse effect both during operation and in the perioperative period.

**Result(s):** All 12 patients underwent subglottic laryngeal closure in safe and no major adverse effects were observed in this study including obvious unplanned conversion to general anaesthesia or administration of intravenous drug like atropine or dopamine. Hemodynamics of patients were stabilized and no obvious respiratory depression was seen. Patients were calm and cooperative during operation, and no symptoms of delirium were seen. Videofluoroscopy on postoperative day 10-14 revealed no aspiration and leakage at the suture site.

**Conclusion(s):** Additional dexmedetomidine infusion can provide excellent surgical condition for the conduct of subglottic laryngeal closure under local anesthesia.

**Keywords:** Dexmedetomidine, Subglottic Laryngeal Closure, Local Anesthesia

**Corresponding Author** Naritomo Miyake (hansui79@yahoo.co.jp)

[O06-09]

## Laser Cordectomy for Tis-T2 glottic Carcinoma: A Ten Years Follow Up Study on 345 Patients

**Angelo Camaioni, Valerio Damiani\*, Enrico de Campora, Claudio Viti, Matteo Simone**

*ENT department, San Giovanni addolorata, Italy*

**Objective:** Traditional approaches to Tis-T2 glottic carcinoma were open neck surgery or radiotherapy. In last decades, endoscopic surgery strongly emerged as a valid alternative, with comparable results in long-term survival and local control. In this study, we evaluate oncologic long term results on 345 patients who underwent laser cordectomy between 1999.

**Method(s):** Between June 1999 and April 2009, 345 patients with glottic carcinoma were surgically treated in our Institution by a single surgeon. Specifically, we performed as initial treatment, 25 type I cordectomies, 45 type II, 60 type III, 102 type IV, 92 type V, 27 type VI (ELSG classification). Mean follow up time was 84 months (range: 2-120 months).

**Result(s):** Histology was: Tis in 64 cases, T1 in 257 patients (T1a in 165 cases, T1b in 92) and T2 in 24. The overall 5-year actuarial recurrence-free survival rate was 86.9% (Tis: 96.8%, T1a: 90.3%, T1b: 79.9%, T2: 66.6%) and the 5-year actuarial disease-specific survival rate was 95.6 % (Tis: 100%, T1a: 96.9%, T1b: 92.4%, T2: 87.5%). In recurring cases (45 patients) we performed a second endoscopic procedure in 20 patients, a subtotal laryngectomy in 11 and a total laryngectomy in 14. The ultimate rate of laryngeal preservation was 95.9 %.

**Conclusion(s):** according to our data, endoscopic CO<sub>2</sub> laser surgery is an effective treatment for Tis-T2 glottic carcinomas.

**Keywords:** Glottic, Laser

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## O07. Basic Science (I) : Human Papilloma Virus / Others

Chairs : Myung-Ju Ahn (Korea)

Sara I. Pai (USA)

14:30 - 16:00 SBR III

[O07-01]

### High Risk HPV in Squamous Cell Carcinoma of the Tonsil in a Korean Population

Min-Sik Kim\*, Young-Hoon Joo, Dong-II Sun,  
Byungjoon Chun, Kwang-Jae Cho

*Department of Otolaryngology-Head and Neck Surgery,  
The Catholic University of Korea, Seoul, Korea*

**Objective:** To determine the role of high risk human papillomavirus (HPV) in the pathogenesis of the squamous cell carcinoma (SCC) of the tonsil in a Korean population.

**Method(s):** The study included 54 subjects with SCC of the tonsil. High risk HPV in situ hybridization was performed to detect HPV infection. We evaluated the relationship between high risk HPV and age, gender, smoking status, alcohol use, primary tumor stage, and cervical metastasis.

**Result(s):** The positive rate of high risk HPV in situ hybridization was 31.5% (17/54). Significant correlations were found between high risk HPV and younger age (younger than 50 years of age) and non-smoking status ( $P=0.005$  and  $P=0.045$ , respectively). However, there was no significant correlation between gender ( $P=0.149$ ), alcohol abuse ( $P=0.506$ ), primary tumor stage ( $P=0.091$ ), cervical metastasis ( $P=0.289$ ) and high risk HPV. In those patients followed for more than 12 months there was a 5-year overall and disease-specific survival of 64% and 69%. High risk HPV was not associated with the disease-specific survival ( $P=0.681$ ).

**Conclusion(s):** High risk HPV infection is associated with the SCC of the tonsil among subject with younger age and tobacco use in Korean.

**Keywords:** HPV, Tonsil Cancer

**Corresponding Author** Min-Sik Kim (entkms@catholic.ac.kr)

[O07-02]

### Characterization of Head and Neck Squamous Cell Carcinoma Cell Lines Containing HPV 16

Nadine Olthof<sup>1</sup>, Thomas Hoffmann<sup>2</sup>, Peter Klussmann<sup>3</sup>,  
Bernd Kremer<sup>1</sup>, Mieke Henfling<sup>4</sup>, Anton Hopman<sup>4</sup>,  
Frans Ramaekers<sup>4</sup>, Ernst-Jan Speel<sup>4\*</sup>

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<sup>2</sup>*Otorhinolaryngology, Head and Neck Surgery,  
University of Duisburg-Essen, Germany*

<sup>3</sup>*Otorhinolaryngology, Head and Neck Surgery,  
University of Giessen, Germany*

<sup>4</sup>*Molecular Cell Biology, Maastricht University Medical Center,  
Netherlands*

**Objective:** Antiviral therapy has a possible beneficial therapeutic effect in patients with human papillomavirus (HPV)-positive head and neck squamous cell carcinomas (HNSCC). Because the cellular features responsible for this effect are not sufficiently understood, it is essential to investigate HPV-positive and -negative tumor cell lines. To what extent the genomic and phenotypic features of these cell lines correspond to those of primary tumors is unknown and has been investigated in this study.

**Method(s):** Three HPV-16-positive and 4 HPV-negative HNSCC cell lines were analyzed, and the obtained results were compared with data previously gathered on primary tumor samples. HPV type and physical status were determined using fluorescence in situ hybridization (FISH), PCR and amplification of papillomavirus oncogenic transcripts (APOT) analysis. Chromosome 1 and 7 copy numbers were determined using FISH. Expression of proteins in the pRb- and p53-pathways and cytokeratines were determined using immunocytochemistry.

**Result(s):** Our experiments revealed that 1) all HPV-positive cell lines have punctate FISH patterns indicating integrated oncogenic HPV, and that the integration status was confirmed in 2 cell lines by APOT, 2) the HPV-positive cell lines exhibit aneusomy for chromosomes 1 and 7, 3) HPV influences expression of proteins in the pRb- and p53-pathways in the cell lines in a similar way as in primary tumors and 4) cytokeratine immunostainings indicate a squamous epithelial origin of the cell lines.

**Conclusion(s):** The investigated HPV-positive HNSCC cell lines are suitable for research on the therapeutical effects of antiviral therapy.

**Keywords:** Human Papillomavirus, Genetic Alterations, Cell Cycle Proteins

**Corresponding Author** Ernst-Jan Speel (ernstjan.speel@molcelb.unimaas.nl)

[O07-03]

## Marked Differences in p16INK4A Immunostaining between Head and Neck Dysplasias and Papillomas Containing High or Low Risk Human Papillomavirus

Jeroen Mooren<sup>1</sup>, Elif Gultekin<sup>2</sup>, Sandra Claessen<sup>3</sup>, Annick Haesevoets<sup>3</sup>, Christian Huebbers<sup>4</sup>, Hans Dienes<sup>2</sup>, Soenke Weissenborn<sup>5</sup>, Peter Klussmann<sup>6</sup>, Bernd Kremer<sup>1</sup>, **Ernst-Jan Speel<sup>3\*</sup>**

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<sup>2</sup>Pathology, University of Cologne, Germany

<sup>3</sup>Molecular Cell Biology, Maastricht University Medical Center,  
Netherlands

<sup>4</sup>Otorhinolaryngology, Head and Neck Surgery,  
University of Cologne, Germany

<sup>5</sup>Virology, University of Cologne, Germany

<sup>6</sup>Otorhinolaryngology, Head and Neck Surgery,  
University of Giessen, Germany

**Objective:** Human papillomavirus (HPV) is a risk factor for head and neck mucosa lesions, including HPV-16 in tonsillar squamous cell carcinomas (TSCC) and HPV-6/11 in laryngeal papillomas. The aim of this study was to determine whether expression of the HPV surrogate marker p16INK4A could predict the presence of high and low risk HPV types in head and neck dysplasias and papillomas.

**Method(s):** P16INK4A immunostaining was performed on paraffin-embedded tissue sections of 8 laryngeal dysplasias (from 4 patients), 14 tonsillar dysplasias (12 patients), 27 laryngeal papillomas (14 patients) and 20 tonsillar papillomas (20 patients). Genomic DNA isolated from these tissues was examined for HPV type by PCR and enzyme-immunoassay analysis. FISH specific for HPV-types 6, 11 and 16 was performed to evaluate HPV physical status.

**Result(s):** A strong p16INK4A immunostaining was predominantly seen in tonsillar dysplasias and associated with integrated HPV-16, except for 1 case showing episomal HPV (9/11 cases). A predominantly intermediate p16INK4A expression level was associated with episomal HPV-6 or 11 in laryngeal dysplasias (3/4 cases) and papillomas (13/14). Low p16INK4A expression levels were detected in tonsillar papillomas, which were HPV-negative. Lesions harboring low-risk HPV-types more often showed a higher p16INK4A staining intensity in the nucleus than in the cytoplasm, whereas this pattern was not explicit in the lesions with high-risk HPV.

**Conclusion(s):** A strong p16INK4A overexpression predicts the presence of high-risk HPV-16 in tonsillar dysplasias. Less intense p16INK4A expression may be the result of an infection with low-risk HPV in laryngeal dysplasias and papillomas, or a HPV-unrelated mechanism in tonsillar papillomas.

**Keywords:** Human Papillomavirus, p16ink4a, Oral Precursor Lesions

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[O07-04]

## HPV and Chung Gene Expression Profiles Predict Response to Chemoradiotherapy in Head and Neck Cancer, Independent of Clinical Factors

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**Objective:** The purpose of this study was to combine gene expression profiles and clinical factors to provide a better prediction model of local control after chemoradiotherapy for advanced head and neck cancer.

**Method(s):** Gene expression data were available for a series of 92 advanced stage head and neck cancer patients treated with primary chemoradiotherapy. The effect of the Chung high risk and Slezos HPV expression profiles on local control was analyzed in a model with age at diagnosis, gender, tumor site, tumor volume, T stage and N stage and HPV profile status.

**Result(s):** Among 75 patients included in the study, the only factors significantly predicting local control were tumor site (oral cavity vs. pharynx, hazard ratio 4.2 [95% CI 1.4–12.5]), Chung gene expression status (high vs. low risk profile, hazard ratio 4.4 [95% CI 1.5–13.3]) and HPV profile (negative vs. positive profile, hazard ratio 6.2 [95% CI 1.7–22.5]).

**Conclusion(s):** Chung high risk expression profile and a negative HPV expression profile were significantly associated with increased risk of local recurrence after chemoradiotherapy in advanced pharynx and oral cavity tumors, independent of clinical factors.

**Keywords:** Gene Expression Profile, HPV, Chemoradiation

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[O07-05]

## HPV Type in Association with the Prognosis of Tonsillar Cancer

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**Objective:** Recently it is known that HPV 16 is related with better prognosis in oropharyngeal cancer. However the prognostic significance of other types of HPV is not reported. To determine the prevalence and prognostic implications of HPV types by DNA test with serologic test in tonsillar cancer.

**Method(s):** A retrospective analysis was performed on 106 eligible patients with tonsillar cancer between 1998 and 2007. Fixed tissues from 68 patients were investigated for the PCR-based HPV DNA typing and ELISA performed for HPV16/18 L1 virus like particles as an antigen. All patients had histologically proven carcinoma without evidence of distant metastases at presentation and were treated with curative intent. Treatment was categorized into three groups: 1. chemotherapy ( $\pm$ RT) 2. surgery ( $\pm$ postop RT) 3. primary RT.

**Result(s):** Mean follow up duration was 50 months. HPV DNA was positive in 36 cases (53%) and negative in 32 cases (47%). HPV 16/18 L1 seropositivity was found in 27 cases (40%). HPV 16 type was found in 19 cases (53%) and HPV 18 was found in 18 cases (50%), in which 3 cases (8%) of HPV 16,18 co-infection. HPV 39,43,45,53,59,68,69,84 were found, most of which were co-infected with HPV 16,18. The Kaplan-Meier 5-year overall survival rate (OS) for HPV-negative group, HPV-16, HPV-18 group were 77%, 100%, and 46% respectively ( $P=0.003$  by log-rank test). And 5-year disease free survival rate (DFS) were 67%, 89%, and 46% ( $P=0.03$ ). 5-year OS for HPV L1 negative, weak positive, positive group were 82%, 42%, and 100% ( $P=0.01$ ). 5-year DFS were 74%, 42%, and 80% ( $P=0.12$ ). In overall and advanced stage, DFS were better in surgery ( $\pm$ postop RT) than other groups ( $P=0.004$ ).

**Conclusion(s):** HPV 18 was found to be associated with poor prognosis than even HPV negative group. And strong host immune response to viral antigen showed better results. Further studies targeting on HPV 18 and viral antigen should be done.

**Keywords:** HPV, Tonsillar Cancer, Prognosis

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[O07-06]

## Immunosuppressive Properties of CD44+ Cancer Stem-like Cells in Squamous Cell Carcinoma of the Head and Neck

**Kazuaki Chikamatsu<sup>1</sup>\*, Hiroki Ishii<sup>1</sup>, Goro Takahashi<sup>1</sup>, Koichi Sakakura<sup>2</sup>, Soldano Ferrone<sup>2</sup>, Keisuke Masuyama<sup>1</sup>**

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**Objective:** Squamous cell carcinoma of the head and neck (SCCHN) contains a heterogenous population of cancer cells. Evidence has accumulated indicating that only a minority of cancer cells with stem cell properties, cancer stem cells (CSCs), is responsible for initiating, maintaining, and expanding the tumor growth. In SCCHN, CD44+ cells with significant tumorigenic potential have been identified as CSCs; however, the immunological properties of such CSCs have not yet been elucidated. In this study, we investigated the immunological functions of CD44+ cells from a SCCHN cell line.

**Method(s):** A subpopulation of CD44+ cells was enriched under serum-free medium culture conditions, and the immunological properties of CD44+ cells, including HLA molecules and antigen processing machinery components expression, cytokine production, inhibition of T-cell proliferation, and induction of immune-suppressive cells were compared with those of CD44- cells using flow cytometry and ELISA assay.

**Result(s):** Analysis of flow cytometry demonstrated that the expression of HLA-A2 molecules was deficient in the parental cell line, whereas the CD44+ cell population restored HLA-A2 expression, although at very low levels. Moreover, CD44+ cells exhibited weak HLA class II expression on the cell surface. Interestingly, down-regulation of TAP2 was found in CD44+ cells. The CD44+ cell population produced significantly higher levels of IL-8, G-CSF, and TGF- $\beta$  than the CD44- cell population. Moreover, CD44+ cells have been shown to not only more strongly inhibit T-cell proliferation, but also to more efficiently induce CD4+CD25+FOXP3+ Treg cells and myeloid-derived suppressor cells as compared with CD44- cells. Additionally, CD44+ cells also suppressed Th1 responses and enhanced regulatory T cell responses.

**Conclusion(s):** Thus, CSCs may have higher immunosuppressive ability promoting evasion from immunosurveillance; therefore, CSCs should be targeted in order to achieve effective cancer immunotherapy in SCCHN.

**Keywords:** Cancer Stem Cells, Immunosuppression, CD44

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[O07-07]

## CD44 Expression Predicts Local Recurrence after Radiotherapy in Larynx Cancer

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**Objective:** To find prediction markers for outcome of larynx cancer after radiotherapy using gene expression microarrays. Biological factors known to influence response to radiotherapy are hypoxia, proliferation, intrinsic radiosensitivity and stem cells. By adding gene sets for these biological predictors to clinical models we hope to improve prediction.

**Method(s):** We generated gene expression data (Illumina bead arrays) of a matched series of T1-2 larynx cancer patients treated with single modality radiotherapy. Patients with a local recurrence were matched for T-stage, subsite, treatment, gender and age with patients without a recurrence. The expression data were analyzed by both hypothesis-driven and data-driven approaches. Gene sets for biological factors known to influence response to radiotherapy (hypoxia, proliferation, intrinsic radiosensitivity, stem cells) were tested for their potential to predict local recurrence. In a second series of 76 patients, a tissue microarray (TMA) was made of the tumor material and stained with an anti-CD44 antibody.

**Result(s):** A total of 52 T1-2 larynx cancer patients were included, comprising 19 patients who subsequently developed a local recurrence and 33 matched controls. Matching for clinical factors was successful and therefore all biological factors found to be predictive were independent of these clinical factors. Gene sets for hypoxia, proliferation and intrinsic radiosensitivity did not significantly correlate with outcome, whereas expression of the putative stem cell marker CD44 did. Probes for all three splice variants of CD44 on the array, when tested separately, significantly predicted local recurrence. The importance of CD44 was confirmed immunohistochemically on the 76 TMA patients.

**Conclusion(s):** Prediction of outcome after radiotherapy appears to be feasible using expression profiling. CD44 was the only biological factor tested which accurately predicted response to radiotherapy in early larynx cancer patients, both at the mRNA and protein levels. Whether this is purely a stem cell number factor needs further study.

**Keywords:** Larynx Carcinoma, Gene Expression, Prediction

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[O07-08]

## Primary Tumor Induces Sentinel Lymph Node Lymphangiogenesis in Oral Squamous Cell Carcinoma

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**Objective:** The main factor that affects the prognosis of patients with oral squamous cell carcinoma (OSCC) is regional lymph node metastases, which usually spreads first to the sentinel lymph nodes (SLNs). Recent studies have demonstrated that tumor cells in several malignancies can induce lymphangiogenesis in SLNs before metastasizing. To elucidate the mechanisms of tumor dissemination of OSCC, we investigated whether primary tumors induce lymphangiogenesis within SLNs in patients with OSCC.

**Method(s):** The mRNA expression of lymphatic specific markers including Flt4/VEGFR-3, Prox1, and LYVE-1 in 23 metastasis-negative SLNs obtained from 10 patients with OSCC was investigated using a real-time quantitative RT-PCR assay, and compared with control lymph nodes from patients with non-cancerous diseases. In addition, VEGF-C and VEGF-D expression of the primary tumor were also examined by immunohistochemistry.

**Result(s):** In SLNs, there were highly significant correlations between the three lymphatic markers examined. Interestingly, the level of LYVE-1 expression in SLNs, despite the absence of metastasis, was significantly higher compared with that in control lymph nodes. Moreover, SLNs from patients with VEGF-C-positive tumor showed significantly higher expression of Flt4/VEGFR-3 than those from patients with VEGF-C-negative tumor.

**Conclusion(s):** Our findings suggest that the primary tumor actively induces lymphangiogenesis in SLNs prior to the onset of metastasis, and that VEGF-C plays an important role in promoting lymph node metastasis.

**Keywords:** Lymphangiogenesis, Sentinel Lymph Nodes, VEGF-C

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[O07-09]

## Does Growing Tumor Volume Induce Lymphangiogenesis? : A Study of Oral/Oropharynx Cancer

**Eun-Jae Chung<sup>1</sup>, Seung-Kuk Baek<sup>1</sup>, Moo-pil Kim<sup>1</sup>, Jeong-Soo Woo<sup>1</sup>, Soon-Young Kwon<sup>1</sup>, Kwang-Yoon Jung<sup>1\*</sup>, Yang-Seok Chae<sup>2</sup>, Nam-Joon Lee<sup>3</sup>**

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**Objective:** Tumor cell metastasis to regional lymph nodes is an early event in the spread of metastatic tumor. It is not known, however, whether preexisting vessels are sufficient to serve this function, or whether tumor cell dissemination requires lymphangiogenesis. The authors postulated that growing primary tumor volume(PTV) promote the neck node metastasis by alternating lymphangiogenesis.

**Method(s):** We investigated 48 patients who had previously been diagnosed with oral cavity/oropharynx cancer. The study group was composed of 29 patients with oral cavity cancer and 19 patients with oropharynx cancer. The tumor area was manually outlined from axial magnetic resonance imaging series. The 3D reconstruction software calculated PTV, automatically. Immunohistochemical staining was performed with VEGF-C/-D, D2-40, and CD31 monoclonal antibodies on the paraffin-embedded tissues obtained from these patients. The associations among the semiquantitative score of VEGF-C/-D stained cancer cells, the density of immunohistochemically stained microvessels, and PTV were investigated.

**Result(s):** VEGF-C expression was significantly associated with lymph node metastasis ( $P=0.018$ ), and increased lymphatic vessel density (LVD,  $P<0.001$ ). However, we found no significant association with PTV. Similarly, among various clinical factors, N stage ( $P=0.001$ ), and LVD ( $P=0.008$ ) were significantly associated with VEGF-D expression. However there was no association between VEGF-D expression and PTV. In univariate analysis, T stage ( $P=0.003$ ), PTV ( $P=0.005$ ), and VEGF-C/-D expression ( $P<0.001$ ,  $P=0.0026$ ) were significantly associated with disease-free survival (DFS). T stage ( $P=0.001$ ), PTV ( $P=0.005$ ), N stage ( $P=0.039$ ), LVD ( $P=0.001$ ), and VEGF-C expression ( $P=0.005$ ) were significant prognostic factors for overall survival (OS). In multivariate analysis, T stage ( $P=0.047$ ), VEGF-C/-D expression ( $P=0.016$ ,  $P=0.038$ ) were significantly associated with DFS. In terms of OS, multivariate analysis showed the significant relationship between OS and T stage ( $P=0.05$ ), VEGF-C expression ( $P=0.05$ )

**Conclusion(s):** VEGF-C/-D expression was significantly associated with high LVD, lymph node metastasis, and poor outcome. However, in contrast to our expectation, there was no significant association with growing PTV.

**Keywords:** Lymphangiogenesis, Lymphatic Metastasis, Tumor Volume

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**O08. Reconstruction (I)****Chairs : Young-Mo Kim (Korea)****Richard E. Hayden (USA)**

14:30 - 16:00 SBR IV

[O08-01]

## **Using the Reconstruction Ladder as the Guideline for Reconstruction after Ablation of Head and Neck Cancer**

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**Objective:** The head and neck cancer is increasing in recent years at Taiwan and it attacks the meridian male population, the most important economical support of the family. One of the major therapeutic modalities includes the wide excision and further chemotherapy and radiotherapy. The defect after tumor ablation is complex and variety. Hence, the reconstruction of the defect after tumor ablation is a challenge job especially at the late stage of cancer. We present the experience of reconstruction guided by the reconstruction ladder after surgical ablation of head and neck cancers at the east Taiwan.

**Method(s):** These patients were included from January 2002 to December 2008. These data were retrieved from the databank of hospital and the Bureau of health promotion, department of health, ROC. We review the patient data from the medical records and Hospital Information System (HIS) system of the hospital.

**Result(s):** There were 885 patients in the database and we excluded the malignant tumors except the squamous cell carcinoma of head and neck and some cases with missing data. There were 726 male patients and 101 female patients. The mean age of these patients was 64, and the youngest was 17 and the eldest was 93. The reconstruction method is principally based on the reconstruction ladder, ranging from directly tissue closure to free tissue transfer and no secondary intention healing. The principle of reconstruction includes replacing like with like, functional recovery, restoration of the appearance and decreasing donor site morbidity. The reconstruction ladder can guide us to these goals with great help.

**Conclusion(s):** Reconstruction after ablation of head and neck cancer provides the possibility for more wide and safe for tumor ablation, uncomplicated wound healing and functional restoration. Successful reconstruction is the best support for the surgeon to do resection of the head and neck cancer.

**Keywords:** Reconstruction Ladder, Head and Neck Cancer

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[O08-02]

## **Algorithm Based Approach for Skullbase Reconstruction**

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**Objective:** In this study, we present algorithmic approach for reconstruction of complex skull base defects and review its efficacy.

**Method(s):** Cases were broadly divided into anterior, antero-lateral, lateral and posterior skull base resections. Based on approach used and defect created, algorithm was made for reconstruction and each case was reconstructed using that. Anterior Skull base defects were further classified into small and complex defects. Small dural defects were reconstructed with patch duraplasty in three layers. Complex defects were further classified with partial maxillectomy and total maxillectomy. Partial defects were reconstructed with regional flap or free soft tissue flap. Total maxillectomy with eye preserved were reconstructed by TFL with iliac crest free flap or free fibula flap. Total maxillectomy with orbital exenteration was reconstructed with free soft tissue flap. Same protocol were made for each skull base subsite and reconstructed accordingly.

**Result(s):** 64 patients underwent skull base resection. 31 of them had anterior skull base resection while 25 had antero-lateral and 7 had lateral skull base resection. Approach and type of flap used for each defect were classified. (Beyond scope of abstract) Associated complications were tabulated and contributing factors for peri-operative morbidity and mortality were assessed. Total 16 (25%) patients had complications. Wound infection (8) and central nervous system (CNS) complications (10) were the main complications. 3 patients had flap failure. Total 7 patients died in peri-operative period.

**Conclusion(s):** Algorithm based reconstruction makes planning for reconstruction of complex defects simple, systemic and improves cosmetics and functional outcome.

**Keywords:** Skull Base, Craniofacial, Reconstruction

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[O08-03]

## Free Flap Reconstruction for Head and Neck Cancer in Elderly Patients over 70 Year-Old

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**Objective:** Free flap transfer is routine method in head and neck (H&N) cancer surgery. The average of lifespan in Taiwan was around 78 year-old. And advanced age over 70 year-old is considered a risk factor, not to mention other frequently associated medical comorbidities. The purpose of this study was to review our experience in this group of patients.

**Method(s):** From Oct, 2006 to Oct 2009, 747 patients with head and neck cancer underwent composite tumor resection and followed by a free flap transfer were reviewed. There were 714 patients less than 70 years and 33 patients ranged from 70 to 85 year-old. Variables included medical comorbidities, medical /surgical complications and outcomes were compared and analyzed.

**Result(s):** The mean age was 74.5 years in elderly group and 49.8 years in younger group. The elderly group had a higher prevalence of hypertension, diabetes and heart disease. 2 surgical mortalities occurred in elderly group, due to acute myocardial infarction and ventilator associated pneumonia, respectively; which showed significance difference compared to younger patients (2/33 vs. 1/714,  $P<0.01$ ). There was no difference in rate of re-exploration (2/31 vs. 76/714,  $P=0.455$ ), rate of secondary procedure (7/31 vs. 126/714,  $P=0.60$ ) and successful rate (31/31 vs. 671/714,  $P<0.159$ ).

**Conclusion(s):** Despite of higher prevalence of medical comorbidities, outcomes of free flap transfer seemed equal between elderly and younger patients. Comprehensive medical evaluation of cardiopulmonary system and meticulous preoperative patient optimization is critical for outcomes of elderly patients.

**Keywords:** Free Flap Transfer, Head and Neck Reconstruction, Elderly Patient

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[O08-04]

## Second Microvascular Free Flaps in Head and Neck Reconstruction -Reliability of Anastomosis in Scars

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**Objective:** Microvascular free flap reconstruction is becoming the standard treatment for head and neck reconstruction. One of the advantages of a free flap is its repeat transplant ability if there are suitable recipient vessels. But in second free flap cases, the operation will be difficult because of the scar or the influence of radiotherapy. This study evaluated the reliability of second free flaps.

**Method(s):** 31 second microvascular free flaps for head and neck reconstruction were performed between January 1999 and December 2009 at Aichi Cancer Center. Two cases of immediate second free flaps as salvage after primary free flap failure were excluded. We reviewed 29 cases; 24 cases were used for the recurrence cases and 5 cases for delayed complication (plate exposure, contracture etc). We evaluated the recipient site and postoperative complications.

**Result(s):** One case of thrombosis occurred in the second free flaps, but it was salvaged. All flaps survived. In 15 cases (51.7%) the microvascular anastomoses were performed at the postoperative scar region. In 7 cases (24.1%), the same vessels used for primary free flap were used as the recipient vessels. 21 cases (72.4%) had previously received radiotherapy at the recipient site. A comparison of the postoperative complication rates and operation time between primary and second operation revealed no statistically significant differences.

**Conclusion(s):** Second free flap reconstruction in the head and neck can be safely accomplished. With careful dissection and judgment the quality of recipient vessels for second anastomosis is safe enough at the scar region, and the same recipient vessels can be used.

**Keywords:** Free Flap, Microsurgery, Reconstruction

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[O08-05]

## The Factors in Prediction of Fistula Following Radial Forearm Free Flap Reconstruction for Head and Neck Cancer

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**Objective:** To evaluate the relationship between postoperative fistula and perioperative risk factors after radial forearm free flap (RFFF) reconstruction for head and neck cancer.

**Method(s):** A total of 180 patients underwent RFFF reconstruction after head and neck ablative surgery from October 1993 to July 2009. Age, gender, systemic disease, smoking status, tumor stage, preoperative radiotherapy, reconstruction site, concurrent neck dissection, flap shape and size, and partial or complete flap necrosis were recorded as the prognostic variables.

**Result(s):** Twenty one (11.7%) of the 180 patients developed fistula. Significant correlations were found between diabetes mellitus ( $P=0.015$ ), preoperative radiotherapy ( $P=0.029$ ) and fistula. Reconstruction of hypopharynx influenced fistula with borderline significance ( $P=0.057$ ). The multivariate analysis showed a significant association of the fistula with diabetes mellitus (odds ratio=5.4 [95% CI, 1.0-27.6]) and preoperative radiotherapy (odds ratio=5.9 [95% CI, 1.1-32.6]). Spontaneous closure was noted in 10 patients, whereas a surgical closure with a local flap or pectoralis major myocutaneous flap was necessary in 11 patients.

**Conclusion(s):** Diabetes mellitus, preoperative radiotherapy were risk factors for fistula in patients undergoing RFFF reconstruction for head and neck cancer.

**Keywords:** Head and Neck Neoplasms, Postoperative Complications, Cutaneous Fistula

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[O08-06]

## Postoperative Morbidity and Mortality after Surgical Resection Followed by Microsurgical Free Tissue Transfer for Head and Neck Cancers in Patients with Liver Cirrhosis

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**Objective:** The aim of this study was to evaluate the association and the related risk factors between postoperative complications and mortality and the severity of liver cirrhosis in head and neck cancer patients undergoing tumor ablation followed by microsurgical free tissue transfer.

**Method(s):** Between January 2000 and December 2008, a total of 3,108 patients were retrospectively reviewed. The diagnosis of liver cirrhosis was made mainly by abdominal ultrasonography. The Child's classification was used to assess the severity of liver cirrhosis.

**Result(s):** There were 60 men and 2 women enrolled. Preoperatively, 42, 17, and 3 patients were classified as Child's class A, B, and C, respectively. Class B patients had statistically significantly prolonged stay in the intensive care unit and hospital stay compared to class A patients. Patients with class B or C cirrhosis had more complications than those with class A cirrhosis (80% vs. 19.1%,  $P<0.001$ ). This included significantly increased rates of pulmonary complications, acute renal failure, and sepsis. The mortality rate was also significantly higher for patients with class B/C cirrhosis than for those with class A cirrhosis (30% vs. 4.8%,  $P=0.011$ ). By logistic regression model, preoperative platelet count, intraoperative blood transfusion  $>/=2$  units, and Child's class were found to be significant predictive factors for morbidities. Likewise, Child's class, albumin level, intraoperative blood transfusion  $>/=2$  units, intraoperative blood loss  $>500$  mL, and prothrombin time were significant predictive factors for mortality.

**Conclusion(s):** Child's class, along with its several components, and intraoperative blood transfusion of  $>/=2$  units are predictive factors for morbidity and mortality.

**Keywords:** Liver Cirrhosis, Free Tissue Transfer, Head and Neck

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[O08-07]

## Fungating Head and Neck Tumors: An Overview for Possible Management

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**Objective:** In this study our aim was to look at the patients who present with fungating cancers as regards pathology, possible reasons behind such an aggressive presentation and the outcome of managing these patients by different modalities including palliative or radical resection and different modalities for reconstruction by either pedicled or free flaps, external beam radiation, or radio active iodine ablation for fungating thyroid cancers.

**Method(s):** Collection of clinical, laboratory, imaging and pathological data of all patients with fungating H&N tumors, admitted to the Head and Neck surgery unit, Main University Hospital, Alexandria School of Medicine, during the period between April 2005 and April 2009.

**Result(s):** Incidence, clinico-pathological data together with the operative procedure and patients' follow up will be presented and analyzed.

**Conclusion(s):** Fungating cancers are quite rare clinical entities that need adequate complex perioperative approach. This study has shown that it is sometimes not feasible to attain free surgical margins due to extensive involvement of several vital structures and the extreme friability of the tumor tissue and the surrounding structures. Nevertheless, surgical intervention even in a palliative manner, if feasible, can be the only hope for attaining an adequate quality of life level for these miserable patients during their remaining, usually not long, postoperative survival period.

**Keywords:** Fungating Head and Neck Tumors, Reconstruction, Management

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[O08-08]

## Risk Factors of Free Flap Compromise in 247 Cases of Microvascular Head and Neck Reconstruction : A Single Surgeon's Experience

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**Objective:** The aim of this study was to evaluate the relationship between free flap compromise and perioperative risk factors such as age, gender, systemic disease, smoking status, preoperative irradiation, previous head and neck surgery, tumor localization, concurrent neck dissection, number of venous anastomosis, flap type, flap ischemic time, and flap shape and size.

**Method(s):** A retrospective review of the 237 patients who underwent a 247 microvascular free flap reconstruction after head and neck ablative surgery from October 1993 to July 2009. Flap donor sites included radial forearm (n=187), anterolateral thigh (n=34), rectus abdominis (n=11), fibula (n=8), lateral thigh (n=7).

**Result(s):** Twenty one (8.5%) cases of free flap compromise due to vascular obstruction were identified, and 11 flaps were lost (4.5%) with an overall success rate of 95.5%. Significant correlation was found between diabetes mellitus and free flap compromise ( $P=0.048$ ). Preoperative irradiation influenced free flap compromise with borderline significance ( $P=0.052$ ). The multivariate analysis showed a significant association of free flap compromise with diabetes mellitus (odds ratio = 4.9 (95% CI, 1.1 to 22.8,  $P=0.041$ )).

**Conclusion(s):** Diabetes mellitus was risk factor for free flap compromise in patients undergoing microvascular head and neck reconstruction. The presence of diabetes mellitus may require more attention to improve patient management and free flap outcomes.

**Keywords:** Head and Neck Neoplasms, Surgical Flaps, Postoperative Complications

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[O08-09]

## Microsurgical Reconstruction without the Classic Microsurgery Team

**Marco Tesseroli<sup>1\*</sup>, Alexandre Medeiros<sup>2</sup>,**  
**Mauricio Spagnol<sup>3</sup>, Andreza Almeida<sup>4</sup>**

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**Objective:** To demonstrate the feasibility to do microsurgical reconstructions also by medical teams without a plastic surgeon or a surgeon with specific training, achieving good results comparable as that presented by traditional worldwide microsurgery departments.

**Method(s):** The first 15 patients who underwent head and neck oncologic resections at a general hospital for a 6 months period are presented. It was used in all cases a 3.5 magnifying glass, prolene 7.0 and/or nylon 8-0. Prospective analysis of tumor localization, the kind of free flap, the kind of anastomose, the surgical time, and complicancies. Patients who should be undergone to myocutaneous or fasciocutaneus flap reconstructions were studied with preoperative Doppler. All free flaps were raised by the H&N surgeon and all the micro-anastomoses were done by a vascular surgeon without previous microsurgery training.

**Result(s):** 7 lateral thigh flaps, 4 jejunal and 4 anteribrachial flaps (photo 1) were performed. The time between the moment of pedicle sections and the end of anastomose range from 90 min to 155 min. Venous thrombosis occurred in 2 cases: one case (thigh) occurred on the 4th post-operative day and could be saved with streptoquinase infusion in the flap's artery. The other had total loss (anteribrachial flap) on the 6th post-operative day, after the patient had been discharged on the 5th. A third case (thigh) had cutaneous partial loss due to a cervical abscess. Considering the only one total flap loss, we have reached a 93.3% success rate.

**Conclusion(s):** Our success rates suggests that microsurgical reconstruction in head and neck cancer can be performed by surgical teams without previous microsurgical experience with good results, given the opportunity to propagate this technique to small medical centers as well.

**Keywords:** Free flap, Microvascular, Reconstruction

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## O09. Surgery (III) : Neck Metastases

Chairs : Soo-Geun Wang (Korea)

Yoav P. Talmi (Israel)

16:30 - 18:00 SBR II

[O09-01]

### Cervical Metastases in Squamous Cell Carcinoma of the Upper Aerodigestive Tract: An Analysis of Prevalence and Distribution

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**Objective:** The aim of the study was to analyze the prevalence and distribution of lymph node metastases in patients with squamous cell carcinoma (SCC) of the upper aerodigestive tract (UADT).

**Method(s):** Hospital records were screened for patients with SCC of the oral cavity, oropharynx, hypopharynx and larynx from 2003 through 2004. Inclusion criteria were: a histologic diagnosis of SCC, no previous definitive treatment for the cancer, and performance of a neck dissection. Distribution of the lymph node levels involved was analyzed, and correlation with clinical status was established. Statistical analysis was performed using Epi Info Version 6 Statistical Software.

**Result(s):** Of the 79 patients included, 41.8% were proven to have pathologic node metastases, while 58.2% were negative. Comparison of this data with the clinical status of the neck reveals that clinical staging of the neck has a sensitivity of 0.5, a specificity of 0.78, a positive predictive value of 0.77 and a negative predictive value of 0.52. False negative rate is high at 23.3%. Ipsilateral neck dissections for the negative neck were found to have pathologically positive nodes in 25.8%, but none were found on contralateral dissections. For clinically N+ necks, only 48% of ipsilateral neck dissections were confirmed to have pathologically positive nodes, with 55.6% of contralateral neck dissections positive for cervical metastases.

**Conclusion(s):** The overall prevalence of pathologic nodal metastases in SCC of the UADT justifies the use of selective neck dissection in the clinically NO neck. The prevalence of contralateral cervical metastases indicates the use of bilateral neck dissection in midline or bilateral tumors. For oral cavity tumors, removal of Levels I to III is adequate for the NO neck. No conclusion can be made from this study for the type of selective neck dissection for laryngeal tumors.

**Keywords:** HNSCCA, Neck Dissection, Cervical Metastases

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[O09-02]

### Efficacy of Selective Neck Dissection in the Management of N1/N2 Oral Cavity Squamous Cell Carcinoma

Sudhir Nair<sup>1</sup>, Azhar Battoo<sup>1\*</sup>, Naveen K<sup>1</sup>, Sheik Zahoor Ahmad<sup>1</sup>, Sandeep Duarah<sup>1</sup>, Sudhir Bahadur<sup>1</sup>, Subramania Iyer<sup>1</sup>, Moni Abraham Kuriakose<sup>2</sup>

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<sup>2</sup>Surgical Oncology, Mujumdar Shah Cancer Center, India

**Objective:** Neck dissections have evolved from radical to more selective with time and experience. Since level V is rarely involved in oral squamous cell carcinoma (OSCC) we follow a protocol of selective neck dissection (SND) of levels I-III/IV for N+ neck in OSCC. In this study we retrospectively analyze of our experience with this approach.

**Method(s):** Retrospective analysis of our patient database for OSCC patients operated in AIMS from 2004-2006 with minimum follow-up of 2.5 years.

**Result(s):** Total of 223 oral cancer inpatients was identified of which 61 cases had N1/N2 OSCC. Out of 32 cases of N1 OSCC patients 29 underwent SND of levels I-III/IV, of which 10 necks were found to be subsequently pathologically negative. Out of 29 cases (41 necks) of N2 OSCC, SND was carried out in 29 necks & 4 cases were pathologically N0 subsequently. Regional recurrence was observed only in 6 cases (5 N1, 1 N2) out of 61 cases of N1/N2 neck for OSCC. Out of 5 recurrences in N1 group only 2 cases failed in the dissected region (one of the cases failed locally also & other in addition also failing in the contra lateral neck). In these recurrent cases cutaneous metastasis was found in one case, distant metastasis in one & local recurrence in 2 cases, leaving only one case with isolated regional recurrence of both the sides. The only recurrent case in N2 group had T4 disease & recurred at multiple levels in addition to local recurrence & distal metastasis, despite receiving postoperative adjuvant chemoradiotherapy.

**Conclusion(s):** SND (levels I-III/IV) for N1/N2 OSCC is a safe and effective procedure and can be carried out with equal efficacy for N1 & selective N2 cases.

**Keywords:** Oral Cancer, Neck Dissection, Chemoradiotherapy

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[O09-03]

## Selective Neck Dissection for cN1 and cN2a Head and Neck Carcinoma Patients

**Maximiliano Neto<sup>1</sup>, Fernando Barbieri<sup>1</sup>, Jose Vieira Junior<sup>1</sup>,  
Juliano Borges Mano<sup>1</sup>, Domingos Boldrini Junior<sup>1</sup>,  
Milene Foschini<sup>2</sup>, Allini Mafra<sup>2</sup>, Carlos Roberto Santos<sup>1</sup>,  
Andre Carvalho<sup>1\*</sup>**

<sup>1</sup>Head and Neck Department, Hospital Cancer Barretos, Brazil

<sup>2</sup>Researcher Support Center, Hospital Cancer Barretos, Brazil

**Objective:** The aim of this study is to evaluate the neck control rate on HNSCC patients clinically staged as cN1 or cN2a submitted to selective neck dissection.

**Method(s):** We reviewed the charts of patients treated in our Institution between 2001 and 2008. Inclusion criteria were: HNSCC from oral cavity, oropharynx, larynx or hypopharynx; N1 or N2a; primary treated with surgery; underwent selective neck dissection. We included 76 patients in this study. Comparison between groups were done using the chi-square test, statistical significance was reached for  $P<0.05$ .

**Result(s):** The majority of the patients were male (85.5%), reported regular consumption of tobacco (90.9%) and alcohol (65.7%). The most prevalent tumor site were oral cavity and oropharynx (84.2%). Regarding the T stage, 2.6% of the patients were classified as T1; 30.3% as T2; 34.2%, T3 and 31.6%, T4. Fifty-nine patients were classified as cN1 (77.6%) and 17 as cN2a (22.4%). In the path report, 20 cases did not confirm lymph node metastasis (26.3%); while 36 (73.7%) were pN+, among them 68.6% presented with extracapsular spread. The majority of the patients (86.8%) was submitted to postoperative radiotherapy (28.9% were chemoradiation). Ipsilateral neck recurrence occurred in 8 patients (10.5%), regardless of the initial clinical stage cN1 vs. cN2a ( $P=0.479$ ).

**Conclusion(s):** Selective neck dissection is an option for selected cN1 and cN2a HNSCC patients. This approach, in our series, presented a reasonable neck control.

**Keywords:** Head and Neck Carcinoma, Neck Dissection, Neck Control

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[O09-04]

## Conversion from Selective Neck Dissection to Comprehensive Neck Dissection: Is It Necessary for the Treatment of Clinically N0 but Pathologically N Positive Cases?

**Dong Jin Lee, So Jung Oh, Jeong In Oh, Young Soo Rho\***

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Head and Neck Cancer Center, Korea*

**Objective:** Selective Neck Dissection is generally accepted as an elective neck treatment method for the N0 patients. But, sometimes, conversion from selective neck dissection to comprehensive neck dissection is needed, especially when we find the positive neck node in the operative field. The purpose of this study was to compare the therapeutic results between the Selective Neck Dissection (SND) and the Conversion Comprehensive Neck Dissections (CCND) for the clinically N0 but pathologically N positive cases.

**Method(s):** We reviewed the medical records retrospectively of the head and neck squamous cell carcinoma patients from 2000 to 2008 at the Ilsong Memorial Institute of Head and Neck Cancer Center, Hallym University Medical Center. Among them, total 19 patients got the selective neck dissection as their elective neck treatment for the clinically N0 neck but the pathologic report was N positive. Total 14 patients got the conversion comprehensive neck dissection as there was positive neck node in the operative field. We used Kaplan-Meyer's method to compare the therapeutic results between selective neck dissection group and conversion comprehensive neck dissection group.

**Result(s):** Among 19 cases who got the selective neck dissection, only one case died with locoregional recurrence which occurred in the out-of-operative field. On the other hand, among 14 cases who got the conversion comprehensive neck dissection, two cases died with locoregional recurrence which occurred in the operative field. When we used Kaplan-Meyer's survival curve, there was no statistic significance between the selective neck dissection group and the conversion selective neck dissection group ( $P=0.1140$ ). The number of patients who got the post-operative adjuvant therapy didn't have any statistical significance between two groups ( $P=0.250$ ).

**Conclusion(s):** In conclusion, even in clinically N0 but pathologically N positive cases, selective neck dissection had the similar disease control rate as the conversion comprehensive neck dissection.

**Keywords:** Selective Neck Dissection, Conversion Comprehensive Neck Dissection, Pathologically N Positive

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[O09-05]

## Nodal Metastases at Level IIb during Neck Dissection for Head and Neck Cancer: Clinical and Pathologic Evaluation

**Enrico de Campora<sup>1\*</sup>, Angelo Camaioni<sup>1</sup>,  
Oreste Gallo<sup>2</sup>, Valerio Damiani<sup>1</sup>**

<sup>1</sup>ENT department, San Giovanni Addolorato hospital, Italy  
<sup>2</sup>Oto-Neuro-Ophthalmological Surgical Sciences department,  
 University of florence, Italy

**Objective:** Selective neck dissection as a part of an elective or therapeutic treatment of the neck is a common practice during the surgical treatment of patients with head and neck cancer. Recently, the need for routine dissection of level IIb has been discussed. The aim of this study was to verify the incidence of metastases at level IIb in patients with clinically negative necks (N0) and clinically positive necks (N1) and discuss the need for its excision.

**Method(s):** A total of 114 patients with head and neck cancer undergoing neck dissection were prospectively analyzed. The total number of neck dissections analyzed was 148. The surgical specimens from each node level of the neck were pathologically diagnosed, with special attention to level IIb.

**Result(s):** Of 148 neck dissections performed, level IIb resulted positive in 5 cases (3.3%): 1 patient with laryngeal cancer, 1 patient with oral cavity cancer, and 2 patients with oropharyngeal cancer, of which 1 underwent bilateral neck dissection. According to clinical N classification, for N0 and N1 the incidence of positive level IIb was 2% and 5%, respectively. All the cases with metastases at level IIb also showed metastases at level IIa. A statistically significant association between the presence of nodal metastases at level IIb and those at level IIa ( $P<0.001$ ) was found. The statistical association between N classification and IIb positive nodes only showed a trend toward significance ( $p = .06$ ).

**Conclusion(s):** The incidence of metastases at level IIb is low, also in the N1 necks, therefore dissection of this level could be unnecessary in N0 necks. Furthermore, an interesting statistical association between the presence of metastases at level IIb and at level IIa was recorded.

**Keywords:** Neck Dissection, Neck Levels, Cancer

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[O09-06]

## Neck Dissection prior to Radiochemotherapy: An Option for Neck Control in cN2/cN3 HNSCC Patients

**Nilson Macedo Junior<sup>1</sup>, Domingos Boldrini Junior<sup>1</sup>,  
Allini Mafra<sup>2</sup>, Carlos Roberto Santos<sup>1</sup>, Andre Carvalho<sup>1\*</sup>**

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**Objective:** The aim of this study is to evaluate the neck control rates of cN2 or cN3 HNSCC patients undergone neck dissection prior to chemoradiation for organ preservation.

**Method(s):** We reviewed the medical charts of patients treated between 2004 and 2008 in our institution. Inclusion criteria for this study were: HNSCC; resectable cN2 or cN3; chemoradiotherapy as treatment approach; underwent neck dissection prior to chemoradiation.

**Result(s):** We included 22 patients in the study. The majority of the patients were male (95.5%), reported regular consumption of tobacco (90.9%) and alcohol (81.8%). The most prevalent tumor site were oropharynx (72.3%) and larynx (18.2%). Regarding the T stage, 9.1% of the patients were classified as T1; 18.2% as T2; 68.2%, T3 and 4.1%, T4. Regarding the N stage, 27.3% of the patients were classified as cN2a; 27.3% as cN2b; 9.1%, cN2c and 36.4%, N3. All patients were submitted to radical classic or modified neck dissection prior to chemoradiation, 5 patients presented pos-operative complications (mainly infection and minor dehiscence). Extracapsular spread was present in 89.5% of the cases. The average time period between surgery and radiotherapy was 7 weeks (95% of the cases initiated the treatment within the 14th week after surgery). During the follow-up period, 28.6% of the patients presented neck recurrence, being 9.5% of those concurrent with local recurrence.

**Conclusion(s):** Neck dissection prior to chemoradiation for organ preservation could be an option for selected cases. In our series, this approach presented a reasonable neck control without compromising the beginning of the chemoradiation protocol.

**Keywords:** Head and Neck Carcinoma, Neck Dissection, Chemoradiation

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[O09-07]

## Management Strategies of Metastatic Adenocarcinoma in the Neck Manifesting as Unknown Primary: A Retrospective Review of Two Head and Neck Network Centres in the United Kingdom

**Irumeer Pai<sup>1</sup>, Asley Hay<sup>1</sup>, Christopher Pepper<sup>1</sup>, Alistair Deery<sup>2</sup>, Philip Wilson<sup>2</sup>, Julia Baxendine-Jones<sup>3</sup>, Peter Williamson<sup>1</sup>, Lisa Pitkin<sup>4\*</sup>**

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**Objective:** Management of metastatic adenocarcinoma presenting as a neck mass can be challenging. There is currently no clear consensus on investigation strategy. Our objective was to retrospectively review patients who presented to the Head and Neck unit at two cancer networks in the UK (St George's, London and the Royal Surrey, Guildford) over a ten year period (1998-2008) and to develop a management algorithm based on our experience.

**Method(s):** Patients were identified from the Head and Neck database in each unit, who had FNA diagnosis of metastatic adenocarcinoma in cervical lymph nodes. Those with an obvious primary or previous history of adenocarcinoma were excluded. A systematic review of subsequent investigations in search of the primary site was performed.

**Result(s):** 41 patients met the inclusion criteria. All underwent initial imaging; 35 underwent CT Scanning (15 skull base to pelvis, 5 skull base to diaphragm, 14 neck and 1 brain), 2 MRI (1 brain and 1 spine), 2 ultrasound (1 abdomen and 1 neck) and the remaining 1 patient a mammogram. 10 patients had further CT scans as secondary imaging (7 skull base to pelvis and 3 chest and abdomen). 16 patients subsequently underwent a procedural investigation (2 FESS, 3 panendoscopy, 5 OGD, 3 colonoscopy, 1 pleural aspiration and 2 lymph node biopsy (adenocarcinoma confirmed)). The final diagnoses were as follows: lung 13, breast 4, prostate 3, sinonasal 2, upper GI 2, ovarian 1 and 12 true unknown primary. The initial FNA of adenocarcinoma was proven incorrect in 4 patients (renal cell carcinoma 2 and thyroid carcinoma 2). The time to definitive diagnosis ranged from 10 days to over 6 weeks.

**Conclusion(s):** Investigation for metastatic adenocarcinoma presenting as a neck mass remains haphazard and we will present a management algorithm based on our outcome.

**Keywords:** Metastatic Adenocarcinoma, Cervical Lymphadenopathy, Treatment Algorithm

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[O09-08]

## Experience with the Hairline Incision for Neck Dissection

**Yoav P. Talmi\*, Lev Bedrin**

*OTO-HNS, Sheba Medical Center and Tel Aviv University, Israel*

**Objective:** A multitude of incisions are suggested for neck dissection. These are considered according to associated procedures while other considerations include skin characteristics and involvement, unilateral vs. bilateral procedures, location of nodal disease and type of dissection, radiation, previous surgery, and need for flap reconstruction or tracheostomy. A transverse incision provides excellent cosmesis and exposure for thyroidectomy and neck dissection and so does the MacFee incision. When in selected cases, exposure is insufficient, the transverse incision line can be extended upward on the hairline, allowing for wide exposure with minimal cosmetic consequences.

**Method(s):** A prospectively evaluated case series of patients undergoing neck dissection as an isolated or combined procedure in our institution utilizing the extended hairline incision. This is performed by incorporating a single transverse incision as far as the hairline, and then curving it up along the hairline border as high as needed.

**Result(s):** 25 cases, 16 with thyroid malignancy, were included. Access was excellent in all cases. In four patients, the upper limb of the incision has widened up to one cm. This scar was revised in one case. In another two patients treated with radiation, the hairline receded and the scar albeit posterior and not evident was no longer at the level of the hairline.

**Conclusion(s):** While the need for exposure for neck dissection beyond a single transverse incision is uncommon in thyroid surgery, this approach is advantageous when better exposure is needed. This can occur during the procedure while the surgeon is committed to the transverse line or in those cases where a wide approach is needed with the desire to provide a maximally pleasing cosmetic result. Application of this hairline incision is useful in selected cases of non-thyroid cancer requiring neck dissection with or without parotidectomy.

**Keywords:** Neck Dissection, Incision, Cosmesis

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[O09-09]

## Usefulness and Limitation of the Harmonic Scalpel Assisted Neck Dissection- Preliminary Results

**Yooseob Shin<sup>1</sup>, So-Yoon Lee<sup>1</sup>, Seung Won Lee<sup>2</sup>,  
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**Objective:** The development of the harmonic scalpel (HS) provided an alternative to conventional methods of hemostasis. The aim of this study was to evaluate the possible advantages of HS in neck dissection by comparing two cohorts of patients undergoing cervical lymph node dissection for metastases of head and neck cancers. We report our experience with the application of HS in various neck dissections, giving special emphasis to safety of hemostasis and operation time and protection of anatomical structures.

**Method(s):** A prospective, nonrandomized study was undertaken on patients undergone various neck dissections using HS (25 pts, HS group) or conventional methods (24 pts, Conventional group). The evaluation included: types of neck dissection, operation time, amount of drainage, number of ligatures, and neck dissection-related complications.

**Result(s):** HS group comprised 19 CND (comprehensive neck dissection), 11 SOND (supraomohyoid neck dissection), 7 LND (lateral neck dissection). The operative time in HS group was significantly shorter than in Conventional group. We speculated that this reduction of operation time could result from small number of ligatures, especially in level V dissection as well as obtaining bloodless surgical field. We experienced so called “sutureless neck dissection” in 5 SOND and 4 LND. HS was exclusively used for ligation of superior thyroid artery and facial artery in all neck dissections of HS group. However, in case of several veins (middle thyroidal or retromandibular vein) and thoracic/lymphatic ducts, conventional ligatures should be needed. No postoperative hemorrhage or hematoma were noted in HS group. There is no significant difference in postoperative outcomes and complications between either group.

**Conclusion(s):** The use of HS in neck dissections is safe and may allow some advantages (shorter operation time, diminished bleeding, bloodless surgical field) over conventional methods of neck dissection. Prospective studies with longer-term follow-up are obviously necessary to address the safety and feasibility of HS assisted neck dissections.

**Keywords:** Harmonic Scalpel, Neck Dissection, Hemostasis

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**O10. Basic Science (II) : P53 / Others**

**Chairs : Se-Heon Kim (Korea)**  
**Thomas Carey (USA)**

16:30 - 18:00 SBR III

[O10-01]

## Loss of Heterozygosity of Major Tumor Suppressor Genes (p16, Rb, E-cadherin, p53) in Hypopharyngeal Squamous Cell Carcinoma

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**Objective:** Microsatellite alterations, especially loss of heterozygosity (LOH) have been postulated as a novel mechanism of carcinogenesis and as a useful prognostic factor in many kinds of cancers. LOH mechanism is also known to be related to the allelic loss of various tumor suppressor genes (TSGs), however, there have been few studies assessing LOH in hypopharyngeal squamous cell carcinoma (HPSCC). In this study, we investigated LOH of four major TSGs in HPSCC in relation with various clinicopathological factors.

**Method(s):** This study included 30 patients who underwent surgical treatment between 2004 and 2008 at Hallym University Medical Center. DNA of each patients were obtained from formalin-fixed paraffin-embedded tissues, and the presence of LOH for chromosomes 9p21 (p16), 13q21 (Rb), 6q22 (E-cadherin), 17p13 (p53) have been analyzed using PCR with 12 microsatellite markers (three markers per each gene). LOH was scored when one allele in the tumor was absent or 50% as dense as the corresponding normal tissue in heterozygotes, and LOH-high was defined in cases where 2 or more LOH were found. **Result(s):** LOH was detected in 26/30 (86.7%). LOH of p53 gene was detected in most highly frequency (53.3%) and LOH was most commonly detected in TP53 marker (52.6%). There was no detectable LOH in normal tissue, which means that LOH results showed statistical discrimination between normal tissue and malignant tissue ( $P<0.05$ ). LOH of p53 gene results were correlated well with higher tumor grade and LOH-High rate showed statistically significant correlation with non-T1 group ( $P<0.05$ ). LOH of Rb and p53 genes and LOH-High rate were more frequently detected in lymph node metastasis and stage III + IV group ( $P<0.05$ ).

**Conclusion(s):** These results suggest that LOH of these TSGs may contribute to the development and progression of HPSCC. Also combined use of various LOH markers may be helpful in deciding prognosis of HPSCC.

**Keywords:** Hypopharynx, Squamous Cell Carcinoma, Loss of Heterozygosity

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[O10-02]

## Molecular Analysis of Surgical Margins for Predicting Local Relapse in Squamous Cell Carcinoma of the Head and Neck

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 Dirk J. Kuik<sup>3</sup>, Elisabeth Bloemena<sup>4</sup>, C. Réne Leemans<sup>1</sup>,  
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**Objective:** The high rate of local relapse (LR) and second primary tumors (SPT) occurrence constitute a major problem in surgical treatment of head and neck cancer (HNSCC) patients. In at least 25% of the surgically treated HNSCC cases, the carcinoma is surrounded by a genetically defined, preneoplastic lesion, also known as “field”, which can be detected in the surgical margins. Over 50% of the LR and SPT develop from such a field that was not radically excised at the time of resection of the primary tumor. The aim of this study was to investigate, whether the HNSCC patients with an unresected field in the surgical margins are more likely to develop local relapse (LR and SPT), and to identify molecular risk factors that might help to predict malignant transformation.

**Method(s):** In this retrospective study we selected the paraffin embedded tissue of all surgical margins from 16 patients treated with primary surgery, who developed local relapse and 19 patients who remained disease free for at least four years of follow up. Loss of heterozygosity (LOH) at chromosomes 3p, 9p and 17p, and p53 and Ki-67 immunohistochemical staining and dysplasia grading were analysed as potential risk factors for cancer relapse.

**Result(s):** Presence of field within the margins, assessed by molecular analysis of the epithelium appears to be significantly associated with an increased risk for development of local relapse. LOH in 9p and p53 immunostaining have the most predictive value ( $P$ -values of 0.027 and 0.017, respectively in the Kaplan-Meier/log-rank-analysis). Presence and grade of dysplasia did not have a significant association with local relapse occurrence.

**Conclusion(s):** These findings might essentially contribute to establishing the future diagnostic workup of excised head and neck cancer specimens and designing patient-tailored follow-up and treatment policy.

**Keywords:** HNSCC, Surgical Margins, Local Relapse

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[O10-03]

## Viral and Molecular Factors Associated with Cervical Squamous Metastasis of Unknown Origin

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**Objective:** Cervical squamous metastasis of unknown origin (MUO) comprises of 3-5% of all head and neck malignancy. Nasopharynx and oropharynx was considered to compose the majority of the primary site. Head and neck cancers and its relationship with EBV, HPV and HPV related molecular markers were investigated by many researchers. However, studies regarding the relationship between cervical squamous MUO and EBV, HPV & molecular markers are lacking. In this study, we would like to explore the prevalence of EBV, HPV and pattern of molecular marker expression in cervical squamous MUP.

**Method(s):** From January 1992 through December 2007, 41 patients were diagnosed as cervical squamous MUO. Retrospective review of medical record and radiographic findings were performed. Tissue microarray was prepared for 31 tissue available patients and molecular analysis was performed on P16, P53, EGFR, Rb using immunohistochemical staining. Pathologic reading was performed by one expertised pathologist. EBV DNA in situ hybridization was performed on the tissue microarray block to explore the EBV prevalence. HPV analysis was performed on sliced tissue extracts using PCR amplified HPV subtyping (HPV DNA kit, Loche).

**Result(s):** 5-yr disease free survival was 70.0%. Smoking ( $P=0.003$ ) and advanced N stage ( $P=0.037$ ) were related with poor survival and cystic LN ( $P=0.023$ ) was associated with better survival. EBV was detected in two patients and HPV was detected in 15 patients. These were mutually exclusive. Strong P16 expression was related with better survival ( $P=0.015$ ) and weak p53 expression was related with better survival ( $P=0.012$ ). EGFR and Rb expression were not significantly related with survival.

**Conclusion(s):** EBV was detect in 6.5 % of the study population and HPV was detected in 45.6% of the population. Among molecular markers, strong p16 expression and weak p53 expression were associated with better survival.

**Keywords:** Cervical Squamous MUO, HPV, EBV

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[O10-04]

## Osteopontin Upregulates Aurora-A Overexpression and Modulates Migration and Invasion of Oral Cavity Squamous Cell Carcinoma (OCSCC) via PI3K/AKT Pathway

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**Objective:** OCSCC is associated with high rates of recurrence and mortality. This high mortality is probably attributable to early metastasis. Although several well-known markers correlated with poor/metastasis prognosis in OCSCC patients was reported, the molecular mechanisms of OCSCC development are still not clear. To explore novel molecular markers and their signaling pathways will be crucial for aiding in treatment of OCSCC patients.

**Method(s):** The semi-quantitative-RT-PCR/Q-RT-PCR/Western blot/IHC approaches were used to evaluate the mRNA/protein expressions of Aurora-A in paired OCSCC specimens. Immunohistochemical staining of Aurora-A expression with clinic-pathologic characteristics was examined using univariate and multivariate analyses. Human oral cancer cell lines with overexpressing-Aurora-A or Aurora-A-mediated siRNAs were generated by transfection. Transwell chamber-, Western blot-, pharmacological-inhibitor-, and immunohistochemical- assays were done to evaluate the signaling pathways that were involved. The correlation among osteopontin, Aurora-A, and p-AKT were also assessed in OCSCC specimens.

**Result(s):** To identify novel oral cancer-associated/metastasis genes and to clarify the underlying molecular mechanisms of these targets in OCSCC progression, we created a bioinformatics scheme consisting of integrating two gene expression profile datasets, including un-pairwise OCSCC, and secondary metastatic tumors vs. benign tumors. Among the novel targets identified, Aurora-A was overexpressed in OCSCC tissues and is associated with cancer metastasis. Furthermore, we employed two co-expression strategies to identify in which pathway Aurora-A was involved. By semi-quantitative-RT-PCR/Q-RT-PCR/Western blot/IHC approaches, we found that Aurora-A is not only an indicator of poor survival, but also exhibits positive correlations with osteopontin/p-AKT in OCSCC specimens. Stimulation of cells with osteopontin results in 1) an increase in Aurora-A protein expression, 2) promoting Aurora-A-expressing oral cancer cell metastasis, and 3) enhances Aurora-A/PI3K complex formation, further supporting the participation of Aurora-A in the osteopontin/PI3K/AKT pathway.

**Conclusion(s):** These finding suggest that Aurora-A is not only an important prognostic factor but also a new therapeutic target in the osteopontin/Aurora-A/PI3K/AKT pathway for OCSCC treatment.

**Keywords:** Aurora-A, Osteopontin, PI3K/AKT

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[O10-05]

## Circulating ANTI-P53 Antibodies in Oral Precancers and Cancers Using ANTI-P53 ELISA

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<sup>1</sup>oral medicine and radiology., Government Dental college, India

<sup>2</sup>Research Division, Regional cancer centre, India

**Objective:** To determine the occurrence of serum anti-p53 antibody expression in oral precancers and cancerous lesions.

**Method(s):** The study was conducted in the department of Oral Medicine and Radiology, Government Dental college, Trivandrum, Kerala, India in collaboration with the Department of Cancer Research, Regional Cancer center, Trivandrum, Kerala, India. All patients who reported to the OP clinic of the Department of Oral Medicine and Radiology, Dental College, Trivandrum and the Head and Neck OP at Regional Cancer Centre, Trivandrum were screened for a period of one year for premalignant lesion/condition and oral cancer. 81 patients were included in the study, the diagnosis was confirmed both clinically and histopathologically. They were grouped according to types of lesions they had. Following assessment of routine blood and urine investigation reports, a punch biopsy of 5 mm diameter and of sufficient depth to ensure the inclusion of connective tissue, were taken from the representative area in each case, under local anesthesia to confirm the clinical diagnosis. The detection of anti-p53 antibodies in patient sera was performed with a commercially available enzyme linked Immunosorbent Assay (Anti-p53 ELISA-II, pharmacell, Paris, distributed by Immunotech, marsielle, France).

**Result(s):** The precancers included leukoplakia and submucous fibrosis. Cancers included carcinoma in situ, well-differentiated squamous cell carcinoma, moderately differentiated squamous cell carcinoma and verrucous carcinoma. The benign group included benign lesions like fibroma and mucocele. The serum anti-p53 antibody expression of the different groups were assessed and statistically analyzed.

**Conclusion(s):** This work has lead to the conclusion that the association between circulating serum anti-p53 antibody expression with oral cancers, precancers and chewing habits may indicate its immense importance as a non invasive surrogate marker for identifying patients at high risk. The potential applicability of circulating serum anti-p53 antibody expression in the decision analysis concerning adjunct therapeutic strategies and appropriate follow up regimen remains to be determined.

**Keywords:** Oral Cancer, Pre Malignant Lesion/Condition, Serum Anti-p53 Antibodies

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[O10-06]

## Predictive Markers for Neoadjuvant Chemotherapy in Advanced Squamous Cell Carcinoma of Maxillary Sinus: ERCC1 and XRCC1

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**Objective:** This study aims to find a possible relation of ERCC1 or XRCC1 expression with response of neoadjuvant chemotherapy and prognosis in advanced squamous cell carcinoma of the maxillary sinus.

**Method(s):** From 1998 to 2006, 17 patients with advanced squamous cell carcinoma of the maxillary sinus received neoadjuvant chemotherapy at the Seoul National University Hospital. The expressions of ERCC1 and XRCC1 were assessed by immunohistochemistry. Complete and partial remissions were categorized as chemo-sensitive group. On the other hand, stable and progressive diseases were categorized as chemo-resistant group.

**Result(s):** Of these 17 patients, 1 had complete remission, 6 had partial remission, 4 had stable disease and 6 had progression of disease. Five-year survival rate was 40% for all 17 patients. The expressions of ERCC1 and XRCC1 were not correlated with nodal or distant metastasis. With a cut off of 65%, patients with higher ERCC1 scores showed chemo-resistance and survival disadvantage over those with lower ERCC1 scores. However, XRCC1 did not show significant effect on the response of neoadjuvant chemotherapy.

**Conclusion(s):** ERCC1 may be used as a useful predictive marker for application of neoadjuvant chemotherapy in advanced squamous cell carcinoma of the maxillary sinus.

**Keywords:** Neoadjuvant Chemotherapy, Squamous Cell Carcinoma, Maxillary Sinus

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[O10-07]

## Role Level of Expression Ki-67 and p-53 in Predicting Aggressiveness Tumors of the Salivary Glands in Children

**Mihael Bolotin<sup>1\*</sup>, Timur Sharoev<sup>1</sup>,  
Vladimir Polyakov<sup>2</sup>, Oleg Blisnukov<sup>3</sup>**

<sup>1</sup>*Children oncology, Health care children, Russian Federation*

<sup>2</sup>*Head and neck tumors, Institute of children oncology and hematology, Russian Federation*

<sup>3</sup>*Patomorphology, Institute of children oncology and hematology, Russian Federation*

**Objective:** Evaluate the significance levels of expression Ki-67 and p53 in predicting the aggressiveness of tumors salivary glands in children.

**Method(s):** We have carried out imunohistochemical analysis and determined the levels of expression of Ki-67 and p53 in 23 children, operated at the Institute of Pediatric Oncology and Hematology from 1991 to 2007.

**Result(s):** All benign tumors had low expression of Ki-67 (less than 2% in all the samples studied) and the absent of expression of p53. All malignant tumors had higher levels of Ki-67 (more than 6%), while malignant tumors with expression of Ki-67 more than 8-10% and the expression of p53 were more aggressive with metastasizing into regional lymph nodes, lungs and development early relapse.

**Conclusion(s):** Determination of levels of expression of Ki-67 and p53 is an important factor in predicting the aggressiveness of malignant tumors of the salivary glands, as well as differential diagnostic criteria of benign and malignant tumors of the salivary glands. Patients with high levels of expression of these markers will most likely require a more aggressive postoperative treatment and closer dynamic observation for the development of relapse.

**Keywords:** Salivary Gland, Children, Ki-67 p53

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[O10-08]

## Next Generation Sequencing to Analyze Cancers of the Head and Neck

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Melissa Barker<sup>2</sup>, Eric Moore<sup>3</sup>, Kerry Olsen<sup>3</sup>,  
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**Objective:** To utilize the tremendous power of the SOLiD next generation DNA sequencing platform to analyze the molecular alterations that occur in head and neck cancers.

**Method(s):** DNA and RNA was isolated from matched normal and cancer from patients with cancer of the oral tongue or oropharyngeal cancer. RNA was examined with the whole transcriptome sequencing capabilities of the SOLiD platform which preserves the strandedness of each transcript. DNA was examined by mate-pair DNA sequencing to characterize genome-wide alterations during cancer development. Data from both was then integrated to obtain a more complete picture of molecular changes in these cancers.

**Result(s):** Full transcriptome sequencing of the RNA and mate-pair sequencing of the DNA was done on 4 oral cancers and 6 oropharyngeal cancers. The transcriptome sequencing was analyzed to characterize important genes that were differentially expressed during the development of oral and oropharyngeal cancers. In addition, there was a sufficient depth of sequencing that the top 50% of expressed genes could be examined for cancer-specific mutations. We could also detect allele-specific changes in expression and found that genes that had these changes were involved in the same pathways as genes that had changes in overall expression. The mate-pair DNA sequencing enabled us to examine changes in copy number across the genome in these cancers. Our results are consistent with a model in which allele-specific deletions and duplications drive allele-specific changes in gene expression in the developing tumor.

**Conclusion(s):** This work has demonstrated the power of Next Generation DNA sequencing to more fully characterize the molecular alterations that occur during the development of head and neck cancer. We are currently exploring using this technology to direct impact the clinical treatment of patients with head and neck cancer.

**Keywords:** Next Generation Sequencing, Oral and Oropharyngeal Cancers, Transcriptomics

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[O10-09]

## Nuclear NF-κB p65 Phosphorylation at Serine 276 by Protein Kinase A Contributes to the Malignant Phenotype of Head and Neck Cancer

**Pattatheyil Arun<sup>1</sup>, Matthew Brown<sup>2</sup>, Reza Ehsanian<sup>3</sup>,  
Zhong Chen<sup>2</sup>, Carter Van Waes<sup>3\*</sup>**

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<sup>3</sup>NIDCD, National Institutes of Health, USA

**Objective:** Aberrant nuclear activation and phosphorylation of the canonical NF-κB subunit RELA/p65 at Serine-536 by inhibitor κB kinase is prevalent in head and neck squamous cell carcinoma (HNSCC), but the role of other kinases in NF-κB activation has not been well defined. Here, we investigated the prevalence and function of p65-Ser276 phosphorylation by protein kinase A (PKA) in the malignant phenotype and gene transactivation, and studied p65-Ser276 as a potential target for therapy.

**Method(s):** Phosphorylation and total p65 protein expression and localization were determined in HNSCC tissue array and in cell lines. The effects of the PKA inhibitor H-89 on NF-κB activation, downstream gene expression, cell proliferation and cell cycle were examined. Knockdown of PKA by specific siRNA confirmed the specificity.

**Result(s):** NF-κB p65 phosphorylated at Ser276 was prevalent in HNSCC and adjacent dysplastic mucosa, but localized to the cytoplasm in normal mucosa. In HNSCC lines, tumor necrosis factor-α (TNF-α) significantly increased, whereas H-89 inhibited constitutive and TNF-α induced nuclear p65 (Ser276) phosphorylation, and significantly suppressed NF-κB and target gene IL-8 reporter activity. Knockdown of PKA by small interfering RNA inhibited NF-κB, IL-8, and BCL-XL reporter gene activities. H-89 suppressed cell proliferation, induced cell death, and blocked the cell cycle in G1-S phase. Consistent with its biological effects, H-89 down-modulated expression of NF-κB related genes Cyclin D1, BCL2, BCL-XL, COX2, IL 8, and VEGF, as well as induced cell cycle inhibitor p21CIP1/WAF1, while suppressing proliferative marker Ki67.

**Conclusion(s):** NF-κB p65 (Ser276) phosphorylation by PKA promotes the malignant phenotype and holds potential as a therapeutic target in HNSCC.

**Keywords:** NF Kappa B, Head and Neck Cancer, Protein Kinase A

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## O11. Surgery (IV) : Larynx, Hypophonyx

**Chairs : Ki hwan Hong (Korea)**

**Michiel van den Brekel (Netherlands)**

16:30 - 18:00 SBR IV

[O11-01]

### Survival Difference between Surgery and Non-Surgical Organ Preservation Therapy as Initial Treatment for Late Stage Hypopharyngeal Cancer

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**Objective:** The traditional initial treatment for late stage hypopharyngeal cancer usually required laryngectomy with adjuvant therapy. In recent years, non-surgical organ preservation therapy using radiotherapy with or without chemotherapy also has been widely used. The purpose of this research is to compare the survival rate between these two different treatment modalities.

**Method(s):** From January 1, 1996 to February 28, 2006, the data of 204 hypopharyngeal cancer patients diagnosed and treated in our department were retrospectively analyzed. One hundred and eighty-eight (92.2%) cases belonged to late stage (stage III & IV). 112 patients received operation and 76 patients received chemo/radiation therapy as initial treatment. Kaplan Meier survival curves were plotted for 2 treatments, and statistical differences between survival curves were calculated by log-rank test.

**Result(s):** The 5-year overall survival rate for late stage hypopharyngeal cancer was 46.3% for surgical group, and 28.7% for non-surgical group. There was significant difference ( $P=0.0001$ ) between 2 survival curves. The 5-year disease-specific survival rate was 61.6% for surgical group and 56.7% for non surgical group. The disease-specific survival of surgical group was also significantly ( $P=0.0176$ ) better than non-surgical group.

**Conclusion(s):** In late stage hypopharyngeal cancer, the patients who received surgery as initial treatment had significantly higher survival rate than those who received chemo/radiation therapy as initial treatment. According to our result, we suggest that advanced stage hypopharyngeal cancer patients should choose surgery as initial treatment in view of better survival.

**Keywords:** Laryngectomy, Organ Preservation, Survival

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[O11-02]

### Study of Characteristics of the Neoglottis and its Comparison with Quality of Voice in Patients who Have Undergone Primary Tracheo-Oesophageal Puncture

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Pankaj Chaturvedi<sup>3</sup>, Vrushali Angadi<sup>4</sup>, Gurmit Bachher<sup>4</sup>,  
Aniruddh Kulkarni<sup>5</sup>, Suyash Kulkarni<sup>5</sup>, Anil K. D'Cruz<sup>3</sup>**

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<sup>2</sup>*Head and Neck Surgery, Kokilaben dhirubhai Hospital, India*

<sup>3</sup>*Head and Neck Surgery, Tata Memorial Hospital, India*

<sup>4</sup>*Speech and swallowing rehabilitation, Tata Memorial Hospital, India*

<sup>5</sup>*Interventional Radiology, Tata Memorial Hospital, India*

**Objective:** Tracheoesophageal prosthesis is a preferred modality of speech rehabilitation following total laryngectomy. The speech quality depends on the morphologic and anatomic characteristics of the neoglottis. The current study was aimed at studying the characteristics of the neoglottis and correlating these findings with the quality of voice in patients with total laryngectomy.

**Method(s):** 50 patients who had undergone total laryngectomy with primary tracheoesophageal puncture and were disease free for at least 3 months were chosen for this prospective observational study. They underwent videofluoroscopic assessment of the neoglottis. A computerized voice analysis was carried out on these patients following the videofluoroscopy. A correlation analysis was carried out between the dimensions of the neoglottis and voice parameters.

**Result(s):** 49 males and 1 female participated in the study with a mean age of 59.72 years. Of the 50 patients chosen; 37 patients had undergone total laryngectomy with primary closure, 7 had undergone a Pectoralis Major Myocutaneous Flap reconstruction and 6 who had undergone a total laryngectomy with partial pharyngectomy. A Pearson's correlation between the dimensions of the neoglottis and voice parameters did not reveal a significant correlation. Based on a visual assessment the patients were divided into three groups depending upon the tone of the PE segment. The hypotonic group showed a significant positive correlation between neoglottic height and fundamental frequency of voice.

**Conclusion(s):** A visual videofluoroscopic assessment of the neoglottis remains a good indicator of voice quality.

**Keywords:** Neoglottis, Pharyngoesophageal Segment,  
Videofluoroscopy

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[O11-03]

## Functional Relationship between the Thyroid Gland and the Parathyroid Glands after Laryngo-Pharyngectomy with Bilateral Neck Dissection

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**Objective:** Hypoparathyroidism after surgery for advanced laryngo-pharyngeal cancer sometimes induces severe complications. To control the calcium metabolism is often quite difficult. From this point of view, preserving the function of the parathyroid glands is crucial, as we must focus on the preservation of the parathyroid glands during the surgical management of laryngo-pharyngeal cancer. To understand better the means to improve it, we did a retrospective analysis of the functional relationship between the thyroid gland and the parathyroid glands.

**Method(s):** Seventy two patients (65 male and 7 female, the mean age was 64.4 years) with laryngo-pharyngeal cancer underwent ablation of the primary lesion with bilateral neck dissection. Forty seven of these patients had hypopharyngeal cancers, 22 had laryngeal cancers and 3 had cervical esophageal cancers. In them, the contralateral thyroid gland and contra-lateral parathyroid glands were preserved, keeping intact the pedicle of the superior thyroid artery and vein. The other vessels were sacrificed for wider exposure of the para-tracheal region. Results of preserving the function were evaluated at 3 months post surgery, based on the necessity of the replacement, according to the levels of TSH, serum Ca and intact PTH.

**Result(s):** Successful preservation of the function of the parathyroid glands was possible in 74%, 53 of 72 patients. That of the thyroid gland was possible in only 35%, 25 cases. The thyroid gland might be much more sensitive to ischemic or congestive conditions. In these 25 patients with successful preservation of the thyroid gland, functional preservation of the parathyroid glands was possible in 96% of cases.

**Conclusion(s):** These results indicated that appropriate blood supply and drainage of the thyroid gland, which results in maintenance of its normal function, can preserve the parathyroid glands functionally. Ischemic or congestive condition of the thyroid gland might lead to the failure of functional preservation of the parathyroid glands.

**Keywords:** Laryngo-Pharyngectomy, Parathyroid Gland, Thyroid Gland

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[O11-04]

## Larynx-Preserving Partial Pharyngectomy for the Treatment of Early Hypopharyngeal Squamous Cell Carcinoma

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**Objective:** Larynx-preserving partial pharyngectomy (LPP) with or without adjuvant radiotherapy as a primary treatment modality for early (T1 or T2) hypopharyngeal squamous cell carcinoma (HPSCC) has not been widely investigated. Here, we evaluated the oncologic and functional results of this treatment modality by undertaking a retrospective review of 26 patients who underwent LPP for early HPSCC.

**Method(s):** The 26 patients who underwent LPP between January 1991 and June 2007 were enrolled in this study. The primary tumor was removed by partial pharyngectomy via a lateral pharyngotomy approach (n=23) for a tumor in the lateral or posterior wall of the hypopharynx, or a horizontal partial laryngopharyngectomy (n=3) for removal of a small tumor confined to the medial wall of the pyriform sinus. To reconstruct the surgical defect area, a forearm free flap was used in 17 patients (65%) and a split thickness skin graft was used in 2 patients (8%). Primary closure was performed in the remaining seven patients (27%). The mean follow-up period was 50 months.

**Result(s):** Sixteen (62%) patients had adjuvant postoperative radiotherapy. The 2-year and 5-year disease specific survival rate was 76% and 57%, respectively. Twelve patients (46%) had tumor recurrence. The most common pattern of recurrence was isolated distant failure (n=6, 50%) followed by local (n=3, 25%) and loco-regional (n=3, 25%) recurrence. Local recurrence developed in one of nine patients (11%) with a positive surgical margin. The ultimate cure rate of the primary tumor was 88% (23 of 26). Twenty-five of the 26 patients (96%) could be decannulated, tolerate an oral diet, and had acceptable postoperative phonatory function.

**Conclusion(s):** LPP appears to be a feasible procedure for selected early HPSCC patients in terms of both oncologic and functional outcomes.

**Keywords:** Hypopharyngeal Neoplasm, Pharyngectomy, Adjuvant Radiotherapy

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[O11-05]

## Transoral Microscopic and Endoscopic Surgery for Hypopharyngeal Cancer

**Taro Sugimoto<sup>1\*</sup>, Seiji Kishimoto<sup>2</sup>, Kazuchika Ohno<sup>1</sup>, Yosuke Ariizumi<sup>1</sup>**

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<sup>2</sup>Head and Neck Surgery, Tokyo Medical and Dental University, Japan

**Objective:** A transoral KTP laser excision has been used to treat pharyngo-laryngeal cancers using a WEERDA (straight) distending laryngoscope in our hospital since December 2005. A transoral excision has been performed for the same disease under a magnifying endoscope using a curved distending laryngoscope at a limited number of hospitals in Japan recently. We herein demonstrate the advantages and disadvantages of these different types of laryngoscopes.

**Method(s):** A total of 27 patients with hypopharyngeal cancer underwent a transoral excision or biopsy using a laryngoscope December 2005 to December 2009. We analyzed how easily and clearly the hypopharynx can be distended to detect the lesion during surgery using these laryngoscopes. Twenty-three cases were male and 4 cases were female. The average and median ages were 67.2 and 68 years old, respectively (range 49 to 83). The stages of all patients were under (r) T2, and (r) N0 without distant metastasis.

**Result(s):** A straight laryngoscope was used in 19, a curved in 10 cases and both in 2 cases. The curved laryngoscope could distend the hypopharynx more easily and widely with less damage to the teeth and tongue, in comparison to the straight one. In addition, new lesions not found preoperatively were detected after the hypopharynx was distended widely by the curved laryngoscope and explored by the magnifying endoscope during the procedure in five of 10 cases. The curved laryngoscope was very effective for identifying the lesions and performing the excision of hypopharyngeal cancer especially in the lower part (posterior, deep posterior wall and deep pyriform sinus). However, it has the disadvantage of requiring new curved surgical instruments. Meanwhile, the straight laryngoscope was still effective in the upper part without the need for new surgical instruments.

**Conclusion(s):** A curved laryngoscope has many advantages, however, it is necessary to develop more curved instruments.

**Keywords:** Transoral Surgery, Curved Laryngoscope, Hypopharyngeal Cancer

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[O11-06]

## Endoscopic Laryngo-Pharyngeal Surgery Using a Double Scope

**Kazuto Matsuura<sup>1\*</sup>, Tetsuya Noguchi<sup>2</sup>, Shigeru Saito<sup>1</sup>**

<sup>1</sup>Head and Neck Surgery, Miyagi Cancer Center, Japan

<sup>2</sup>Internal medicine, Miyagi Cancer Center, Japan

**Objective:** Endoscopic treatment becomes the standard for superficial cancer with the esophagus, and a procedure of EMR (Endoscopic mucosal resection) and ESD (Endoscopic submucosal resection) is established. However, as for the endoscopic treatment for the laryngopharyngeal superficial cancer, it cannot be the standard therapies. Radiotherapy is usually of choice for it. It is thought that treatment stress is big for a lesion. Therefore we introduced ELPS (Endoscopic laryngo-pharyngeal surgery) in cooperation with a digestive organ endoscope specialist as minimum invasive surgery for patients with laryngopharyngeal superficial cancer from June, 2007.

**Method(s):** The point of the surgery is the development of the operation field, the identification of the lesion and counter tension at the resection. We could make a pharynx one lumen by using a curve type laryngoscope, and enough operation fields were obtained. Furthermore, we were able to know a range of the lesioned part precisely by using Lugol painting, a magnifying endoscope and narrowband endoscope. In the case that the resection by the procedure of EMR and ESD had difficult, we inserted the laryngeal fiber nasally and were able to make counter tension at the resection by using the retension forceps which we put out from there. Under this counter tension, we performed resection using digestive organ endoscope (the double scope method). We performed ELPS for 20 laryngopharyngeal lesions by March, 2009. Of these, seven patients underwent the resection by the double scope method.

**Result(s):** Extensive resection more than 50 mm was possible. Also, complicated excision to achieve to endolarynx was possible. Complete resection was found in the pathological results of the resected specimen.

**Conclusion(s):** As for ELPS, progress is expected in future by the development of the resection device. It was thought that the double scope method was a useful procedure at the present.

**Keywords:** Endoscopic Laryngo-Pharyngeal Surgery, Double Scope Method, Laryngopharyngeal Superficial Cancer

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[O11-07]

## Hypopharyngectomy by Using the Robotic Surgical System in Hypopharyngeal Cancer

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**Objective:** Hypopharyngeal carcinoma still remains to show poor prognosis for several years even though various treatment approaches have been attempted. Recent trend of treatment is to perform organ preservation therapy to improve the quality of life. Recent application of robotic technology in the fields of surgery has brought about improvement of minimally invasive techniques, which in turn, leads to decreased postoperative morbidity. In the treatment of hypopharyngeal carcinomas, performing transoral robotic surgery (TORS) may achieve a lower surgical morbidity rate as well as higher chance of organ preservation.

**Method(s):** TORS was performed using “da Vinci Surgical Robot”. FK retractor was used to expose the cancerous lesion transorally, and an endoscopic arm was introduced through the oral cavity with two instrument arms placed 30 degrees apart from the endoscopic arm. We performed TORS on eight patient with pyriform sinus carcinoma and one patients with posterior pharyngeal wall carcinoma, as a prospective human trial.

**Result(s):** TORS was performed successfully in all nine patients. The mean robotic operation time was 62.3 minutes, and an average of 15.6 minutes was required for the setting of the robotic system. By using the robotic surgical system, thyroid inner perichondrium was peeled off to obtain safe margin of antero-lateral portion. There was no significant perioperative complication in all cases. Swallowing function completely returned in all patients within 7.8 days average. Decannulation could be carried out within an average of 6.2 days after surgery.

**Conclusion(s):** Technical feasibility and efficacy of TORS was proven in this study. We propose TORS as a treatment option for organ preservation to increase the quality of life of the patients.

**Keywords:** Transoral Robotic Surgery, Hypopharyngeal Cancer, Hypopharyngectomy

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[O11-08]

## Clinical Outcomes of Hypopharyngeal Cancer after Conservative Laryngeal Surgery

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<sup>1</sup>Department of Otolaryngology-Head and Neck Surgery,  
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<sup>2</sup>Department of Otorhinolaryngology-Head and Neck Surgery,  
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Medical Center/ Ilsong Memorial Head and Neck Cancer Center,  
Korea

**Objective:** This aim of the study was to report clinical outcomes of patients who underwent conservative laryngeal surgery for hypopharyngeal cancer and to analyze functional outcome.

**Method(s):** Of 103 patients undergoing surgery for previously untreated hypopharyngeal cancer in our institution from January 1992 to August 2008, 37 were recruited in the study. 36 patients received post-operative radiotherapy. Reports of the site and extent of tumor, type of conservative laryngeal surgery and histopathologic finding were reviewed. In addition, subjective and objective evaluation of voice and swallowing and postoperative follow-up were reviewed.

**Result(s):** The site of origin was the pyriform sinus (PS) in 32, posterior pharyngeal wall (PPW) in 4 and postericoid area (PC) in 1 case. Partial laryngopharyngectomy was performed in 10 cases, supraglottic partial laryngopharyngectomy (SPLP) in 17 cases, supracricoid hemilaryngo Pharyngectomy (SCHLP) in 5 cases and wide vertical hemilaryngo pharyngectomy (WVHLP) in 5 cases. The 3-year disease specific survival rate and 3-year disease free survival rate following conservative laryngeal surgery were 75.26% and 60.82%. 34 (92%) of 37 patients had successful removed tracheostomy tubes with a median time to decannulation of 23 days. Normal or soft diet swallowing and satisfactory voice quality were achieved in all cases.

**Conclusion(s):** Conservative laryngeal surgery maintains physiologic speech and swallowing in selected patients with hypopharyngeal cancer. There is a good oncologic outcome and an excellent functional recovery when strict selection criteria and various surgical methods are applied and an intensive education for swallowing rehabilitation is followed.

**Keywords:** Hypopharyngeal Cancer, Conservation, Surgery

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[O11-09]

## Pharyngolaryngoesophagectomy with laparoscopic gastric pull-up: our experience

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**Objective:** The aim our study was to evaluate affordability of pharyngolaryngoesophagectomy with laparoscopic gastric pull-up in the management of hypopharyngo-oesophageal carcinomas.

**Method(s):** Between October 2002 and June 2009 we performed 23 pharyngolaryngoesophagectomy with laparoscopic gastric pull-up in patients affected by hypopharyngo-oesophageal carcinomas. Surgical procedure was performed in one stage by two surgical team. During the demolitive phase, a first team performed a circumferential pharyngolaryngoesophagectomy with bilateral (radical or selective) neck dissections and total thyroectomy; after that the second team performed a gastric tubulization with transhiatal esophageal dissection. At last we restored the base of tongue- gastric continuity by a personal technique.

**Result(s):** In our sample, the intraoperative mortality was 0 %, whereas we recorded a post-operative mortality of 8,7 %. There were two anastomotic leakage in the third and ninth postoperative day that needed a surgical revision in one case (post-operative morbidity: 12,5 %). Oral food intake was restored after  $14,3 \pm 9,5$  days. Patients were discharged from the hospital after  $18 \pm 9,2$  days.

**Conclusion(s):** In conclusion, we consider the pharyngolaryngoesophagectomy with laparoscopic gastric pull-up, a safe procedure with a low post-operative mortality and reduced post-operative complications.

**Keywords:** Pull up, Pharyngolaryngoesophagectomy

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## LS01. ERBITUX - Setting New Standards in the Management of SCCHN

**Chair: Kwang Hyun Kim (Korea)**

11:20 - 13:00 CBR I+II+III

[LS01]

## Extreme- The First Significant Improvement in Survival in Recurrent and/or Metastatic Squamous Cell Head and Neck Cancer (SCCHN) for 30 Years.

**Jan Baptist Vermorken**

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R/M SCCHN carries a dismal prognosis with a median survival of about 6 months. The overall response rate with single agent cytotoxics ranges between 15 and 30 %. Higher response rates are reported with combinations. However, these higher response rates have never translated into a better survival. This finally changed with the publication of the Erbitux in first-line Treatment for Recurrent or Metastatic Head and Neck Cancer (EXTREME) study (1). In that study, 442 patients with previously untreated R/M SCCHN were randomized to cis- (100 mg/m<sup>2</sup>) or carboplatin (AUC 5), day 1, and 5-fluorouracil (1000 mg/m<sup>2</sup>/dayx4)(PF), every 3 weeks (maximally 6 cycles), or PF plus the Epidermal Growth Factor Receptor (EGFR) targeting IgG1 monoclonal antibody cetuximab (loading dose 400 mg/m<sup>2</sup> → 250 mg/m<sup>2</sup>/week) (PFE). Patients with stable disease who received PFE continued to receive cetuximab until disease progression or unacceptable toxic effects, whichever occurred first. No crossover was permitted. The primary endpoint was overall survival. The addition of cetuximab to PF significantly prolonged survival (median: 10.1 vs 7.4 months; hazard ratio [HR] for death, 0.80; 95% confidence interval, 0.64 to 0.99;  $P=0.04$ ). The addition of cetuximab prolonged also progression-free survival (median: 5.6 vs 3.3 months; HR for progression, 0.54;  $P<0.001$ ) and increased the response rate (36% vs 20%,  $P<0.001$ ). The most common grade 3 or 4 adverse events in PFE and PF were anemia (19% and 13%, respectively), neutropenia (23% and 22%), and thrombocytopenia (11% in both groups). More patients receiving PFE developed sepsis (9 vs 1,  $P=0.02$ ) and more patients showed severe hypomagnesemia (11 vs 3,  $P=0.05$ ). Of 219 patients receiving PFE, 9% had grade 3 skin reactions and 3% had grade 3 or 4 infusion-related reactions. Quality of life with TPE was not deteriorated and there were no cetuximab-related deaths.

[T1-01]

## TPF or PF Induction Chemotherapy Followed by CCRT: A Multicenter, Randomized Trial

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**Objective:** To evaluate the efficacy and safety of the two induction chemotherapy regimen of docetaxel, cisplatin, and 5-fluorouracil (TPF) versus cisplatin and 5-fluorouracil (PF), both followed by CRT in LAHNC.

**Method(s):** Eligibility criteria included unresectable stage III or IV LAHNC. Patients received either PF (cisplatin 75 mg/m<sup>2</sup> on D1 plus fluorouracil 1,000 mg/m<sup>2</sup> on D1-D5) or TPF (docetaxel 70 mg/m<sup>2</sup> on D1, cisplatin 75 mg/m<sup>2</sup> on D1, 5-fluorouracil 750 mg/m<sup>2</sup> on D1-D5); both regimens were administrated for 3 cycles every 3 weeks. Patients with complete response or partial response received additional CRT (cisplatin 30 mg/m<sup>2</sup> weekly plus 66–70.2Gy). The primary end point was response rate of induction chemotherapy and the secondary end points were safety, TTF, TTP and OS.

**Result(s):** A total of 86 patients were randomly assigned to PF (n=43) or TPF (n=43). Eighty-three percent of patients had stage IV HNC. The response rate was 81% in the PF arm vs. 85% in the TPF arm ( $P=0.66$ ). Patients who completed 3 cycles of induction chemotherapy were 93% in PF arm and 72% in TPF arm. Median TTF was 15.4 months in the PF arm compared with 17.9 months in the TPF arm ( $P=0.99$ ). At a median follow-up duration of 12.3 months, although patients in the TPF arm had a trend to longer PFS (PFS at 2 years, 55.1% in PF arm vs. 70.0% in TPF arm ( $P=0.25$ )), there were no significant differences in OS and PFS between 2 arms. Grade 3/4 toxicities during induction chemotherapy consisted mainly of neutropenia (49% in PF arm vs. 46% in TPF arm). Any grade 3/4 hematologic and nonhematologic toxicities were not statistically different between 2 arms. Long-term follow-up data of survival will be presented in the meeting.

**Conclusion(s):** Induction chemotherapy with TPF or PF prior the CRT is feasible with manageable toxicity. TPF and PF regimen showed similar response and survival outcome.

**Keywords:** Induction Chemotherapy, Docetaxel, Cisplatin And 5-Fluorouracil, Locally Advanced Head and Neck Cancer

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[T1-03]

## TPF Induction-Radioimmunochemotherapy of Head & Neck Cancer

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**Objective:** Here we show interim results evaluating the safety and feasibility of a TPF induction therapy under pegfilgrastim protection with a subsequent concomitant RT immunochemotherapy using cetuximab and cisplatin.

**Method(s):** 66 patients (12 female/ 54 male) with an advanced (T3/ T4) head & neck cancer were treated. Patients were between 38 and 82 years old (median 59), Karnofski >60%. Induction therapy consisted of three 21-day-cycles TPF (75 mg/m<sup>2</sup> taxotere d1; 35 mg/m<sup>2</sup> cisplatin d1,2; 750 mg/m<sup>2</sup> 5-FU d1-5) and on d7 a protective dose of 6 mg mafgfilgrastim. Before and after induction therapy PET-CT was used to evaluate response. PET-CT allowed best possible RT-planning with best adapted field margins. Subsequent radioimmunochemotherapy consisted of 400 mg/m<sup>2</sup> cetuximab on day 1 (initial dose) and seven weekly cycles of 250 mg/m<sup>2</sup> cetuximab and 40 mg/abs cisplatin on day 1. Radiotherapy on d1-5/; 1.8 Gy/day for a median dose 61.2 Gy (59.4 - 70.2 Gy). During the whole treatment CRP was monitored twice weekly and if necessary, antibiotics were administered iv. Typical side effects (e.g. rash, mucositis) were treated accordingly.

**Result(s):** All 66 patients were evaluated after therapy completion. One death occurred which was not treatment related (myocard infarct). 3 patients stopped treatment after the induction therapy. The response rate were: CR 54% (33), PR 30% (19), SD 11% (7) and PD 5% (3). 8 Grade III/ IV toxicities were observed (skin rash, diarrhoe). All toxicities were reversible. In 4 patients, therapy had to be interrupted for two weeks (skin rash).

**Conclusion(s):** The new regimen is safe, shows great promise and deserves further development but should be limited to the clinical setting. PET-CT as a diagnostic tool, pegfilgrastim as a myeloprotective agent and taxotere/ cetuximab make a good combination. Especially during the induction therapy QoL is dramatically improved.

**Keywords:** Cetuximab, Pegfilgrastim, Taxotere

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[T1-02]

## A Phase II Trial of Neoadjuvant Paclitaxel and Cisplatin in Patients with Locally Advanced Head and Neck Cancer

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**Objective:** To evaluate the efficacy and safety of a paclitaxel-platinum regimen for the treatment of locally advanced head and neck cancer in the neoadjuvant setting.

**Method(s):** Eligibility criteria included measurable, nonmetastatic, histologically-proven stage III or IV locally advanced head and neck cancer (LAHNC). Patients received paclitaxel at a dose of 175 mg/m<sup>2</sup> given as a 3-h intravenous infusion followed by a continuous infusion of cisplatin at a dose of 75 mg/m<sup>2</sup> on Day 1 every 21 days for a total of 3 cycles, prior to definitive therapy. Treatment after completion of neoadjuvant chemotherapy was to be decided by the investigator. The primary objective of this study was to evaluate tumor response rate for paclitaxel in combination with cisplatin.

**Result(s):** Between May 2005 and June 2007, 53 patients were enrolled and 50 were treated. Thirty-nine (78%) of patients were male and the median age was 56 (range, 34–73). Sixty-four percent of patients had squamous cell carcinoma. The predominant locations of the tumor were nasopharynx (52%), oropharynx (20%), and hypopharynx (10%). A majority of patients (76%) had Stage IV disease. A total of 143 courses of study therapy were administered and patients received a median of 3 courses of therapy. The relative dose intensity was ≥90% in 48 (96%) patients for both drugs. The overall response rate was 72.0% in evaluable patients. Forty-six patients (92%) received any subsequent therapy for primary disease. Forty-five (90%) patients received radiotherapy and 30% of patients received surgery. Progression-free survival at 1 year was 74.2%. Grade 3/4 neutropenia was the predominant hematologic abnormality (24%/12%) and grade 3 anemia was noted in 6% in this study. Nonhematologic toxicities were generally mild and grade 3 nausea was observed in only 6% of patients.

**Conclusion(s):** Paclitaxel in combination with cisplatin had therapeutic efficacy with manageable toxicity in patients with LAHNC.

**Keywords:** Induction Chemotherapy, Paclitaxel, Locally Advanced Head and Neck Cancer

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[T1-04]

## Inter-Arterial Regional Autotransfusional Chemotherapy and Single-Stage Plastic Surgery of Defect in Complex Treatment of the Locally Advanced Cancer of Tongue and Floor of Mouth Cavity

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**Objective:** Evaluation of results of single-stage plastic surgery in complex treatment of the locally advanced cancer of tongue and floor of mouth cavity.

**Method(s):** We have undertaken 12 radical operations with single-stage surgery after resectional defects with application of musculocutaneous flaps on nodding muscle for 3 patients, and with application of big thoracic muscle for 9 patients. Three patients had cancer of tongue T3N0M0. Six patients had cancer of mucosal floor of mouth cavity T3N1M0 and three patients had cancer of mucosal fauces T3N1M0. During preoperative phase all patients received regional inter-arterial autotransfusional chemotherapy according to the following scheme: metotreksat 30 mg+10.0 of plasma for the first day and 5-fluorouracil 500 mg intravenously for 5 days.

**Result(s):** During postoperative phase 3 patients (25%) had fistula which later has been closed. Primary healing has been considered for 9 patients, which has positively affected into their psychic-mental status

**Conclusion(s):** Use of single-stage plastic surgery in combination with autoplasmic chemotherapy for locally advanced cancers of oro-pharyngeal zone will allow to achieve good functional and cosmetic results and thus to avoid the above-mentioned limitations.

**Keywords:** Autotransfusional Chemotherapy, Plastic Surgery, Oro-pharyngeal Zone

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[T1-05]

## Survival Outcome by Early Surgical Therapy and Sequential Chemoradiation after Induction Chemotherapy in the Treatment of Hypopharyngeal Cancer

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**Objective:** Induction chemotherapy is used in clinical practice and is thought to be beneficial for reducing the rate of metastases and increasing organ preservation and survival rates. The aim of this study is to compare survival data between patients who underwent sequential chemoradiation therapy (CCRT) versus early surgical therapy after induction chemotherapy in hypopharyngeal cancer.

**Method(s):** We retrospectively analyzed ninety-eight eligible patients with hypopharyngeal cancer who were treated with induction chemotherapy between January 1997 and December 2006. Initially, these patients were treated with two cycles of induction chemotherapy consisting of cisplatin and 5-fluorouracil. We analyzed survival data dividing four groups according to treatment strategy (Group 1 [N=7]: patients who had a complete response to chemotherapy and treated with definitive radiotherapy; Group 2 [N=59]: patients who had a partial response to chemotherapy and treated with sequential CCRT; Group 3 [N=19]: patients who underwent surgery with postoperative radiotherapy in non-responders to chemotherapy; Group 4 [N=13]: patients who treated with chemoradiotherapy in non-responders to chemotherapy).

**Result(s):** With a mean follow-up of 38.0 months, 5-year disease specific survival rate (DFS) and overall survival rate (OS) for all patients were 47.0% and 39.7%, respectively. The 5-year DFS was 71.4% for group 1, 42.1% for group 2, 60.6% for group 3 and 30.8% for group 4. The 5-year OS was 51.4% for group 1, 39.6% for group 2, 52.6% for group 3 and 23.1% for group 4. Patients who underwent early surgical therapy in non-responders to induction chemotherapy showed similar survival outcome with patients who had complete response.

**Conclusion(s):** Early surgical therapy in patients who had no response to induction chemotherapy was treatment modality to improve survival. The decision making of treatment modality according to response to induction chemotherapy can be effective option in the patients with hypopharyngeal cancer.

**Keywords:** Hypopharyngeal Cancer, Induction Chemotherapy

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[T1-07]

## Evaluation of P16 Expression as an Indicator of Response to Concurrent Chemoradiotherapy in Stage IV Squamous Cell Carcinoma of Head and Neck (Preliminary Data)

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**Objective:** High-risk HPVs, especially HPV-16, are associated with a subgroup of head-and-neck cancers. Indeed, HPV infection could account for the development of head-and-neck cancer in certain individuals that lack the classical risk factors for this disease (tobacco and alcohol abuse). Some studies have indicated a relatively better outcome for HPV-positive patients who have head and neck squamous cell carcinoma (HNSCC). This study, we will test response and outcome of concurrent chemoradiotherapy (CCRT) in stage IV head and neck cancer with expression of high P16 level.

**Method(s):** Stage IV squamous cell carcinoma of head and neck (HNSCC) received pre-treatment biopsies. Pretreatment biopsies from 36 patients were tested for P16. They were treated CCRT (two courses of chemotherapy with cisplatin (80 mg/m<sup>2</sup>) and with fluorouracil (800 mg/m<sup>2</sup>/d for 4 days) and radiotherapy (50c Gy). If their diseases get partial response, they could receive salvage surgery.

**Result(s):** At present, thirty six patients (35 male, 1 female) with stage IV squamous cell carcinoma of head and neck (HNSCC) were enrolled since Jan 2009. Thirty one patients are stage IVb and five patients are stage IVa. All of them had received concurrent chemoradiotherapy. Eighteen patients are oropharyngeal cancer, 13 are oral cancer and 5 patients are hypopharyngeal cancer. Until now, some high P16 expression patients, who undertook CCRT, have high response rates in both the primary tumor and lymph node metastases, even in oral cavity or hypopharyngeal area.

**Conclusion(s):** For patients with locoregionally advanced head and neck squamous cell carcinoma, high p16 expression may be a marker of good response to concurrent chemoradiotherapy. This led to widespread expectation that neoadjuvant concurrent chemoradiotherapy followed by surgery would lead to better outcomes in terms of higher cure rates and the need for less extensive surgery in locoregionally advanced head and neck cancer.

**Keywords:** P16, HNSCC, Chemoradiotherapy

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[T1-06]

## Conditionally Replicating Adenovirus Improves Gene Replication Efficiency and Anticancer Effect of E1-Deleted Adenovirus Carrying TRAIL in HNSCC

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<sup>2</sup>Department of Otorhinolaryngology, Seoul National University, Korea

**Objective:** To overcome the low efficiency of gene therapy, we combined a conditionally replicating adenovirus (CRAd) and an adenoviral vector with a therapeutic gene, TRAIL.

**Method(s):** We investigated the anti-cancer effect of a combination of CRAd and adenovirus carrying tumor necrosis factor related apoptosis inducing ligand (TRAIL) on head and neck cancer cell lines and in xenograft model.

**Result(s):** Upon combined application of CRAd and ad-luciferase in head and neck cancer cell lines, we observed considerably increased luciferase activity that was 10- to 50-fold greater than with ad-luciferase alone. The Combination of CRAd and ad-TRAIL showed significant suppression of growth in cell lines and increased the sub-G1 portion of cells by 30-fold when compared to any single treatment. The expression of TRAIL was highly amplified by the combined treatment and was accompanied by expression of molecules related to apoptosis. In a xenograft animal model, mice treated with CRAd and ad-TRAIL showed complete regression of established tumors, while mice treated with CRAd or ad-TRAIL alone did not.

**Conclusion(s):** In conclusion, this combined strategy utilizing CRAd and adenovirus carrying a therapeutic gene increased gene transfer rate and enhanced anti-tumor effects. We expect that this combination strategy could be extended to a multi-target cancer gene therapy by combining multiple adenoviruses and CRAd.

**Keywords:** Gene Therapy, CRAd, TRAIL

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[T1-08]

## Growth Inhibition and Apoptosis with Novel H31 Metabolites from Marine Bacillus SW31 in Head and Neck Cancer Cells

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**Objective:** The toxic effects of current therapeutic agents used to treat various cancers have motivated investigators to pursue novel bioactive compounds, especially from natural products. The ocean and its micro-organisms has been a rich source of new bioactive metabolites. H31 is a new anti-tumor material that was originally discovered in marine Bacillus spp. H31 has demonstrated powerful anticancer effect in various cancers at very low concentrations. In this study, we investigated the effect of H31 as a therapeutic agent in head and neck cancer.

**Method(s):** We finally found 2 (713) candidate materials from marine microbial extracts in anti-cancer drug screening by MTT assay. We investigated the effect of H31 (one of the candidates) on HGF-induced proliferation, dispersion, invasion, and expression of MMPs (by RT-PCR, zymogram) and induction of apoptosis (by DNA fragmentation assay, FACScan with Annexin V-FITC) in FaDu and KB cells. We analyzed signal pathway of H31 and evaluated the anticancer effect in C3H/HeJ syngeneic mice. In addition, drug toxicity (embryotoxicity and neurotoxicity) were investigated in vivo zebrafish model.

**Result(s):** H31 is originated from novel marine Bacillus spp. (similarity 70% with *Bacillus firmus* by gene sequencing). H31 inhibited HGF-induced scattering, migration, invasion and MMP-2 activity of FaDu and KB cells in dose-dependant. H31 induced apoptosis in dose dependent manner. Combined with c-JUN, p53, cytochrome C, and caspase-3, H31 induced apoptosis of KB cells, an oral cavity cancer cell line. Tumor growth in C3H/HeJ syngeneic mice was suppressed by H31. In addition, in a zebrafish model used for toxicity testing, a considerable dose of H31 did not result in embryo or neurotoxicity.

**Conclusion(s):** Our results suggest that H31, a natural product from marine *Bacillus SW31*, may be a candidate for potential novel treatment of head and neck cancer.

**Keywords:** Anticancer Drug, Head and Neck Cancer, *Bacillus SW31*

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[T1-09]

## A Mouth Cancer Epidemiological Study in the Mid-Northern Brazilian Region

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 Jose Menezes<sup>2</sup>, Roberto Montenegro<sup>3</sup>, Sheila Lima<sup>3</sup>,  
 Cristiane Amaral<sup>3</sup>, Elder NArciso Feltrim<sup>4\*</sup>

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<sup>4</sup>Oncology, Instituto Harmonia, Brazil

**Objective:** Mouth cancer is a serious, high-incidence worldwide disease. Besides showing that it affects predominantly men, epidemiological studies have built a worldwide consensus about the link between this disease and smoking, and alcohol use. Its link with the patient's job has also been suggested. A study by the International Agency for Research on Cancer has reported Brazil as the second country to India with the highest mouth-cancer rate. Determining the epidemiological profile of mouth-cancer in patients treated at a reference health service for cancer in mid-north Brazil.

**Method(s):** The statistical data from medical records from 2003 to 2008 filed with the Cancer Hospital in Araguaína, Tocantins a Brazilian state integrating the "Amazonia Legal" were analyzed using Prism version 4.0 and SPSS version 16.0 software packs.

**Result(s):** A total of 238 clinical records of patients with head or neck cancer presenting with no skin tumors were retrieved. Male patients of black and white mixed descent were predominant (70.6%). Farm laborers comprised 38.2% of the cases. Late stage (III and IV) cancer had higher incidence rates ( $P<0.05$ ). From the cases studied, 22% were in the mouth with primary site more commonly on the tongue. There was a statistically significant relationship between mouth cancer and smoking ( $P=0.001$ ), as well as, a stronger correlation between mouth cancer and smoking associated with alcohol use as compared with any other individual factors studied. Individuals with low level education and farm laborers were predominant among mouth cancer patients.

**Conclusion(s):** The incidence of mouth cancer at the Araguaína Cancer Hospital was higher than the Brazilian average. The determination of an above-the-average incidence rate may be due to the screening service for potentially cancerous mouth lesions provided by the Araguaína Health Center. The findings of the present study agree with those in the international literature.

**Keywords:** Mouth, Cancer, Araguaína

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[T1-11]

## NBI Endoscopy for Unknown Primary Tumor Site of the Neck

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 Masakazu Miyazaki, Hiroyuki Daiko, Masahisa Saikawa, Satoshi Ebihara

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**Objective:** In inspection for squamous cell carcinoma of unknown primary tumor site of the neck, CT, MRI, laryngoscopy, gastrointestinal endoscopy and PET are used to examine the primary lesion. In the esophagus, Lugol chromoendoscopy facilitates early detection. Lugol staining cannot be used in the head and neck region, owing to the severe mucosal irritation it causes, which produces pain and discomfort and can result in aspiration into the airway. Narrow band imaging (NBI) endoscopy in which an optical color separation filter is used to narrow the bandwidth of spectral transmittance, was used in this study. Narrow bandwidth filters make it possible to visualize malignant lesions, particularly those lesions with a developed microvasculature.

**Method(s):** Among the patients who visited our clinic between June 2006 and July 2009, 19 were diagnosed with primary unknown squamous cell carcinoma, and in whom the primary lesion could not be detected by conventional white light laryngoscopy. We evaluated these 19 patients by NBI endoscopy and PET.

**Result(s):** We detected the primary lesion by NBI endoscopy in two patients. In one patient, we detected superficial squamous carcinoma in one of the tonsils, and in the other patient, we detected a thick squamous carcinoma in the pyriform sinus that was evaluated as a primary lesion of neck metastasis. Both primary lesions were not detected by PET. PET detected lung cancer and skin cancer, which were diagnosed as the primary lesions of neck metastasis. Upper gastrointestinal endoscopy detected esophageal cancer in one patient. Fourteen patients were treated as having primary unknown squamous cell carcinoma. In one of these 14 patients, mesopharyngeal squamous cell carcinoma was detected.

**Conclusion(s):** Not only PET but also NBI endoscopy is effective for the detection of squamous cell carcinoma of unknown primary tumor site of the neck.

**Keywords:** Narrow Band Imaging, Unknown Primary Tumor Site of The Neck

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[T1-10]

## Narrowband Imaging for Early Detection of Malignant Tumors After Treatment for Head and Neck Cancer

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**Objective:** To determine the value of narrowband imaging (NBI) screening for the early detection of head and neck squamous cell carcinoma (HNSCC) in patients who have received treatment and to assess the impact of radiotherapy on NBI detection.

**Method(s):** This is a cross-sectional study conducted in a tertiary referral center from July, 2007 to February, 2008. A total of 206 patients with head and neck cancer HNSCC underwent rhinolarynx videendoscopic screening performed using both the conventional white-light and NBI systems during their routine postoperative follow-up sessions. Main Outcome Measures: The rate of detecting malignancies malignant tumors, depending on the anatomical site, and stage of cancer, and on the history of radiotherapy after primary treatment.

**Result(s):** We identified 68 lesions by performing endoscopy in the conventional white-light mode and/or the NBI mode. Of these, 62 were histopathologically confirmed to be cancerous. The rates of detecting cancerous lesions by the white-light and NBI modes were 100% and 97% for oral lesions, 68.9% and 100% for oropharyngeal lesions ( $P=0.02$ ), and 38.5% and 100% for hypopharyngeal lesions ( $P=0.001$ ), respectively. No difference was found between the 2 modes with regard to the detection of visible T1 to T4 tumors. However, the NBI mode was significantly better than the white-light mode for the detection of carcinoma in situ ( $P<0.001$ ). The detection rate of NBI was not altered in the post-irradiated patient.

**Conclusion(s):** We found that NBI-assisted endoscopy is highly useful for the detection of pre-cancerous lesions in the oropharyngeal and hypopharyngeal mucosa in the post treatment follow up sessions and is not affected by a history of radiotherapy in patients with HNSCC.

**Keywords:** Head and Neck Cancers, Narrow Band Imaging, Surveillance

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[T1-12]

## The Appearance of the Retropharyngeal Fat Plane on Magnetic Resonance Images in Assessing Posterior Wall Invasion by Hypopharyngeal Squamous Cell Carcinoma

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**Objective:** Some types of cancer can invade the posterior wall of the hypopharynx. The retropharyngeal fat plane is a boundary between the hypopharynx and the prevertebral musculature. The purpose of this study was to investigate the appearance of the retropharyngeal fat plane on unenhanced T1-weighted MRI in the assessment of cancerous invasion of the posterior wall in hypopharyngeal squamous cell carcinoma.

**Method(s):** T1-weighted MR images of 17 patients with primary hypopharyngeal squamous cell carcinomas were examined. MR images were interpreted in a blinded fashion by one head and neck radiologist focusing on preservation of the retropharyngeal fat plane. All patients underwent surgery for primary lesions. MRI findings were compared with surgical and pathological findings.

**Result(s):** MR images from 11 of 17 patients indicated preservation of the retropharyngeal fat plane. In the remaining six patients, the fat was entirely degraded. Of the 11 patients with a preserved a retropharyngeal fat plane, the pathology in nine cases did not involve the posterior hypopharyngeal wall. Only two patients were found to show invasion of the posterior wall. Both of those patients exhibited submucosal invasion that did not involve the pharyngeal constrictor muscles. On the other hand, all six patients lacking a retropharyngeal fat plane exhibited extreme degradation of the pharyngeal constrictor muscles.

**Conclusion(s):** Our results indicate that the appearance of the retropharyngeal fat plane on unenhanced T1-weighted MRI can be used to preoperatively predict whether pharyngeal constrictor muscles have been invaded in hypopharyngeal squamous cell carcinomas.

**Keywords:** Hypopharyngeal Squamous Cell Carcinoma, Retropharyngeal Fat Plane, Magnetic Resonance Imaging

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[T1-13]

## Predictors of Speech Outcome in Head-Neck Cancer Patients Using Speech Handicap Index (SHI)

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**Objective:** To evaluate post-treatment speech outcomes using recently validated English version of SHI, in a cohort of English speaking head-neck cancer (HNC) patients.

**Method(s):** Sixty-three consecutive follow-up oral cancer (OC) or oropharyngeal cancers (OPC) patients were recruited for this study. Tests used for data analysis were Mann-Whitney U-test (for two patients subgroups) and Kruskal-Wallis test (three or more subgroups); *P*-value <0.05 were taken as significant.

**Result(s):** Speech was rated as average or bad by 64.7% of OC and 23.7% for OPC patients. The mean total SHI scores (SD) were significantly higher for OC patients as compared to OPC patients with values of 34.4 (29.1) and 18.6 (25.6). The mean total SHI scores (SD) for patients having oral tongue cancers, base of tongue cancers and tonsillar cancers were 35.2 (29.2), 38.3 (30.5) and 5.9 (8.4) respectively (*P*<0.001). Patients with higher T-stage (T3 and T4) had mean total SHI scores of 51.7 as compared to 17.2 for those with early T-stage (T1 and T2) disease. The mean total SHI scores (SD) for patients with >5 years in follow-up were significantly higher 32.9 (31.2) vs. those having <5 years in the follow-up, 12.1 (16.7). Patients who underwent multiple surgeries had significantly higher total mean scores as compared to those having just single surgery, 53.3 (27.3) vs. 19.1 (24.9). Similarly total mean SHI scores were higher for patients undergoing reconstruction, 34.2 (29.4) as against without reconstruction 18.7 (25.5). Patients undergoing glossectomy had a significantly higher total mean score, 32.6 (29.5) as compared to those having no glossectomy, 12.0 (19.8).

**Conclusion(s):** SHI is a valuable tool in speech assessment in HNC patients. Site and sub-site of cancer, T-stage, duration of follow-up, glossectomy, number of surgeries and reconstruction of the primary defect directly affects post-treatment speech outcome in OC and OPC patients.

**Keywords:** Speech, Head-Neck Cancer (Hnc), Speech Handicap Indedx (SHI)

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[T1-15]

## Outcome of Hypopharyngeal Squamous Cell Carcinoma Treated with Concurrent Chemoradiotherapy

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**Objective:** To examine both survival and functional outcomes of patients with hypopharyngeal squamous cell carcinoma treated with concurrent chemoradiotherapy.

**Method(s):** Retrospective data was collected for all patients with hypopharyngeal squamous cell carcinoma treated by concurrent chemoradiotherapy in our centre from 2000 to 2009. Functional organ preservation and survival outcomes were analysed. Functional organ preservation was assessed by the 1) presence of the need for a feeding tube and also 2) the presence of tracheostomy 6 months post therapy.

**Result(s):** Patients with hypopharyngeal squamous cell carcinoma were treated with concurrent chemoradiotherapy in our institution. There were a total of 55 patients that underwent such treatment and we look at their overall survival. The 3 year overall survival was about 33%. Although organ preservation was about 60%, functional organ preservation was much lower.

**Conclusion(s):** Concurrent chemotherapy remains an important treatment option for patients with hypopharyngeal squamous cell carcinoma.

**Keywords:** Hypopharyngeal SCC, Concurrent, Chemoradiotherapy

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[T1-14]

## Long-Term Results of Radiotherapy in Patients with Nasopharyngeal Cancer

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**Objective:** To analyze the treatment outcomes and complications after long-term follow-up of 190 patients with nasopharyngeal carcinoma treated with radiotherapy.

**Method(s):** Between December 1981 and December 2006, 190 eligible patients with non-metastatic nasopharyngeal carcinoma were treated at our department in curative intent. Of these patients, 103 (54.2%) patients were treated with radiotherapy (RT) alone and 87 (45.8%) patients received concurrent chemoradiation therapy (CCRT). The distribution of clinical stage according to AJCC 6th edition were I:7 (3.6%), IIA:8 (4.2%), IIB:33 (17.4%), III:82 (43.2%), IVA:31 (16.3%), IVB:29 (15.3%). The accumulated radiation doses to the primary tumor were 66.6–87.0 Gy (median 72 Gy). Treatment outcomes and prognostic factors were retrospectively analyzed. Acute and late toxicity were assessed according to CTCAE v3.0.

**Result(s):** The median age was 49 years (range, 8–78 years). With a mean follow-up of 73 months, 93 (48.9%) patients had relapses that were local 44 (23.2%), nodal 13 (6.8%), or distant 49 (25.8%). 5- and 10-year overall survival (OS) rate was 55.6% and 44.5%, disease-free survival (DFS) rate was 54.8% and 51.3%, and disease-specific survival (DSS) rate was 65.3% and 57.4%, respectively. Multivariate analyses revealed that CCRT, age, gender, and stage were significant prognostic factors for OS. The CCRT and gender were independent prognostic factors for both DFS and DSS. There was no grade 4 or 5 acute toxicity, but grade 3 mucositis and hematologic toxicity were in 42 patients (22.1%) and 18 patients (9.5%), respectively. During the follow-up, Grade 3 hearing loss in 9 patients and trismus in 6 patients were reported.

**Conclusion(s):** The results in our study were in accordance with findings in previous literatures and we confirmed that CCRT, low stage, female gender, and young age were identified as being related to improvement in OS. Further studies on radioprotective strategies or effective chemoagents which can lessen the acute and late complications are needed. This study might be comparative data on chronic complications with current RT techniques including intensity modulated radiation therapy.

**Keywords:** Nasopharyngeal Carcinoma, Radiotherapy, Complications

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[T1-16]

## Periparotid Recurrence of Nasopharyngeal Carcinoma in Patients Treated with Parotid Gland-Sparing Radiotherapy

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**Objective:** To review our experience with and identify the clinical characteristics of periparotid recurrence of nasopharyngeal carcinoma (NPC) after parotid gland-sparing radiotherapy.

**Method(s):** We retrospectively reviewed the charts of 296 patients with NPC who underwent parotid gland-sparing radiotherapy at the Tri-Service General Hospital from 1998 to 2008. Eighty-three patients underwent three-dimensional conformal radiotherapy (3DCRT), and 205 patients underwent intensity-modulated radiotherapy (IMRT); parotid glands were spared bilaterally in all patients. None of these patients had undergone previous radiotherapy or surgical treatment to the head and neck.

**Result(s):** Disease recurred in a spared parotid gland in 3 patients (1.04%). Two of these patients had undergone 3DCRT and the third patient underwent IMRT. All 3 patients had undergone parotidectomy. Adjuvant radiotherapy or concurrent chemoradiation were administered. One patient died of metastatic disease 26 months after diagnosis of recurrence; the others were well with no evidence of disease at 63 and 6 months after initial recurrence.

**Conclusion(s):** Recurrence is an uncommon pattern of locoregional failure after parotid gland-sparing radiotherapy for NPC. Ipsilateral neck level-II and multilevel lymph node involvement are important predisposing factors to periparotid recurrence. Early diagnosis and aggressive therapy for patients with periparotid recurrence may improve outcomes.

**Keywords:** Periparotid Recurrence, Nasopharyngeal Carcinoma, Parotid Gland-Sparing Radiotherapy

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[T1-17]

## Apoptosis and Expression of AQP5 and TGF- $\beta$ in the Irradiated Rat Submandibular Gland

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**Objective:** To evaluate the effect of X-irradiation on apoptosis and the changes of morphology and expression of aquaporin 5 (AQP5) and transforming growth factor  $\beta$  (TGF- $\beta$ ) in rat submandibular gland.

**Method(s):** The submandibular glands of male SD rat were locally X-irradiated in the head and neck region with a single dose of 3, 10, 20, or 30 Gy and analyzed apoptosis and the changes of morphology and expression of AQP5 and TGF- $\beta$  at early post-irradiation phase (1 and 8 hours and 1, 2, 3 and 5 days after irradiation) and late post-irradiation phase (10, 20, 30 and 60 days after irradiation). The morphological and morphometrical changes in the glands were assessed after H & E staining. Apoptosis was measured by tunnel assay and electron microscopy. The expressions of AQP5 and TGF- $\beta$  were identified by immunohistochemical staining.

**Result(s):** The X-irradiated submandibular glands showed degenerative changes including pyknotic nuclei, vacuolization of acinar cells, lysis of acini and granular convoluted tubules (GCT), and interstitial edema. These degenerative changes were detected more frequently at high dose and a dose-related effect was noticed. Acinar and GCT cells number of irradiated glands were no significant change comparing to non-irradiated control. From 20 days after irradiation, increased apoptotic cells were observed and GCT and intercalated duct (ID) cells expressed higher apoptotic index than cells of non-irradiated control. Immunohistochemically, a marked decrease of AQP5 expression on membrane of acinar cells from 10 days after irradiation and in TGF- $\beta$  expression on cytoplasm of GCT from 20 days after irradiation were seen in glands of irradiated rat comparing to that of non-irradiated control.

**Conclusion(s):** Apoptosis after X-irradiation develops relatively late and X-irradiation induces the loss of AQP 5 in acinar cells and the loss of TGF- $\beta$  in ductal cells in rat SMG.

**Keywords:** Submandibular Gland, Radiation, Apoptosis

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[T1-19]

## Reconstruction of the Upper Respiratory Tracts in Oncologic Patients

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**Objective:** Tracheal pathology is one of the most complicated clinical problems in thoracic surgery. Surgical treatment appears to be the main effective approach for the patients with the malignant and benign tumors or congenital and acquired tracheal stenosis. To reconstruct these defects it is necessary to use the combination of plastic materials including the bio-engineered transplants. The success of tracheal reconstruction depends on the complete transplant epithelialization. But in the case of extensive tracheal defects the complete restoration of the mucosa at the expense of marginal epithelialization is not possible. The model of the tracheal reconstruction showed the possibility of functional adaptation of epidermal cells in the new micro-surroundings and their ability to restore the tracheal epithelium.

**Method(s):** For the reconstruction of the upper respiratory tract was used the bioengineering transplant. Transposed osteo-muscular and muscular-cutaneous flaps are used as the basis for implantation of stem-cells. Mucous membrane is restored by means of a tissue-equivalent. The tissue-equivalent includes allogen cellular culture of fibroblasts and of epidermic keratinocytes attached to the polymer biocompatible net and collagen gel. 32 patients were treated by this method, only 27 patients were evaluated.

**Result(s):** Epithelialization and complete adaptation of the flaps were observed in 26 patients on the 21st day by endoscopic methods. 4 patients had complications such as laryngo-pharyngeal fistulas. One patient had suppuration of the donor wound.

**Conclusion(s):** The research done covers the fundamental mechanisms of tissue reparation and practical aspects of application of tissue cellular transplants. This research has been supported by the ethical committee of P.A.Hertzen Moscow Research Oncological Institute, Russian Federation.

**Keyword:** Reconstruction

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[T1-18]

## Framless Stereotactic Radiosurgery for Refractory Trigeminal Neuralgia

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**Objective:** Radiosurgery has been an optional treatment of trigeminal neuralgia. We reported our experience of cyberknife on these medically refractory patients to determine the effectiveness.

**Method(s):** Between 2006 and 2007, 7 patients underwent stereotactic radiosurgery in our institution. Averaged 5.8-7.5 mm segment of the trigeminal nerve was targeted at least 4mm apart from ventral brainstem. CT cisternography was applied to localize in each patient. They were treated in one session and a median maximal dose of 76 Gy with a median marginal dose of 60 Gy was given.

**Result(s):** A median follow-up of 11 months is processed. 5 patients had complete pain relief, 1 had moderate pain relief and the other experienced minimal improvement. The pain relief was achieved within 3 days on 3 patients, 14 days on 2 patients and as slow as 3 months on 1 patient. Occurrence of dysesthesia happened on the patient with poor result. No recurrence is remarked after the follow-up of the 6 responsive patients.

**Conclusion(s):** In comparison to the microvascular decompression, cyberknife stereotactic radiosurgery provides a non-invasive option to treat the trigeminal neuralgia. At least 85% rate of pain relief is reported in our experience. The treatment doses and target lengths were safe and effective.

**Keywords:** Trigeminal Neuralgia, Cisternography, Cyberknife

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[T1-20]

## Clinical-Experimental Using Titanium Implants with Multifunctional Bioactive Nanostructured Coatings

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**Objective:** Based MNIOI nom. Hertzen conducted experimental work on implantation in the area of bone defect of titanium plates with different versions of Bio-ceramic coating. The first stage used two groups of rats, each of which consisted of four animals. The animals performed trepanation of the parietal bone of up to 3-4 mm, with replacement of the bone defect titanium plate of appropriate size with the Bio-ceramic nanostructure deposition and titanium without coating. At the second stage of experimental work used large laboratory animals, close to its mass-dimensional characteristics to the person. To assess osteoinductive and mechanics bearing potentials of nanostructured coatings of titanium implants for osteosynthesis of bone defect sheep served zygomatic osteotomy and ulnar bones.

**Method(s):** Regulation of titanium plates in osteosynthesis was monitored directly on the day of implantation by means of X-ray study of the control implants, as well as the surrounding tissues, was carried out in terms 4 and 6 weeks after surgery.

**Result(s):** When compared with the control group of animals with implatirovannymi Nanostructured titanium plates after 4 weeks of fracture callus formation is noted with the maturation of mature bone after 6 weeks of the fracture indicated marked the formation of mature bone tissue with no signs of breakage of the bone. On the basis of the Department of microsurgery MNIOI nom. Hertzen performed limited clinical trials perforated titanium plate for osteosynthesis in crano-maxillofacial surgery. Tests were carried out in 9 patients at different stages of special treatment. On the clinical course of wound healing (presence of edema and hyperemia of the mucosa in the area of surgical intervention, consistency seams, overall temperature reaction of the organism), clinical and laboratory parameters (complete blood count, blood chemistry), X-ray-picture of the plasty of the bone defect and the surrounding tissues). In all 9 cases observed healing of the wound by primary intention; stitches removed in 10-14 days. Checking inspections and radiological monitoring carried out in accordance with the requirements for timing of the dynamic monitoring of cancer patients.

**Conclusion(s):**

**Keywords:** Titanium Implants, Nanotechnology, Cancer

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[T1-21]

## 23 Years Experience of Infrahyoid Musculocutaneous Flap (IHMF) in Reconstruction after Head and Neck Cancer Surgery

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Pornchai O-charoenrat, Paramaporn Prasarttong-o-soth,  
Seubwong Chuthapisith, Pradit Rushatamukayanunt,  
Waraporn Imruetaicharoenchoke, Kris Bhotisawan**

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**Objective:** Infrahyoid musculocutaneous pedicular flap (IHMF) has been used for reconstruction of small to medium size defect after oncologic head and neck cancer surgery. It can be without the requirement of microsurgical skill and resources. Further more it also less bulky than some pedicle or local flaps.

**Method(s):** Retrospective cross-sectional study design in single tertiary hospital (Siriraj hospital, Bangkok, Thailand), systematic charts review of 80 cases from April 1987 to June 2009. Report in success rate and potential independent factor affected outcome and also compared outcomes of horizontal flap design with vertical flap design.

**Result(s):** There were 80 IHMF flaps for cancer reconstruction (tongue 22, lower gum 17, floor of mouth 15, buccal mucosa 14, lower lip 10, parotid 2). The mean age was 57 yr. There were 64 vertical flap design and 16 horizontal flap design. Both group had no significant different in flap outcome. There were only 1 case of intraoperative failure due to grossly flap ischemia, 5 cases of early flap complication (congestion 2, partial loss 1, infection 1, and hematoma 1). Only one had partial flap necrosis at 2 weeks post operatively.

**Conclusion(s):** IHMF was reliable and versatile for use in small to medium size defect reconstruction after head and neck cancer surgery with good result. This flap should be considered as an option for head and neck reconstruction.

**Keywords:** Infrahyoid Musculocutaneous Flap, Head and Neck Reconstruction, Flap Complication

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[T1-23]

## Anterolateral Thigh Flap for Reconstruction of Extensive Oral Cavity Defect; Functional Results and Donor Site Morbidity

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**Objective:** The anterolateral thigh flap (ALT) has been utilized in clinical applications for oral cavity defect after cancer ablative surgery. This flap has many advantages: no major artery sacrificed, functional and esthetic results are often good. But, there is few case of ALT flap used in extended defect. So, in this study we willing to present about reconstruction case that used ALT flap with vastus lateralis muscle in extensive oral cavity defect. In addition, we evaluate the morbidity of donor site and functional outcomes of ALT flap.

**Method(s):** From 2004 to 2009, 12 patients affected by oral squamous cell carcinoma received microsurgical reconstruction with ALT flap. Retrospective clinical study of these 12 patients about clinical information, records of operation and postoperative complication was done by review of medical records. Evaluation about donor site morbidity include postoperative assessment, manual muscle test and range of movement of hip and knee, gait analysis and investigation by questionnaire about sensation, fatigue, appearance.

**Result(s):** In 12 patients, 2 were pathological stage III and the others were stage IV. Location of lesion were tongue (8pts) and lower gum (4pts). 4 of 8 patients with lesion of tongue had total glossectomy and another 4 patients had hemiglossectomy. 4 patients with lesion of gum had hemimandiblectomy or partial mandiblectomy. Size of ALT flap were from 6x9 to 10x18. In 8 patients there were 2 perforators and in 4 patients there was 1 perforator. We accomplished 100% flap survival without formation of oral fistula. All patients achieved oral diet and pronounced well. We observed only a transient gait impairment in 1 patient.

**Conclusion(s):** In our experiences, we found out the ALT flap is the ideal soft tissue flap in oral cavity reconstruction after extensive resection due to tumor. This flap presents functional at the received site with the additional advantages of minimal donor site morbidity.

**Keywords:** Anterolateral Thigh Flap, Reconstruction, ALT Flap

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[T1-22]

## Experience of Transverse Gracilis Flap for Tongue Reconstruction in Sixteen Patients

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**Objective:** The gracilis flap is an optimal flap for functional muscular reconstruction as well as soft tissue defect correction. It is introduced in head and neck reconstruction over last ten years however there are some debatable viewpoints regarding technical aspect and outcome.

**Method(s):** At European Institute of Oncology (IEO), Milan, Italy; from 2007 to 2009, we performed 16 transverse gracilis flaps for total or partial glossectomy reconstructions. All cases had diagnosed of squamous cell carcinoma and underwent immediate microsurgical reconstructions.

**Result(s):** There were 4 partial and 12 total glossectomy reconstructions. The mean age was 52.5 years (range 26-67 years). Fourteen out of 16 flaps were reinnervated. There were 3 total flap necrosis, 1 partial flap necrosis and 1 neck infection. The pectoral flaps were performed to replace those three total flap necrosis cases. All patients were able to obtained self feeding after almost one week of swallowing rehabilitation. All of them were scheduled for regular post operative radiotherapy. There was one case that the loss of volume was significant and the patient needed a PEG feeding for few months.

**Conclusion(s):** The transverse gracilis flap is becoming a good alternative flap for functional tongue reconstruction, particularly for total glossectomy. The resistance to infection, stability of volume over the time, ease of harvesting, minimal donor site morbidity and constant vascular pedicle are some of the advantages. We still modify the flap insetting and innervation technique to achieve the better result.

**Keywords:** Gracilis Flap, Tongue Reconstruction, Surgical Complication

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[T1-24]

## Reconstruction of Complex Mandible, Intra Oral and Extra Oral Soft Tissues Defect with Double Paddle Free Fibular Flap Case Reports

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**Objective:** Management of complex lower face defect is great challenge even for very skillful surgeons. Radical resection of intraoral cancer stage IV with involvement of mandible usually creates intraoral, extraoral soft tissues and mandible bone defects. Authors share experience of using double paddle free fibular flap.

**Method(s):** So far it was considered that complex intraoral, extraoral and bone defects require two free flaps, which makes one stage surgery very complicated. Many surgeons choose to do two step reconstruction. We recommend use double paddle free fibular flap, which provides one stage reconstruction option. During last year we did two cases of one stage reconstruction for intraoral tumor patients with wide involvement of mandible. Radical cancer resection created intraoral, extraoral soft tissues and mandible bone defect. In both cases we used double paddle free fibular flaps. Vascularised fibula bone graft was used for reconstruction of mandible, one skin paddle we used for reconstruction of intraoral defect and second skin paddle we used for extraoral defect reconstruction. Average fibula length was 15 cm, but skin paddle size was 7x4 cm.

**Result(s):** Post surgery periods were smooth in both cases. Skin islands were well vascularised, flaps healed well, no marginal necrosis, or healing by secondary intention. Both fibular grafts were taken well, and osteotomies healed.

**Conclusion(s):** Complex mandible bone, intraoral and extra oral soft tissues defect reconstruction with double paddle free fibular flap is good reconstruction option for patients with intraoral cancers stage IV. Flap is safe, well predictable and provides one stage reconstruction option with good esthetical result.

**Keywords:** Mandible Reconstruction, Double Paddle Free Fibular Flap, Complex Face Defect

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[T1-25]

## Mechanical Pharynx Suture and Voice Prostheses after Laryngectomy

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**Objective:** 6,952 patients diagnosed larynx cancer. Under the third stage of this illness laryngectomy is commonly used. If the cancerous growth doesn't exceed the larynx, it is possible after larynx ablation to take in the gullet by the mechanical seam with the help of suture device. Nevertheless, in this case it is impossible to install the voice prosthetic device, as the gullet defect is necessary for it. We have proposed the new method that allows to solve this problem.

**Method(s):** We used the suture device for the closure of gullet defect after larynx ablation in case of 114 patients.

**Result(s):** In case of all patients we observed the primary heal wound, although 63.2% patients experienced the radiation therapy. All patients have a good voice. In case of one of them the phonation appeared after the myotomy of constrictor pharynals.

**Conclusion(s):** The results of this study indicate that the proposed method of gullet integrity restoration after laryngectomy is reliable, efficient and easy for implementation. Compared to conventional methods it allows to spend far less time. This method restores the voice function of a good quality.

**Keywords:** Voice prostheses, Laryngectomy, Rehabilitation

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[T1-26]

## Coding Nucleotide Polymorphism 185G>A in the S100A2 Gene has No Effect on S100A2-Mediated Anti-Tumor Function in Oral Cancer

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**Objective:** S100A2, a Ca<sup>2+</sup>-binding protein with two EF-hands, is a tumor suppressor in oral cancer. Helix III flanking the C-terminal EF-hand is implicated to participate in the interaction of S100A2 and its target(s). The aim of this study was to examine if the coding sequence polymorphism S100A2\_185G>A, leading to the peptide 62 substitution of asparagine (AAC, A allele) for serine (AGC, G allele) in helix III, had modulation effects on S100A-mediated tumor suppression.

**Method(s):** We sequenced the entire coding sequence in the exons 2 and 3 of S100A2 gene in normal oral keratinocytes (NOKs), dysplastic oral keratinocytes (DOKs), 8 oral cancer lines, and 24 pair-wise oral cancer specimens. We also compared the in vitro anti-tumor effect of wild-type (G allele) and variant (A allele) S100A2 expression using cell proliferation, migration, invasion and colony formation assay.

**Result(s):** With the exception of CAL27 and SCC-15 cancer lines being heterozygotes of A and G allele, the remaining oral cells were homozygotic in G alleles. No alterations of anti-growth, anti-migration, anti-invasion, and anti-colony formation were observed between variant and wildtype cells. Moreover, no minor S100A2\_185A allele was detected in 24-pairwise clinical specimens.

**Conclusion(s):** The coding sequence polymorphism S100A2\_185G>A had no regulatory role in S100A2-mediated tumor suppression in oral cancer.

**Keywords:** S100A2, Polymorphism, Tumor Suppressor

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[T1-27]

## Inconsistent Behavior of Connexin 30 in Head-and-Neck Cancer Cells

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**Objective:** The relation of connexins and cancer progression has been studied in various organs and cell lines, with connexins currently being considered tumor suppressors. However, there have been inconsistent results regarding the contribution of the connexin to tumor cell proliferation. This study is aimed to elucidate the relation between connexin and head-and-neck cancer.

**Method(s):** The expression of connexin-30 (Cx30) in human head-and-neck cancers was evaluated by immunohistochemistry of clinical specimens. Furthermore, the expression of Cx30 with regard to apoptosis and cell differentiation was investigated. Finally we aimed to clarify the role of Cx30, by transfecting three kinds of vectors that express either full length Cx30 (Cx30-Full), Cx30 devoid of C-terminal region (Cx30-DelC) or Cx30 C-terminal region (Cx30-CT), in HSC-4, a head-and-neck cancer cell line.

**Result(s):** Cx30 expression in cancer cells was drastically decreased compared to apparently normal mucosa. In the cancer tissues, expression of Cx30 was not related to apoptosis assessed by TdT-mediated dUTP-biotin nick end labeling (TUNEL) reaction or to cell differentiation assessed by immunoreaction to involucrin. Transfected Cx30-Full was localized on the plasma membrane of HSC-4 cells, while Cx30-DelC and Cx30-CT was expressed in the cytoplasm or circumnuclear sites. We studied the effect on the growth rate followed by immunostaining with anti-Ki-67 (MIB-1). The MIB indices of HSC-4 cells transfected with Cx30-Full and Cx30-DelC, but not Cx30-CT were shown to be significantly higher than that of the controls.

**Conclusion(s):** The immunohistochemical study suggests that Cx30 decrease in the carcinogenesis of head-and-neck cancer. Analysis of cell line demonstrated that Cx30 enhanced the proliferation of HSC-4 cells and the proliferating activity was considered to be achieved without the transport of the protein onto the plasma membrane. Cx30 may have inconsistent function in head-and-neck cancer cell and this function may relate to Cx30 localization in tumor cell.

**Keywords:** Connexin 30, Immunohistochemistry, Gene Transfection

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[T1-28]

## Tumor Susceptibility Gene 101 is An Indicator of Poor Survival in OCSCC and Inhibits Invasive Ability of Oral Cancer Cells by Suppression of FLJ10540 Oncogene Expression

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**Objective:** The function of tumor susceptibility gene 101 (TSG101) in oral carcinogenesis is largely unexplored. The aim of this study is to investigate the clinicopathologic features and functional roles of TSG101 in human oral carcinomas and cell lines.

**Method(s):** The semiquantitative RT-PCR, western blot, and IHC approaches were used to evaluate the RNA and protein expression of TSG101 in paired OCSCC patients' specimens. Immunohistochemistry analysis of TSG101 expression was assessed in 256 OCSCC patients. Results were correlated with clinicopathologic characteristics using univariate and multivariate analyses. Human oral cancer cell lines with overexpressing TSG101 or TSG101-mediated siRNAs to repress endogenous TSG101 were generated by transfection to further elucidate the mechanism of TSG101-mediated FLJ10540 regulation.

**Result(s):** Here, we showed that the mRNA and protein levels of TSG101 were significantly downregulated in OCSCC compared to adjacent non-cancerous tissues by semiquantitative RT-PCR, western blot and IHC. The cumulative 5-year survival rate was significantly correlated with a relatively advanced tumor stage, positive nodal status, TNM stage, and weak expression of TSG101. Functionally, TSG101 had the abilities to decrease cell invasion in oral cancer cells through suppression an oncogene, FLJ10540 and p-AKT protein expressions. Conversely, depletion of TSG101 expression by siRNAs not only promoted oral cancer cell invasive ability, but also enhanced FLJ10540 and p-AKT protein expressions. Finally, immunohistochemical and Western blotting analysis of human aggressive OCSCC specimens showed a significant negatively correlation among TSG101, FLJ10540, and p-AKT expression.

**Conclusion(s):** TSG101 negatively regulates FLJ10540 levels, and down-regulation of TSG101 is associated with poor prognosis in OCSCC.

**Keywords:** TSG101, FLJ10540, p-AKT

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[T1-29]

## Differential Effects of Recombinant Human EGF on Proliferation and Radiation Survival of Normal Fibroblast and Cancer Cell Lines

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**Objective:** To evaluate the effects of recombinant human epidermal growth factor (rhEGF) on proliferation and radiation survival of normal fibroblast and cancer cell lines (HN3, A549, and EMT-6) both in vitro and in vivo.

**Method(s):** Using normal fibroblast and cancer cell lines, we evaluated the expression of EGFR, and determined their proliferation and survival with rhEGF alone or in combination with radiation. For the combination treatments, we applied 10 nM rhEGF and delivered single radiation doses of 0, 2, 5, and 10 Gy. In the animal study, we introduced EMT-6 cells into BALB/c mice to assay for tumor growth delay. We applied single radiation dose of 10 or 20 Gy, with or without 1.0 mg/kg of rhEGF, three times a day, for 7 days.

**Result(s):** In a dose-dependent manner, rhEGF stimulated proliferation of the normal fibroblast, but not the cancer cell lines with low or intermediate expression of EGFR. rhEGF inhibited proliferation of the cancer cell line with the highest EGFR expression. Administration of rhEGF in combination with radiation attenuated the cell killing effect of radiation on normal fibroblast, but it had no effect or even augmented the radiation effect in cancer cell lines. In the animal study, we observed no difference in tumor growth rates when rhEGF was combined with radiation compared to radiation alone.

**Conclusion(s):** Our results suggested that rhEGF might be useful in preventing and/or treating radiation-induced injury without stimulating tumor growth.

**Keywords:** Recombinant Human EGF, Radiotherapy, *In vitro/In vivo*

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[T1-30]

## Active STAT3 Regulates VEGF by Dexamethasone Treatment in Head and Neck Cancer Cell Lines

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**Objective:** Glucocorticoids (GCs) modulate the synthesis of many pro-inflammatory cytokines and influence multiple transduction pathways. GCs negatively or positively influence the transcription factors of their target genes. All of these transcription signals are closely connected to cancer survival or death. We investigated the action of dexamethasone (DEX) on head and neck cancer cell lines.

**Method(s):** Cells treated with dexamethasone and signalings were detected by western blot and ELISA. For regulation of STAT3 expression, cells were transfected with wild type STAT3 for over-expressing or si-RNA of STAT3 for repressing.

**Result(s):** When SNU-1041 and SNU-1076 were treated with DEX, two cell lines showed different patterns of responses. DEX inhibition of cell growth depended on concentration in SNU-1041, but not in SNU-1076. Furthermore, DEX suppressed VEGF secretion from SNU-1041 but not from SNU-1076. We explored the mechanism that explains these distinct differences. After DEX treatment, the differences of NF- $\kappa$ B (p65), Glucocorticoid receptor (GR) and p-AKT were not observed between cell lines. However, phospho-STAT3 decreased in SNU-1041 only. Moreover, STAT3 inhibition using si-RNA suppressed VEGF secretion. When STAT3 was over-expressed after DEX treatment, the level of VEGF in the culture media was restored.

**Conclusion(s):** Taken together, we suggest that p-STAT3 can be a mediating factor which regulates VEGF secretion in the DEX treatment. Because the relationship between the three molecules DEX, STAT3 and VEGF is scarcely known, our findings clarified one of the signaling pathways of DEX, which is often used in clinical conditions, often used in clinical condition, clarifying these different responses is important in clinical decision-making.

**Keywords:** Dexamethasone, STAT3, VEGF

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[T1-31]

## Effect of Nitric Oxide Synthase (NOS) Inhibitor and CXC Chemokine Receptor-4 (CXCR4) Antagonist in a Xenograft Mouse Model of Head and Neck Cancer

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**Objective:** CXCR4 plays a central role in cell migration in metastasis and dissemination of cancer. Nitric oxide (NO) related to angiogenesis and tumor progression. Efficacy of individual or combination chemotherapy of NOS inhibitor and CXCR4 antagonist were examined in xenograft mouse models of head and neck cancer.

**Method(s):** ACCIM (derive from cervical metastatic lesion of human adenoid cystic carcinoma in a nude mouse) were s.c. implanted in nude mice. On day 19, mice were randomized to receive (a) PBS (control), (b) AMD3100 (CXCR4 antagonist), (c) NG-nitro-L- arginine- methyl- ester (L-NAME; NOS inhibitor), (d) 1400W (inducible NOS inhibitor), (e) both AMD3100 and L-NAME, or (f) both AMD3100 and 1400W by i.p. injection. Mice were sacrificed on day 35.

**Result(s):** AMD3100, L-NAME and 1400W as single agents inhibited tumor growth by 20%, 27% and 54% ( $P<0.05$ ). Furthermore, combined therapy (AMD3100 and L-NAME, AMD3100 and 1400W) inhibited tumor growth by 50% to 52% ( $P<0.05$  for both). None of the nude mice showed toxic signs. The immunohistochemical examination revealed decreased expression of CXCR4, eNOS and iNOS in tumor cells treated with combined therapy compared with those of the control, and apoptotic tumor cells were increased as demonstrated by TUNEL method. When the effect of each agent on tumor-induced angiogenesis in tumor stroma was examined histologically, the MVD was significantly lower in the 1400W and combined therapy groups than in the control, AMD3100 and L-NAME groups ( $P<0.005$ ).

**Conclusion(s):** Although single agent therapy by AMD3100 or L-NAME was not able to inhibit tumor growth, the combined therapy significantly inhibited. The effect was similar to single agent therapy by 1400W. These results suggest that single agent therapy by 1400W and combination therapy by AMD3100 and L-NAME have apoptosis induction and significant inhibitory activities against *in vivo* tumor-induced angiogenesis and proliferation of ACCIM.

**Keywords:** Nitric Oxide Synthase, CXCR4, Xenograft Mouse Model

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[T1-32]

## Identification of Responsible Genes Associated with an Acquired Resistance for Cis-Diamminedichloroplatinum by Microarray Analyses of mRNA and miRNA in Human Head and Neck Squamous Cell Carcinoma

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**Objective:** This study was performed to determine genetic mechanisms of acquisition of chemoresistance for cis-diamminedichloroplatinum (CDDP) in human head and neck squamous cell carcinoma (HNSCC).

**Method(s):** An HNSCC cell line RPMI2650 was used. The IC50 value was calculated using an MTT assay and a flow cytometry analysis was used to determine apoptosis. Three microarray platforms were used; the cDNA microarray slides (Amersham Biosciences), the CodeLink Uniset Human 20K 1 Bioarray System, and the Human miRNA Microarray Rel12.0. qRT-PCR and immunoblotting were performed to evaluate the mRNA and protein expressions. The entire coding region of the candidate gene was cloned into pcDNA3.1/V5-His vector and was transfected. siRNAs were purchased from Ambion and were transfected.

**Result(s):** Establishment of CDDP-resistant cell line from RPMI2650 was successful, and its derived CDDP-resistant cell line RPMI2650CR showed a 9.38-fold increase of IC50 value, and decreased apoptosis-inducing capacity was evident. The cDNA microarray analysis identified a total of 16 upregulated and one downregulated genes by a factor of 10-fold or more, and the CodeLink Bioarray identified 16 upregulated and 11 downregulated genes. IGF2 showed more than 10-fold upregulation using these two microarray systems and was further analyzed. Results of qRT-PCR demonstrated a 220-fold increased mRNA expression of IGF2, and a prominent protein upregulation by Western blotting was also observed. The expression vector of IGF2 was introduced in RPMI2650, and a significant increase of IC50 as well as significant decrease of apoptotic cells was observed. On the other hand, siRNA-mediated knockdown of IGF2 in RP-MI2650CR caused significant decrease of IC50 as well as induction of apoptosis.

**Conclusion(s):** We identified the IGF2 gene as one of the strong candidates for CDDP-chemoresistance for the first time.

**Keywords:** Cis-Diamminedichloroplatinum, Microarray, IGF2

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[T1-33]

## Erythropoietin Receptor (EPOR) in Oral Cavity Cancer

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**Objective:** Our study was aimed to evaluate the clinicopathological significance of erythropoietin receptor (EPOR) expression in oral cavity cancer.

**Method(s):** The study included 256 patients who underwent primary surgical resection between Oct 1996 and Aug 2005 for treatment of squamous cell carcinoma of the oral cavity cancer without previous radiotherapy and/or chemotherapy. The clinicopathological information including gender, age, primary tumor stage (T), nodal status (N), and TNM stage was obtained from the clinical records and the pathologic reports, retrospectively. The TNM status was classified according to 1997 American Joint Committee on Cancer staging system.

**Result(s):** A total of 256 patients included 17 women and 239 men with an average age of 50.9 years (ranged, 26-87 years). Thirty-nine patients were classified as T1, 55 as T2, 64 as T3 and 98 as T4. One hundred and fifty-three patients were classified as N0, 38 as N1, 48 as N2b, 13 as N2c and 4 as N3. Thirty-four patients were classified as TNM stage I, 38 as stage II, 61 as stage III and 123 as stage IV. The mean follow-up period was 49.3 months (ranged, 2-141 months). The high expression of EPOR significantly correlated with relatively advanced tumor stage (T1+2 vs. T3+4) ( $P<0.001$ ), advanced TNM stage (I+II vs. III+IV) ( $P<0.001$ ) (Table 1), positive N stage (positive vs. negative) ( $P<0.001$ ) and lower 5-year overall survival rate (54.3% vs. 71%) ( $P=0.0028$ ). However, only the T classification (HR=3.293, 95%CI=1.877-5.778,  $P<0.001$ ) and N classification (HR: 2.990, 95%CI=1.937-4.616,  $P<0.001$ ) were the independent prognostic factors according to the Cox's regression analysis.

**Conclusion(s):** Our study demonstrated that erythropoietin receptor can be used as a biomarker to predict the clinicopathologic features in oral cavity cancer. High expression of erythropoietin receptor usually accompanied with an advanced stage of oral cavity cancer and poorer prognosis.

**Keywords:** Erythropoietin receptor, Oral Cancer

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[T1-35]

## The Feasibility of Preservation of the Submandibular Gland during Neck Dissection for the Patients with Early Oral Cancer

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**Objective:** The impact of submandibular gland (SMG) preservation during neck dissection for the patients with early oral squamous cell carcinoma (OSCC) on their survivals remains undocumented.

**Method(s):** The medical records of all patients with early OSCC (stage I, II) who underwent wide excision of the primary tumor and simultaneous neck dissection between 1999 and 2006 were retrospectively reviewed.

**Result(s):** 408 patients were analysed, including 33 patients with and 375 patients without SMG preservation. The 5-year disease-free and overall survival rates were 78.8% and 90.9% for the patients with SMG preservation and 75.5% and 90.4% for the patients without SMG preservation, which had no statistically significant differences ( $P=0.79$ ,  $P=0.99$ , respectively). Similar survivals between SMG preservation or not were observed either in oral tongue SCC or in buccal SCC. T2 OSCC with SMG preservation had significantly lower 5-year disease free survival than those without SMG preservation ( $P=0.02$ ), but overall survivals were similar between these two groups.

**Conclusion(s):** Preservation of the SMG during neck dissection may be oncologically safe in patients with T1 OSCC, but the feasibility of SMG preservation was less clear for T2 OSCC.

**Keywords:** Oral Cancer, Submandibular Gland, Preservation

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[T1-34]

## Halsted En Bloc Resection of Squamous Cell Carcinoma of the Tongue via Lip Split Mandibulotomy

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**Objective:** Oral tongue carcinomas, which does not invade the periosteum of the mandible, can be approached through a midline mandibulotomy with preservation of the mandible. This approach offer excellent three-dimensional exposure and aesthetic result. Combined operation which remove the primary cancer, intralymphatic pathways and cervical neck nodes en bloc can be performed via this approach.

**Method(s):** This is a retrospective review from January 2006 to December 2007 at Department of Otorhinolaryngology-Head & Neck Surgery, University Kebangsaan Malaysia Medical Centre (UKMMC), Kuala Lumpur. Case records of patients who had undergone Halsted en bloc resection of tongue squamous cell carcinoma (SCC) via mandibulotomy lip-split approach during this period were reviewed.

**Result(s):** There were 9 patients; 7 female and 2 male; aged between 33 and 69 years old with median age of 47.2. There were 6 Chinese, 2 Malays, and 1 Indian. Five patients had T2NoMo, 1 had T2N1Mo, 2 had T3NoMo and 1 had T4N1Mo. None of the patients had any high risk habits. Eight patients had primary sites at the lateral border of tongue with 1 extending to the floor of the mouth. Seven patients underwent wedged excision of tumour and two had partial hemiglossectomy. Three patients underwent modified radical neck dissection and 4 selective supraomohyoidean neck dissection. Mandibulotomy was performed for all patients. Seven histopathological examinations showed well differentiated squamous cell carcinoma, 1 moderately differentiated and 1 poorly differentiated. Surgical margins were clear in 4 patients, 1 close to anterior and deep margin and 4 involved surgical margin. Post-operative radiation was given to 5 patients. The mean duration of follow-up was 13.8 months. Long-term complication such as osteoradionecrosis, malunion or non-union was not seen in our patients.

**Conclusion(s):** Halsted en-bloc resection via lip split mandibulotomy approach in selective tongue carcinoma offer an excellent alternative surgical access.

**Keywords:** Ca Tongue, Lip Split Mandibulotomy, En Bloc Resection

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[T1-36]

## Rare Involvement of the Submandibular Gland in Patients with Oral Squamous Cell Carcinoma

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**Objective:** The true involvement of the submandibular gland in primary oral cancer seems quite uncommon. We want to answer the first basic question about the incidence of submandibular gland involvement by oral squamous cell carcinoma and then try to identify clinical risk factors that may predict submandibular gland involvement.

**Method(s):** We retrospectively reviewed the pathologic records of 342 patients with oral squamous cell carcinoma who underwent wide excision of primary oral cancer and simultaneous neck dissection from January 2000 to December 2003.

**Result(s):** Of the 383 submandibular glands, only seven (1.8%) exhibited tumor involvement. Of them, five glands were involved by direct extension from the primary tumor. One gland showed local invasion from an adjacent involved lymph node in level I and one was from intraglandular lymph node metastasis. All of these six tumors with submandibular gland involvement were T4 disease ( $P=0.0003$ ) and the neck nodal statuses were all more than N2b ( $P<0.0001$ ).

**Conclusion(s):** The patients with early stage oral squamous cell carcinoma with preoperative N0 neck might be candidates for preservation of the submandibular gland.

**Keywords:** Submandibular Gland, Oral Cancer, Xerostomia

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[T1-37]

## Surgery Alone for Localized Squamous Carcinoma of Oral Cavity: Recurrence Patterns and Second Primary Tumors

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**Objective:** This study was conducted to review the oncological outcomes of patients with localized squamous cell carcinoma (SCC) of oral cavity who underwent surgery alone without any other postoperative adjuvant therapy.

**Method(s):** Patients recorded in the head and neck cancer registry of Cathay General Hospital between January 1998 and March 2008 were reviewed. Seventy-one patients with T1-3N0 oral SCC who had surgery alone were included in our study. Follow-ups were continued until December 2009.

**Result(s):** Forty-three patients were T1, 22 were T2, and 6 were T3. The 3-year and 5-year overall survival rates were 89% and 75.1%, respectively. There was no significant difference concerning the age ( $P=0.514$ ), the betel nut chewing ( $P=0.319$ ), the tumor stage ( $P=0.913$ ), the histology grade ( $P=0.721$ ) and the margin status ( $P=0.924$ ). Fifteen patients (21.1%) were observed with recurrences (9 with regional recurrences, 4 with local, 2 with locoregional). At the time of analysis, 15 patients developed second primary tumors, and 13 (86.7%) were at the oral cavity. Most patients with local recurrences (3 patients, 75%) and second primary cancers (10 patients, 66.7%) could be salvaged with treatment. However, only 3 (27.3%) of 11 patients with nodal recurrence were controlled after a second treatment. For patients with recurrences and second cancers, the 5-year overall survival rates were 44.1% and 60.9%, respectively.

**Conclusion(s):** A good survival rate can be obtained for localized oral SCC patients treated with surgery alone. Regular follow-up is necessary to improve their survival, giving special attention to the development of recurrent and second primary cancers.

**Keywords:** Second Primary Cancer, Oral Squamous Cell Carcinoma, Surgery

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[T1-39]

## The Correlation between Different Surgeons and Oral Cancer Treatment an Analysis on 5-year Survival Rate

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**Objective:** The purpose of this report is to discuss the correlation of 5-year survival rate between the oral and maxillofacial surgeon and the TNM stage. We will discuss the reason in regards to the surgeon's protocol and skill which may have an impact on the 5-year survival rate, and at which stage the protocol may have the greatest impact.

**Method(s):** The main 3 oral and maxillofacial surgeons of the Changhua Christian Hospital have performed resections of oral cancer from 1999 to 2008. The total patient number is 735. The patients were separated into 3 groups according to the 3 surgeons (group A, group B, group C). Each group is divided into 4 stages based on TNM system.

**Result(s):** The 5-year survival rate of Group A in stage 1 is 94.3%, stage 2 is 89.8%, stage 3 is 66.7% and stage 4 is 53.8%; Group B: stage 1 is 70.0%, stage 2 is 71.4%, stage 3 is 67.7% and stage 4 is 39.7%; Group C: stage 1 is 93.5%, stage 2 is 92.2%, stage 3 is 67.7% and stage 4 is 61.2%. We found greater differences in 5-year survival rates in patients in stage 1 and 2 between group A and C. The differences between all 3 groups are less when the patients are in stage 3 and 4.

**Conclusion(s):** During the early stages of oral cancer treatment, there is a greater difference between 5 year-survival rates in relation to surgeons. As the patient approaches stage 3 and 4, this difference is less prominent. This is most likely due to the surgeon's ability to differentiate and establish an appropriate safety margin, and the skill to completely remove the tumor before its metastasis.

**Keyword:** Surgeon

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[T1-38]

## Adequate Area of Neck Dissection of Cancer of the Tongue for Stage II, III and IV

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**Objective:** A great deal of effort has been made in indicating neck dissection for tongue carcinoma. Late cervical metastases (LCM) after surgery, including primary site and neck dissection, occur and have great influence on the prognosis. The indication and preferred dissection area for prophylactic neck dissection of the clinically negative neck (N0) in tongue carcinoma are still controversial and have not been standardized. Our concern is to consider the adequate area of neck dissection, especially in T2N0, T2N1 and T3N0 cases of tongue carcinoma.

**Method(s):** We retrospectively analyzed the efficacy of surgical treatment in 56 cases with stage I (T1N0), stage II (T2N0), stage III (T2N1 and T3N0) and stage IV (T2/3 N2b/c). All cases underwent surgical procedure alone as an initial treatment at our hospital.

**Result(s):** In 6 cases of T1N0, lesions were removed with a surgical margin of more than 10 mm, which showed no LCM. In 18 cases of T2N0, which were resected with a surgical margin of 20 mm, there was LCM in 9 cases. In 5 cases of T2N1 performed with partial resection of the tongue and radical neck dissection (RND), no LCM was recognized. On the other hand, in 3 out of 4 cases of T3N0, including the resection of level I, LCM occurred. In 9 cases of level IV with pull-through technique and RND, there was LCM in 2 cases.

**Conclusion(s):** In LCM of 50% (9/18) of stage II, 55.5% (5/9) was salvaged by RND, which leads to a necessity of prophylactic neck dissection of level I, II and III in late T2N0. In stage III, neck dissection around XI nerve is important because LCM were observed there. It seems reasonable to suppose that the pull-through technique, RND ipsilateral to the primary site and supraomohyoid neck dissection contralateral to the lesion are adequate area in stage IV.

**Keywords:** Tongue Carcinoma, Surgery, Neck Dissection

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[T1-40]

## Functional Outcomes of Patients with Advanced Pyriform Sinus Cancer Treated with Extended Near-total Laryngopharyngectomy and Free Fasciocutaneous Flap Reconstruction

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**Objective:** Management of an advanced hypopharyngeal cancer requires consideration of disease control, consequences of treatment, and quality of life issues. The purpose of this study is to evaluate the functional results in patients with advanced pyriform sinus cancer treated with extended near-total laryngopharyngectomy and fasciocutaneous free flap reconstruction.

**Method(s):** A total of 13 patients with advanced pyriform sinus cancer (stage III or IV) underwent extended near-total laryngopharyngectomy with fasciocutaneous free flap reconstruction (ten anterolateral thigh flap and three radial forearm flap). Laryngostroboscopic examination was performed during postoperatively follow up to check if local recurrence on the neopharynx and to evaluate the speech shunt as well as the flap condition. The vocal function studies involved perceptual judgement of voice quality, patient's self-rating, acoustic and aerodynamic measurements, and subglottic pressure measurements.

**Result(s):** The average length of hospitalization was 19 days (range from 14 to 35 days). Eight patients could achieve shunt speech 1.5-2 months after operation. Three patients received post-operative concurrent chemoradiotherapy and one received adjuvant radiotherapy alone.

**Conclusion(s):** Extended near-total laryngopharyngectomy and free fasciocutaneous flap reconstruction is an oncologically safe and voice-conserving procedure in the surgical treatment of patients with locally advanced pyriform sinus cancer.

**Keywords:** Pyriform Sinus Cancer, Near-total Laryngopharyngectomy, Free Fasciocutaneous Flap

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[T1-41]

## Endoscopic Submucosal Dissection for Cancers of Oro-Hypopharynx Using a Transnasal Ultra-Thin Endoscope

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**Objective:** The standard treatment for early stage cancers of pharynx is surgical resection or radiation therapy, but these treatments are very invasive and sometimes impair quality of life. Endoscopic submucosal dissection (ESD) has been expanded in indication to the treatment of pharyngeal tumors.

**Method(s):** Between July 2008 and August 2009, ESD was performed for 9 superficial cancers of oro-hypopharynx. All cases were male with a median age of 72 years (range, 66-81 years). The procedures were as follows. Under general anesthesia, transoral intubation, and supine position, ESD starts with identification and demarcation of the tumor margins by iodine staining. After marking, glycerol solution is injected into the subepithelial layer to separate the mucosa from the muscle layer proper. Then a circumferential mucosal incision is made with a hooked electric knife using a conventional endoscope. Next, a head and neck surgeon grasps the edge of the incised mucosa by forceps transorally, the piece of mucosal tissue is then lifted to obtain effective countertraction. Then, the subepithelial tissue and vessels are cut from the oral side using an electric needle knife through a working channel of the endoscope. Transnasal approach enables us to get the tangential view especially for the lesion of posterior wall of oropharynx, so it is easy to cut from the oral side. Finally, endoscopic en bloc resection is completed.

**Result(s):** All 9 cases were successfully treated with ESD. All lesions were resected en bloc and histologically proven as squamous cell carcinoma. Tumor invasion beneath the epithelium was found in four lesions, and 5 lesions were confined to epithelium. The median tumor size of the resected specimens was 25 mm (range, 6-45 mm). All patients were discharged without severe complications. The median hospital stay was 5 days (range, 3-9 days).

**Conclusion(s):** ESD using a transnasal ultra-thin endoscope is safe and less invasive for superficial cancers of oro-hypopharynx.

**Keywords:** Superficial Pharyngeal Cancer, ESD, Transnasal Ultrathin Endoscopy

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[T1-43]

## Cavernous Supraglottic Pattern of Adult Laryngeal Hemangioma: Surgical Outcome

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**Objective:** To investigate the clinical features of adult laryngeal hemangioma, particularly focusing on the surgical and voice assessment outcomes in the large supraglottic cavernous pattern.

**Method(s):** A retrospective study. Thirteen cases of adult laryngeal hemangioma underwent laryngomicrosurgery. Two cases were large supraglottic cavernous hemangiomas and received further investigation about voice assessment after CO2 laser.

**Result(s):** Nine cases were glottic and 4 cases supraglottic. In the 2 large cavernous supraglottic cases, CO2 laser ablation was performed smoothly and vocal performance showed a marked postoperative improvement. No recurrence or complications were noted. The other 3 glottic cavernous hemangiomas of small and medium size were treated effectively without CO2 laser. No cavernous hemangiomas were diagnosed in the epiglottis and subglottis.

**Conclusion(s):** Large cavernous laryngeal hemangioma usually occurs at the supraglottis. CO2 laser ablation represents a safe and effective procedure. Postoperative vocal performance markedly improved although the cavernous hemangiomas were supraglottic.

**Keywords:** Cavernous Hemangioma, Supraglottic

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[T1-42]

## Central Neck Dissection in Papillary Thyroid Carcinoma: A Preliminary Study

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**Objective:** The role of central neck dissection in the standard treatment of papillary thyroid carcinoma has been debated for several years. This retrospective investigation was done to derive epidemiologic data regarding the presence of central neck nodal metastasis in patients with papillary thyroid carcinoma undergoing total thyroidectomy with central compartment neck dissection. We evaluated the distribution pattern of central lymph node metastasis as well as the post-operative complications of central neck dissection.

**Method(s):** Retrospective medical chart review of seventeen patients with papillary thyroid carcinoma who underwent elective total thyroidectomy with central compartment neck dissection with or without lateral compartment neck dissection were included in the study. Lymph node involvement was analyzed by neck subsites, clinicopathologic variables predictive of nodal metastasis and postoperative complications were determined.

**Result(s):** The central and lateral nodal metastases were 94.11% and 47.05% respectively. Majority of the patients were tumor node metastasis (TNM) stage I (41.1%) based on AJCC Staging Manual (2002). Examination of the 17 central neck dissection specimens showed that the ipsilateral paratracheal lymph node metastasis was present in 13 (76.4%) patients, while patients with pretracheal (41.1%), contralateral paratracheal (29.4%) and superior mediastinal (11.7%) lymph node metastasis were also noted respectively. Transient recurrent laryngeal nerve paresis occurred in one patient while ten patients had transient postoperative hypoparathyroidism. One patient had acute myocardial infarction and another patient underwent reoperation due to drain failure.

**Conclusion(s):** Papillary thyroid carcinoma is associated with central lymph node metastasis mostly in the ipsilateral paratracheal and pretracheal subsites. Thus, performing central neck dissection at the time of primary thyroidectomy may reduce the rate of recurrence, can provide more accurate staging information, may guide in postoperative management which can improve locoregional control. Furthermore, it may reduce the risk to reoperate the patient.

**Keywords:** Papillary Thyroid Carcinoma, Cervical Lymph Node Metastases, Central Neck Dissection.

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[T1-44]

## The Role of Skull Base Surgery for Pediatric Parameningeal Rhabdomyosarcoma

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**Objective:** Rhabdomyosarcoma (RMS) is the most common soft tissue sarcoma of childhood. Surgery is usually performed on the remnant tumor after initial chemotherapy. However, the surgical removal of such a residual tumor in the skull base is critical. This study reviewed the technique and outcome of skull base surgery for pediatric RMS.

**Method(s):** Seven patients presenting with pediatric RMS who had undergone skull base surgery between December 2001 and November 2007, were retrospectively reviewed. The tumor site, surgical approach, complications, regional recurrence after surgery and survival were analyzed.

**Result(s):** The sites of the residual tumors were the infratemporal fossa (4), tegmen of the nasal and paranasal cavity (2) and the orbit with anterior skull base invasion (1). A coronal and/or preauricular skin incision (6) and facial dismasking flap (1) were applied as the skin preparation. Anterior skull base surgery was performed by means of a frontal craniotomy (2), infratemporal fossa approach with a lateral craniotomy (4) or anterior-middle skull base with a front-lateral craniotomy (1). The tumors were totally extirpated under a sufficient surgical field. After surgery, facial palsy (5), occlusal disbalance (1), diplopia (1), and a facial deformity (1) occurred. However, those complications were transient. Local recurrence occurred in 2 cases and distant metastasis was observed in 2 cases. The overall 3-year survival rate was 41.7%.

**Conclusion(s):** These residual tumors were safely and totally removed with only minimal morbidity. Skull base surgery is therefore advocated for the removal of residual pediatric RMS in the parameningeal region after completion of the initial treatment.

**Keywords:** Rhabdomyosarcoma, Pediatric, Skull Base Surgery

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[T1-45]

## Infratemporal Fossa Meningioma Excised via Lower Cheek Flap Approach

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**Objective:** Extracranial meningiomas are rare and incomplete excision leads to recurrence. Adequate exposure of the tumor and involved bone is important for complete removal. We report a case of 69-year-old man with extracranial meningioma presented with recurrent right temporal region swelling with no neurological deficit. Incisional biopsy of the lesion reported as extracranial meningioma WHO Grade 1. Computed tomography (CT) scan and magnetic resonance imaging (MRI) showed right temporal region mass which extends inferiorly into infratemporal fossa.

**Method(s):** A combined right lower cheek flap and frontal uni-coronal incision was performed to remove the tumour. Incision for lower cheek flap was continued superiorly with uni-coronal incision. Marginal resection of the anterior part of ascending mandible was performed to gain more access. However we managed to spare the zygomatic arch as the tumour was approached superiorly via frontal uni-coronal incision.

**Result(s):** Intra-operatively, tumor sized 5x3cm was found extending from the right temporal area to inferiorly between lateral pterygoid and zygomatic arch. The tumour was removed in toto. Post operatively was uneventful. No facial nerve palsy and patient has only mild trismus. Repeated MRI 6 months post surgery showed no recurrence.

**Conclusion(s):** Complete excision of extracranial meningioma is important to prevent recurrence. For extracranial infratemporal meningioma, alternative access to infratemporal fossa can be achieved by the lower cheek flap.

**Keywords:** Extracranial Infratemporal Meningioma, Lower Cheek Flap, Infratemporal Fossa

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[T1-46]

## Treatment Outcome in Patients Undergoing Partial Laryngopharyngectomy for Hypopharyngeal and Supraglottic Carcinoma

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**Objective:** This study reports the treatment of the patients with hypopharyngeal and supraglottic squamous cell carcinoma, using conservative surgery and radiotherapy.

**Method(s):** Nineteen patients with hypopharyngeal and supraglottic SCC were treated between 1991 and 2009, using partial laryngopharyngectomy with or without complementary radiotherapy. Sixty-eight percent had stage III-IV lesions. Quality of life questionnaire and clinical examination including VFSS were used for evaluation of laryngeal function.

**Result(s):** Conservation surgery was undertaken. All patients underwent neck dissection. Five patients were carried out neo-adjuvant chemotherapy. Sixty-three percent of the patients received post-operative radiotherapy. Reconstruction was achieved by primary closure in 16 cases, radial forearm free flap in three. Three-year overall and disease specific survival rates were 65 and 80%, respectively. Successful laryngeal function preservation with local control was achieved in 80% of the patients. In cases of primary closure, postoperative stenosis and dysphagia was minimally reported and not significantly different from radial forearm free flap reconstruction cases.

**Conclusion(s):** Partial laryngopharyngectomy is a feasible treatment for early and selected advanced stage hypopharyngeal and supraglottic carcinoma with a good functional and oncologic outcome.

**Keywords:** Partial Laryngopharyngectomy, Hypopharyngeal and Supraglottic Carcinom, Functional and Oncologic Outcome

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[T1-47]

## Clinical Study of Stage III and IV in Laryngeal Cancer

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**Objective:** Laryngeal cancer, especially in T1 and T2, shows good prognosis. Generally, irradiation alone for T1 and concomitant chemoradiotherapy (CCRT) for T2 are performed at the first stage for treatment. For advanced laryngeal cancer, however, treatment is still controversial and has not been standardized as to indication and methods of surgeries. Furthermore, classification for T3 of UICC (2003) was modified, and old type T2 belongs to T3, which made options of treatment for T3 more complex.

**Method(s):** Clinical study was made of 37 patients with previously untreated laryngeal cancer of stage III and IV (male 36 and 1 female) from 1996 to 2006 at our hospital. Their mean age was 67.8 years. There were 21 cases (supraglottic type 11, glottic type 10) in stage III (3 in T2, 18 in T3, 14 in N0, 1 in N1, 1 in N2a and 2 in N2c) and 16 cases (supraglottic type 16, glottis type 2) in stage IV (2 in T1, 14 in T4, 6 in N0, 1 in N1, 2 in N2a, 4 in N2c and 4 in N3).

**Result(s):** Total laryngectomy (TL) was made in 12 cases, partial laryngectomy (PL) in 1 and CCRT in 20 as the first line treatment. For recurrent and remnant cancer, TL in 1 and PL in 1 were performed as salvage surgery. 5-year relative survival rates showed 71% in stage III, 43% in stage IV, 100% in T1, 67% in T2, 76% in T3 and 40% in T4. Comparing the differences in survival rate between the surgery and CCRT, 5-year survival rates were 92% for surgery and 49% for CCRT in advanced cancer.

**Conclusion(s):** Based on these results, we concluded that for the sake of survival, surgery was better than radiotherapy alone or CCRT at stage III and stage IV of laryngeal cancer.

**Keywords:** Laryngeal Cancer, Concomitant Chemoradiotherapy, Surgery

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[T1-48]

## Evaluation of Vocal Functions after Partial and Total Laryngectomy

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**Objective:** Frontolateral partial laryngectomy (FLPL) is an alternative to total laryngectomy (TL) in the treatment of local recurrence after radiotherapy for laryngeal carcinomas. Although several studies have explored postoperative voice outcomes for laryngeal cancer, the comparative studies between different treatments have been little reported. To compare functional outcomes of total laryngectomy and partial laryngectomy in laryngeal cancer patients, we performed subjective analysis by Voice Handicap Index (VHI)-10 and objective analysis using aerodynamic and acoustic analyzer.

**Method(s):** Twenty seven patients with laryngeal cancer treated with total laryngectomy and 10 patients were treated with vertical partial laryngectomy. Voice after total laryngectomy were tracheoesophageal (TE) speech. Vocal function was examined subjectively by VHI-10 and objectively aerodynamic and acoustic analysis. In aerodynamic analysis, we studied maximum phonation time (MPT), the mean flow rate (MFR), vocal efficiency index (alternating current/direct current [AC/DC]). Acoustic analysis involved the evaluation of fundamental frequency (F0) and intensity using phonation analyzer (PA-1000).

**Result(s):** VHI-10 score of total laryngectomy (TL) patients were higher than partial laryngectomy (PL) patients, but TE speech patients did not differ from PL patients significantly. In aerodynamic analysis, MPT in TE patients were longer than in PL patients. Comparing with PL patients, MFR were lower and AC/DC were higher in TE patients. Acoustic analyses revealed F0 in PL patients were higher than TE speech patients and intensity were not different between both patients.

**Conclusion(s):** There were no significant difference between vocal outcomes after total laryngectomy (tracheoesophageal speech) and vertical partial laryngectomy subjectively. Tracheoesophageal speech had a higher functional impact on MPT, MFR and vocal efficiency index (AC/DC) comparing with speech following vertical partial laryngectomy.

**Keywords:** Vocal Function, Total Laryngectomy, Partial Laryngectomy

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[T1-49]

## The Management of HNSCC in Obese Patients

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**Objective:** To study the management and outcome of obese patients with HNSCC treated in a tertiary cancer hospital.

**Method(s):** A retrospective review of 111 obese patients (BMI >30) with histologically proven HNSCC that were treated in a single hospital from 1999 to 2007. We reviewed the clinical data of these patients with particular attention to the following parameters: condition of examinations, location and stage of disease, presence of co-morbidity with ACE 27 score, surgical and medical complications following treatment and oncological outcome.

**Result(s):** There were 96 males and 15 females (male to female ratio=6.4) with a median age at 54.5 year old (range 37, 70). Median survival from time of diagnosis to time of death or time of last follow-up was 38 months (range 2, 109). Associated co-morbidities in this cohort of patients were hypertension (48%), hypercholesterolemia (30%), non-insulin dependent diabetes (19%) and ischemic heart disease (17%). These 111 patients presented with a total of 120 squamous cell carcinomas with eight patients presenting with tumors at more than one site. The tumors were located in the oral cavity (25), oropharynx (31), larynx (43), hypopharynx (16) and trachea (1) while 4 other patients had unknown primaries. Pan-endoscopic assessments were difficult in 29 out of 111 patients. There were discordant in clinical examination of cervical lymphadenopathy vs. imaging in 25 patients. 20 patients required modified treatment as a direct consequence of obesity. 68 patients underwent surgery, of which 40 (59%) developed post-op complication. These complications were classified as Grade II, III and IV in 41%, 15% and 3% of patients respectively. The two- and five-year overall survival were 61% and 50% respectively.

**Conclusion(s):** HNSCC in obese patients are associated with difficult assessment of tumour extent at presentation, high post-operative complications and modification to the standard of care as a direct consequence of obesity.

**Keywords:** HNSCC, Obesity, Treatment

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[T1-51]

## Clinical Outcome for Head and Neck Mucosal Malignant Melanoma

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**Objective:** Head and neck mucosal malignant melanoma (HNMM) is rare and has a poor prognosis. Different therapies have been reported, but a standard therapy has not yet been established. Our standard therapy consists of surgical resection with adjuvant chemotherapy. We evaluated the clinical outcome for cases of head and neck mucosal malignant melanoma at our institute.

**Method(s):** We evaluated the medical records of 18 HNMM patients who were diagnosed and treated at Aichi Cancer Center from January 1998 to December 2008.

**Result(s):** The median age was 66.5 years (range, 51–79 year). There were 8 men and 10 women. There were 11 subsites in nasal cavity, 2 in sinonasal, 4 in oral cavity, and 1 in cervical esophagus. Fifteen patients were operated on followed by chemotherapy. Three patients received chemotherapy followed by conventional radiation, due to advanced disease which was not candidates for surgical resection. The median follow up was 13 months (range, 5–79 months). The overall survival at 2 years was 47.5% (95%CI: 22.9–68.7%) and the disease-free survival rate at 2 years was 27.8% (95%CI: 7.4–53.3%).

**Conclusion(s):** Our clinical outcome was no different from reported outcomes, but was not satisfactory. We expect that new therapy regimens will include molecular targeted therapies and carbon ion radiotherapy.

**Keywords:** Head and Neck Mucosal Malignant Melanoma, Surgery, Chemotherapy

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[T1-50]

## Treatment for Malignant Melanoma in the Head and Neck

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**Objective:** In general, malignant melanoma in the head and neck (MMHN) is considered to provide poor prognosis. For the treatment of MMHN, radical excision is mainly indicated. Other therapies are usually not effective. The purpose of this study was to evaluate outcome of our treatment of MMHN and examine relationship between satellite lesion around primary site and prognosis.

**Method(s):** This study includes nine patients of MMHN treated in our department from 1992 to 2008. There were four men and five women, with a median age of 47 years (range, 51–79 years). Primary lesions were the nasal cavity in four cases, the paranasal sinus in four cases, and the oral cavity in one case. Survival rates were calculated by the Kaplan-Meier method.

**Result(s):** The 5-year overall survival rate of all patients was 55.6%. Seven patients were treated with radical surgery. In the seven patients, three patients without satellite lesion are all alive with no recurrence, while four patients with satellite lesion all showed local recurrence and distant metastasis. The other two patients were treated with chemotherapy and stereotactic radiotherapy. In the one patient, local site showed complete response. After three years, salvage surgery was performed due to the recurrence of the regional site. This patient is alive without tumor. The other patient died because of distant metastasis.

**Conclusion(s):** Our study suggests that the prognosis of MMHN is influenced by the presence of satellite lesion around primary site.

**Keywords:** Malignant Melanoma, Surgery, Satellite Lesion

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[T1-52]

## Evidence to Refine Selective Neck Dissection in Head and Neck Cancer by Using Pre-Operative Lymphoscintigraphy

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**Objective:** Cervical lymph node involvement is the primary prognostic factor in patient with head and neck squamous cell carcinoma and is important for staging and treatment. Surgeons have been encouraged by the accuracy of sentinel node biopsy in cutaneous melanoma. We attempted to determine the need and use for lymphoscintigraphy in all types of head and neck cancer as a means to more accurately guide selective neck dissection.

**Method(s):** To provide evidence for the need of pre-operative lymphoscintigraphy, we reviewed recent cases in which positive nodes were found in cervical zones not classically described as the regions which drain the site of the primary tumor.

**Result(s):** Three cases were found in which a single positive neck node was found in a zone outside of the common lymphatic drainage patterns. Patient I is a male with a floor of mouth (FOM) squamous cell carcinoma (SCC) who had bilateral neck dissections and was found to have one positive node in the infra-omohyoid region of zone IV. This normally would not be included in a selective neck dissection for a FOM cancer. Patient II is a patient with a retromolar trigone SCC that was found to have a single positive node in the supraclavicular region. Patient III had a scalp melanoma with the positive node found in the pre-mastoid region.

**Conclusion(s):** Given that head and neck cancer does not always follow classically described lymphatic drainage patterns, lymphoscintigraphy can be used to distinguish lymphatic drainage patterns and nodes prior to resection to guide the neck dissection. This potentially improves the accuracy of nodal staging and avoids over and under treating this patient population.

**Keywords:** Lymphoscintigraphy, Sentinel Node

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[T1-53]

## An Atypical Meningioma of Maxillary Sinus—Case Report

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**Objective:** Extracranial meningiomas are very rare tumors, comprising ~2% of all meningiomas. Previously reported sites include the orbit, parapharyngeal space, and rarely, the paranasal sinuses. The reported locations of paranasal sinus included the frontal, the ethmoid, and the sphenoid sinus, and we cannot find the case of the maxillary sinus. So we report a rare case of an atypical meningioma in maxillary sinus.

**Method(s):** We report a 35-year-old man with the left facial pain and nasal obstruction. The main presenting symptoms were swelling of the left cheek. Computed tomography (CT) showed a well defined expansive growing mass with thinning and remodeling of the walls of maxillary sinus. A biopsy was taken from the left nasal cavity. Histopathological examination showed atypical meningioma. He underwent tumorectomy with Weber-Ferguson incision.

**Result(s):** For the case reported here, we were able to remove the tumor with keeping the lateral wall of maxillary sinus and orbital wall, because the adhesion was not so hard. The anterior wall bone was returned after tumorectomy and fixed by titan mini plate. A follow-up examination 1 year later revealed no evidence of recurrence of tumor.

**Conclusion(s):** In our case, it shows strongly positive immunoreactivity with MIB-1 (12%), but microscopically, cellular atypia, necrosis, or increased mitotic activity was not so hard. So we diagnosed atypical meningioma (WHO grade II). The diagnosis of an extracranial meningioma is made histologically, but the histopathologic appearance is very diverse. Immunohistochemical staining is often useful to confirm the diagnosis.

**Keywords:** Atypical Meningioma, Extracranial Meningioma, Maxillary Sinus

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[T1-54]

## Examination of Endoscopic Mucosal Resection for Superficial Head and Neck Cancer—About Risk Factors for Lymph Node Metastasis

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**Objective:** Endoscopic mucosal resection (EMR) has recently seen frequent use for superficial head and neck cancer. However, indications for EMR have yet to be decided. We think that high risk of lymph node metastasis should be considered as one of the standards.

**Method(s):** A total of 37 lesions of 29 patients with head and neck cancer underwent EMR in our hospital between June 2006 and December 2008. We measured tumor thickness and width of subepithelial invasion and determined risk factors for lymph node metastasis by histopathological examination.

**Result(s):** Frequency of risk factors for lymph node metastasis was significantly high when tumor thickness was >1.5 mm or width of subepithelial invasion was >8.0 mm.

**Conclusion(s):** Indications for EMR should thus consider tumor thickness and width of subepithelial invasion.

**Keywords:** Endoscopic Mucosal Resection, Superficial, Lymph Node Metastasis, Tumor Thickness, Width of Subepithelial Invasion

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[T1-55]

## The Excision of Juvenile Nasal Angiofibroma with Preoperative Embolization and Radiofrequency Ablation

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**Objective:** Juvenile nasopharyngeal angiofibroma (JNA) is a rare locally invasive neoplasm composed of cavernous vascular channels set in an abundant myxoid stroma of fibroblasts and myofibroblasts. Therefore, the excision JNA is often complicated by massive intraoperative blood loss. Several methods are proposed to minimize such a complication. We report here our experience of treatment of the case of JNA with an excision following the preoperative embolization combined with radiofrequency ablation.

**Method(s):** The patient was 19-old male with JNA who underwent embolization of maxillary artery with 1 mL of PVA microspheres 100–300  $\mu$ m (Bead Block, Biocompatibles, US). The tumor was removed in 3 days after embolization. Just before surgery a 3D-navigated radiofrequency ablation of the tumor was carried out (Treon Stelt station, Medtronic Inc., USA and Valley lab Radionics Cool Tip RF system, Covidien, USA). The navigation was performed using a computed tomography data. The ablation was listed 15 min in impedance control mode with 3 cm- active part single electrode.

**Result(s):** The tumor was removed with no complications. Intraoperative blood loss was 30 mL. Microscopically specimen was characterized by classic morphological features of JNA with multiple confluent areas of coagulative necrosis within the tumor accompanied by the vascular necrosis; multiple intravascular PVA microspheres were found as well. The patient has no complications of treatment and feels well 8 month later.

**Conclusion(s):** Combined approach using embolization and radiofrequency ablation can be safe and effective measure to reduce intraoperative blood loss during surgical excision of JNA. Such a method of treatment of the JNA as surgical excision combined with preoperative embolization and radiofrequency ablation has never been reported previously to the best of our knowledge.

**Keywords:** Juvenile Nasal Angiofibroma, Radiofrequency Ablation, Embolization

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[T1-56]

## Clear Cell Sarcoma of the Right Cheek In An 11-Year Old Girl

Rifqah N<sup>1</sup>, Primuharsa Putra S H A<sup>2\*</sup>, Jabar M N<sup>1</sup>, Hamidah A<sup>3</sup>, Ramli R<sup>1</sup>

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<sup>3</sup>Paediatric Oncology Unit, Department of Paediatric, Universiti Kebangsaan Malaysia Medical Centre, Malaysia

**Objective:** Clear cell sarcoma (CCS) of tendons and aponeuroses (also known as malignant melanoma of soft parts) is a slow and progressive malignant tumor with poor prognosis. It is a rare tumor accounting for less than 1% of all soft tissue sarcomas. The tumor commonly arises in the extremities with predilection for the lower extremities. The patients are mostly young adults. In this paper, we present the case of a CCS with hitherto unreported site of origin.

**Method(s):** An 11-year-old girl presented with large left pre-auricular swelling for 8 months.

**Result(s):** She underwent a left superficial parotidectomy in other hospital. Due to uncertainty in the diagnosis, the treatment was delayed for 6 months and during that period the growth recurred. She then sought traditional treatment and later was admitted to Pediatric oncology. While in the ward she had an acute massive bleeding from the mass. She underwent emergency exploration under general anesthesia to stop the bleeding and post-operative recovery was uneventful. The final histopathological diagnosis was consistent with clear cell sarcoma. Immunohistochemically, the malignant cells were positive for vimentin, CD99 and bel-2, and weakly positive for EMA. These cells are negative for CK, S-100, HMB-45 and melan A. The cyto-chromosome analysis revealed no chromosomal abnormality. She underwent 3courses of chemotherapy. After the swelling has shrunk, she underwent excision of the remaining tumor followed by adjuvant chemotherapy. After 3-months of follow up, the patient was well and asymptomatic. There had been no local recurrences or metastases.

**Conclusion(s):** As this case has demonstrated, CCS is a rare neoplasm with a difficult clinical and histological differential diagnosis.

**Keywords:** Clear Cell Sarcoma, Malignant Melanoma of Soft Parts, Head & Neck

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[T1-57]

## Ectopic Lingual Thyroid: Investigations beyond Histology

**Peter Peters\***

*Department of Otolaryngology, Princess Alexandra Hospital, Australia*

**Objective:** The ectopic thyroid gland is a uncommon occurrence with locations ranging from the neck, mediastinum, lingual and sublingual regions, intracardially, trachea, aorta, submandibular gland, adrenal gland, parotid gland, oesophagus and gall bladder. The incidence of ectopic thyroid is reported to be approximately 1 in 4-8,000. The rate of ectopic lingual thyroid is varied throughout the literature ranging from 1 in 3,000 to 1 in 10,000 and extending to 1 in 200,000, and is reported as being 4 and 8 times more common in females. Neoplastic change is felt to be rare, occurring in 1 in 100 lingual thyroids, with less than 50 reported in the literature. The histological variants reported in the literature include follicular carcinoma, adenocarcinoma, Hurthle cell and papillary carcinoma. Other known complications reported in the literature include dysphagia. There are 4 reported cases in the literature of lingual thyroid causing obstructive sleep apnea, with only one case having conducted a formal sleep study prior to surgical excision.

**Method(s):** Our case of a 38 yr male with an incidental finding of an ectopic lingual thyroid initially presented during intubation for orthopaedic surgery following a MVA. A sleep study was conducted pre and post surgical excision of the ectopic gland.

**Result(s):** The patients Respiratory distress index (RDI) was determined to be 38.6 preoperatively and 3.7 postoperatively. Histology of the excised gland revealed normal functioning thyroid tissue. This allowed definitive proof of OSA being caused solely by the ectopic lingual thyroid, despite numerous OSA risk factors.

**Conclusion(s):** Failure to conduct such tests would have not shown the success of the procedure and proof that despite numerous other risk factors of OSA, his OSA was purely due to the presence of an ectopic lingual thyroid. Swallowing studies would also pertinent in cases of dysphagia.

**Keywords:** Ectopic, Thyroid, Apnoea

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[T1-58]

## Odontogenic Myxoma

**Wan-ting Yang\***

*Dentistry, Changhua Christian Hospital, Taiwan*

**Objective:** To determine the most suitable method of reconstruction for maxilla after resection in patients diagnosed with odontogenic myxoma.

**Method(s):** Six patients diagnosed with odontogenic myxoma in the maxilla were divided into three groups. The first group underwent iliac bone graft reconstruction, the second fibula fasciocutaneous free flap, and the third with only an obturator.

**Result(s):** Patients wearing obturators had the least amount of complications, in terms of donor morbidity, infection, and leakage.

**Conclusion(s):** It would be best to reconstruct the maxilla in patients diagnosed with odontogenic myxoma with a temporary obturator, which will then be replaced with a permanent one a year after.

**Keywords:** Odontogenic Myxoma, Obturator, Iliac Bone Graft

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[T1-59]

## Oncocytic Carcinoma of the Nasal Septum: A Case Report

**Kathleen Fellizar\*, Hypete Raymund Aujero, Arsenio Claro Cabungcal**

*Otorhinolaryngology, Philippine General Hospital, Philippines*

**Objective:** 1) To report a rare case of a 74-year old male who presented with unilateral nasal obstruction associated with recurrent epistaxis

2) To describe a case in which the pre-operative histopathologic diagnosis differed from the post-operative histopathologic diagnosis and its effects on management

3) To present the surgical treatment in a case of a 74-year old male with oncocytic carcinoma of the nasal septum

**Method(s):** Study Design: Case report

Setting: Tertiary care center

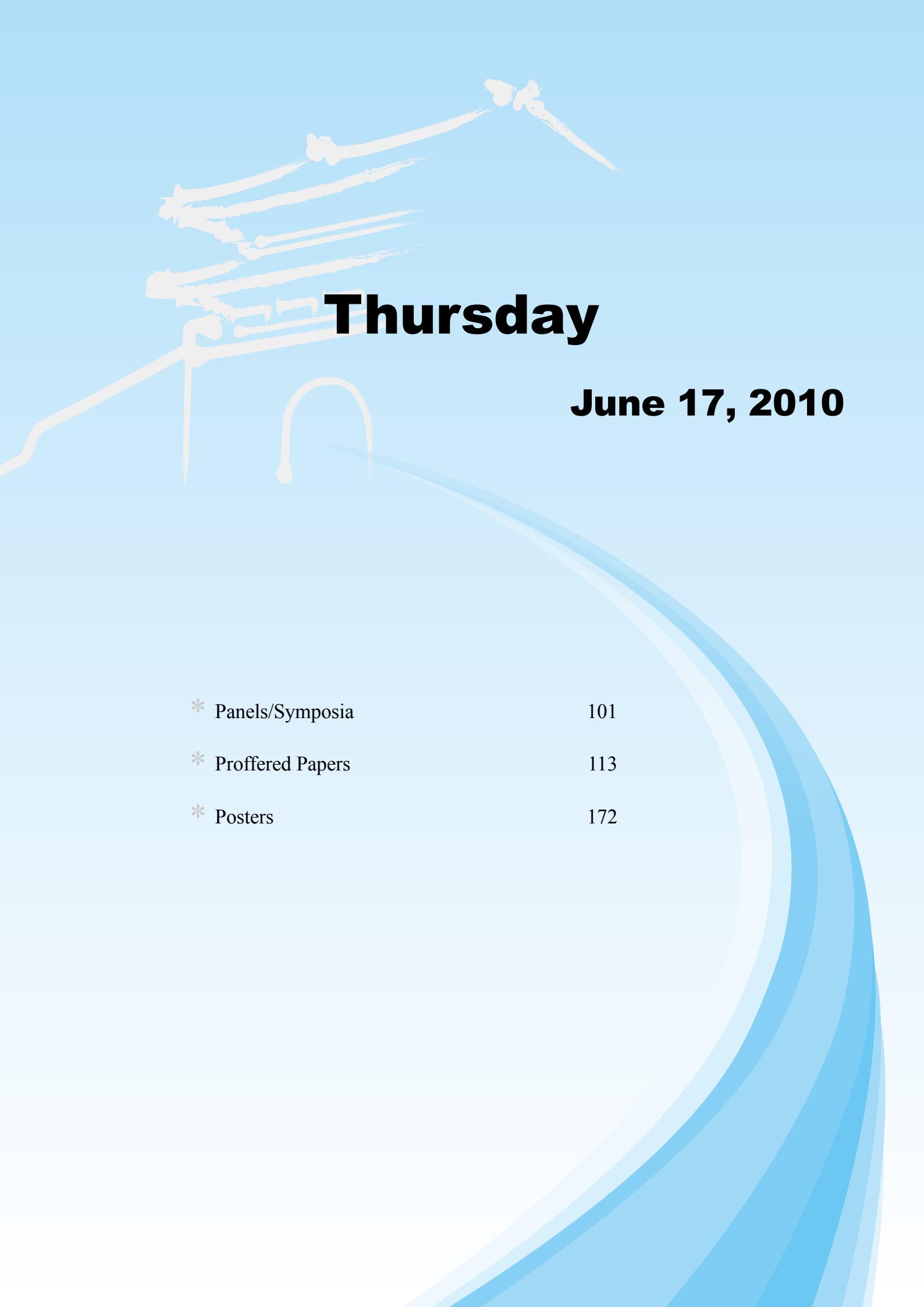
Patient: One patient

**Result(s):** A 74-year old male presenting with unilateral nasal obstruction and recurrent epistaxis is presented. On examination, a violaceous right intranasal mass was seen, with an initial biopsy hemangioma. He underwent endoscopic excision of the mass. Intraoperatively, the mass was seen attached to and perforating the posterior septum at the right nasal cavity, abutting the middle turbinate of the left nasal cavity. Final histopathology revealed oncocytic carcinoma. Endoscopic septectomy and middle turbinectomy was subsequently done. All surgical margins of resection were negative.

**Conclusion(s):** A case of a 74-year old presenting with unilateral nasal obstruction, recurrent epistaxis and a right intranasal mass is presented. It is a case that was initially diagnosed as hemangioma but was later revised to oncocytic carcinoma. Oncocytic carcinoma is a rare tumor of the salivary glands with very few reported cases, most of which involve the parotid gland. It has a tendency to recur with inadequate excision and can be mistaken for other pathologies. Diagnosis is histopathologic. It is to be emphasized that adequate tissue samples should be taken in order to provide a definite diagnosis from biopsy, and subsequently institute proper definitive management.

**Keywords:** Oncocytic Carcinoma, Nasal Septum, Case Report

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# **Thursday**

**June 17, 2010**

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## P07. Christopher O'Brien Memorial Symposium: Cutaneous Malignancy of the Head and Neck

**Chair : Jatin Shah (USA)**

**Moderator : Jatin Shah (USA)**

08:00 - 09:30 CBR I + II

[P07-01]

### Treatment of Aggressive Cutaneous Squamous Cell Carcinoma: Then and Now

**Randal Weber**

*Head and Neck Surgery, University of Texas MD Anderson Cancer Center, USA*

Advanced HN cSCC carries a 30-40% risk of death by 2 years with standard therapies. Traditionally these patients have been treated with surgery with or without radiation. Despite aggressive local therapy relapse rates are high. A new era for treating aggressive cSCC is being heralded through better understanding of the biology of this disease. Laboratory studies have demonstrated that cSCC over-expresses the epidermal growth factor receptor (EGFR) and may be responsible for aggressive behavior in a subset of patients. Novel therapeutic approaches use small molecule tyrosine kinase inhibitors like gefitinib as an induction therapy that target the intracellular domain of the epidermal growth factor receptor. This class of targeted agents can directly impact the molecular pathways that promote the malignant phenotype typical of cancer: invasion, migration, angiogenesis, proliferation and down regulation of apoptosis. This presentation will review the results of standard therapy for cSCC and new approaches directed towards molecular targets responsible for tumor progression.

**Keywords:** Cutaneous, Squamous Cell, EGFR Inhibitors

**Contact Information** Randal Weber (rsweber@mdanderson.org)

[P07-02]

### Role of Elective Node Dissection in Head and Neck Cutaneous Squamous Cell Carcinoma

**Randall Morton**

*Otolaryngology-Head and Neck Surgery, Counties-Manukau DHB, New Zealand*

The risk of nodal metastases from cutaneous Squamous Carcinoma of the Head and Neck (cHNSCC) is about 5%. The presence of advanced nodal metastases has major prognostic and morbidity implications.

It is important to try to identify which of the cHNSCC cases that are N0 will develop nodal metastases, so that the consequences of treating advanced disease can be avoided. Treatment approaches for N0 cases include: watchful waiting, sentinel lymph node biopsy, lymphatic mapping with directed lymphadenectomy, or elective selective lymphadenectomy.

The therapeutic efficacy of each of these treatment approaches is unknown.

There is substantial selection bias in the literature regarding risk of nodal metastases. Using data from large cohort and high-quality case-control studies a high-risk sub-set of HNSCC can be identified. This comprises those cases with either poor differentiation or perineural/lymphovascular infiltration, a those cases with all 3 of the following: 20+mm diameter, Clark level 5, and Moderate differentiation.

Using these criteria, multi-centre, prospective RCTs can be designed to evaluate the effectiveness of various management regimens for the nodes in patients presenting with N0 HNSCC.

**Keywords:** Sentinel Nodes, Occult Disease, Pathology

**Contact Information** Randall Morton (RPMorton@middlemore.co.nz)

[P07-03]

## Regional Metastases in SCC of the Head and Neck

**Jonathan Clark**

*Head and Neck Surgery,  
Sydney Head and Neck Cancer Institute, Australia*

Australia, due to its Caucasian population and high solar UV exposure has one of the highest rates of cutaneous SCC in the world. Professor Chris O'Brien established the Sydney Head and Neck Cancer Institute and published many important studies on the distribution and prognosis of nodal metastases from cutaneous SCC to the parotid and neck. Recent work from the SHNCI has aimed to further define the staging of nodal metastases, rate and distribution of neck involvement, determine the role and extent of parotidectomy and neck dissection, define high and low risk groups to guide adjuvant therapy and also commence a prospective trial sentinel node biopsy for high risk cutaneous primaries.

**Keywords:** Cutaneous, Squamous Cell Carcinoma, Parotid

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[P07-04]

## Coverage and Soft Tissue Reconstruction

**Fu-Chan Wei**

*Department of Plastic and Reconstructive Surgery,  
Chang Gung Memorial Hospital, Taiwan*

Many cutaneous flaps have been used for reconstruction of coverage and soft tissue defect in the head and neck. Among them Anterolateral thigh has become the most important workhorse flap in our center in recent years.

It can be used for buccal mucosa tongue, palate, floor of mouth, through and through defect of the cheek and laryngopharangeal reconstruction. It provides adequate tissue and volume for almost all soft tissue defect in the head and neck. Its location allows reconstruction team to work simultaneously with the excision team, thus save much anesthesia time.

**Keywords:** Cutaneous Flaps, Buccal Mucosa, Head and Neck

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## P08. Clinical Relevance of Concurrent Chemoradiotherapy

**Chair : Jean Louis Lefebvre (France)**

**Moderator : Brian O'Sullivan (Canada)**

08:00 - 09:30 CBR III

[P08-01]

### When to Add Chemotherapy for Treatment of Head and Neck Carcinomas

Kian Ang

*Department of Radiation Oncology,  
University of Texas M. D. Anderson Cancer Center, USA*

Combinations of chemotherapy and radiation have been intensive investigated in the three two decades. A large meta-analysis of data of randomized trials in head and neck cancers conductive till mid 1990s, for example, showed that induction chemotherapy in aggregate did not improve the outcome of patients with locally advanced head and neck carcinoma. However, concurrent radiation and chemotherapy increased the survival rate by 8% relative to radiation alone. More recently completed cooperative group trials confirm the superiority of concurrent radiation and chemotherapy. Unfortunately, emerging long-term follow up data also indicate that the complication rates of concurrent radiation and chemotherapy, including excess in long-term mortality, were higher compared with radiation alone, compromising the overall therapeutic benefit. Consequently, it is important to develop stringent criteria for recommending concurrent radiation and chemotherapy for patients with so-called locally advanced disease (i.e., stages III and IV by AJCC criteria) given the heterogeneity of T- and N- stages. The objectives of this presentation are to: 1) briefly summarize the results of a through meta-analysis on radiation chemotherapy; 2) present data showing defined subsets of patients with stage III-IV disease not needing concurrent radiation and chemotherapy; 3) illustrate examples of emerging biomarkers that can be used to select patients when validated.

**Keywords:** Head and Neck Cancer, Radiotherapy, Chemotherapy

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[P08-02]

### Sequential Therapy and Concurrent Chemotherapy as Curative Therapy in Advanced Head and Neck Cancer: State of the Art 2010

Marshall Posner

*Adult Oncology, Dana-Farber Cancer Institute, USA*

Concurrent Chemotherapy (CRT) has improved survival in locally advanced squamous cell cancer of the head and neck (HNC). CRT focuses therapeutic attention on local treatment and improves local regional control (LRC) without substantial impact on distant failure. CRT regimens and high dose radiation, as employed in CRT, are also associated with substantial acute and delayed morbidity and toxicity which are difficult to predict and impact significantly on survival and quality of life acutely and over considerable periods of time. Cisplatin-fluorouracil (PF) based induction chemotherapy has been shown to improve survival and organ preservation; improve LRC; and reduce distant metastases with less late toxicity compared to standard approaches with radiation and surgery. PF has been shown to be less effective than CRT for LRC but equivalent to CRT for survival and organ preservation as shown in Phase III trials due to enhanced morbidity and toxicity from CRT. The combination of docetaxel, cisplatin, and 5-fluorouracil (TPF) has now been shown to have a significant advantage in survival, organ preservation, toxicity and LRC compared to PF and has replaced PF as the standard of care for induction chemotherapy. TPF-based Sequential Therapy (TPF-ST) represents the preferred standard therapy for patients with advanced HNC and good performance status based on the available evidence. The most common site of failure in TPF-ST and CRT continues to be primarily local-regional failure. This suggests that the focus on future studies might best be applied to increasing the efficacy of CRT in a TPF-ST regimen to improve local regional control and to reduce CRT toxicity, possibly by reducing radiation doses, changing CRT drugs, and integrating surgery in a site specific manner. The future of HNC therapy is in the integration of all three modalities into a Sequential Therapy approach. This is critical in managing complex patients and attaining optimal outcomes.

**Keywords:** Head and Neck Cancer, Chemotherapy, Chemoradiotherapy

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[P08-03]

## Overview of the Clinical Trials on Concurrent Chemoradiotherapy for Nasopharyngeal Cancer

Anne wing mui Lee

Clinical Oncology, Pamela Youde Nethersole Eastern Hospital,  
China

Radiotherapy is the primary treatment modality for nasopharyngeal carcinoma (NPC), but the results for patients with advanced locoregional disease are unsatisfactory. The meta-analysis by BAUJAT et al. (2006) confirmed that significant survival benefit could be achieved by adding chemotherapy; concurrent chemotherapy was the most potent combination leading to significant benefit in overall survival.

The first trial that achieved significant survival benefit was the Intergroup-0099 Study (AL-SARRAF et al. 1998) using cisplatin in concurrence with radiotherapy at conventional fractionation followed by combination of cisplatin and fluorouracil. This is supported by subsequent confirmatory trials by WEE et al. (2005), LEE et al. (2005: the NPC-9901 Trial on N2-3 disease) and CHEN et al (2008). In addition, the NPC-9902 Trial (on T3-4N0-1 disease) by LEE et al. (2006) showed that combining this regimen with accelerated fractionation could achieve substantially greater benefit.

The trials using concurrent chemotherapy alone showed less consistent conclusions. LIN et al. (2003) using concurrent cisplatin and fluorouracil reported significant survival benefit, but subsequent re-analysis (LIN et al. 2004) showed that the benefit was significant for low-risk patients only. The trial by CHAN et al. (2005) using concurrent weekly cisplatin and that by KWONG et al. (2004b) using concurrent uracil-tegafur only showed borderline improvement in overall survival and no significant improvement in failure rate. A trial by ZHANG et al. (2005) using concurrent oxaliplatin showed significant improvement in OS at 2-year, longer results are awaited.

Hence, the current recommendation is to use the Intergroup-0099 regimen of cisplatin-based concurrent-adjuvant chemoradiotherapy. However, there are concerns about the tolerance of this regimen, the efficacy for distant control, and the contribution of the adjuvant phase. One logical strategy for future improvement is to change the sequence of the Intergroup-0099 regimen from concurrent-adjuvant to induction-concurrent because the induction sequence is more potent for reducing failures and substantially better tolerated. Reported Phase II studies on induction-concurrent chemoradiotherapy all showed encouraging results, and 2 randomized trials are now on-going to evaluate the benefit of induction-concurrent chemoradiotherapy.

Overview of clinical trials on concurrent chemoradiotherapy, the messages learnt and the direction for future improvement will be discussed.

**Keywords:** Nasopharyngeal Cancer, Concurrent Chemoradiotherapy

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[P08-04]

## Recent Progress in Chemoradiotherapy in Head and Neck Cancer

Satoshi Fukuda

Otolaryngology-Head & Neck Surgery,  
Hokkaido University Graduate School of Medicine, Japan

Recent progress in diagnosis, treatment and prevention for head and neck cancer is remarkable. Among these are PET-CT, NBI imaging fiberscope, navigation surgery, chemoprevention and so on.

In this Lecture, I mainly would like to talk about superselective high-dose cisplatin infusion with concomitant radiotherapy for head and neck Cancer, especially focusing on advanced nasal cavity and paranasal sinuses (Cancer 115:4705-4714, 2009).

The current study aimed to evaluate the efficacy of superselective high-dose cisplatin infusion with concomitant radiotherapy (RADPLAT) for previously untreated patients with advanced cancer of nasal cavity and paranasal sinuses. Between October 1999 and December 2006, 47 patients were given superselective intra-arterial infusions of cisplatin (100-120 mg/m<sup>2</sup> per week) with simultaneous intravenous infusions of thiosulfate to neutralize cisplatin toxicity and conventional external-beam radiotherapy (65-70 grays).

There were 7 patients (14.9%) diagnosed with T3, 22 (46.8%) with T4a, and 18 (38.3%) with T4b disease. During the median follow-up period of 4.6 years, the 5-year local progression-free survival rate was 78.4% for all patients (n=47), 69.0% for patients with T4b disease (n=18), and 83.2% for patients with <T4b disease (n=29). The 5-year overall survival rate was 69.3% for all patients, 61.1% for patients with T4b disease, and 71.1% for patients with <T4b disease. RADPLAT was feasible in 45 patients (95.7%). Although a single institution experience, the results of the current study suggest that RADPLAT can cure the majority of patients with advanced cancer of the nasal cavity and paranasal sinuses, as well as preserve organs.

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## P09. Revisiting Induction Chemotherapy

**Chair : Thomas Robbins (USA)**

**Moderator : Jean Louis Lefebvre (France)**

13:50 - 15:20 CBR I + II

[P09-01]

### Bioselection and Decision Making in Advanced Cancers of the Larynx and Oropharynx

**Gregory T. Wolf**

*NCI Head and Neck Cancer Specialized Program of Research Excellence, Department of Otolaryngology  
University of Michigan Hospitals, USA*

The past two decades have seen a major shift in head and neck cancer treatment paradigms to strategies of chemotherapy and radiation as an alternative to radical surgery for patients with advanced laryngeal and oropharyngeal cancers. This shift has resulted in significantly increased intensity and duration of treatment that has been accompanied by major long term functional sequelae in speech and swallowing in many cases. It is clear that not all patients benefit from a chemoradiation approach and prior trials have not improved overall survival rates. Better patient selection would reduce treatment redundancy, morbidity, cost and likely improve overall survival rates. The emphasis of clinical research in the University of Michigan Head and Neck Oncology Program has focused on proof of principle clinical trials that use the biology of an individual cancer to select a patient for an organ preservation approach with chemoradiation. Correlative studies of biomarkers of clinical outcome have been evaluated as part of these trials to potentially allow pretreatment selection of patients based on molecular biomarkers. Markers studied include p53, EGFR, VEGF, PCNA, HPV-16, Bcl-xL, Bcl-2, DNA aneuploidy and clinical markers such as tumor histologic growth pattern and patient smoking history. This work began in laryngeal cancer by using the most consistent clinical predictor of radiation response which was clinical tumor regression after neoadjuvant chemotherapy. Using such a marker to select patients for chemoradiation achieved unprecedented 5 year disease-specific survival rates of 82% in both surgically treated and organ preservation treatment groups for patients with far advanced cancers. This success prompted extension of bioselectionTM to oropharyngeal cancer with equally promising results.

The biomarker work identified p53 and Bcl-xL expression as important selection factors for chemoradiation in laryngeal cancer and HPV-16 and EGFR expression as important factors for patients with oropharyngeal cancers. This presentation will review major paradigm shifts in head and neck oncology that are shaping future trials and illustrate how incorporation of multiple predictive biomarkers can enhance “bioselection” for treatment in patients with advanced cancers and can lead to innovative clinical trial design.

**Keywords:** Larynx, Oropharynx, Bioselection

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[P09-02]

### Induction CT for Advanced L/H SCC: Evidence Based Indications and Frontiers

**Rainald Knecht**

*ENT Department, Frankfurt University Medical School,  
University Hospital, Germany*

THURSDAY, JUNE 17

[P09-03]

## Sequential Approaches for Larynx and Hypopharynx Cancer

**Marshall Posner**

*Adult Oncology, Dana-Farber Cancer Institute, USA*

Although highly debated in the 1980's, randomized clinical trials have now provided undeniable evidence that systemic chemotherapy is effective in improving survival, organ preservation and local-regional control (LRC) in locally advanced head and neck cancer (HNC). Therapy with cisplatin/5-fluorouracil-based induction chemotherapy (PF) has lead to improved survival and organ preservation; improved local regional control and reduced distant metastases; and less toxicity compared to standard radiation and surgery. Randomized Phase III trials have shown that PF is equivalent to chemoradiotherapy (CRT) for survival in HNC and laryngectomy free survival (LFS) in patients with larynx and hypopharynx cancer (LHC) with substantially less toxicity and treatment-related mortality than CRT. The combination of docetaxel, cisplatin, and 5-flurouracil (TPF) has now replaced PF as the standard of care for induction chemotherapy because of significant and meaningful improvements in survival and LFS compared to PF. TPF-based Sequential Therapy (TPF-ST) represents the preferred standard therapy for patients with advanced LHC and good performance status based on the available evidence. Despite a survival, LRC and LFS improvement and reduced distant metastases with the TPF-ST approach, the primary site of failure in TPF-ST and in CRT trials for LHC continues to be local and regional. This suggests that the focus on future studies might best be focused towards improving LRC and LFS. Mortality and efficacy with CRT can be reduced by reducing radiation doses; improved radiation technology; changing CRT drugs and delivery plans; and integrating surgery. The integration of all three modalities in a Sequential Therapy approach is critical in managing complex patients and attaining optimal outcomes. Our understanding of the biology of HNC and the outcomes of therapy lend strong support the notion that Sequential Therapy should replace induction chemotherapy and CRT as the standard of care in clinical practice. Intensive curative therapy is associated with significant acute toxicity and late consequent morbidity; therapy for LHC will require intensive clinical management and long term follow up by all three therapeutic disciplines.

**Keywords:** Larynx Cancer, Hypopharynx Cancer, Chemotherapy

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[P09-04]

## Evolution of Larynx Preservation Programmes

**Jean louis Lefebvre**

*Département de cancérologie cervico-faciale,  
Centre Oscar Lambret, France*

Larynx preservation (LP) has been extensively studied over the past three decades. However only 6 randomized clinical trials (RCTs) specifically designed for LP have been published to date.

50 % by irradiation (RT) or in the other cases by TL.<sup>≥</sup>The first generation of RCTs compared induction chemotherapy (ICT) versus surgery (total laryngectomy, TL). ICT consisted of cisplatin -5 FU (PF), followed in case of a tumour shrinkage 3 RCTs with this design were pooled in a metaanalysis concluding that there was a non-significant 6% difference in survival favouring the surgery arm and a LP rate of nearly 60%. A recent RCT compared PF vs TPF (PF + docetaxel) before RT in good responders and the LP rate was significantly higher in the TPF arm.

The second generation of RCTs compared ICT vs concomitant chemotherapy and RT (CRT). One RCT compared ICT (PF) vs CRT, vs RT. The LP rate was significantly higher in the CRT arm but at the price of a substancial toxicity and without difference in survival (overall, laryngectomy-free) between ICT and CRT. Another trial compared ICT (PF) vs alternating CRT without difference between both arms.

As additional data are emerging from trials not designed for LP but with subset analysis of larynx/hypopharynx cancers, the new trend is sequencing ICT and CRT and to assess the potential role of bioradiotherapy (BRT: RT+molecumar targeted therapy). One randomized phase II study has assessed LP comparing CRT vs BRT (RT+cetuximab) in good responders after 3 cycles of TPF. Preliminary results showed that tolerance and compliance was higher in the arm ICT+BRT, with similar immediate LP.

Comparison between these RCTS is difficult as the definition of LP varies and does not include in all trials the quality of function of the preserved larynx. In addition when survival is included in the evaluation (survival with larynx) there is no difference any longer between these different LP approaches. LP remains a challenging clinical research and a clear definition of LP in terms of benefit for the patients is warranted.

**Keywords:** Larynx Preservation, Chemotherapy-Radiotherapy, Bioradiotherapy

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## P10. Recent Trends in Skull Base Surgery

**Chair : Dan Fliss (Israel)**

**Moderator : Ehab Hanna(USA)**

13:50 - 15:20 CBR III

[P10-01]

### Endoscopic Skull Base Surgery for Sinonasal Malignancy: Preservation of Oncological Principles

**Carl Snyderman**

*Otolaryngology, University of Pittsburgh Medical Center, USA*

Endoscopic endonasal approaches to the skull base can be applied to the treatment of sinonasal malignancy. For tumors such as olfactory neuroblastomas, the gold standard of treatment is a craniofacial resection with postoperative radiation therapy. The goals of surgery are complete tumor removal with minimal morbidity. An endonasal approach with endoscopic resection provides superior visualization and avoids the morbidity of a craniotomy and brain retraction. The area of dural invasion is excised en bloc and clear margins are confirmed intraoperatively. The extent of surgery includes resection of the dura and olfactory bulbs bilaterally in most cases. Reconstruction of large dural defects is reliably obtained with the use of a vascularized septal mucosal flap or extracranial pericranial flap. Review of the medical literature demonstrates that there is a greater published survival rate for endoscopic surgery compared to open surgery for the treatment of esthesioneuroblastoma (Devaiah et al., 2009). Our own experience with 35 olfactory neuroblastomas treated with an endoscopic endonasal resection reveals excellent results with limited follow up. Intracranial extension and brain invasion are not absolute contraindications to endoscopic resection. Skull base teams should be prepared to convert to an open approach if clear resection margins cannot be obtained endoscopically. Postoperative quality of life is excellent using different measures of sinonasal morbidity. Oncological principles can be maintained with an endoscopic endonasal approach with comparable oncological outcomes. Postoperative morbidity appears to be less with endonasal surgery. Centers with skull base teams will need to collect long-term results to conclusively demonstrate equivalency of open and endoscopic techniques.

**Keywords:** Skull Base, Endoscopic Surgery, Sinonasal Malignancy

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[P10-02]

### Endoscopic Nasopharyngectomy

**Sheng-po Hao**

*Otolaryngology, Shin Kong Wu Ho-Su Memorial Hospital, Taiwan*

Nasopharyngeal carcinoma (NPC) is a malignant epithelial tumor arising in the nasopharyngeal space. NPCs are undifferentiated or poorly differentiated carcinomas and are very radioresponsive, so most patients with NPC are treated with radiation therapy or concurrent chemoradiation therapy. Salvage surgery is a justified treatment for primary recurrence of nasopharyngeal carcinoma (rNPC). Skull base surgery can play a role in rescuing patients with more advanced local recurrence of NPC. Traditional surgical approaches to nasopharynx include transpalatal, transmandibular, transfacial (maxillary swing or facial translocation), transtemporal and/or combined neurosurgical approaches. However, in recent years, there is a trend of shifting paradigm from open to endoscopic in skull base surgery. Thus endoscopic nasopharyngectomy has replaced several traditional open approaches for patients with rNPC. However, endoscopic resection is still a controversial issue in cases of high grade malignancy. The current indication of endoscopic resection for rNPC is still limited in cases with central or limited lateral extension which may yield the same survival rate but less morbidity comparing with open nasopharyngectomy. In conclusion, endoscopic nasopharyngectomy is feasible and safe in rNPC with central or limited lateral extension. Its indication for more advanced cases need further justification.

**Keywords:** NPC, Endoscopic Nasopharyngectomy, Skull Base Surgery

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[P10-03]

## Prognostic Factors in Anterior Skull Base Malignancies

**Snehal Patel**

*Head and Neck Service, Memorial Sloan-Kettering Cancer Center,  
USA*

**Background:** Malignant tumors of the skull base are rare. Therefore, no single center treats enough patients to accumulate significant numbers for meaningful analysis of outcomes after craniofacial resection (CFR). This presentation will discuss prognostic factors of outcome based on a large cohort analyzed retrospectively by an International Collaborative Study Group.

**Patients and Methods:** 1,307 patients who underwent CFR in 17 institutions were analyzable for outcome. The median age was 54 years (range 1-98). Definitive treatment prior to CFR had been administered in 59% patients: radiation therapy in 367 (28%), chemotherapy in 151 (12%) and surgery in 523 (40%). The majority of tumors (87%) involved the anterior cranial fossa. Squamous cell carcinoma (29%) and adenocarcinoma (16%) were the most common histologic types. The margins of surgical resection were reported close/positive in 412 (32%) patients. Adjuvant postoperative radiation therapy was used in 510 (39%) and chemotherapy in 57 (4%) patients.

**Results:** Postoperative complications were reported in 433 (33%) patients, local wound complications being the commonest (18%). The postoperative mortality rate was 4%. With a median follow-up of 25 months, the 5-year overall, disease-specific and recurrence-free survival rates were 54%, 60% and 53% respectively. The histology of the primary tumor, its intracranial extent and status of surgical margins were independent predictors of overall, disease-specific and recurrence-free survival on multivariate analysis.

**Conclusions:** CFS is a safe and effective treatment option for malignant tumors of the skull base. The histology of the primary tumor, its intracranial extent, and the status of surgical margins are independent determinants of outcome.

**Keywords:** Skull Base Neoplasms/Surgery, Skull Base Neoplasms/Mortality, International Cooperation

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[P10-04]

## Quality of Life in Patients with Skull Base Tumors

**Dan Fliss**

*Otolaryngology Head and Neck Surgery,  
Tel Aviv Sourasky Medical Center, Israel*

In selection of the right treatment for a specific patient, the surgeon should consider not only the best approach to remove a tumor but also the impact of treatment on the quality of life (QOL) of the patient. Procedures involving extirpation of skull base tumors may be associated with high morbidity. It is therefore important to study patients with skull base neoplasms, because survival differences between various treatment modalities may be small, yet larger differences are expected regarding morbidity. The overall QOL in the majority of patients after skull base tumor resection can be classified as "good", with significant improvement taking place within 12 months following surgery. Patients with carcinomas, acoustic schwannoma, or Cushing's disease suffer from more significant deterioration in their QOL after any intervention. Data retrieved from disease-specific questionnaires revealed that financial and emotional domains have the worse impact on patients QOL. Old age, malignancy, comorbidity, radiotherapy, and extensive surgery were found to be also negative prognostic factors for QOL. Pain control regimens, antidepresants, and other psychological modalities, including group support, can improve QOL measures in these patients. It is critical that surgeons understand that they cannot assess their patient's perspectives on QOL correctly without asking them. For adequate assessment, validated disease-specific instruments addressing multiple domains of QOL should be utilized.

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## P11. Recent Progress in Management of Neck

**Chair : C. René Leemans (Netherlands)**

**Moderator : K Thomas Robbins (USA)**

15:50 - 17:20 CBR I + II

[P11-01]

### The Importance of Standardization in Neck Dissection: Observations Based on Outcomes

**Masahisa Saikawa**

*Division of Head and Neck Surgery, National Cancer Center Hospital East, Japan*

**Objective:** To standardize details of neck dissection so that the same neck dissection procedure is performed in every hospital if the primary site and TNM-stage of the disease are the same. Because of few exchanges of doctors and surgical techniques among leading Japanese hospitals, nonradical neck dissections in Japan became so diverse that an urgent intervention was necessary to ensure the uniformity and comparability of the procedures.

**Methods:** In 2002, the Japan Neck Dissection Study Group (JNDSG) was organized with the participation of 22 leading Japanese hospitals. To enhance exchanges among member hospitals and standardize nonradical neck dissections, JNDSG planned a prospective study, in which surgeons from participating hospitals were directed to observe neck dissections conducted in other hospitals. To standardize the observation method, JNDSG created a specialized form consisting of 79 questions regarding details of neck dissection. An observing surgeon had to fill out the form during surgical observation. The study was divided into the first and second stages.

**Results:** 1) A total of 235 patients were enrolled between February 18, 2004 and November 22, 2006. 2) Of the 79 questions, difference among participating hospitals was confirmed in 13 questions and strongly suspected in 7 questions. To standardize these 20 questions or details, JNDSG established a manual based on the discussion about the optimal maneuvers concerning the details because there was very few evidence. 3) As the study proceeded from the first to the second stage, the intensity of difference among participating hospitals decreased in 11 details and increased in 6 details. Because there were more details showing decreased intensity, this study was concluded to have contributed to some extent to the standardization of nonradical neck dissections in Japan. 4) Although the 2-year neck control and overall survival rates of the second-stage patients were higher than those of control, the differences were not significant.

**Conclusions:** Although standardization of a surgical procedure in a multi-institutional setting is a very rare undertaking, this study achieved noteworthy success. To establish medical evidence concerning details of neck dissection and achieve complete standardization, JNDSG has started another prospective study.

**Keywords:** Neck Dissection, Head and Neck Cancer, Standardization

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[P11-02]

### Is There Any Progress in the Clinical Management of the N0 Neck

**Javier Gavilán**

*Otorhinolaryngology, La Paz University Hospital, Spain*

Nodal involvement is the most important prognostic factor in head and neck cancer. Whereas treatment of N+ patients is well defined, the optimal management of the clinically N0 neck remains controversial. Wait-and-see, surgery, and radiotherapy are the traditional options for the management of the N0 neck. However, in recent years new tools such as ultrasound fine needle aspiration cytology, sentinel node biopsy, or PET scans have been proposed to decrease the number of unnecessary treated N0 patients.

This presentation deals with the real usefulness of these and other relatively new tools in a common clinical practice, away from research laboratories and leading technological centers.

**Keywords:** N0 Neck, Treatment, Neck Dissection

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[P11-03]

## Planned Neck Dissection after Radiation in the Era of PET/CT

**Sandro Stoeckli**

Otorhinolaryngology, Head and Neck Surgery,  
Kantonsspital St. Gallen, Switzerland

**Background:** Primary radiochemotherapy plays an important role in organ preservation protocols for the treatment of advanced head and neck squamous cell carcinomas (HNSCC). Early detection of persistent or recurrent disease is crucial for the success of surgical salvage treatment. Radiation induced tissue alterations diminish diagnostic accuracy of morphologic imaging modalities like contrast enhanced high resolution computed tomography (HRCT), magnetic resonance imaging (MRI) and ultrasound (US) with fine needle aspiration cytology (FNAC). In line positron emission tomography with 18-Fluoro-Deoxy-Glucose (FDG) and CT (PET/CT) combines morphologic and metabolic assessment of tumors. The aims of this study were to compare the diagnostic accuracy of PET/CT, HRCT, MRI and US-FNAC (1) for the early detection of a persistent primary tumor, and (2) for the early detection of persistent nodal disease.

**Methods:** All patients undergoing primary radiochemotherapy for an advanced HNSCC (stage III/IV) were eligible. Initial staging with PET/CT, HRCT, MRI and US-FNAC was performed prior to radiation therapy. Restaging with the same imaging modalities was done 6 to 8 weeks after completion of the radiation regimen. Within two weeks after restaging panendoscopy with biopsy of the primary tumor site and planned neck dissection were performed. The imaging modalities were compared against histologic work-up as standard of reference.

**Results:** The sensitivity, specificity, PPV and NPV for PET/CT for the assessment of a local recurrence was 83, 88, 53 and 97%, respectively, and for the assessment of a neck recurrence 36, 95, 77 and 77%, respectively.

**Conclusions:** PET/CT is highly accurate for the exclusion of a local recurrence after primary chemoradiation, but less accurate for the exclusion of regional relapse in the neck. The comparison with the other imaging modalities will be presented at the conference.

**Keywords:** PET/CT, Radiotherapy, Head and Neck

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[P11-04]

## Treating the Neck with Intensity Modulated Radiation Therapy (IMRT): Are There New Issues?

**Vincent Grégoire<sup>1</sup>\*, Marc Hamoir<sup>2</sup>, Jean-Pascal Machiels<sup>3</sup>**

<sup>1</sup>Radiation Oncology Department,

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<sup>3</sup>Medical Oncology Dept.,

Universite Catholique de Louvain, Belgium

Assessment and treatment of regional lymph nodes (LNs) in the neck are of utmost importance in the management of patients with head and neck squamous cell carcinoma (SCC). The philosophy of treatment of the neck has evolved over the past decades. Radiation oncologists and head and neck surgeons progressively realized that extensive treatments were associated with more morbidity but not always with a better oncologic outcome than less extensive procedures. Today, a comprehensive approach of the treatment of the neck needs to be multidisciplinary, taking into account the quality of life of the patients, but without jeopardizing cure and survival.

A better understanding of the patterns of LN metastasis promoted the use of not only selective dissection but also selective irradiation in selected patients. Such philosophy does not only allow a reduction in the treatment morbidity, but it also permits safer re-irradiation in case of developments of second primary cancer in the head and neck area. With the use of Intensity Modulated Radiation Therapy (IMRT), the dose fractionation concept can also be revisited. Indeed Simultaneous Integrated Boost IMRT (SIB-IMRT) enables the delivery of graded dose of radiation in various target volumes. For example, it does allow to delivering a slightly lower dose per fraction to the prophylactic nodal areas than in the metastatic node and/or the primary tumor volumes. Revisiting the 2 Gy dose per fraction, however, needs to be done with caution especially when combining radiotherapy with concomitant chemotherapy or targeted agents.

This lecture will summarize the state of the art in treatments of neck, and elaborate on future clinical research directions aiming at improving overall survival and/or decreasing morbidity.

**Keywords:** Radiation Oncology, Selective Neck Irradiation, Intensity Modulated Radiation Oncology

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## P12. Functional Outcome and QOL

**Chair : Jan Betka (Czech Republic)**

**Moderator : Uta Tschiesner (Germany)**

15:50 - 17:20 CBR III

[P12-01]

[P12-02]

### Major Elements of Progress in H&N QOL

**Ernest Weymuller**

*Department of Otolaryngology–Head & Neck Surgery,  
University of Washington, USA*

Over the last 20 years, investigations in quality of life (QOL) in H&N cancer have achieved substantial sophistication. The topic has been accepted as an important component in the evaluation and management of patients with H&N cancer. Well-recognized psychometric techniques have been applied to validate a number of H&N specific QOL instruments and a variety of QOL issues have been addressed. This chapter is not a comprehensive QOL manual. It is intended to provide a guide to reference material for the interested reader, to summarize the current state of QOL methodology in H&N cancer, and to highlight areas of potential future investigation.

Given the current therapeutic options for head and neck (H&N) cancer, it is impossible to avoid treatment-related side effects. Unlike most other cancers, the treatment-related side effects of H&N cancer are immediately noticeable in social settings (disfigurement, altered speech, inability to swallow, etc.). These outcomes have a direct impact on the day-to-day ability of our patients to enjoy their existence, i.e., their quality of life (QOL). Cured H&N cancer patients have a worse QOL than age-matched controls<sup>1</sup> and there is good evidence that, in comparison to more common cancers, patients treated for H&N cancer are more impaired with respect to QOL<sup>2</sup>, and have suicide rates that are significantly greater than those with other cancers and the general population (Stephanie Misono as cited by Zeller)<sup>3</sup>.

Emphasizing the importance of QOL in H&N cancer patients may allow for earlier detection of disability and depression and provide opportunities for corrective intervention. It is for these reasons that investigations in QOL are relevant and important.

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**Anil K. D'Cruz**

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India*

[P12-03]

## Quality of Life and Early Glottic Cancer

**Randall Morton**

*Otolaryngology-Head and Neck Surgery, Counties-Manukau DHB,  
New Zealand*

The survival outcomes for early (Tis/T1/T2) Glottic cancer are comparable, irrespective of whether the patient is treated initially with radiotherapy (RT) or surgery. The current preferred surgical approach is trans-oral laser microsurgery (TLM).

The functional outcomes - principally Voice but also Swallowing - differ according to treatment modality. How these effects impact on overall Quality of Life (QOL) is reviewed in this presentation.

A systematic review of the literature reveals no Randomised Clinical Trials (level 1 or 2 evidence) that can be used; data from 11 level 3 studies (6 of which have 'blinded' assessments) and 4 level 4 studies are used to examine differences in voice and QOL outcomes after treatment for early glottic cancer.

The results are not thoroughly consistent; a major difficulty is the small size and heterogeneity of the studies. On balance, however, there is insufficient evidence to indicate better voicing outcomes with any specific treatment (excluding the now largely historical laryngofissure approach, which has manifestly poorer voice outcomes).

There are 9 comparative studies that have addressed QOL outcomes in early glottic cancer: 4 showed no significant difference in QOL outcome with treatment, 3 have components of QOL that were better with TLM, while 2 show RT with better QOL or QOL component outcomes.

**Conclusion:**

Overall survival and local tumour control is similar after treatment with TLM or RT

Voice outcomes are generally not significantly different between TLM or RT

Patient-rated global QOL is probably unrelated to treatment if voicing is reasonable.

**Keywords:** Glottic Cancer, Voice Outcomes, Quality of Life

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[P12-04]

## Quality of Life after Head and Neck Cancer Treatment

**Jan Olofsson**

*Department of Otolaryngology/Head & Neck Surgery,  
Haukeland University Hospital, Norway*

**Objective:** Multiple Quality of Life studies are performed in head and neck cancer patients. Psychological factors account for 30% of HRQoL. Our aim was to look at QoL after treatment of head and neck cancer with focus on personality and relation to mood, social support, drinking of alcohol and smoking.

**Methods:** About 650,000 new cases of head and neck carcinomas are annually reported world wide. 90% are squamous cell carcinomas. The incidence of these cancer varies in different continents. At least 50% of these patients are curatively treated.

HRQoL was assessed by ORTC-QLQ-C30 (ver. 3.0) and QLQ-H&N35 HRQoL. Personality was determined by the Eysenck Personality Inventory/Questionnaire (EPI/EPQ), mood by the Beck Depression Inventory (BDI) scores, level of social support by the Murberg social support test.

200 members of the Norwegian Society of Laryngectomees were invited to answer questions assessing QoL and were analysed together with the responses from all HNSCC treatment survivors in Western Norway between 1992 and 1997. These samples included 96 of 106 eligible patients.

**Results:** Neuroticism was associated with low HRQoL. Extraversion was associated with general HRQoL, physical and emotional scores. Radiation therapy was associated with H&N35 symptom scores. Problem-focused coping style was associated with T-stage and whether or not radiotherapy was administered to the neck.

Reported level of alcohol consumption was associated with global HRQoL and DTC. Reported smoking level was associated with DTC. T-stage was inversely associated with secondary HRQoL scores. High neuroticism generally predicted low secondary HRQoL scores.

**Conclusions:** HRQoL of laryngectomees is relatively similar to that of a general population of patients treated for HNSCC and related to activity level within a patient interest organisation and associated with decreased mood. High neuroticism, but not extraversion is broadly associated with lower HRQoL. The level of problem-focused coping style was associated with T-stage and whether radiotherapy was administered to the neck. Level of avoidance coping was inversely associated with HRQoL. A

high T-stage, high neuroticism, coping by humor and coping by problem-solving directly predicted low HRQoL, whereas neuroticism was only associated with HRQoL through avoidance coping.

**Keywords:** H&N Cancer, HRQoL, Personality

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## O12. Reconstruction (II) : Free Flap

**Chairs : Hideyuki Kawauchi (Japan)**

**John Yoo (Canada)**

08:00 - 09:30 SBR I

[O12-01]

### Clinical and Pathomorphological Results of 40 Patients with Head and Neck Reconstructions Using Microvascular Flaps and Bone Grafts

Anna Kazanceva<sup>1</sup>, Juris Tars<sup>1</sup>, Kalvis Pastars<sup>2\*</sup>, Valerija Groma<sup>3</sup>, Egils Kornevs<sup>1</sup>, Arguts Keirans<sup>2</sup>

<sup>1</sup>Department of Head and Neck Surgery, RAKUS, Latvia

<sup>2</sup>Center of Plastic and Reconstructive Microsurgery, RAKUS, Latvia

<sup>3</sup>Institute of Anatomy and Anthropology, Riga Stradiņš University, Latvia

**Objective:** Sufficient reconstruction ensures primary wound closure and healing after radical tumor surgery. Problems and limitations in head and neck reconstruction are irradiated tissue, functional sensibility, cosmetic deformation, patient physiologic status, donor side defect. We analyze the clinical results; to evaluate the local effects of postoperative radiation therapy on the microvascular flaps; to estimate the histological appearance and degree of osteointegration and vascular supply using TGF- $\beta$ , CD34 immunohistochemistry was performed.

**Method(s):** 40 patients with various histologically confirmed head and neck malignancies were used in this study. Immunohistochemistry was applied to the bone graft biopsy specimens.

**Result(s):** Advanced skin cancer required en-bloc resection of tumor and invaded structures, many patients required neck dissection. Indications for adjuvant post-operative radiotherapy: close or positive margins, perineural invasion, two or more positive nodes, extracapsular spread, nodes >3 cm, parotid metastases, poorly differentiated tumor. In cases of clinically complete bone grafts osteointegration TGF- $\beta$  expression was related to the osteoblastic cell lineage, CD34 in turn, to the vascular beds. We determine no flap complication after the adjuvant radiotherapy.

**Conclusion(s):** Complications and success of mandibular reconstructions depend on: the type of the malignancy, immediate reconstructions, radiotherapy, location of the defect, surgical approach and method of the graft fixation as also dental/functional rehabilitation. The bone graft osteointegration is completed in 6 months after surgery. TGF- $\beta$  is involved in early stages of bone development as well as in bone repair and remodeling after trauma. Vascular supply is essential for bone graft healing and clinical outcome. The adjuvant radiotherapy do not compromise flap healing and is important for tumor control.

**Keywords:** Head and Neck Cancer, Head and Neck Reconstruct, Acin Expressio

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[O12-02]

### Tongue Reconstruction: Preserving Form and Function while Decreasing Donor Site Morbidity Using the Partial Superior Latissimus Flap

Brian Parrett<sup>1\*</sup>, Rudolf Buntic<sup>1</sup>, Darrell Brooks<sup>1</sup>, Jennifer Prince<sup>1</sup>, Mark Singer<sup>2</sup>

<sup>1</sup>Division of Microsurgery, The Buncke Clinic, California Pacific Medical Center, USA

<sup>2</sup>Department of Head and Neck Surgery, California Pacific Medical Center, USA

**Objective:** The radial forearm flap for tongue reconstruction has several disadvantages: an aesthetically displeasing donor site, sacrifice of a major hand artery, and graft loss over tendons. In search for a better reconstruction, we have begun to reconstruct glossectomy defects with the partial superior latissimus muscle free flap.

**Method(s):** Our initial cases using the partial latissimus flap for tongue reconstruction were retrospectively reviewed to determine outcomes including flap and donor site complications as well as speech and swallow function. We also sought to describe the evolution of our technique.

**Result(s):** Two total and five hemi-glossectomy defects were reconstructed with the partial superior latissimus flap in seven patients (mean age, 59 years). In all cases, the lateral latissimus muscle and its thoracodorsal nerve innervation were left intact. All flaps were innervated by coaptation of the thoracodorsal nerve transverse branch to either the hypoglossal or lingual nerve. Mean operative time was 4.5 hours and pedicle length was 9 to 14 cm. A skin paddle was included in 4 flaps to reconstruct the floor of mouth. All flaps survived with no partial flap loss or donor site complications. Six patients received post-operative radiation. With a mean follow-up of one year, there was no wound dehiscence or fistula formation. Mean speech intelligibility was 90% and all patients were maintained solely on an oral diet by post-operative day 30. One patient required late release and resurfacing of intraoral scarring.

**Conclusion(s):** The partial latissimus flap should be an alternative to the radial forearm flap for tongue reconstruction. This flap is reliable and has the advantages of large caliber vessels, a long vascular pedicle, preservation of the majority of the donor latissimus muscle in situ, the potential for re-innervation, and the ability to be easily molded to the three-dimensional intraoral defect.

**Keywords:** Partial Latissimus Flap, Tongue Reconstruction

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[O12-03]

## FAMM Flap: Can It used after Oral Radiotherapy?

**Gerald Valette\***, Gael Potard, Christine Martins carvalho,  
Yves Gauvin, Florence Rogez, Laurent Delahaye,  
Remi Marianowski

*Head and Neck Surgery Center,  
University Hospital of BREST, France*

**Objective:** The FAMM (FAMM: Facial Artery Mucosa Muscular) Flap described by Pribaz in 1992, can be used in oral surgery on different indications. The primary reconstruction after the resection for an oral cancer is the most evaluated indication. There is no data about FAMM flap vitality when it's done after an oral radiotherapy.

**Method(s):** 20 cases from the university hospital of Brest head and neck surgery center between April 2007 and September 2009 were analyzed in a retrospective study. The indication (primary reconstruction, osteoradionecrosis, bucco-sinus defect), the status of treatment (post radiotherapy or not), complications (hematoma, infection, necrosis), the weaning delay of the pedicula and time to an oral feeding was analyzed.

**Result(s):** One case of hematoma, no infection and no necrosis were observed. One case did not give a good result. There is no difference in terms of viability between a post radiotherapy surgery. The weaning delay and the time delay to an oral feeding is twice longer after radiotherapy.

**Conclusion(s):** This flap can be used after radiotherapy with precaution care, a longer delay to oral refeeding is necessary and not used in an advanced osteoradionecrosis. The FAMM flap represents a good solution event after radiotherapy for the loss of medium size substance, it represents a good solution between directed healing and more consistent skin flaps.

**Keywords:** FAMM Flap, Postradiotherapy, Osteoradionecrosis

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[O12-04]

## The Utility of Free Vertical Rectus Abdominis Myocutaneous Flap in Head and Neck Reconstruction

**Hamdy Elmarakby\***

*Surgery, National Cancer Institute, Egypt*

**Objective:** To evaluate the utility and the versatility of the free vertical rectus abdominis flap in a variety of head neck defects. This will focus on the suitability of the flap designs in various head and neck defects as well as the relatively long vascular pedicle (DIEA and vein) that can reach the neck vessels particularly with the scalp reconstruction. The robust vascularity as compared to the standard TRAM flap will be tested.

**Method(s):** A group of 12 patients with variety of head and neck defects (scalp, temple and side of the face) after resection of head and neck cancer were selected in the study. All patients were not suitable for local or locoregional flaps because of previous failures or disease recurrences and/or after radiotherapy treatment. A two team approach was adopted in all cases where one team undertook the resection while the other team carried out the flap harvest simultaneously.

**Result(s):** All patients survived the procedure with an average operative time 245 minutes with 2 units of whole blood transfusion. There were no single flap loss however, there were 2 cases who required re-exploration because of haematoma. The average hospital stay was 10 days and all patients were followed up for 6 months where no late complications or tumour recurrences developed.

**Conclusion(s):** The free vertical rectus abdominis flap is a versatile and suitable alternative to the free TRAM flap in head and neck reconstruction. This is particularly useful where a longer pedicle is required to reach the neck vessels in scalp defects. The flap design is much easier and the vascularity is more robust as there is no dodgy zone 4 as it is with the TRAM flaps. Moreover the bulk and the volume of the flap is much less as it contains less fat than the classic TRAM flap.

**Keywords:** VRAM, Free, Myo Cutaneous

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[O12-05]

## Deep Inferior Epigastric Artery Perforated Rectus Abdominis Free Flap for Head and Neck Reconstruction

**Cesare Piazza\***, Johnny Cappiello, Andrea Bolzoni villaret, Francesca Del Bon, Stefano Mangili, Michele Sessa, Piero Nicolai

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University of Brescia, Italy

**Objective:** The deep inferior epigastric artery perforated rectus abdominis (DIEAP-ra) free flap is a modification of the classic myocutaneous DIEA free flap in which only the fascio-cutaneous tissue is harvested based on the paraumbilical perforators of the medial row. We herein retrospectively describe our experience with this reconstructive technique.

**Method(s):** From June 2004 to February 2009, 24 patients affected by maxillo-facial, skull base, oral and oropharyngeal defects following oncologic surgery were submitted to reconstruction with DIEAP-ra at our Institute. The skin paddle was single in 16 patients and double in 8. Flap sizes ranged from 6×8 cm to 12×14 cm. Thickness of the skin paddle ranged from 1.4 cm to 2 cm. After harvesting the DIEAP-ra, the longitudinally split muscular belly was sutured and the anterior rectus sheath closed by a mattress nonabsorbable suture without inlay mesh interposition.

**Result(s):** Surgical defects encompassed half hard palate in 10 patients, orbit and part of the cranial vault in 1, radical extended parotidectomy in 4, subtotal glossectomy in 7, and total glossectomy in 2. Our only complete flap necrosis (4%) developed as a consequence of an oro-cutaneous fistula due to parapharyngeal space infection. It required a second latissimus dorsi free flap. Another case (4%) developed a partial necrosis for oropharyngeal fistula after total glossectomy. Fistula healed after transposition of a pedicled myofascial pectoralis major flap. Two patients (8%) presented a minor salivary fistula healed by standard medications. No major complications of the donor site were observed.

**Conclusion(s):** DIEAP-ra is a valid alternative to the classic myocutaneous DIEA free flap when applied to complex maxillo-facial or tongue major defects. Its greatest advantages are represented by the reduced donor site morbidity and a more adjustable thickness of the skin paddle, particularly in females and obese patients.

**Keywords:** Rectus Abdominis, Free Flap, Head and Neck Reconstruction

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[O12-06]

## Iliac Crest-Tensor Facia Lata Osteomyocutaneous Flap for Orbitomaxillary Reconstruction

**Subramania Iyer<sup>1</sup>\***, Moni Abraham Kuriakose<sup>2</sup>, Pattatheyil Arun<sup>3</sup>, Vikram Kekatpure<sup>4</sup>, Sudhir Nair<sup>1</sup>

<sup>1</sup>Head and Neck Surgery, Amrita Institute of Medical Sciences, India

<sup>2</sup>Head and Neck Surgery, Kochi, India

<sup>3</sup>Head and Neck Surgery, Majumdar Shah cancer Centre, India

<sup>4</sup>Head and Neck Surgery, Bangalore, India

**Objective:** A new method of reconstruction of maxillectomy defects using Iliac crest-Tensor facial lata flap is proposed. The results of the cadaver dissection, use of the flap in 7 clinical cases and its superiority over the existing methods is described.

**Method(s):** Initial cadaver dissections were carried out to assess the flap and pedicle characteristics of the iliac crest-TFL flap. This flap was used in 5 cases of cancers of the maxilla which necessitated extensive resection of the orbital floor along with the maxillectomy. The flap was raised as a muscle and bone flap in three cases and in two, a skin paddle was included. The immediate and delayed outcome at 6 month follow up were analyzed. The functional outcome with regards to the ocular position and function, palatal obturation, speech and swallowing were recorded. The bone viability at 6 months was assessed by CT scan.

**Result(s):** Cadaver studies helped identify tissue and the pedicle characteristics. In the clinical series all the five flaps survived. The pedicle length averaged 7 cm and direct anastomosis was possible to the neck vessels. The delayed outcome assessment showed that the orbital support was excellent with no diplopia in all the cases. The palatal defect could be obturated successfully in all the cases resulting in normal speech and swallowing. The CT scan showed excellent integration in all the cases. Primary closure of the donor site was possible with evidence of no donor site morbidity.

**Conclusion(s):** Iliac crest-TFL flap is a reliable and safe method of reconstruction of the orbitomaxillary defects. This flap addresses the issues of both orbital support and palatal obturation very well. The flap is associated with minimal morbidity and easy to harvest.

**Keywords:** Iliac Crest-TFL Flap, Maxillectomy, Microvascular Reconstruction

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[O12-07]

## **Anterolateral Thigh Cutaneous Flap vs. Radial Forearm Free Flap: Our Experience in Oral, Oropharyngeal and Hypopharyngeal Reconstruction**

**Camaioni Angelo, Damiani Valerio\*, Loreti Andrea,  
Viti Claudio, Matteo Simone**

*ENT Department, San Giovanni Addolorato Hospital, Italy*

**Objective:** To compare radial forearm fasciocutaneous free flap (RFFF) versus the thinned anterolateral thigh cutaneous free flap (tALT flap), in oral, oropharyngeal and hypopharyngeal reconstruction after oncologic surgery.

**Method(s):** Between January 2003 and June 2009, we surgically treated with a demolitive procedure 89 patients affected by oral, oropharyngeal and hypopharyngeal carcinoma; in reconstructive phase we used a RFFF in 27 cases and in 62 a tALT flap.

**Result(s):** In patients treated with RFFF we had a 92,6% of flaps survival; in cases treated with tALT flap we had a 93,5% of survival ( $P<0,9$ ). Functional results at receiving site were comparable in both groups. Functional results at donor site were worse in the RFFF group, with permanent forearm movement impairment in 37,0% of cases; in the tALT flap group we had no permanent impairment and we noticed only transitory gait impairment in 9,7% of patients.

**Conclusion(s):** In our experience, thinned ALT flap is comparable to RFFF in term of functional results at receiving site, but, having no limitation in availability of donor tissue, it allows a more extended resection of the tumor. Moreover, the donor site can be closed primarily with only an inconspicuous curvilinear scar left over the thigh and with a significantly reduced functional impairment.

**Keywords:** ALT, RFFF, Reconstruction

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[O12-08]

## **The Versatility of Anterolateral Thigh Flap for Multiple Defects in Head and Neck Reconstruction**

**Chien-chung Chen, Pao-Yuan Lin\*, Seng-Feng Jeng**

*Plastic and Reconstructive Surgery,  
Chang Gung Memorial Hospital, Taiwan*

**Objective:** Anterolateral thigh flap is a workhorse flap for the head and neck reconstruction. In patients with composite or different sites of defects, double free flaps reconstruction would be necessary. In the literature, two free forearm flaps were always used to accomplish the reconstruction. However, the skin graft was usually needed in the donor site and scar was prominent. Therefore, one flap from the same thigh for two defects reconstruction at the same time would be useful for these patients.

**Method(s):** From July of 2006 to September of 2009, there were 11 patients with two different defects during the same operation needed soft tissue reconstruction. Anterolateral thigh perforator flaps in different forms were used for those defects reconstruction in one operation. Two free flaps divided from one anterolateral thigh flap and two recipient vessels anastomosis (type 1), two flaps with two perforators from the same pedicle and one recipient vessel anastomosis (type 2), or only one perforator within the flap and one recipient vessel anastomosis (type 3) were included.

**Result(s):** These patients were all male, and the age ranged from 44 years to 70 years. There were three patients in type 1, four patients in type 2 and four patients in type 3. The hospitalization period ranged from 12 days to 32 days. All of the flaps were viable but there was only one patient with venous thrombosis that needed venous revision on the day 5 postoperatively. All of the patients, the donor site was closed primarily.

**Conclusion(s):** Anterolateral thigh flap can be divided into three different types depended on the numbers of the perforators, and it can provide one long flap or two individual flaps for the defects repair during the same surgery. And the donor site morbidity is minimal. Anterolateral thigh flap is a useful flap for those multiple defects because of its versatility.

**Keywords:** Microsurgery, Head and Neck, Anterolateral Thigh Flap

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[O12-09]

## The Medial Sural Perforator Free Flap for the Oropharyngeal Reconstruction

**Jong woo Choi<sup>1\*</sup>, Sang Yoon Kim<sup>2</sup>, Seung-Ho Choi<sup>2</sup>, Soon Yuhl Nam<sup>2</sup>, Kyung S Koh<sup>1</sup>**

<sup>1</sup>Plastic and Reconstructive Surgery, Seoul Asan Medical Center, Korea

<sup>2</sup>Head and Neck Department, Seoul Asan Medical Center, Korea

**Objective:** The functional oropharyngeal reconstruction require various flaps according to the size and location of the defect. The oropharyngeal defects after the resection of the tumors have been usually reconstructed with radial forearm, anterolateral thigh (ALT) perforator or rectus myocutaneous free flaps. But, in case of radial forearm free flaps, sometimes the flaps are too thin to reconstruct large submental defect. On the contrary, ALT perforator free flaps are often too thick to reconstruct the 3 dimensional oropharyngeal defects which require folding of flaps. For better functional reconstructions, new flaps with intermediate volume are needed. We have applied medial sural perforator free flaps for oropharyngeal reconstructions.

**Method(s):** From March, 2006 to Dec. 2009, we reconstructed the 160 cases of oropharyngeal defects with free flaps. Among these, medial sural perforator free flaps were used in 18 cases. The follow up period was 26 months in average. 10 were for tongue reconstructions and 6 were for tonsillar reconstruction and 2 were for buccal reconstructions. Preoperatively, 3D CT angiography were performed for identification of medial sural perforators.

**Result(s):** All cases except one were done successfully. In 1 case, the flaps failed due to vascular spasm of the perforator at postoperative day 1. In 10 cases, the donor sites were closed primarily. The mean thickness were 7.1 mm (5-12 mm) in medial sural perforator free flaps. The size of the flaps were 5×15 cm in average. The length of pedicle was 8 cm (5-15 cm) in average. There is no fistula, bleeding or infection. The functional reconstruction with medial sural perforator free flaps were successful.

**Conclusion(s):** Medial sural perforator free flaps could be one more alternative in case of medium sized defects in which radial forearm or ALT perforator free flaps would not be adequate in point of flap volumes.

**Keywords:** Medial Sural Perforator Free Flap, Oropharyngeal Reconstruction, Flap Thickness

**Corresponding Author** Jong woo Choi (pschoi@amc.seoul.kr)

**O13. Salivary Gland****Chairs : Igor Reshetov (Russia)****Peter Zbaeren (Switzerland)**

08:00 - 09:30 SBR II

[O13-01]

**Surgical Management of Minor Salivary Gland Tumors****Liang Zhou\***

*Dept. Otolaryngology- Head & Neck Surgery,  
Eye Ear Nose and Throat Hospital/Fudan University, China*

**Objective:** To study the clinical features of minor salivary gland tumors and to discuss the treatment modalities for these tumors.

**Method(s):** Retrospective analysis of 54 cases of minor salivary gland tumor operated in our hospital from 1997 to 2004.

**Result(s):** Among 54 cases with minor salivary gland tumors in this series, 16 patients lost of follow up. Among the remaining 38 patients, 2 patients with nasal cavity adenoid cystic carcinoma died of tumor recurrence 2 and 3 years after the surgery respectively, one patient with laryngeal myoepithelial carcinoma died of tumor recurrence 3 years after the surgery and one patient with paranasal sinus mucoepidermoid carcinoma died of recurrence 17 months after the surgery. 2 patients with paranasal sinus adenoid cystic carcinoma recurred after the primary surgery and were survived without tumor after salvage surgery. The other patients survived with no tumor recurrence.

**Conclusion(s):** While different histopathology of minor salivary gland tumors were found in this group, malignant tumors were predominant, accounting for 81.4%. The treatment of choice for minor salivary gland tumors depends upon the location and the histopathology of the tumors. The treatment policy for benign tumors is simply tumor excision, while that for malignant tumors is surgery combined with pre- or post-operative radiation therapy. Complete surgical resection with tumor-free margin is essential to success.

**Keywords:** Minor Salivary Gland Tumors, Clinical Manifestation, Treatment

**Corresponding Author** Liang Zhou (zhoulent@126.com)

[O13-02]

**Descriptive Study of 1,207 Salivary Gland Tumors in Chinese Population: One Cancer Center Experience 1997-2007****Qing-Hai Ji<sup>1</sup>\*, Yu-Long Wang<sup>1</sup>, Tong-Zhen Chen<sup>2</sup>**

<sup>1</sup>*Department of Head & Neck Surgery, Cancer Hospital, Fudan University, China*

<sup>2</sup>*Department of Pathology, Cancer Hospital, Fudan University, China*

**Objective:** To investigate the disease distribution and clinicopathological characteristics of salivary gland tumors (SGC) primarily operated at one Chinese tertiary cancer center.

**Method(s):** All the files of the salivary gland tumors operated primarily at Department of Head& Neck Surgery, Cancer Hospital, Fudan University, Shanghai, China from 1997 to 2007 were built in a database. Histological slides were re-reviewed and re-classified by the pathologists according to the 2005 WHO classification.

**Result(s):** Totally 1,207 cases of salivary gland tumor were operated at our department (male: female, 598:609). The median age is 48 years old (8-86). The cases of parotid, submandibular, sublingual and small salivary gland were 903, 261, 6 and 37, respectively. Plate was the popular site of small salivary gland tumor (18). Among 917 benign cases, pleomorphic adenoma (67.61%), warthin tumor (22.68%) and base cell adenoma (4.0%) were the most popular types. Mucoepidermoid carcinoma(24.1%), adenoid cystic carcinoma (18.0%), acinic cell carcinoma (12.5%), lymphoepithelial carcinoma (9.83%) and salivary duct carcinoma (9.15%) were the popular types in 290 malignant cases. The most popular malignant types at parotid region were mucoepidermoid carcinoma (27.82%, 55/197) and acinic cell carcinoma (16.24%, 32/197), while it's adenoid cystic carcinoma (29.23%, 19/65) followed by salivary duct carcinoma (15.38%, 10/65) at submandibular gland. Adenoid cystic carcinoma is the dominant malignant type at sublingual gland (70%, 5/7) and small salivary gland (50%, 14/26). The median follow up time and follow up rate of parotid carcinoma were 28 months (2-128 months) and 86.36% (152/176). Five year survival rate and 10 year survival rate were 83% and 67%. Cox regression analysis showed that metastasis ( $P<0.000$ ), TNM stage ( $P=0.039$ ) and pathological grade ( $P=0.006$ ) were the risk factors of parotid carcinoma.

**Conclusion(s):** Pathological grade and TNM stage based comprehensive management with operation and radiation therapy can achieve a relatively better result of salivary gland carcinomas.

**Keywords:** Salivary Gland Tumor, Prognosis, Disease Distribution

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[O13-03]

## Clinicopathological Factors are Predictors of Distant Metastasis from Major Salivary Gland Carcinomas

Fernanda Viviane Mariano<sup>1</sup>, Sabrina Daniela da Silva<sup>2</sup>,  
 Thiago Celestino Chulan<sup>2</sup>, Oslei Paes de Almeida<sup>1</sup>,  
Luiz Paulo Kowalski<sup>2\*</sup>

<sup>1</sup>Department of Oral Diagnosis,

University of Campinas (UNICAMP), Brazil

<sup>2</sup>Department of Head and Neck Surgery and Otorhinolaryngology,  
 AC Camargo Hospital, Brazil

**Objective:** The aim of this study was evaluate a series of patients with major salivary gland carcinomas in order to identify potential risk factors associated with distant metastasis.

**Method(s):** Two hundred fifty-five patients treated for major salivary gland cancer at A.C. Camargo Hospital, Brazil, from 1953 to 2004 were reviewed. Clinical and treatment data were obtained from the medical records and histopathological features reviewed.

**Result(s):** Fifty-seven (22.4%) out of 255 patients had distant metastasis. The lungs were the most common metastatic site (40 cases, 64.5%) and the adenoid cystic carcinoma the most frequent histological type involved (27 cases, 47.4%). The percentage of tumors in the submandibular, parotid, and sublingual glands that presented distant metastasis was 41.9%, 19.7%, and 16.7%, respectively. The predictive factors of distant metastasis were clinical stage, positive lymph nodes, histological type, facial paralysis, and invasion of adjacent structures.

**Conclusion(s):** Considering that mortality rates are high in patients with distant metastasis, identification of predictive clinicopathological factors can influence the pre-treatment evaluation and, probably, in the future high risk patients could be included in clinical trials.

**Keywords:** Salivary Gland Carcinomas, Distant Metastasis, Predictive Factors

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[O13-04]

## Mucoepidermoid Carcinoma of the Oral Cavity: Retrospective Analysis of 90 Cases

Robert Ord, Beomjune Kim\*

*Oral and Maxillofacial Surgery,*

*The University of Maryland Medical Center, USA*

**Objective:** Review demographics, treatment and outcomes for mucoepidermoid carcinoma (MEC) of the oral cavity.

**Method(s):** Retrospective chart review.

**Result(s):** 210 cases of minor salivary gland tumors (158 malignant) were seen in the OMS department University of Maryland, November 1989-December 2009. 90 MECs (43.2% total), ages 11-86 (average 51.1 years) with 36 males and 54 females (1:1.5 ratio). The palate is the commonest site 32 cases (35.5%) followed by the retromolar fossa (RMF), buccal and central intra-osseous. Low grade MEC occurred in 60 cases (66.6%) with high grade 10 cases (11%). 61 MECs were Stage I (67.7%) and 15 Stage IV (16.6%). Ten patients had positive nodes, 6 high grade MEC and 4 low grade (all low grade were intra-osseous/RMF tumors). Treatment of the primary was by 1 cm margin excision, bone was not removed in the palate unless clinically/radiologically involved for low/intermediate grade MEC. No recurrences were seen with this palatal periosteal stripping (fu 2-142 months average 48.5 months). There was 1 local recurrence for low grade MEC 1.6% (RMF site). In the 10 high grade MEC group, 3 are alive, 3 died of disease, 3 are lost to follow up and 1 died of pancreatic cancer.

**Conclusion(s):** Prognosis for low and intermediate grade MEC is excellent with wide local excision (local control 98%), as most are Stage I and bone removal is not required in the hard palate unless clinical/radiologic invasion is present. 3 of 4 intra-osseous low grade MEC of the mandible had positive nodes (75%) and elective neck dissection in the No neck is advisable for these tumors. 3 of 7 (42.9%) high grade MEC who could be followed up died of disease, despite radical surgery and radiation therapy.

**Keywords:** Mucoepidermoid Carcinoma, Oral Cavity, Neck Dissection

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[O13-05]

## Comparison of Primary and Secondary Squamous Cell Carcinoma of the Parotid Salivary Gland

Lavanya Varatharajan<sup>1\*</sup>, Prince Modayil<sup>2</sup>,  
Jonathan Williams<sup>3</sup>, Michael Lee<sup>2</sup>

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<sup>2</sup>Otorhinolaryngology, St George's Hospital, UK

<sup>3</sup>Pathology, St George's Hospital, UK

**Objective:** To evaluate the probable risk factors and management of patients with primary and metastatic parotid SCC and to assess whether they exhibit different biologic behaviours.

**Method(s):** A retrospective review was carried out of all patients treated for parotid SCC during the period 1989 to 2009 in a tertiary referral hospital.

**Result(s):** There were 9 patients (60%) (6 males and 3 females) with primary parotid SCC. 6 patients (40%) (5 males and 1 female) had metastatic parotid SCC. 67% of patients in each group were Caucasian. Local invasion was present in 6 patients (67%) with primary SCC and 3 patients (50%) with metastatic SCC. 2 patients (22%) with primary parotid SCC and 4 patients (67%) with metastatic SCC had early (T2) stage cancer and 7 patients (78%) in the primary SCC group and 2 patients (33%) in the metastatic SCC group had late (T3 and T4) stage cancer. All patients underwent parotidectomy and 5 patients in each group had simultaneous neck dissection. 8 patients (89%) in the primary parotid SCC group and 4 patients (67%) in the metastatic parotid SCC group had post-operative radiotherapy. In the primary parotid SCC group, disease recurrence occurred in 2 patients (22%) and 3 patients (33%) died of the disease. In the metastatic SCC group, 1 patient (17%) had disease recurrence and died of the disease. Overall 1 and 5 years survival rates are 78% and 56% in the primary parotid SCC group, and 100% and 50% in the metastatic parotid SCC group, respectively.

**Conclusion(s):** Primary SCC is more common than metastatic SCC of the parotid gland, in our study. Being male and Caucasian are probable risk factors for parotid SCC and the malignant potential of primary parotid SCC appears to be greater than metastatic SCC. Parotidectomy with neck dissection and postoperative radiotherapy remains the mainstay of treatment.

**Keywords:** Squamous Cell Carcinoma

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[O13-06]

## The Retrograde Technique for Total Parotidectomy with Nerve Preservation for Recurrent Parotid Tumors

Soliman El-shakhs\*

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**Objective:** Most of the tumors of the parotid gland are benign, mostly pleomorphic adenoma and adenolymphoma. Tumor recurrence is not uncommon for several reasons, mostly the technique of first operation, and to less extent to tumor pathology. So re-surgery carries a greater surgical challenge for preservation of facial nerve.

**Method(s):** Most of patient with recurrent parotid tumors present with a swelling which is overlying the facial trunk, and anterograde technique is not possible, therefore retrograde technique is adopted in 33 patient. 28 were benign and 5 had malignant lesions proved after superficial parotidectomy.

**Result(s):** Although the operative time was longer, but the incidence of facial injury was very low (<2%) with mild and minimal affecting. No permanent nerve injury and no one required nerve sacrifice and grafting.

**Conclusion(s):** Total parotidectomy with nerve preservation is feasible with the retrograde technique. The technique of retrograde parotidectomy with nerve preservation, will be presented & discussed in this paper.

**Keywords:** Parotid, Facial Nerve, Retrograde

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[O13-07]

## Surgical Results of the Intraoral Removal for the Submandibular Mixed Tumor

**Ki hwan Hong\***, Yun Su Yang

Otolaryngology-HNS,  
Chonbuk National University Hospital, Korea

**Objective:** Pleomorphic adenoma represents a most common benign neoplasm of major salivary glands. Most of this benign tumor in the submandibular gland have been treated surgically without difficulty via transcervical approach. However, a few clinical problems in the transcervical approach has been mentioned such as nerve injury or aesthetic scar not pleased. In this study we introduced the intraoral approach for removal of the submandibular mixed tumor.

**Method(s):** Total 17 cases of pleomorphic adenoma of the submandibular gland were treated via intraoral approach. The surgical technique and morbidity associated with this approach were reviewed.

**Result(s):** During surgery the tumor and submandibular gland are easily dissected from surrounding tissue and removed through intraoral incision. Early postoperative morbidity developed such as a temporary paresis of lingual nerve and a temporary limitation of tongue movement, but recovered within short-term period. No late complaints were appeared such as neurological discomfort and tumor recurrence. All patients were followed up for the recurrence of the tumor. Most of patients show no recurrence, no neurological deficits and no external scars.

**Conclusion(s):** We propose that the benign mixed tumor of the submandibular gland could be removed easily via intraoral route without an external scar and nerve injury.

**Keywords:** Intraoral Approach, Submandibular Tumor

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[O13-08]

## Technique of Transoral Endoscopic Extirpation of the Submandibular Gland

**Andreas Sesterhenn, Jochen Werner\***

ORL, HNS, University Hospital Marburg, Germany

**Objective:** The concept of “Natural Orifice Surgery” (NOS) is gaining increasing importance in many fields of surgery. In this connection there is an upcoming demand on such procedures also for circumscribed findings in the soft tissue of the neck. The access to the soft tissue of the neck is realized through a transoral approach. The intent of transoral endoscopic resection of the submandibular gland consist in comparison to the transcutaneous approach, in a minimal invasive procedure preserving as much function of all relevant surrounding structures as well as aesthetic aspects.

**Method(s):** The contribution describes and demonstrates the technique of transoral endoscopic resection of the submandibular gland. From mucosal incision in the lateral floor of mouth and subsequent identification of the lingual nerve and Whartons duct. Then the further preparation towards the caudal direction using special instruments until exposition of the gland and subsequent extirpation.

**Result(s):** With the presented technique the submandibular gland can be safely resected preserving all relevant surrounding structures. The placement of a drain is not necessary. Postoperative pain sensations seem to be lower compared to conventional resections of the submandibular gland via an external approach. Patients should be put on a diet based of liquids for the first 24 hours postoperatively.

**Conclusion(s):** The concept of transoral endoscopic extirpation of the submandibular gland offers a gentle technique avoiding visible scars due to skin incisions. The technique is reliable, safe and shows potential to probably become a standard procedure for extirpation of the submandibular gland.

**Keywords:** Natural Orifice Surgery, Submandibular Gland, Minimal Invasive Surgery

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[O13-09]

## Use of Tisseel Sealant for Drainless Parotidectomies: Huge Benefit with a Small Cost

**Christopher Goh\*, Dennis Chua, Rachel Ho**

*Otolaryngology, Singapore General Hospital, Singapore*

**Objective:** To determine whether it is safe and cost effective to perform parotid surgery with Tisseel sealant without suction drains.

**Method(s):** A prospective, randomised, case-control study on 54 patients undergoing superficial parotidectomies was conducted from September 2007 to September 2009. These patients were randomised into 2 groups: patients with Tisseel sealant without suction drainage and patients who underwent the conventional surgery with suction drainage post-operatively. We used a parotid pressure bandage for patients with Tisseel sealant without suction drainage to prevent seromas. Data on co-morbidities of patients, post operative complications, recurrence of lesion, and duration of hospitalisation were collected.

**Result(s):** Patients without drains stayed an average of 1.1 day compared with patients with suction drainage who stayed an average of 2.8 days. The financial savings to each patient was \$241. Patients who underwent conventional surgery with drains had more complications in terms of drain site infection and silk stitch granuloma.

**Conclusion(s):** This paper is a randomised, case-controlled study on parotid surgery with Tisseel sealants. It has shown that it is safer and cheaper to perform parotid surgery with Tisseel sealant and a parotid bandage. This has changed our practice in our institution and has reduced the average length of hospitalization for patients undergoing parotid surgery.

**Keywords:** Superficial Parotidectomy, Tisseel Sealant, Cost Benefit

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## O14. Imaging (II) : CT / PET

Chairs : Ji Hoon Kim (Korea)

Buvanesh Singh (USA)

08:00 - 09:30 SBR III

[O14-01]

### Clinical Availability of Functional 3-Dimensional Phonation CT in Laryngeal Cancer

Young-Hak Park\*, Hyun Soo Kim, Ji Young Choi,  
Kwang Jae Cho, Dong-II Sun, Min-Sik Kim, Seung Ho Cho

*Otolaryngology Head and Neck Surgery, St. Mary's Hospital/  
Catholic University/College of Medicine, Korea*

**Objective:** Functional 3-D phonation CT(F3DPCT) is useful for visualizing the active changes in length, tension and mass of the vocal fold for pitch control. The purpose of our study is to evaluate the clinical value of F3DPCT in laryngeal cancer extended to anterior commissure, paraglottic and subglottic space and compared to postoperative pathologic findings.

**Method(s):** Between 2003 and 2008, we analyzed 45 medical records of laryngeal cancer patients who were performed preoperative F3DPCT. Patients phonate 3 different vowel sounds, /ah/, /hi/, /ih/ with different pitch and four separate series of scans were obtained, one during quiet breathing, and the others during phonation. Analysis of the CT examination was performed by two radiologists experienced in head and neck imaging. F3DPCT findings were compared with operative and histological findings.

**Result(s):** 8 patients had been treated with chemo or radiotherapy and 37 patients had been treated with surgery. According to the CT findings, the anterior commissure was invaded in 20 patients, the subglottic region in 10 patients, paraglottic space in 18 patients. According to histological findings, the anterior commissure was invaded in 15 patients, the subglottic region in 11 patients, paraglottic space in 16 patients. F3DPCT evaluation failed to interpretation for anterior commissure (5 tumors), subglottic extension (1 tumor), paraglottic space invasion (2 tumors). F3DPCT could assist in identifying tumor extension with high accuracy, more than 90% especially the tumor invasion to the paraglottic and subglottic space.

**Conclusion(s):** Our results of F3DPCT assessment of the paraglottic space and subglottic region are better than those of the 2D-CT or MRI in the literatures. In this study, compared with operative and histological findings, F3DPCT could assist in identifying tumor extension with high accuracy, more than 90% especially the tumor invasion to the paraglottic space (94.2%) and subglottic region (97.1%). 3D phonation CT is a useful diagnostic tool for evaluation of pre-therapeutic staging in laryngeal cancer and determine the surgical planning.

**Keywords:** Functional 3-D Phonation CT, Laryngeal Cancer

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[O14-02]

### Seeking the Useful Findings of the CT and MRI for Detection of the Extranodal Spread (ENS) in Patients with Head and Neck Cancer

Solyung Jung\*, Moonsik Oh

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The Catholic University of Korea*

**Objective:** Extranodal spread (ENS) of the head and neck cancer is very important because it influences locoregional and distant metastasis, survival, and treatment. We studied to find the useful CT and MRI findings for the detection of extranodal spread (ENS) in metastatic neck nodes.

**Method(s):** CT and MRI of 111 nodes in 69 patients with head and neck cancer were evaluated for seeking the useful findings such as necrosis, diameter (longest, shortest), volume, and known CT and MR findings suggesting ENS. CT and MR findings suggesting ESN are indistinct nodal margin, irregular nodal capsular enhancement, and infiltration into the surrounding tissue. A node was considered to have ENS if a node has either one of above three findings. The results were compared with pathology from the surgical resection.

**Result(s):** Useful CT and MR findings were necrosis >90% ( $P=0.006$ ), shortest diameter of the node ( $P=0.045$ ), the longest and shortest diameter and the volume of node in the level II of the neck ( $P=0.005, 0.001, 0.01$ , respectively), and three CT and MR findings suggesting ENS. Especially infiltration into the surrounding tissue is useful in contrast enhanced CT and T2WI, and indistinct nodal margin and infiltration in contrast enhanced T1WI.

**Conclusion(s):** We should be familiar with CT and MR findings that are useful to expect extranodal spread in patient with head and neck cancer.

**Keywords:** Lymph Node, MRI, CT

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[O14-03]

## Intraoral Ultrasonography of Parapharyngeal Space Masses

Toshiki Tomita<sup>1\*</sup>, Hiroyuki Ozawa<sup>1</sup>, Ryoichi Fujii<sup>1</sup>, Seiji Shigetomi<sup>1</sup>, Yorihisa Imanishi<sup>1</sup>, Kaoru Ogawa<sup>1</sup>, Suketaka Momoshima<sup>2</sup>

<sup>1</sup>Otolaryngology, Keio University School of Medicine, Japan

<sup>2</sup>Diagnostic Radiology, Keio University School of Medicine, Japan

**Objective:** Many diagnostic procedures have been described for the evaluation of parapharyngeal space masses. A combination of CT, MRI, and fine needle aspiration (FNA) is usually best, but sometimes inadequate for the complete evaluation. The objective of this study is to assess the role of intraoral ultrasonography in the preoperative evaluation and follow-up of patients with parapharyngeal space masses.

**Method(s):** A retrospective review of patients with parapharyngeal space masses underwent intraoral ultrasonography was performed. Examinations were performed with B-mode and a color Doppler flow imaging system (Aloca SSD3500) equipped with a 7.5-MHz linear array transducer. We attempted to distinguish between the mass and internal carotid artery (ICA), and determined the characteristics of color flow images of the mass. To evaluate the accuracy of intraoral ultrasonographic measurement, we compared unidimensional measurement (UDM) and bidimensional measurement (BDM) of the mass obtained by ultrasonography and MRI.

**Result(s):** Twenty-one patients were included in this study. Intraoral ultrasonography was performed in all patients without difficulty. The mass could be detected by B-mode ultrasonography in all patients. The ICA was detected by color Doppler ultrasonography in 6 patients. Color Doppler study showed hypervascularity in the masses that was consistent with paragangliomas observed by MRI and angiography in 2 patients. We could obtain UDM and BDM by both ultrasonography and MRI for 11 of the 21 masses. Unidimensional and bidimensional measurements of the masses by ultrasonography were significantly compatible with those by MRI.

**Conclusion(s):** Intraoral ultrasonography is feasible and reliable for the evaluation of parapharyngeal space masses. Measurement by ultrasonography will be useful in patients with small masses for whom a course of observation is adopted. Intraoral ultrasonography can play an important role in the preoperative evaluation and/or follow-up of patients with parapharyngeal space masses.

**Keywords:** Parapharyngeal Space, Intraoral Ultrasonography, Color Doppler

**Corresponding Author** Toshiki Tomita (t-tomita@sc.itc.keio.ac.jp)

[O14-04]

## The Diagnostic Values of Ultrasonography in the Papillary Thyroid Carcinoma

Seung hoon Woo\*, Jin Pyeong Kim, Jin Yong Kim, Ho Youp Kim, Seong Yong Ahn

Otorhinolaryngology-Head and Neck Surgery, Gyeongsang National University Hospital, Korea

**Objective:** To evaluate the usefulness of ultrasonography for the diagnosis of papillary thyroid carcinoma (PTC).

**Method(s):** A retrospective study of 100 patients with PTC who confirmed pathologic diagnosis between March 2000 and January 2009. Ultrasonographic (USG) and fine needle aspiration cytologic (FNAC) diagnosis have been compared with the pathologic diagnosis in all patients.

**Result(s):** A total of 100 patients, 33 males and 67 females, underwent USG and FNAC of the thyroid nodules and confirmed pathologic results. The average age was 51.61 years. The positive predictive value of FNAC was 86.2% and USG was 89.7%. Diagnostic rate of malignancy in USG or FNAC was 98.3%. In the true positive rate of suspicious malignant nodule of USG finding, marked hypoechoic was 100%, microcalcification 87.8%, well-defined spiculated margin 67%, macrocalcification 62.5%, and taller than wide 60%.

**Conclusion(s):** Our results identified that positive predictive value of USG was 89.7% in the diagnosis of the PTC. And among the suspicious malignant nodule in USG findings, marked hypoechoic and microcalcification were more reliable than other findings. Technique that combine USG and FNAC is more accurate than either technique alone.

**Keywords:** Ultrasonography, Fine Needle Aspiration Cytology, Papillary Thyroid Carcinoma

**Corresponding Author** Seung hoon Woo (lesaby@hanmail.net)

[O14-05]

## Routine Surveillance Imaging Following Chemoradiation for Advanced-Stage Oropharyngeal Carcinoma: Better than Clinical Exam?

Gerald Kangelaris<sup>1\*</sup>, Sue Yom<sup>2</sup>, Huang Kim<sup>2</sup>,  
David Eisele<sup>1</sup>, Steven Wang<sup>1</sup>

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**Objective:** To determine the predictive value of patient symptomatology and physical exam findings compared to routine surveillance MRI or PET-CT in detecting locoregional treatment failure following definitive chemoradiation in advanced-stage oropharyngeal carcinoma.

**Method(s):** We identified patients with Stage III-IV oropharyngeal carcinoma who underwent chemoradiation therapy between April 2000 and September 2004 and underwent longitudinal follow-up care at our institution. Patient charts were retrospectively reviewed for findings on surveillance imaging, patient symptomatology and physical exam findings. Our outcome measurement was recurrent cancer.

**Result(s):** Forty-three patients received a total of 252 advanced radiographic surveillance studies over an average follow-up of three years, a mean of 5.9 studies per patient. Sixteen patients experienced false positive surveillance studies that resulted in intervention, a false positive rate of 7.9 percent. Three patients displayed disease progression following treatment conclusion. Four patients experienced recurrent disease, two of whom had new symptoms or physical exam findings that preceded radiographic identification of disease. Surveillance studies identified recurrent disease in two asymptomatic patients who were salvaged, one of whom remains free of disease at follow-up. The overall sensitivity and specificity of the imaging surveillance program is 50 and 56 percent, respectively.

**Conclusion(s):** In asymptomatic oropharyngeal cancer patients who have been treated with chemoradiation, a routine radiographic surveillance program produces limited opportunity for salvage and contributes to unnecessary morbid procedural investigations into disease recurrence. Patient symptomatology and routine physical examination may provide sufficient prognostic information regarding treatment failure.

**Keywords:** Oropharyngeal Carcinoma, Cancer Recurrence, Surveillance Imaging

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[O14-06]

## Comparative Study of Clinical Examination, USG, CT Scan and PET CT in the Accurate Detection of Neck Nodal Metastasis in Oral Cavity Squamous Carcinomas

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Pankaj Chaturvedi<sup>2</sup>, Supreeta Arya<sup>3</sup>, Nilendu Purandare<sup>4</sup>,  
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<sup>5</sup>Pathology, Tata Memorial Hospital, India

**Objective:** · To determine the sensitivity, specificity, positive predictive value and negative predictive value of clinical examination, ultrasound, CT scan, PET-CT in detecting neck nodal metastasis in oral cavity squamous cell carcinomas.

· To determine the best modality available for the preoperative diagnosis and staging of neck nodal disease.

**Method(s):** Fifty patients with proven squamous cell carcinoma of oral cavity were evaluated for metastatic cervical lymph nodes by clinical examination, USG, CT scan and PET-CT, followed by neck dissection within one month of investigations. Histopathologic analysis of the resection specimen served as the reference standard. This was a prospective observational study.

**Result(s):** The sensitivity, specificity, positive predictive value and negative predictive value were found to be 85%, 50%, 65% and 75% for clinical examination; 77%, 71%, 74% and 74% for USG; 73%, 75%, 76% and 72% for CT scan; and 73%, 66%, 70% and 70% for PET-CT, respectively.

**Conclusion(s):** Although radiology aids in decision making for neck dissection in N0 neck, no single investigation has been proved to have sufficient sensitivity and specificity to merit its use as investigation of choice. Hence other factors, apart from radiology, should also be considered in decision making.

**Keywords:** Neck Nodes, CT Scan, PET-CT

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[O14-07]

## The Effectiveness of 124-I PET/CT and FDG-PET/CT in Patients with Differentiated Thyroid Carcinoma with Negative I-131 Scan and Elevated Serum Thyroglobulin: Preliminary Report

**Byung Hee Kang<sup>1</sup>, Jandee Lee<sup>1</sup>, Ra Mi Kim<sup>1</sup>, Guk Yong Na<sup>1</sup>,  
Joon Gi Yun<sup>2</sup>, Gi Jeong Cheon<sup>3</sup>, Euy-Young Soh<sup>1\*</sup>**

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<sup>3</sup>Nuclear Medicine, Korea Cancer Center Hospital, Korea

**Objective:** Although the prognosis of differentiated thyroid carcinoma (DTC) is generally encouraging, a diagnostic dilemma is posed by increasing level of serum thyroglobulin (Tg) without detection of recurrent tumor with conventional imaging tools. The objective of this study was to compare the diagnostic accuracy of iodine-124 positron emission tomography/computed tomography (124I-PET/CT) and 2-[18F]fluoro-2-deoxy-D-glucose-(FDG)-PET/CT in detection of recurrent DTC lesions in patients with negative 131I whole body scan (131I-WBS) and high Tg level.

**Method(s):** This prospective study was begun under Institutional Review Board approval From July 2009 and is currently ongoing. We studied 12 patients with papillary thyroid cancer who had undergone total thyroidectomy and radioiodine treatment (RIT) and followed up for 18- 83 months after the last RIT. In all patients, cervical ultrasonography and FDT-PET/CT was performed first. Within one week, 124I-PET/CT was performed after 24 h after oral administration of 2 mCi 124I. The findings on the 124I-PET/CT were compared with the findings on FDT-PET/CT and were also correlated with radiologic and/or cytological investigations.

**Result(s):** Among the 12 patients, 4 (33.3%) showed positive findings in FDT-PET/CT, and 3 (25.0%) in 124I-PET/CT. One lesion demonstrated pathological tracer uptake with both FDT-PET/CT and 124I-PET/CT, while 6 lesions were positive with only one of these modalities. Disease management was modified or disease re-staging clarified in 7 patients (58.3%).

**Conclusion(s):** Our results indicate that combined FDG-PET/CT and 124I-PET/CT is useful diagnostic tools in patients with DTC and with negative 131I-WBS and high Tg levels. This fusion of metabolic and morphologic information appears to be promising tools for improving restaging and changed therapeutic strategies in these patients.

**Keywords:** 124I-PET, FDG-PET, Recurrent Thyroid Carcinoma

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[O14-08]

## Dual Time Point PET/CT in Evaluating Patients with Head and Neck Cancer

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**Objective:** In dual time point PET/CT, Initial PET/CT image is obtained at 1 hour after FDG injection (standard PET/CT) and another image is obtained 2 hours after initial image (delayed PET/CT). FDG uptake decreases with time elapse in normal tissue, but increase in malignant lesion. The aim of this study is to evaluate the role of dual time point PET/CT in staging of head and neck cancer patients.

**Method(s):** From July 2008 to December 2009, 24 patients with the head and neck cancer who underwent dual time point PET/CT scan before treatment were retrospectively reviewed. Standard uptake value (SUV) of primary site and neck was measured by a doctor of nuclear medicine blindly. We compare the SUV value of standard PET/CT and delayed PET/CT in primary site and neck. Visual analysis of grade 1 to 4 and retention index (% increase of SUV in delayed image) was also measured.

**Result(s):** The SUV of primary site was  $6.3 \pm 3.3$  in standard PET/CT and  $8.2 \pm 4.4$  in delayed PET/CT ( $P < 0.05$ ). Visual analysis of primary site was  $3.3 \pm 0.97$  in standard PET/CT and  $3.6 \pm 0.89$  in delayed PET/CT ( $P < 0.05$ ). The retention index of primary site was  $31.3 \pm 14.9\%$ . The SUV of neck was  $2.5 \pm 1.3$  in standard PET/CT and  $2.9 \pm 1.9$  in delayed PET/CT ( $P < 0.05$ ). Visual analysis of neck was  $1.8 \pm 1.2$  in standard PET/CT and  $2.0 \pm 1.2$  in delayed PET/CT ( $P < 0.05$ ). The retention index of neck was  $16.2 \pm 22.7\%$ . The retention index of pathologically negative lymph nodes was  $20.0 \pm 29.0\%$  and positive lymph nodes was  $0.85 \pm 34.5\%$ .

**Conclusion(s):** SUV value and visual analysis increase in delayed PET/CT in primary tumor evaluation but the clinical utility of dual time point PET/CT was not observed in evaluation of cervical metastasis.

**Keywords:** Head and Neck Cancer, Dual Time Point PET CT

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[O14-09]

## Metabolic Tumor Volume of [18F]-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Predicts Short-Term Outcome to Radiotherapy With or Without Chemotherapy in Pharyngeal Cancer

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Joon Young Choi<sup>2</sup>, Keunchil Park<sup>3</sup>, Yong Chan Ahn<sup>4</sup>,  
Hyung-Jin Kim<sup>5</sup>, Young-Hyeh Ko<sup>6</sup>, Chung-Hwan Baek<sup>1\*</sup>**

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**Objective:** This study aimed to investigate whether metabolic tumor volume (MTV) measured from [18F]-fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) predicts short-term outcome to radiotherapy with or without chemotherapy and disease-free survival (DFS) in patients with pharyngeal cancers.

**Method(s):** The MTVs of primary sites with or without neck nodes were measured in 82 patients. Short-term outcome was assessed using the treatment response evaluation by the Response Evaluation Criteria in Solid Tumors and recurrence events during follow-up (complete response/no recurrence or residual disease/recurrence).

**Result(s):** A total of 64 patients had complete response/no recurrence as of the last follow-up. A cutoff of 40 mL for the MTV was the best discriminative value for predicting treatment response. By univariate analyses, patients with MTV > 40 mL showed a significantly lower number of complete response/no recurrence than did patients with MTV ≤ 40 mL (68.2% versus 87.8%; hazard ratio [HR], 3.34; 95% confidence interval [95% CI], 1.09-10.08;  $P=0.03$ ), as is the same in tumor-node-metastasis stage (87.5% for I-II versus 90% for III versus 63.8% for IV;  $P=0.02$ ). However, MTV was only a significant predictor of short-term outcome by multivariate analyses (HR, 4.09; 95% CI, 1.02-16.43;  $P=0.04$ ). MTV >40 mL indicated a significantly worse DFS than MTV ≤ 40 mL (HR, 3.42; 95% CI, 1.04-11.26;  $P=0.04$ ). The standardized uptake value for the primary tumor did not show any correlation with treatment outcome or DFS.

**Conclusion(s):** MTV has a potential value in predicting short-term outcome and DFS in patients with pharyngeal cancers.

**Keywords:** Metabolic Tumor Volume, FDG-PET/CT, Treatment Response

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**O15. Oral Cavity (I)**

**Chairs : Eun Chang Choi (Korea)**  
**Ashok Shenoy (India)**

08:00 - 09:30 SBR IV

[O15-01]

## Oral Cancer Knowledge among Newly Graduated Medical and Dental Practitioners in Jordan

**Arwa Alami\***, Rula Sabbagh, Abdell hameed Hamdan

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**Objective:** Oral cancer remains a devastating and crippling disease, and even with the new developments of radiotherapy, chemotherapy and improvement in surgical procedures, mortality rates remains the same for the last several decades, which could be attributed to the fact that most oral cancers are diagnosed at late stages. General medical and dental practitioners are the first to come in contact with patients and their knowledge of this condition affects greatly the treatment outcome. The aim of our study was to assess their knowledge of oral cancer.

**Method(s):** Newly graduated medical and dental students applying for residents jobs at a cancer center in Jordan were given a questionnaire assessing their knowledge of oral cancer, its risk factors, symptoms and common conditions associated with it.

**Result(s):** 93 participants answered the survey, of them only 73% knew that alcohol consumption is a risk factor, 52% believed that poor oral hygiene can cause oral cancer, 91% knew that squamous cell carcinoma is the most common form of oral cancer, 59% knew that most lesions are diagnosed in late stage and only 29% knew that erythroplakia is associated with oral cancer while 52% knew that leukoplakia is associated with it.

**Conclusion(s):** Although most participants had some knowledge about oral cancer, its risk factors and appearance, there was a deficiency that may prevent newly graduated medical and dental students from playing an integral role in early diagnosis of oral cancer thus early referral of patients to specialist as well as their insufficient knowledge of the condition will not enable them to educate their patients about prevention and diagnosis of oral cancer. More courses about oral cancer must be given to students to increase their awareness about this disease.

**Keywords:** Oral Cancer Knowldge, Newly Graduated, Medical and Dental

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[O15-02]

## Squamous Cell Carcinoma of the Oral Tongue in the Pediatric Age Group: A Matched-Pair Analysis of Survival

**Ian Ganly\*, Luc Morris, Snehal Patel, Jatin Shah**

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**Objective:** Squamous cell carcinoma (SCC) of the oral tongue is uncommon in young patients, and rare in the pediatric age group (ages 20 and younger). It is believed to exhibit aggressive behavior and carry poor prognosis in younger patients. However, outcomes of oral tongue SCC in pediatric patients have not been studied. The objective of this study was to compare outcomes of a pediatric cohort of patients compared with a matched cohort of adult patients.

**Method(s):** Retrospective matched-pair cohort study of 10 pediatric and 40 adult patients diagnosed with SCC of the oral tongue who were treated at Memorial Sloan-Kettering Cancer Center. Adult patients were matched to pediatric patients 4:1 for gender, tobacco history, tumor status, nodal status, distant metastasis status, surgical procedure, and administration of adjuvant radiotherapy. Overall survival (OS), disease-specific survival (DSS), and recurrence-free survival (RFS) were calculated using the Kaplan-Meier method.

**Result(s):** Five year OS was equivalent in the two groups: 70.0% in the pediatric group and 64.0% in the adult group ( $P=0.97$ ). Five year DSS was also equivalent: 80.0% in the pediatric group, and 76.0% in the adult group ( $P=0.90$ ). Five year RFS was 70.0% in the pediatric group and 78.4% in the adult group ( $P=0.54$ ).

**Conclusion(s):** When pediatric and adult patients were matched for gender, tobacco history, TNM status, surgical procedure and adjuvant radiotherapy, outcomes for OS, DSS and RFS were equivalent. Pediatric patients with SCC of the oral tongue should be managed similarly to adult patients.

**Keywords:** Squamous Cell Cancer, Tongue, Young

**Corresponding Author** Ian Ganly (ganlyi@mskcc.org)

[O15-03]

## Survival in Young Patients with Squamous Cell Carcinoma of the Oral Tongue : A 16-Year Experience at a Single Institution

**So-Yoon Lee<sup>1</sup>, Hyang Ae Shin<sup>2</sup>, Ha Min Jeong<sup>3</sup>, Yoo Seob Shin<sup>1</sup>, Hyun Jun Hong<sup>1</sup>, Yoon Woo Koh<sup>1</sup>, Se-heon Kim<sup>1</sup>, Eun Chang Choi<sup>1\*</sup>**

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<sup>2</sup>Department of Otorhinolaryngology,

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<sup>3</sup>Department of Otorhinolaryngology, Wonkwang Institute for Medical Science, College of Medicine, Korea

**Objective:** Controversy exists regarding the prognosis of young patients with squamous cell carcinoma (SCC) of the oral tongue. The aim of this study was to compare the oncologic outcomes of surgically treated oral tongue SCC patients aged 40 years and younger to those of patients older than 40 years of age over a 16-year period at a single institution.

**Method(s):** A retrospective analysis of 160 consecutive, previously untreated oral tongue SCC patients who underwent surgery with or without postoperative radiotherapy/chemotherapy as initial treatment at Severance Hospital from December 1991 to December 2007 was performed. Thirty-two patients (20.0%) were aged 40 years or younger and 128 patients (80.0%) were older than 40 years of age. There were no statistically significant differences in sex, overall stage and treatment modalities between these two groups.

**Result(s):** The 5-year overall survival rate and disease-specific survival rate in young patients were 71.9%, and in older patients, 66.6% and 70.9%, respectively. There were no significant differences in locoregional recurrence and distant metastasis between two groups. In stage I-II, recurrence rate of young and older patients was similar (35.3% versus 28.2%) and the result was same in stage III-IV (40.0% versus 43.9%). Pathologic tumor stage and resection margin status were confirmed as prognostic factors for 5-year disease-specific survival by multivariate analysis.

**Conclusion(s):** Our data strongly suggest that young patients with SCC of the oral tongue have similar prognosis to patients older than 40 years. The prognosis was poor in patients presenting with advanced pathologic tumor stage and with positive resection margin, regardless of age.

**Keywords:** Oral Tongue, Squamous Cell Carcinoma, Young Patients

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[O15-04]

## Clinical Outcome of Squamous Cell Carcinoma of Tongue in Young Patients: Stage Matched Comparative Analysis

**Min-Sik Kim\*, Jun-Ook Park, Dong-Il Sun, Kwang-Jae Cho, Jung-hae Cho**

*Department of Otolaryngology-Head and Neck Surgery,  
The Catholic University of Korea, Seoul, Korea*

**Objective:** The aim of this study was to analyze clinical characteristics of tongue cancer in this group, and to compare with that of old group.

**Method(s):** A retrospective review was made of the 85 patients who diagnosed as squamous cell carcinoma of oral tongue, and divided into two age groups, over 45 years of age and under 45 years. The following data were recorded from the patients file: age, sex, tobacco and alcohol consumption, staging, pathology, treatment modality, hospital day, and clinical outcome. To compare the prognosis of similar staged patients in both group, Each age group divided into early (stage I, II) and advanced stage group (stage III, IV), and compared individually.

**Result(s):** There were 23 patients in the young age group, and 62 patients in the old age group. According to early stage group, clinical prognosis of patients in both age group was good, and there was no significant difference. But, according to advanced stage group, the overall and regional recurrence rate was 47.8%, and 88% in young age group, and that was significantly higher than old age group ( $P=0.019^*$ ,  $P=0.004^*$ ). The disease-specific survival rate of patients in young age group was significantly lower than that of patients in old age group ( $P=0.025^*$ ).

**Conclusion(s):** Tongue cancer in young age has significantly different clinical outcome according to stage. The clinical outcome of advanced staged tongue cancer (stage III, IV) in young age is more poorer than that in old age. Regional recurrence seems to be main cause of poor prognosis. Early detection and complete neck treatment is needed to improve prognosis.

**Keywords:** Squamous Cell Carcinoma, Tongue, Young

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[O15-05]

## Survival Outcomes for Second Primary Malignancy of the Oral Cavity: A Matched-Paired Analysis

**Han-ju Chen, Huan-Sen Chen, Yen-Liang Chang\***

*Department of Otolaryngology, Head & Neck Surgery,  
Cathay General Hospital, Taiwan*

**Objective:** To date, a definitively worse outcome for the second primary squamous cell carcinoma (SCC) of the oral cavity as compared to the first primary has not been discretely demonstrated. This study was conducted to determine whether prognosis for second primary SCC of the oral cavity is truly poorer than prognosis for first primaries.

**Method(s):** Patients recorded in the head and neck cancer registry of Cathay General Hospital between January 1998 and December 2007 were reviewed. Twenty-seven cases of second primaries of the oral cavity with SCC histology were identified. We matched each of these patients by gender, tumor site, overall stage, and treatment modality with patients having exactly one primary malignancy of the oral cavity. Qualitative variables were analysed using Fisher's exact test. Survival analysis was performed using the method of Kaplan and Meier and log-rank test.

**Result(s):** Matched survival analysis did not demonstrate a difference in overall survival ( $P=0.345$ ) or disease-specific survival ( $P=0.261$ ) between the two groups; however, there was a significant difference in recurrence-free survival being worse in patients with second primary cancer ( $P=0.01$ ). The frequency of recurrences was found to be higher in patients with second primary (51.9% vs 22.2%,  $P=0.047$ ).

**Conclusion(s):** In this series, patients with second primary SCC of the oral cavity had a poorer locoregional control than did patients with single primary. This did not translate into a survival difference.

**Keywords:** Second Primary Malignancy, Oral Cavity, Survival Outcome

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[O15-06]

## Survival Rate and Prognostic Indicators of Advanced Buccogingival Sulcus Cancer

**Basavaraj Patil<sup>1</sup>\*, Deepak C Kittur<sup>1</sup>, Bant Dattaraya<sup>2</sup>**

<sup>1</sup>*Head & Neck Oncology,  
Karnatak Cancer Therapy & Research Institute, India*  
<sup>2</sup>*Preventive & Social Medicine,  
Karnatak Institute of Medical Sciences, India*

**Objective:** To evaluate local control and survival rate of advanced buccogingival sulcus cancer

To determine prognostic variables which influence treatment outcome.

**Method(s):** Records of 1,028 oral cancer patients, surgically treated at KCT&RI, Hubli, India from 1989 to 2006, were retrospectively reviewed. The primary site in 186 cases was the buccogingival sulcus (BGS), of which 167 fulfilled our inclusion criteria.

Inclusion Criteria:

Histopathological diagnosis of squamous cell carcinoma

Minimum follow up period of 3 years

Previously untreated cases

Exclusion Criteria:

Lesions extending to retromolar trigone

Lesions restricted to buccal mucosa/ alveolus

Mortality unrelated to primary disease

Different treatment strategies were employed in managing patients with diverse clinical presentations. This included variations in neck dissections, reconstruction procedures and management of osseous involvement. All the prognostic variables were assessed across the study sample and disease free survival (DFS) rate was drawn from the sample group. Chi square and Fischer's exact tests were employed.

**Result(s):** Of the 22 (stage-III) and 145 (stage-IV) cases, there were 29 (T3) and 138 (T4) cases. Clinical node assessment revealed 26 N0, 82 N1, 57 N2 and 2 N3 patients. Overall survival rate at 3 years was 68.2%. Extra-capsular spread (ECS) resulted in 33/53 recurrences ( $P=<0.0001$ ). Statistically significant results were obtained for factors like Stage III versus Stage IV ( $P=0.0137$ ) and N1 versus N2 ( $P=0.0002$ ) affecting DFS. On the contrary, T-status, involvement of skin or muscle planes had no impact on DFS. Even the more aggressive hemimandibulectomy did not yield any significant therapeutic advantage over the more conservative marginal mandibulectomy.

**Conclusion(s):** Increased nodal status, stage IV diseases and ECS negatively impact the DFS rate. Management protocols must include wide soft tissue margins, conservative osseous procedures and vigilant neck management to optimize treatment outcomes while minimizing morbidity.

**Keywords:** Buccogingival Cancer, Disease Free Survival, Prognostic Indicators

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[O15-07]

## Intraoral Sonography-Assisted Resection of T1-2 Tongue Cancer for Adequate Deep Resection

Tae wook Kim<sup>1</sup>, Chung-Hwan Baek<sup>2\*</sup>, Young-Ik Son<sup>1</sup>, Han-Sin Jeong<sup>2</sup>, Man Ki Chung<sup>1</sup>, Ki-Nam Park<sup>2</sup>, Young-Hyeh Ko<sup>3</sup>, Hyung-Jin Kim<sup>4</sup>

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<sup>3</sup>Pathology, Samsung Medical Center, Korea

<sup>4</sup>Radiology, Sungkyunkwan University School of Medicine, Korea

**Objective:** To investigate the clinical usefulness of intraoral sonography-assisted resection for securing adequate deep resection margins in T1-2 tongue cancers.

**Method(s):** Twenty consecutive patients with clinical T1-2 tongue cancers were enrolled and their lesions were removed by intraoral sonography assisted resection. We then retrospectively collected data from 20 T stage matched patients without intraoral sonography assisted resection as the control group. All resections were performed with a goal of 15 mm margin. The mucosal and deep safety margins were compared between the two groups.

**Result(s):** Intraoral sonography could predict the paraffin-embedded tumor thickness with an error of 3.16 2.24 mm. The deep safety margins were more adequate for intraoral sonography assisted resection ( $9.8 \pm 5.2$  mm) than for conventional resection ( $4.0 \pm 2.03$  mm) ( $P < 0.001$ ), while the mucosal safety margins were not different.

**Conclusion(s):** Intraoral sonography assisted resection provides a more adequate deep resection margin for early T-stage tongue cancers.

**Keywords:** Ultrasonography, Tongue Cancer, Resection Margin

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[O15-08]

## Flexible Carbon Dioxide Laser in Surgical Treatment of Oral Cavity Carcinomas

Gianluca Bellocchi<sup>1\*</sup>, Valerio Damiani<sup>2</sup>, Alberto Rocco<sup>2</sup>

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<sup>2</sup>ENT Department, San Camillo Forlanini Hospital, Italy

**Objective:** Carbon dioxide (CO<sub>2</sub>) lasers have become one of the most common surgical lasers due to excellent tissue interaction properties that offer precise control of cutting and ablation depth, minimal thermal damage to surrounding tissue, and good hemostasis. However, in many minimally invasive surgical procedures, use of CO<sub>2</sub> lasers has been significantly negatively affected by the absence of reliable, flexible fiber laser beam delivery systems. Recently, novel optical fibers for CO<sub>2</sub> lasers were developed that offer high flexibility and mechanical robustness.

**Method(s):** The Authors present their experience in patients affected by oral cavity cancer submitted to minimally invasive surgical demolition using flexible CO<sub>2</sub> laser. In these patients we specifically analysed the presence of postoperative pain, the degree of cicatricial retraction, and the speech and swallowing functional results.

**Result(s):** All primary tumors were completely resected, with negative margins, confirmed by intraoperative and definite pathology. None of the patients required tracheotomy or placement of a percutaneous endoscopic gastrostomy tube. We obtained a significantly reduced postoperative pain and significantly reduce postoperative cicatricial retraction with flexible CO<sub>2</sub> laser, compared with monopolar pencils. Moreover, it allows to minimize the functional sequelae in terms of speech and swallowing impairment.

**Conclusion(s):** In our experience, the use of this recently developed flexible CO<sub>2</sub> laser, allows surgeons to perform delicate and precise laser surgery procedures in a minimally invasive manner.

**Keywords:** Laser, Oral Cancer, Flexible

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[O15-09]

## Surgical Approaches for Oral Cancer: Feasibility of Transoral and Pull-Through Approach

**Kyung Tae\***, Yong Bae Ji, Kun Park

*Otolaryngology-Head and Neck Surgery,  
College of Medicine, Hanyang University, Korea*

**Objective:** Surgery is the initial definitive treatment modality for oral cancer. The commonly employed surgical approaches are transoral, pull-through approach, lower and upper cheek flap and mandibulotomy approach. The factors that influence the choice of surgical approach for primary tumour are the size, depth, site of tumour and proximity of mandible. The purpose of this study is to evaluate feasibility and usefulness of transoral and pull-through approach in the surgery of oral cancer.

**Method(s):** A total of 112 patients with oral cancer who underwent surgery from 1994 to 2007 were analyzed retrospectively, excluding lip cancer.

**Result(s):** Among 112 patients, the most common primary site was oral tongue (64), and the follows were FOM (20) and buccal mucosa (11). Transoral approach was carried out in 64 patients, pull-through in 23, mandibular lingual releasing in 6, cheek flap in 11, visor flap in 2 and mandibulotomy in 6. Most of T1, T2 and part of T3 oral cancer were resected by transoral approach and the moderate sized T2, T3 tongue and floor of mouth cancer was resected by pull-through or mandibular lingual releasing approach without mandibulotomy or lip-splitting incision. There was no statistically significant difference in locoregional recurrence according to surgical approach.

**Conclusion(s):** Transoral approach and pull-through or mandibular lingual releasing approach are very useful approach in the surgery of oral cancer while avoiding mandibulotomy.

**Keywords:** Surgical Approach, Oral Cavity Cancer, Pull-Through Approach

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## O16. Oral Cavity (II) : Neck / Others

**Chairs : Min-Sik Kim (Korea)**

**Pankaj Chaturvedi (India)**

13:50 - 15:20 SBR I

[O16-01]

### Advocating the “Pull-Through” Technique for Resection of Tongue and Mouth Floor Musculature

**Shyuang-Der Terng<sup>1\*</sup>, Ching-Yuan Lin<sup>1</sup>, Shou-Fong Lin<sup>2</sup>, Shih-Jung Cheng<sup>3</sup>, Lawrence KC Yen<sup>4</sup>, Tsung-Ming Chen<sup>5</sup>**

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**Objective:** Oral cavity cancer is the 4th leading cancer among Taiwanese men in both incidence and mortality. Locally advanced tongue cancers still pose a major challenge for the clinicians. Traditionally the mandibulotomy approach, also known as mandibular swing or mandibular osteotomy, plus lip-splitting or labiomental incision technique were commonly applied for resection of the tongue cancers with significant inferior extension. For lesser complications and greater patient-satisfaction, we present our series of “pull-through” technique for the tongue cancers with downward extension.

**Method(s):** This is a single institute experience from Sun Yat-Sen Cancer Center (SYS SCC), the first cancer center in Taiwan. From July, 2002 to June, 2009, all patients who underwent glossectomy plus mouth floor musculature resection and soft tissue flap reconstruction were retrieved from our database. Total 84 patients their medical records were reviewed. Nine of them with tumors involving or close to the mandibles and managed with segmental or hemimandibulectomy for composite resection were excluded. Another 2 cases were excluded for their preserved mouth floor musculature. These 73 cases were analyzed for their safety and efficacy in different surgical approaches.

**Result(s):** The mandibulotomy approach has many drawbacks regarding the osteotomy and the fixation plates, especially after the radiation therapy. A non-osteotomy approach could be free of these complications, while the operation time, the blood loss, and most important of all the survival outcomes were comparable.

**Conclusion(s):** Tongue and buccal subsites share over 2/3 of all the oral cancers in Taiwan. Surgical resection of the deeply infiltrative tongue cancer requires good exposure of the target area. Our series of pull-through technique provided both an oncologically safe and sound approach for the en-bloc resection of the tongue in continuity to neck.

**Keywords:** Pull-Through, Mandibular Swing, Mandibulotomy

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[O16-02]

### Surgical Treatment of Squamous Cell Carcinoma of the Floor of Mouth: Glasgow Experience

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**Objective:** The floor of mouth (FOM) is the second common site for primary malignancy in the oral cavity. Tumour size and characteristics will determine the extent of resection and influence the type of reconstruction used. The present study reviewed our experience in surgical treatment of floor of mouth carcinoma and its correlation to tumour characteristics and socio-demographic variables.

**Method(s):** A series of 62 patients from January 2006 till August 2007, were reviewed. Patients were grouped according to tumour characteristics as site, size, mandibular and tongue invasion. Surgical variables were recorded for each group including access, tumour resection, neck dissection and reconstructive modalities.

**Result(s):** 40 (64.5%) patients were males while 22 (35.5%) patients were females. The overall patients' mean age at time of diagnosis was 61.4 years (39-86 years). 66 (46.5%) patients had squamous cell carcinoma with primary origin of anterior FOM. T1 was the commonest tumour size presented in 28 (45%) patients. Locoregional flaps and free flaps were the most common flaps used for T1 and T4 respectively.

**Conclusion(s):** Treatment of FOM cancer is a surgical challenge. Different treatment modalities for each group were recorded. The study identifies our modality of treatment for the different classifications and invasion characteristics of FOM tumours.

**Keywords:** Floor of Mouth Cancer, Surgery

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[O16-03]

## Squamous Cell Carcinoma of the Lip: A Proposal of a Modification for the Treatment of Cervical Metastasis in Type T2

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Rui Mamede, Hilton Rizc

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**Objective:** To analyse the incidence of cervical metastasis in squamous cell carcinoma of the lower lip in stage T2 divided in two subgroups.

**Method(s):** A retrospective study was conducted on 105 cases of squamous cell carcinoma of the lip with oncologic follow-up of 6 to 156 months and average of 31.2 months. Lesions staged as T2 were found to behave differently according to size. One hundred and five cases of squamous cell carcinomas of the lip were staged and compared.

**Result(s):** Despite of cervical metastasis rate in stage T2 (19%) be similar to stage T1 (17%) ( $P=0.9719$ ), when stage T2 is divided into two subgroups the statistics are quite distinct. The 36 cases of T2 lesions detected in the sample were divided into two subgroups, T2a (2.0-3.0 cm) and T2b (3.1-4.0 cm), which were compared in terms of cervical metastasis, by the exact Fisher test and also “Qui-quadrado” ( $\chi^2$ ) test. Cure rates for group T1 (83%) and subgroup T2a (91%) were similar ( $P=0.3047$ ). In contrast, a significant difference in cure rate was observed when groups T1 and T2a (83-91%) were compared to subgroup T2b (64%). Finally, cure rates for subgroups T2a (91%) and T2b (64%) were also significantly different ( $P=0.06$ ).

**Conclusion(s):** T1 and T2a tumors are similar and should be submitted to the same treatment. T2b tumors present a high rate of cervical metastasis (36%), which can be compared to T3 and T4 stages (43%) ( $P=0.91$ ) and should therefore be submitted to more aggressive treatment.

**Keywords:** Lip Carcinoma, Cervical Metastasis, Lip Surgery

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[O16-04]

## Sentinel Node Biopsy Provides a Decision for Neck Dissection in Early Stage of Tongue Cancer

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Syuji Yokoyama, Miha Kunii, Koichi Omori

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**Objective:** In our department, since the year two thousand, sentinel node (SN) biopsy has been used as part of the decision for neck dissection for early tongue cancer. In our strategy using SN biopsy, SN was diagnosed pathologically in frozen section. When metastasis in SN was positive, neck dissection was performed. And when SN was negative, neck dissection was not performed, but the patient was followed.

**Method(s):** From 1983 to 2007, there were 178 cases of tongue cancer, the number of stage I cases was 45, and that of stage II was 45. These 90 cases were estimated as materials in this study. 5 years overall survival rate of stage I and II was 90% (Stage I: 97%, Stage II: 83%).

**Result(s):** 21 cases (Stage I: 10 cases, Stage II: 11cases) underwent SN biopsy, the average of their following time was 44 months and 5 years overall survival rate for the cases with SN biopsy was 100%. And that for the cases without SN biopsy was 89%.

**Conclusion(s):** There are some reports those said elective neck dissection should be performed routinely with early stage tongue cancer. Our strategy provided favorable outcome, as well as routinely performing neck dissection.

**Keywords:** Head and Neck, Sentinel Node, Neck Dissection

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[O16-05]

## Sentinel Node Mapping in Oral Cancer—Pakistani Experience

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**Objective:** Oral cancer metastasis to the regional lymph nodes worsen substantially the prognosis of patients. Due to the high probability of occult metastasis (about 30%), during surgical resection of the primary tumor elective dissection of lymph nodes is also performed. In this prospective study the applicability of the concept of the sentinel lymph node in patients with oral cavity cancer was analysed between June 2005 and November 2008. These SNB procedures were performed in department of otolaryngology and Head and Neck surgery At Aga Khan university hospital Karachi Pakistan.

**Method(s):** Forty two cases with T1---T4 tumors of the oral cavity/oropharynx cancer with clinically N0 under went with preoperative lympho-scintigraphy (LSG), intra-operative use of gamma probe, and pathological evaluation with step serial sectioning and immune-histochemistry, with a follow-up of at least 12 months.

**Result(s):** 32 were male and 10 were female. The sentinel node was identified in 35 and not indentified in 7 patients. We found Sensitivity 5.7%, Specificity 71.4% Accuracy 16.66% Positive predicted value 5.7% and Negative predicted value 71.4%.

**Conclusion(s):** Our goals were to assess the feasibility of sentinel lymph node (SLN) localization using preoperative lymphoscintigraphy and intraoperative gamma probe radiolocalization and to determine the utility of SLN biopsy in diagnosing occult metastasis in the neck in patients with N0 SCC of the oral cavity but our results differ markedly from other studies.

**Keywords:** Sentinel Node Mapping, Oral Cancer

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[O16-06]

## One Day Radioguided Sentinel Node Biopsy in 41 Oral Cavity Squamous Cell Carcinomas

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**Objective:** The aim of this study , based on radioguided surgery three hours after lymphoscintigraphy (same day protocol) is to detect few SNs truly close to the tumour site.

**Method(s):** 41 patients (20m, 21 f, mean age 63.2 years.) affected by cT1-T2N0 oral cavity SCC were enrolled. They were submitted to lymphoscintigraphy using a dose of 30-50 MBq Nanocol® diluted in 0.3 mL injected superficially in subepithelial stroma of the peritumoral area. A dynamic and static planar scintigraphy was acquired immediately after the injection and prolonged until the appearance of SNs in at least two levels of the neck, for about 30 minutes. Surgery and radioguided SNB using a hand-held gamma probe was performed within 3 hours after lymphoscintigraphy.

**Result(s):** SNs were found in all cases and in 90.2% of them (37/41) they were localised in the ipsilateral neck levels I-II only. The mean number of SNs detected was 2.2 and the mean size was 14.2 mm. Metastases were found in 13 out of 41 cases (31.7%), at level I, II and III, all identified by step serial sectioning on routine H&E staining. Other metastatic nodes were found in neck specimen in 5 of these patients after neck dissection. No one of the 28 patients with negative SN had node metastases in the ipsilateral neck in the follow up (mean 36.8 months).

**Conclusion(s):** This study confirms the accuracy of SNB to predict the presence of occult metastases and the validity of same day protocol in detecting SN really close to tumour site (Level I end II).

**Keywords:** Tumour, SNB, Lymphoscintigraphy

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[O16-07]

## Neck Management in Early Tongue Cancer

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**Objective:** Neck recurrence is a frequent cause of failure in early cancer of the tongue. Various options of management of the neck include observation, elective neck dissection and elective neck irradiation. A retrospective review of patients who underwent surgery for their primary disease was carried out to determine if the choice of the neck treatment had an impact on the incidence of neck failure.

**Method(s):** This is a retrospective review of 60 previously untreated patients with early (T1/ T2 N0) cancer of the anterior tongue managed surgically at our institute between 1997-2007. All patients had wide excision of their tongue lesion and either neck observation or elective neck dissection based on their preference after detailed discussion about the risks and benefits. Prior to 2001, all neck dissections were selective (supraomohyoid, SOND), however, subsequent to a few failures in the neck in this group, from 2001, modified radical neck dissection type 1 (MRND), became the elective neck dissection of choice. All patients with histological positive nodes in their neck dissection specimens were subjected to post-operative radiotherapy. Patients were analyzed for the incidence of neck failures within 2 years post surgery.

**Result(s):** The overall incidence of neck failure was 22%. The failure rates were 29%, 21% and 8% in the group which had neck observation, SOND and MRND respectively. Majority (88%) of the failures in the group on neck observation were successfully salvaged, however none in the neck dissection group could be surgically salvaged. All failures in the neck dissection group were in the upper neck and 60% had no histological evidence of metastasis in their neck dissection specimens.

**Conclusion(s):** This study indicates that a comprehensive modified RND is preferable to SOND in patients undergoing surgery for early tongue cancer. Based on this, a prospective randomized trial is presently being undertaken between these 2 groups.

**Keywords:** Early Tongue Cancer, SOND, MRND

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[O16-08]

## Lymph Node Ratio: A Significant Prognostic Factor for Prediction of Recurrence and Survival in Patients with Oral Cancer

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**Objective:** The conventional staging system (TNM) quantifies lymph node disease according to the number, size, and laterality of metastatic cervical lymph nodes. However in the era of selective neck dissection, this staging system is difficult to represent the entire lymph node status because of the various extent of neck dissection. The purpose of this study was to evaluate the utility of lymph node ratio (LNR, number of positive lymph nodes/total number of dissected lymph nodes) as a prognostic factor predicting recurrence and survival in patients with oral cavity squamous cell carcinoma (OSCC).

**Method(s):** Seventy-eight patients who underwent neck dissection with adjuvant radiotherapy between 2002 and 2005 for OSCC were included. The median follow-up was 68 months. Five-year overall survival, and recurrence free survival rates were calculated using the Kaplan-Meier method with log rank test. The variables compared were age, sex, TNM stage, tumor size, pN stage, extracapsular invasion, total number of lymph nodes dissected, and LNR to univariate and multivariate analysis.

**Result(s):** The median number of dissected lymph nodes was 47 (range: 24–87), and the median LNR was 0.06 (3/47). The TNM stage, tumor size, pN stage, extracapsular invasion and LNR were associated with worse overall and recurrence free survival in univariable analysis. The crude hazard ratio 8.96 (95 percent confidence interval: 1.45 to 30.75) for overall survival and 8.86 (1.94 to 36.42) for recurrence free survival in increased LNR. Adjusted hazard ratio for LNR in multivariate regression analysis were 9.76 (1.45 to 40.34) and 10.24 (2.44 to 42.36) respectively. The total number of dissected lymph nodes was not related to survival or recurrence.

**Conclusion(s):** The pathologic assessment using LNR was found to be a reliable prognostic factor for recurrence and survival after curative surgery for oral cavity squamous cell carcinoma (OSCC).

**Keywords:** Lymph Node Ratio, Oral Cancer, Prognosis

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[O16-09]

## High Rate of Regional Failure of the Untreated Neck in Squamous Cell Carcinoma of the Hard Palate and Maxillary Alveolus

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**Objective:** The incidence of cervical metastasis in squamous cell carcinoma (SCC) of the hard palate and maxillary alveolus is believed to be low. However, contemporary outcomes data are limited and patterns of regional recurrence have not been defined. The objective of this study was to determine the incidence of regional recurrence in hard palate and maxillary alveolus SCC, and to identify factors predictive of regional recurrence.

**Method(s):** One hundred thirty-nine patients with SCC of the hard palate and maxillary alveolus were identified from a pre-existing database of oral cavity cancer patients treated at Memorial Sloan-Kettering Cancer Center between 1985 and 2006. Patient, tumor and treatment details were recorded from patient charts. The incidence of regional metastasis at presentation and at recurrence, and regional recurrence-free survival (RRFS) were calculated by the Kaplan-Meier method. Factors predictive of RRFS were identified on Cox multivariable regression analysis.

**Result(s):** At presentation, 12 of 139 (8.6%) patients had clinical or radiographic evidence of cervical metastases. Regional recurrence occurred in 28.4% of patients. The incidence of regional recurrence was significantly associated with pathologic T status, and ranged from 18.7% (pT1) to 37.3% (pT4). Overall five-year RRFS was 59.2%. Pathologic T status was an independent predictor of RRFS on multivariate analysis ( $P<.0001$ ). Survival after regional recurrence was poor, and the majority (65.6%) of patients was not able to be salvaged.

**Conclusion(s):** Patients with primary tumors of the hard palate and maxillary alveolus staged T2-T4 exhibit high rates of regional recurrence. In most cases of regional relapse, successful salvage is not achieved. Elective treatment of the neck is therefore recommended for stage T2-T4 SCC of the hard palate and maxillary alveolus.

**Keywords:** Hard Palate, Regional Recurrence, Upper Alveolus

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**O17. Reconstruction (III)****Chairs : Phil-Sang Chung (Korea)****Yu-wai Chan (Hong Kong)**

13:50 - 15:20 SBR II

[O17-01]

## **Microinvasive Access to the Visceral Autoflaps for Microsurgical Reconstruction in Head and Neck Cancer Patients**

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**Objective:** Microinvasive diagnostic and surgery is one of the most promising lines of up-to-date oncology. In our institute was developed a method of microinvasive abdominal access to form the visceral autoflaps in cancer patients.

**Method(s):** We have an experience of treatment 50 patients aged from 16 to 55 years with malignant local extended craniofacial (27) and oropharyngeal tumors (23). For plastic closing the large postoperative defect were used the abdominal organs. We chose para umbilical incision as the appropriate access to the abdominal cavity with minimal external trauma of the anterior abdominal wall. Using video assisted technique (video endoscopy system) aponeurosis was dissected along median centerline. Donor's organs (omentum, greater curve of the stomach, transverse colon, jejunum) were delivered through the minilaparotomy wound on the anterior abdominal wall, then vessel's peduncle of free flap was exposed (right gastro-omental vessels, vessels colicae media, vessels jejunum) and visceral autotransplant was formed. Dissection away the transplant followed by the extracorporeal forming of the organs' anastomosis. In 3 cases was made an attempt to form the 1 gastro-omental and 1 colon-omental autotransplants and in 1 case at adiposity during formation omental flap. After inspection the abdominal cavity usual upper median laparotomy was performed.

**Result(s):** In 47 cases the operation was completely made through the minimal access (3 patients had abdominal operative intervention before). It was formed and prepared for autotransplantation 26 omental free flaps, 7 gastro-omental, 15 colon-omental and 2 jejunum flaps. There were no intra- and postoperative abdominal complications.

**Conclusion(s):** Microinvasive technology to form visceral autotransplants for head and neck reconstruction allows to minimize operative trauma and to shorten the period of postsurgical treatment. We recommend using this access when operating the weak cancer patients and young women to avoid additional undesirable scar on donor's site.

**Keywords:** Microinvasive Access, Oncology, Visceral Autotransplant

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[O17-02]

## **Microsurgical Reconstruction Proximal Portion of the Digestive Tract in Patients with Head and Neck Malignant Tumors**

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Oleg Matorin, Andrey Polyakov, Mikhail Ratushnyy**

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Russian Federation*

**Objective:** Surgical treatment planning for excision of tissues and plan for reconstruction is not generally accepted. Larger defects of the mucosa and soft tissues or bone in the proximal portions of the digestive tract cannot be repaired by primary closure, a split-thickness skin graft, or with more elaborate reconstruction using regional cutaneous or myocutaneous flaps. We use different approaches for complex reconstruction with a lot of variants of plastic materials.

**Method(s):** Our experience includes 947 clinical cases malignant tumors of head and neck, who underwent microsurgical reconstructive interventions at different stages of treatment and rehabilitation.

**Result(s):** The first point of reconstruction in 47.5% cases, the patients need to restoration oral cavity, oropharynx, laryngopharynx and oesophagus (n=450) with isolation vessels, skull base, mediastinum. About 70% of the operated patients had stages III-IV cancer. About 30% of the patients had continued tumor growth or recurrence. About 90% of the patients tolerated radiation or chemoradiation therapy in doses exceeding 100 Gy in some cases. Squamous cell carcinoma was dominate— 72%. About 90% cases were complex defects: soft tissue and bone with aero and digestive tracts.

A wide range of an autologous plastic material, including different types of grafts from integuments, bone fragments and visceral organs. A total of 460 revascularized flaps were applied. 156 tectorial tissue flaps used in 150 cases. 304 visceral flaps were autotransplantation in 300 clinical cases.

Microsurgical reconstruction with visceral flap (omental, gastro-omental, jejunum, colon, colon-omental etc.) is effective in 94.2% cases as one step method in this group of patients. It gives good functional and aesthetic results in 62% cases. Maximum follow-up period up to 17 years.

**Conclusion(s):**

**Keywords:** Microsurgery, Digestive Tract, Visceral Flap

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[O17-03]

## **Algorithm for Choosing the Side of Donor Free Fibula Flap in Mandibular Reconstruction : Choice of Donor Side Depending on the Defect -Mucosa vs. Skin**

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Sandip Durrah, Daxesh Patel, Subramania Iyer\***

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**Objective:** The use of free fibula flaps is an established method for reconstructing mandibulectomy defects. However, the choice of optimal side of fibula to be harvested is not yet defined. Here, we have constructed an algorithm for the choice of side of fibula based on the anatomical relationship between bone, muscle ,skin paddle and vascular pedicle to facilitate optimal orientation between the components of the flap for reconstruction of composite defects.

**Method(s):** Anatomical orientation of the skin paddle, flexor hallucis longus muscle, fibula bone and the direction of vascular pedicle were studied on both limbs and orientation of the composite flap was studied in relation to the orientation of the defect.

**Result(s):** We were able to select the side of fibula based on the algorithm developed by us and we have successfully used it in a variety of oral cavity defects involving a segment of the mandible.

**Conclusion(s):** The choice of side of fibula in the reconstruction of mandibulectomy defect should not be arbitrary but the orientation of the components of the composite flap and the nature of the defect should be taken into consideration while reconstructing the defect and the algorithm developed by us is a useful tool to that end.

**Keywords:** Head and Neck Reconstruction, Free Fibula Flap

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[O17-04]

## **Computer Aided Design Mandible Reconstruction with Double Barrel Vascularized Free Fibula Flap and Simultaneous Implant**

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**Objective:** Although the reconstruction of mandible with microsurgical technique is mature nowadays, mandible defect caused by tumor ablation surgery is still a great challenge to the oral and maxillofacial surgeons. Focused on the contour and the occlusion of the mandible, here we introduced a method of computer aided design mandible reconstruction.

**Method(s):** 5 patients suffered from mandible tumor enrolled in our study. Preoperative CT data of maxillofacial region and the fibula region were imported into Mimics software to calculate the 3 dimensional objects of the mandible, maxilla and the fibula. Virtual surgery of tumor resection, fibula reconstruction and simultaneous implant insertion was performed in the Mimics platform. The reconstructed mandible object was export and fabricated into the rapid prototype model. The reconstruction titanium plate was precurved and the implant template was molded according to the model. Surgery was performed accurately according to the templates.

**Result(s):** In the Mimics platform, we planned the tumor resection, fibula transfer and implant insertion procedures. The surgery was performed accurately according to the preoperative planning with the help of the RP model and the templates. On the 3rd month of follow up, the superstructures of the implants was introduced. 18 months postoperative, the facial contour was excellent with perfect symmetry. The occlusion relationship is great.

**Conclusion(s):** With preoperative computer aided design, the spacial relationship of the mandible, the fibula graft and the implants can be planned individually. Combined with RP technique, the planned special relationship of the fibula graft and the implants can be transferred into the mandible during surgery, which helps to achieve the optimum result.

**Keywords:** Mandible Reconstruction, Fibula, Computer Aided Design

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[O17-05]

## A New Option in Head and Neck Reconstruction: The Free Supraclavicular Transverse Cervical Artery Perforator Flap

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**Objective:** The free supraclavicular transverse cervical artery perforator (STCAP) flap has been recently introduced as an option for facial and oral reconstruction. Cadaveric studies have demonstrated its vascular anatomy as based on perforators coming from the transverse cervical artery (TCA). By contrast, its drainage is through the superficial cervical and external jugular (EJV) veins. Its main attractive is represented by its easy access for head and neck surgeons, fast harvesting, and low donor site morbidity. Purpose of this study is to describe harvesting technique, complication rate, and functional outcomes of this flap.

**Method(s):** Between December 2007 and October 2008, we applied the free STCAP flap for reconstruction of 6 head and neck cancer patients: 4 oral cavities (3 floor of the mouth and 1 hemi-mobile tongue) and 2 post-auriculectomy and skin of the parotid region defects. None of them had been previously treated by radiotherapy (RT) and all were cN0.

**Result(s):** Flap harvesting mean time was 40 minutes. Mean size of the skin paddle was 6×8 cm and every neck donor site was closed primarily. Mean length of pedicle was 8 cm (vessels caliber of 2 mm for TCA and 5 mm for EJV). One patient developed an oral fistula managed by primary suture under local anesthesia. No flap failure occurred. Scar on the lower part of the neck always resulted inconspicuous 2 months after surgery.

**Conclusion(s):** Texture and pliability of this flap render it an ideal reconstructive option for middle-sized soft tissues oral and facial defects. Essential prerequisites are no previous neck dissection of level III-V or RT. Another potential limit can be represented by the need for relatively close recipient vessels due to the short pedicle. STCAP free flap represents an expeditious, reliable, and safe procedure. No donor site morbidity has been observed.

**Keywords:** Supraclavicular Free Flap, Head and Neck, Reconstruction

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[O17-06]

## Modified Design of Radial Forearm Flaps for Intraoral Reconstruction- A Comparison of Results with the Conventional Design

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<sup>3</sup>*Head and Neck Surgery, Bangalore, India*

**Objective:** A prospective study was designed to assess the feasibility of using a modified radial forearm flap based on multiple perforators from the radial artery allowing it to be fabricated in different shapes with direct closure of the donor site, as described by Matev. This modified design was compared with the conventional design.

**Method(s):** 15 patients underwent reconstruction of tongue and floor of mouth defects using modified design of radial forearm flaps. The results after reconstruction was assessed both at the recipient site and the donor site at 6 months follow up. The donor area was assessed for the healing time, quality of the scar as assessed by the patient and an independent observer and presence of sensory deficits. The recipient site was analysed for the quality of scarring and suppleness of the reconstructed area. The results of this group was compared to the conventional design of radial forearm flaps in a similar number of patients.

**Result(s):** The modified design of the radial forearm flaps could be used in the cases where the defect size was less than 6×4 cm. Primary closure could be achieved in most of the patients and in the remaining the grafted area could be transposed to the mid forearm. The donor site was found to be more acceptable to the patients when compared to the conventional design.

**Conclusion(s):** Modified design of radial forearm flaps has been found to be useful for reconstruction of intraoral defects. This allowed a better fashioning of the flap to suit the defect as well as allowed to achieve a better donor site.

**Keywords:** Radial Forearm Flap, Head and Neck Reconstruction

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[O17-07]

## Functional Oral Rehabilitation with Free Flap and Early Dental Prosthesis Application after Ablative Tumor Surgery

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**Objective:** Oral tissue defects after oral cancer resection result in poor quality of life due to malnutrition, speech problem and dysphasia. The purpose of this clinical study was to evaluate the restoration of the oral cavity tissue defects both esthetically and functionally using predesigned free flap and dental prosthesis.

**Method(s):** Between 2006 and 2009, 65 patients were underwent oral cancer resection and free flap reconstruction in department of oral and maxillofacial surgery of Asan medical center. Soft tissue defects were reconstructed with radial forearm free flap or latissimus dorsi free flap and jaw defects were reconstructed with free fibular flap. Early oral rehabilitation was performed using temporary denture in maxilla and resected mandible. Definite oral prosthesis was applied 6 months after operation. Dental implants were inserted in selected cases. Quality of life before and after dental rehabilitation was evaluated and subjective evaluations of facial esthetic were also reported.

**Result(s):** Early wearing of dental prosthesis improved the quality of life in aspects of chewing, drooling of saliva, speech, soft tissue support around mouth and esthetics. Lower denture was specially designed and relined with soft liner to increase the retention of dental prosthesis which improved the satisfaction of patients. Dental implant showed most satisfactory results than other removal denture in both maxilla and mandible defects patients.

**Conclusion(s):** Early application of removable and fixed prosthesis within 3 months after operation improved the quality of life in oral cancer patients. Dental implant rehabilitation showed most efficient methods for restoring oral function and esthetics after ablative jaw surgery.

**Keywords:** Oral Cancer, Dental Prosthesis, Dental Implant

**Corresponding Author** Kang min Ahn (ahnkangmin@hanmail.net)

[O17-08]

## Mandibular Reconstruction Using Pectoralis Major Myocutaneous Flap and Titanium Plates after Ablative Surgery for Locally Advanced Tumors of the Oral Cavity

**Mohammed El-Zohairy<sup>1</sup>\*, Ahmed Mostafa<sup>1</sup>,  
Hesham Abdel-Fattah<sup>2</sup>, Sheroul Khalifa<sup>3</sup>, Ayman Amin<sup>1</sup>**

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<sup>2</sup>*Maxillofacial, National Cancer Institute, Egypt*

<sup>3</sup>*Maxillofacial, Faculty of Oral & dental Medicine,  
Cairo University, Egypt*

**Objective:** The most common indication for mandible resection remains ablative surgery for cancer of the oral cavity and oropharynx. The use of vascularized bone grafts has become state-of the art for mandibular reconstruction. However, the high cost of such surgery may not be justified in patients with advanced disease and poor prognosis, or poor performance status. This study was conducted to assess whether titanium plate and pedicled pectoralis major myocutaneous flap is a valid alternative to complex reconstruction with bony free flaps in such patients.

**Method(s):** The study involves a total of 33 patients who were treated over 5 year period (2003-2008) at the National Cancer Institute, Cairo University, Egypt. Mandibular resections were performed for treatment of patients with primary oral cavity tumors invading the mandible. The extent of mandibular involvement by tumor was preoperatively assessed by X-ray panoramic view and CT scan.

**Result(s):** Of 33 patients, 25 were males, and 8 were females. The age ranged from 42 to 63 years. All patients had preoperative histological diagnosis; squamous cell carcinoma was the commonest histology. 24 patients received post operative radiation therapy. The Overall flap survival was 100%; partial necrosis of the flap skin was observed in 3 patients. One patient developed wound dehiscence, another had a cervical abscess which was drained. Oro-cutaneous fistula occurred in 5 patients that closed spontaneously. There were 4 cases of plate failure, one patient experienced plate fracture at 13 months after reconstruction. Three patients experienced delayed external plate exposure. All patients achieved good functional and acceptable esthetic outcome. Minimum follow-up period was 12 months, 7 patients developed loco-regional tumor recurrence, and three patients died of their disease.

**Conclusion(s):** Titanium plate and pedicled pectoralis major myocutaneous flap is a safe and reliable option for composite mandibular defects.

**Keywords:** Mandible Reconstruction, Titanium Plate, Pectoralis Major Myocutaneous Flap

**Corresponding Author** Mohammed El-Zohairy (mohamedzohairy@gmail.com)

[O17-09]

## **Microsurgical Autotransplantation as a Component of Surgical Treatment and Rehabilitation of Patients with Locally Spread Tumors Involving Facial Skeleton**

Igor Reshetov, Valery Chissov, Andrey Polyakov\*,  
Sergey Kravtsov, Oleg Matorin, Michael Ratushny

*Microsurgery, P.A.Hertzen Cancer Research Institute,  
Russian Federation*

**Objective:** Expansion of surgical treatment radicalism and improvement of patients' functional and social rehabilitation, using the resources of microsurgical tissue autotransplantation method.

**Method(s):** Surgical treatment of malignant tumors in maxillofacial zone was conducted for 272 patients. Recurrent tumors dominated (47%). The third stage of tumorous process ascertained in 35%, the fourth stage in 60% of cases. 175 patients (64%) received immediate reconstruction, in 36% of observations reconstruction was postponed for unfavorable oncological forecast. Scull base and pachymeninx resection was made in 37 (14%) cases. For eliminating of 175 (65%) orofacial defects, 37 (14%) craniofacial defects, 54 (19%) oroorbitofacial, 5 (2%) isolated defects of mandible autotransplantation of 300 spare flaps was conducted: visceral 50 gastroomental, 11 colonomental, 41 omental; skin-muscular-bone: 8 radial, 18 iliac, 3 scapular, 11 fibular, 101 rib-muscular, 2 rib-scapular, 30 different skin-muscular flaps and 25 skin-fascia radial flaps.

Visceral flaps were used for tissue defects elimination of oral cavity floor, oropharynx and cheek, muscular-rib for oroorbitofacial and orofacial defects, fibular flap for isolated defects of mandible, iliac autotransplant for total defects of hard palate, radial for small defects of oral cavity, cheek and vestibule of mouth, and skin-muscular radial for alveolar processes reconstruction. Soft tissues' vast defects combining with facial skeleton small defects were removed using skin-muscular and skin-fascial flaps.

**Result(s):** Complications appeared in 25% cases. Lethality was 2,4%. Flap necrosis was in 4,7% and flap necrosis in the bone autotransplants group was registered in 5,7% cases.

**Conclusion(s):** In the patients group with oral cavity and fauces defects, natural nutrition and breathing was restored for 88,6% patients. 93,2% of patients were satisfied with the cosmetic results, 32% returned to their job.

**Keywords:** Facial Skeleton, Reconstruction, Malignant Tumours

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## O18. Basic Science (III)

**Chairs : Dong-Wan Kim (Korea)**  
**Robert Ferris (USA)**

13:50 - 15:20 SBR III

[O18-01]

### Chromosomal Instability Predicts the Progression of Premalignant Oral Lesions

**Rinske M.P.T. Hamers<sup>1\*</sup>, Theke J.H Siebers<sup>2</sup>, Annick Haesevoets<sup>3</sup>, Iris R. Zwijnenberg<sup>4</sup>, Adri C. Voogd<sup>5</sup>, Frans C.S. Ramaekers<sup>6</sup>, Thijs M.A.W. Merkx<sup>7</sup>, Bernd Kremer<sup>4</sup>, Pieter J. Slootweg<sup>8</sup>, Ernst-Jan Speel<sup>6</sup>**

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<sup>4</sup>Otorhinolaryngology and Head and Neck Surgery, Maastricht University Medical, Netherlands; <sup>5</sup>Epidemiology, Maastricht University Medical Center, Netherlands; <sup>6</sup>Molecular Cell Biology, Maastricht University Medical Center, Netherlands; <sup>7</sup>Oral and Maxillofacial Surgery, GROW School for Oncology & Developmental Biology, Netherlands; <sup>8</sup>Pathology, St Radboud University Medical Center Nijmegen, Netherlands

**Objective:** A major dilemma in the management of patients with precursor lesions of the oral mucosa lies in deciding which lesions will progress into carcinoma. The aim of this study was to evaluate the value of chromosomal instability (CIN) detected by fluorescence in situ hybridization (FISH) for the identification of oral premalignant lesions at risk for progression.

**Method(s):** We examined a series of premalignant oral mucosa lesions of 106 patients by means of FISH on paraffin-embedded tissue sections using chromosome 1 and 7-specific centromere probes. CIN was indicated by the presence of chromosome imbalances and/or polyploidization. Results were correlated with histopathological data as well as with clinical follow-up data.

**Result(s):** The 5-year progression-free survival rate was 90%. Outcome of routine histopathology did only predict malignant progression when comparing severe dysplasia with lower stage precursor lesions (hyperplasia, mild en moderate dysplasia) ( $P=0.003$ ). CIN was detected in all different subgroups of histopathological differentiation. Moreover, the percentage of precursor lesions harboring CIN increased with progressing histopathological stage. CIN was significantly associated with a lower progression-free survival as compared with lesions without CIN ( $P<0.001$ ).

**Conclusion(s):** The tumorigenesis of the oral mucosa is associated with the development of CIN, which can reliably identify lesions at risk for malignant progression.

**Keywords:** Oral Leukoplakia, Chromosomal Instability, Malignant Progression

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[O18-02]

### The Expression and Significance of Brg1 in Laryngeal Squamous Cell Carcinoma

**Cui Xiangyan<sup>1</sup>, Wang Xin<sup>2</sup>, Chen Weilun<sup>1</sup>, Yu Hong<sup>2</sup>, Zhu Wei<sup>1\*</sup>**

<sup>1</sup>Department of Otolaryngology-Head and Neck Surgery, The First Hospital of Jilin University, China

<sup>2</sup>Department of Otolaryngology-Head and Neck Surgery, ChangChun, China

**Objective:** Brg1 protein is the central catalytic ATPase of the SWI/SNF chromatin-remodeling complex. The SWI/SNF chromatin-remodeling complex plays essential roles in a variety of cellular processes including differentiation, proliferation and DNA repair. Loss of SWI/SNF subunit has been reported in number of malignant cell lines and tumors, and a large number of experimental observations suggest that this complex functions as a tumor suppressor. This article is to study the expression of Brg1 in laryngeal squamous cell carcinoma (LSCC) and its relationship with the occurrence and development of tumor.

**Method(s):** Immunohistochemical method was used to detect the expressions of Brg1 in 30 cases of LSCC and 10 cases of normal mucosa adjacent tumor.

**Result(s):** The expression of Brg1 in normal mucosa adjacent cancer was positive (grey value is  $124.6\pm4.51$ ), and the expression of Brg1 in LSCC was low (grey value is  $159.2\pm7.69$ ), the difference between the two groups was significant ( $P<0.01$ ). The grey value expressed by Brg1 in well, moderately and poorly LSCC were  $132.8\pm1.92$ ,  $165.2\pm2.59$ ,  $179.6\pm1.52$  respectively; moderately and poorly differentiated LSCC compared with well differentiation respectively, the difference was significant ( $P<0.01$ ). The grey value expressed by Brg1 in I-II stage, III stage and IV stage were  $145.3\pm2.36$ ,  $165.2\pm4.31$ ,  $179.4\pm3.03$  respectively; III stage and IV stage compared with I-II stage respectively, the difference was significant ( $P<0.05$ ). The grey value expressed by Brg1 in vascular invasion group and no vascular invasion group were  $176.8\pm3.48$  and  $143.5\pm8.26$ , the difference between the two groups was significant ( $P<0.01$ ).

**Conclusion(s):** The expression of Brg1 in LSCC is low, and it is related to the development of cancer and pathological factors, which may be an important factor in laryngeal cancer.

**Keywords:** Laryngeal Carcinoma, Brg1, Immunohistochemistry

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[O18-03]

## Novel Mechanisms of IGF-IR/EGFR Cross-Talk that Counteracts the Antitumor Action of the Human Anti-IGF-IR Antibody IMC-A12 in Head and Neck Cancer

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*Thoracic/Head & Neck Medical Oncology,  
The University of Texas M. D. Anderson Cancer Center, USA*

**Objective:** The insulin like growth factor-I receptor (IGF-IR) axis, which has been linked to cell proliferation, survival, angiogenesis, and invasion, is frequently deregulated in head and neck squamous cell carcinoma (HNSCC) and thus emerging as a promising target for therapy of the disease. However, the mechanisms mediating resistance to the IGF-IR targeting agents are poorly understood.

**Method(s):** The effects of IMC-A12 on viability/proliferation and apoptosis of a panel of HNSCC cells cultured in normal tissue culture plates or poly (HEMA)-coated plates were examined by the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT), the 3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenol)-2-(4-sulfophenyl)-2H-tetrazolium (MTS), TUNEL-based FACS, and western blot analyses. The effects of IMC-A12 on anchorage-independent cell proliferation were analyzed by soft agar assay. The antitumor effects of IMC-A12, either alone or in combination with inhibitors targeting EGFR or Src, were evaluated using xenograft or orthotopic tongue tumor models of representative IMC-A12-sensitive and -resistant HNSCC cells. The transcriptional, translational, and posttranslational regulations of proteins involved in IMC-A12-mediated EGFR activation were measured by real-time polymerase chain reaction, western blotting, metabolic labeling with 35S-methionine, immunohistochemical analysis.

**Result(s):** We found that: (a) treatment with IMC-A12 led to activation of EGFR and Akt and (b) activated EGFR/Akt pathway induced mTOR-mediated increases in EGFR and Akt protein expressions in HNSCC cells. Co-targeting EGFR abolished resistance to IMC-A12 and induced apoptosis in HNSCC cells in vitro and in vivo. Most HNSCC tissues with EGFR overexpression had associated high levels of IGF-IR expression.

**Conclusion(s):** Our data suggest that IMC-A12-induced sequential activation of EGFR, and PI3K/Akt/mTOR followed by enhanced synthesis of EGFR and Akt proteins, further amplifying EGFR signaling and thus counteracting the antitumor action of the anti-IGF-IR humanized monoclonal antibody, IMC-A12 in HNSCC. Our results indicate the needs of integration of molecularly targeted agents blocking EGFR to the treatment regimens with IGF-IR Ab for patients with HNSCC.

**Keywords:** IGF-IR, Src, Akt

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[O18-04]

## Significance of Matrix Metallo-Proteinases in Oral Squamous Cell Carcinomas

Bhushan Jayade<sup>1</sup>\*, Basavaraj Patil<sup>2</sup>, Kishore Bhat<sup>3</sup>

<sup>1</sup>*Oral & Maxillofacial Surgery,  
SDM College of Dental Sciences Dharwad, India*  
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India*  
<sup>3</sup>*Molecular Biology, Maratha Mandal Institute, India*

**Objective:** Matrix metallo-proteinases are a group of Zinc based enzymes associated with increased invasive property and malignant potential of cancerous cells. Their role in other malignancies is fairly well established. However their role in Oral SCC is sparsley reported especially from the Indian subcontinent.

Objectives of this study are

- 1) Evaluate the expression of Matrix metallo-proteinases (MMP-2, MMP-9) in stage IV Oral SCCs
- 2) Co-relate their levels of expression with clinico-pathological parameters mainly lymph node metastasis
- 3) Co-relate their levels of expression with response of the patient to therapy

**Method(s):** 60 consecutive patients with clinically stage IV disease (Oral SCC) treated at Karnataka Cancer Therapy and Research Institute were enroled in this study with prior consent. After excision a tissue sample from the lesion was taken. Using Zymography the expression of MMP-2 and MMP-9 has been evaluated. This data is being co-related with the pathologic lymphatic status of the patient. Also a co-relation is being done with the response of the patient to multimodality therapy. This data will be subjected to stastical analysis.

**Result(s):** Will be presented in this oral presentation

**Conclusion(s):** Will be presented in this oral presentation

**Keywords:** Matrix Metallo-Protineases, Zymography, Oral Squamous Cell Carcinomas

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[O18-05]

## Induction of Cell Death by Atmospheric Non-Thermal Plasma in Head and Neck Cancer

**Chul-ho Kim<sup>1</sup>, Seung Joon Baek<sup>2\*</sup>**

<sup>1</sup>Department of Otolaryngology, Ajou Medical Center,  
Ajou University, Korea

<sup>2</sup>Department of Pathobiology, College of Veterinary Medicine,  
University of Tenne, Korea

**Objective:** Plasma is generated by ionizing of neutral gas molecules, resulting in a mixture of energy particles, including electrons and ions. Recent progress in the understanding of non-thermal atmospheric plasma has led to applications in biomedicine. Plasma is known to induce power- and time-dependent cell growth arrest. However, exact molecular mechanisms involved in plasma-induced cell growth arrest are unclear.

**Method(s):** In this study, we investigated the feasibility of non-thermal atmospheric plasma treatment for cancer therapy and examined the mechanism by which plasma induces anti-proliferative and anti-invasive properties and cell death in human head and neck cancer cells.

**Result(s):** Non-thermal atmospheric plasma induced cell growth arrest in the human head and neck cancer cell lines FaDu, KB, and spccy-1. Plasma inhibited migration and invasion of FaDu in dose-dependant. Low doses and short exposure to plasma resulted in apoptosis induction in FaDu, as assessed by DAPI staining, TUNEL assay, and caspase 3/7 activity. We also found that plasma treatment to the cells increases  $\beta$ -catenin phosphorylation, suggesting that the  $\beta$ -catenin degradation plays a role at least in part in plasma-induced anti-proliferative activity.

**Conclusion(s):** Plasma induces apoptosis and cell cycle arrest in human head and neck cancer cells. Non-thermal atmospheric plasma constitutes a new biologic tool with the potential for therapeutic applications that modulate cell structure and function.

**Keywords:** Atmospheric Non-Thermal Plasma, Apoptosis, Head and Neck Cancer

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[O18-06]

## Curcumin Inhibits Migration of Squamous Cell Carcinoma of the Tongue through Down-Regulation of MMP10

**Raymond King-Yin Tsang\*, Thian-Sze Wong,  
Wai-Kuen Ho, William I. Wei**

*Department of Surgery, University of Hong Kong, Hong Kong*

**Objective:** Curcumin is a natural polyphenol found in turmeric. Curcumin has been shown to have anti-metastatic effects in various cancers. Our study was to investigate the effect of curcumin on tongue SCC and its possible target of action.

**Method(s):**

1. Gene expression profile changes of cells from tongue SCC cell line in response to curcumin treatment was assessed with microarray.
2. The changes in migration activity of tongue cancer cell lines CAL27, HN21B and HN96 treated with curcumin was assessed with wound healing assay.
3. The expression of MMP10 mRNA was assessed with quantitative RT-PCR.
4. MMP10 protein expressions in the 3 tongue SCC cell lines after curcumin treatment were assessed with immunohistochemical stain and Western blotting.

**Result(s):**

1. Curcumin down regulates the MMP10 expression in tongue cancer cell line HN21B by 2.64 fold.
2. The reduction of mRNA expressions of MMP10 in 3 cell lines after curcumin treatment were confirmed with RT-PCR.
3. The reduction in the protein expression of MMP10 after increasing dose of curcumin were demonstrated with immunohistochemical staining on cell lines and tissue arrays.
4. The reduction of MMP10 protein expression was confirmed in Western blotting.
5. Wound assay showed that curcumin inhibits tumor cells migration in all 3 tongue cancer cell lines.

**Conclusion(s):** This study demonstrated that curcumin could inhibit tumor cells migration through the repression of over-expressed MMP10 in tongue SCC. The potential for developing curcumin as a treatment for tongue SCC is worth investigating.

**Keywords:** Curcumin, MMP10, Tongue Cancer

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[O18-07]

## Inostamycin Prevents Malignant Phenotype of Cancer: Inhibition of Phosphatidylinositol Synthesis Provides a Therapeutic Advantage for Head and Neck Squamous Cell Carcinoma

**Yuh Baba\***

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**Objective:** Head and neck squamous cell carcinoma (HNSCC) remains the sixth most common neoplasm worldwide, with a~600,000 new cases per year (Stewart and Kleihues, 2003). Recurrent and/or metastatic HNSCC patients have a poor prognosis that has remained unchanged over the past 30 years (Khuri et al., 2000; Forastiere et al., 2001). Over 50% of newly diagnosed patients with HNSCC do not achieve complete remission and relapse with metastasis to distant organs in ~10% of cases. Therefore, more effort is needed to gain a better understanding of this disease and develop novel improved treatment strategies.

**Method(s):** Inostamycin, a polyether compound, was isolated from Streptomyces spp. MH816-AF15 as a specific inhibitor of cytidine 5'-diphosphate 1, 2-diacyl-sn-glycerol (CDP-DG): inositol transferase, which synthesizes phosphatidylinositol (PI) (Imoto et al., 1990). Inostamycin suppresses growth of small cell lung carcinoma in vitro and Ehrlich tumor in vivo (Nishioka et al., 1994; Imoto et al., 1998).

**Result(s):** Inhibition of cytidine 5'-diphosphate 1,2-diacyl-sn-glycerol (CDP-DG): inositol transferase by inostamycin, an antibiotic isolated from Streptomyces spp. MH816-AF15, induces G1 cell cycle arrest accompanied by decrease in cyclin D1 and phosphorylated RB protein levels, along with suppression of in vitro invasive through reduced production of matrix metalloproteinases (MMP-2 and MMP-9) and cell motility in head and neck cancer cell lines. Furthermore, inostamycin abrogated stimulatory effect of VEGF on growth and migration activities of endothelial cells by targeting ERK-cyclin D1 and p38 pathways, respectively.

**Conclusion(s):** Because inostamycin has both antiproliferative and anti-invasive abilities, inhibition of phosphatidylinositol synthesis could be a potent therapeutic strategy for head and neck cancer as the ‘cancer dormant therapy’, i.e. a therapeutic concept to prolong ‘time to treatment failure’ or ‘time to progression’.

**Keywords:** Inostamycin, Head and Neck Squamous Cell Carcinoma, Cancer Dormant Therapy

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[O18-08]

## 3,3'-Diindolylmethane Induces G2/M Cell Cycle Arrest in Oral Cancer Cells

**Jing-Ru Weng\*, Ching-Tung Ye,  
Chia-Ming Chang, Zhu-Ren Lin**

Department of Biological Science and Technology,  
China Medical University and China Medical University Hospital,  
Taiwan

**Objective:** Indole-3-carbinol (I3C) is a common chemopreventive agent found in Cruciferous vegetables, which suppresses cancer cell proliferation through cell cycle arrest and apoptosis. However, I3C undergoes rapid self-condensation to form 3,3'-diindolylmethane (DIM) and other oligomeric metabolites in acidic milieu. Evidence indicates that DIM exhibits similar activities, relative to I3C, in mediating cell cycle arrest and apoptosis, yet with higher potency. Thus, we evaluated the antitumor effects of DIM in oral cancer cells.

**Method(s):** The in vitro effects of DIM were evaluated in SCC15 and SCC2095 human oral cancer cell lines. Cell viability, apoptosis, cell cycle, and signaling targets were determined by MTT, ELISA, flow cytometry, and immunoblotting, respectively.

**Result(s):** DIM reduced cell viability of SCC15 and SCC2095 cells with IC<sub>50</sub> of 39 μM and 22 μM, respectively. It induced G2/M arrest in a dose dependent manner up to 30 μM, and apoptosis at 50 μM, as evidenced by caspase 3 activation. Mechanistic evidence indicates that DIM upregulated the expression of Bad, survivin, and Bcl2, accompanied by the downregulation of the expression of CDK inhibitors, p27KIP1, and p21CIP/WAF1.

**Conclusion(s):** DIM induces G2/M cell cycle arrest and apoptosis in oral cancer cells, which might, in part, attributable to a pleiotropic mechanism similar to that of I3C.

**Keywords:** Indole-3-Carbinol, 3,3'-Diindolylmethane, Oral Cancer

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[O18-09]

## Cancer Associated Fibroblast (CAF) Expressing CD44 Influenced the Ability of Cancer Cell's Migration

**Seon-hui Shim<sup>1</sup>, J. Hun Hah<sup>2</sup>,**  
**Kwang Hyun Kim<sup>2</sup>, Myung-Whun Sung<sup>2\*</sup>**

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<sup>2</sup>Department of Otorhinolaryngology, Seoul National University,  
Korea

**Objective:** Cancer associated fibroblast (CAF) is considered of one of the most important factor which is influencing to tumor microenvironment. And we found CAF over-expressed CD44 when compared to normal part of fibroblast. Thus, we focused on the role of CAF which is over-expressing CD44.

**Method(s):** We gathered tissues from several head and neck cancer patients and isolated fibroblast from tumor tissues and normal tissues away from cancer. To test the effect of CAF on cancer cells, fibroblast and head and neck cancer cell lines were co-cultured in trans-well system which is modified with our own idea.

**Result(s):** We found that CAFs over-expressed CD44, compared to corresponding fibroblasts from normal tissue. On wound healing assay, cancer cells co-cultured with CAFs showed faster migration than those cultured with normal fibroblasts. After neutralizing the CD44 on CAF, the motility of cancer cells reduced. To confirm that CAF should influence tumor cell's migration, we performed migration assay in a 3-dimensional environment. A mixture of CAFs and cancer cells were laid on an upper well and the level of migration of these cells through soft agar in the bottom well was tested. Cancer cells which get ability to migrate can form colonies and survive in the bottom well. For antibody-free mixtures, the cells in the upper well showed migration and were found in the bottom well. However, when treated with neutralizing antibody, cells could neither migrate nor make colonies well. Moreover, when cancer cells were kept to contact with CAFs for several days, the expression of CD44 on cancer cells were increased.

**Conclusion(s):** In conclusion, we found that blocking CD44 on CAF reduced the motility and invasiveness of cancer cells. These observations suggest that CAF is an important factor to control aggressiveness of cancer cells in tumor-microenvironment.

**Keywords:** Cancer Associated Fibroblast, CD44, Tumor Microenvironment

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**O19. OROPHARYNX****Chairs : Liang Zhou (China)****Javier Gavilán (Spain)**

13:50 - 15:20 SBR IV

[O19-01]

**Screening and Minimal Invasive Surgery for the Superficial Pharyngeal Cancers**

**Kenji Okami\***, Akihiro Sakai, Ryousuke Sugimoto,  
Koji Ebisumoto, Masahiro Iida

*Otolaryngology, Tokai University, Japan*

**Objective:** The key to improve the cancer prognosis is an early detection of the primary lesion. The screening of the high risk patients is important for early detection of head and neck cancer. The purpose of this study is to investigate the usefulness of the screening of the esophageal cancer patients for pharyngeal cancer and of the minimal invasive surgery.

**Method(s):** An optical technique with narrow-band filters (Narrow Band Imaging system, Olympus, Tokyo) emphasizing the microvascular proliferation pattern was used for the screening of the mucosal lesion. About 250 patients with esophageal cancer underwent screening videoendoscopy for hypopharyngeal cancer with NBI system. The detected mucosal lesions were resected by minimal invasive surgery such as transoral microscopic surgery and endoscopic mucosal resection (EMR).

**Result(s):** We diagnosed 43 pharyngeal lesions (41 patients) by NBI system. The 31 early mucosal lesions were resected successfully by transoral microscopic surgery (22 lesions) and EMR (9 lesions). There was no postoperative complication such as bleeding, dyspnea, or dysphagia. And tracheostomy or tube feeding were not necessary in any patients. The other 12 cases were treated with chemo-radiotherapy.

**Conclusion(s):** The NBI system will be a strong tool for the early detection of pharyngeal cancers. And minimal invasive surgery was useful to maintain the quality of life after the treatment. The advantage and disadvantage of this system are discussed.

**Keywords:** Early Detection, Pharyngeal Cancer, NBI System

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[O19-02]

**Transoral Robotic Surgery (TORS) as Single Therapy for Oropharyngeal Cancer**

**Eric Moore\*, Kerry Olsen, Jan Kasperbauer**

*ORL/HNS, Mayo Clinic, USA*

**Objective:** To present the functional and oncologic outcomes of 32 patients who underwent transoral robotic surgery (TORS) and simultaneous neck dissection without any other adjuvant therapy for Stage 1-3 oropharyngeal (OP) squamous cell carcinoma (SCCA).

**Method(s):** Single-center prospective case analysis concentrating on swallow function, feeding tube dependence, local and regional control, overall and disease specific survival, and cost analysis of therapy.

**Result(s):** Of a group of 102 patients who underwent TORS for T1-3/N0-2 OP SCCA, 32 (31%) patients were identified who either did not meet criteria for adjuvant therapy, or who refused adjuvant therapy. Over the mean follow-up period of 26 months, 32 of 32 patients had no disease recurrence at the primary site. One patient developed disease recurrence in the neck and underwent revision surgery and adjuvant chemoradiation therapy with no subsequent evidence of recurrence. The 5-year regional estimate was 96%. The 5-year determinant survival estimate was 100%. The mean duration of hospitalization was 3.2 days. There were no major complications relating to TORS. No patient required a permanent feeding or tracheostomy tube.

**Conclusion(s):** TORS is an effective treatment option for OP SCCA. For selected T1-3/N0-1 SCCAs this remains an option for single modality therapy, offering patients high expectation of disease control and rapid return to function. As a single episode of therapy, TORS and neck dissection is the most cost-effective treatment option for select OP SCCAs.

**Keywords:** Transoral Robotic Surgery (TORS), Oropharyngeal Cancer, Tonsil Cancer

**Corresponding Author** Eric Moore (moore.eric@mayo.edu)

[O19-03]

## Robotic Surgery for the Treatment of Head and Neck Cancer: Prospective Experiences in Safety and Efficacy

Young Min Park, Won Shik Kim, Jin Sei Jung,  
Eun Chang Choi, Se-heon Kim\*

*Otorhinolaryngology, Yonsei University College of Medicine, Korea*

**Objective:** The current trend in managing head and neck cancer is to perform organ preservation therapy which improves quality of life and decreases treatment related morbidity. Robotic surgery is one of the minimal invasive treatment options. The purpose of this prospective study was to determine the safety, and efficacy of robotic surgery (TORS) for various head and neck tumors.

**Method(s):** From April 2008 to September 2009, 41 patients were enrolled in an institutional review board-approved prospective trial using the daVinci surgical robot. Inclusion criteria for the study consisted of adults with early head and neck tumor involving the oral cavity, oropharynx, hypopharynx, and larynx. Under general anesthesia, not only adequacy of exposure but also tumor extent was evaluated pre-operatively.

**Result(s):** The average setup time was 22 minutes with average operation time of 71 minutes and average blood loss was 11cc. Robotic endoscope provided three dimensional magnified views and overcame the ‘line of sight’. By using the articulated robotic arms, pyriform sinus resection, lateral oropharyngectomy and base of tongue resection were successfully done with en bloc pattern. There were no intraoperative complications. Bleeding was easily controlled by bipolar Maryland forceps and suture tie method by using the robotic arms and laryngeal clips. Negative resection margins were achieved in all therapeutic cases. Intraoral allograft graft was performed in 8 lateral oropharyngectomy cases, but no free flap reconstruction was done in any case. The average time for decannulation and oral feeding was 5.2 days and 6.6 days, respectively.

**Conclusion(s):** TORS is a safe, feasible, and minimally invasive alternative to classic open surgery or endoscopic transoral laser surgery in patients with early cancer of the head and neck area.

**Keywords:** Robotic Surgery, Head and Neck Cancer, Prospective Study

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[O19-04]

## Transoral Robotic Surgery for the Management of Head and Neck Tumour: Preliminary Results

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**Objective:** The aim of this prospective study was to determine the technical feasibility, safety, and efficacy of TORS as a routine procedure for a variety of malignant and non malignant head and neck lesions.

**Method(s):** From April 2008 to September 2009, 27 patients were enrolled in an institutional prospective trial using the DaVinci surgical robot. Inclusion criteria for the study consisted of adults with early head and neck tumour involving the oral cavity, oropharynx, hypopharynx, and larynx accessible to transoral resection.

**Result(s):** Twenty-seven patients were included in this study. In all cases, access to the tumor was adequately possible with variety of mouth gag and the procedure was successfully carried on. In all 27 cases, negative resection margins were achieved. None of them received intraoperative reconstruction. Four of 27 patients underwent concomitant unilateral selective neck dissections. Eighteen patients clinically N0 were enrolled in a sentinel node protocol study. None of the patients required tracheotomy and there were no intraoperative or postoperative complications related to the use of Robot da Vinci system. The average setup time was 24.30 minutes (range, 60-10 minutes), with a rapid decrease in the setup time as the study progressed. The average surgical time was 68.35 minutes (range, 180-12 minutes) depending on tumour site and size.

**Conclusion(s):** TORS seem to be a safe, feasible, and offers a minimally invasive alternative to classic open surgery or transoral laser surgery in patients with early cancer of the head and neck. The learning curve is short for surgeons familiar with transoral surgery.

**Keywords:** Head Neck Cancer, Trans Oral Robotic Surgery, Robot Da Vinci

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[O19-05]

## Long Term Results of Surgical Treatment of Advanced Squamous Cell Carcinoma of the Oropharynx

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**Objective:** The purpose of this study was to review the oncologic and functional outcomes of patients with clinical stages III and IV squamous cell carcinoma of the oropharynx who underwent tumor resection and neck dissection with or without postoperative radiotherapy at two Head and Neck Surgery Departments.

**Method(s):** The records of 246 patients, who had resectable clinical stage III and IV SCC of the oropharynx were reviewed. The patients were treated from 1990 to 2005. All included patients were treated with surgery followed or not of postoperative radiotherapy.

**Result(s):** Forty-seven patients had surgery only, 191 had surgery and radiotherapy, and 8 had surgery and chemoradiotherapy. Sixty-one had tumors at stage III, 169 at stage IVa and 16 at stage IVb. Fatal postoperative complications were noted in 9 patients (3.6%). Tracheostomy was done in 237 patients, and 223 had decannulation. Temporary feeding tubes were placed in 241 patients, 218 had the tubes removed. During follow-up, there were 74 (30.1%) local recurrences, 45 neck recurrences (18.3%), and 29 distant metastasis (11.8%). Five-year actuarial survival for the entire group was 40.5%. Univariate analyses showed significant differences according to T stage, T1 and T2 tumors had a superior overall survival (OS) (56% vs. 31%,  $P=.0006$ ) and patients at age <55 year had a better OS (45% vs. 36%,  $P=0.01$ ). The 5-year survival rates were 54.3% when lymph nodes were histologically negative, 42.9% when up to three lymph nodes were positive and 27.3% when four or more lymph nodes were positive ( $P=0.0356$ ).

**Conclusion(s):** Surgical treatment of oropharynx carcinoma can be performed with a low risk of postoperative mortality, but with a high risk of long term use of tracheostomy and feeding tubes. Long term survival rates achieved in this series can be considered similar to the reported by the most recent published series using chemoradiation.

**Keywords:** Oropharynx, Squamous Cell Carcinoma, Surgery

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[O19-06]

## Primary Surgery and Postoperative Radiotherapy - Not an Obsolete Treatment Modality for Advanced Oropharyngeal Carcinomas

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**Objective:** There is a great variation in the treatment of oropharyngeal carcinoma. Lately radiochemotherapy is increasingly used. The aim of this study was to see the effect of changing treatment from radiotherapy to primary surgery and postoperative radiotherapy for advanced oropharyngeal carcinomas.

**Method(s):** Since 2000 all patients diagnosed with a tonsillar and base of tongue carcinoma have been offered surgery and postoperative radiotherapy if the tumor and the patient was considered operable. We serve the Western part of Norway (about 1 million people). Every single head and neck cancer patient is registered in a departmental data base. All patients (also incurable) are seen in a multidisciplinary clinic. Of the 69 patients treated in this period 4 patients were not treated and 20 patients received radiotherapy as the single modality treatment. 45 patients were operated and given postoperative radiotherapy.

**Result(s):** The two year follow-up showed that no patients in the non-treated group were alive, 16 (80%) of patients in the radiotherapy group and 41 patients (91%) in the group treated with surgery and postoperative radiotherapy were alive. We have only seen one local recurrence and one general recurrence in the 45 patients treated with primary operation. This gives a four years disease free specific survival in the combined group of 96%. No recurrences have been seen in the treated necks.

**Conclusion(s):** Concurrent radiochemotherapy may yield a three year actual locoregional control of over 80%. Similar results are also reported with the use of IMRT together with chemotherapy and radioprotective agents. Our results with primary surgery and postoperative radiotherapy are definitely comparable, or even better than for modern radiochemotherapy. In addition the functional results are good with most patients returning to work and only one patient has a permanent feeding tube.

**Keywords:** Oropharyngeal Carcinoma, Surgery and Radiotherapy

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[O19-07]

## Pathological Evaluation of Sentinel Lymph Node in Head and Neck Squamous Cell Carcinoma

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<sup>2</sup>Head and Neck, AIMS, Kochi, India

**Objective:** The objective of this study is to determine relative efficacy of different methods of pathological evaluation of sentinel lymph nodes in oral squamous cell carcinoma.

**Method(s):** Sentinel lymph nodes harvested as part of an on going prospective randomized study were evaluated systemically to compare relative efficacy of different methods of pathological evaluation of sentinel lymph nodes. This included frozen section, imprint cytology, routine hematoxylin and eosin (H&E) staining, serial step sectioning with H&E and immunohistochemistry (IHC). The identified metastases were classified into macro metastasis ( $>2.0$  mm), micro metastasis (0.2 mm to 2.0 mm), isolated tumor cells of less than 0.2 mm size and single tumor cells.

**Result(s):** Total 192 sentinel lymph nodes in 80 patients were harvested. Occult metastasis was detected in 20 patients. Frozen section and imprint cytology identified occult metastasis in 10/20 patients. Routine H&E evaluation detected metastasis in 13 patients, while serial step sectioning with H&E and IHC upstaged the disease in seven further patients (9%). Macro metastasis and micro metastases were detected in 8 and 7 patients respectively, while isolated tumour cells were detected in 5 patients. Frozen section detected macro metastasis in 7/8 cases but failed to detect smaller deposits in majority of cases (missed micro metastasis in 4/7 and isolated tumor cells in 5/5). Serial step sectioning upstaged the disease by 10% and sensitivity and negative predictive value of serial step sectioning with H&E was 90% and 97% respectively.

**Conclusion(s):** Frozen section and imprint cytology are not effective in identifying occult metastasis in oral squamous cell carcinoma. Immunohistochemistry and serial step sectioning are required to identify micro metastasis and isolated tumor cells.

**Keywords:** Sentinel Node Biopsy, Lymphoscintigraphy, Occult Metastasis

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[O19-08]

## Sentinel Node Biopsy for Oral and Oropharyngeal Squamous Cell Carcinomas: Update and Longterm Experience

**Martina Broglie<sup>1</sup>, Gerhard Huber<sup>2</sup>, Sarah Haile<sup>1</sup>, Sandro Stoeckli<sup>3\*</sup>**

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**Objective:** Evaluation of clinical application of Sentinel node biopsy (SNB) and treatment results in early (T1/T2) oral and oropharyngeal squamous cell cancer (OSCC) concerning overall (OS) and disease free survival (DSF).

**Method(s):** Prospective consecutive cohort analysis of 129 patients (69% males, median age 63 years, range 29-91 years), between 2000 and 2009. Lymphatic mapping consisted of preoperative lymphoscintigraphy and intraoperative use of a hand-held gammaprobe.

**Result(s):** Detection rate of sentinel nodes (SNs) was 96% by lymphoscintigraphy and 99% by intraoperative hand-held gammaprobe, respectively. On average, 3.1 SNs (range 1-11) with an average size of 10.2mm (range 3-28 mm) were excised. 48/128 patients (37.5%) had positive SNs. In 9 cases only Isolated Tumour Cells (ITC) whereas in 23 cases micrometastasis and in 16 cases macrometastasis were found, resulting in an upstaging rate of 30%. The average size of tumor positive SNs was 11.3mm with a range from 5-23mm. In 4 out of 48 completion neck dissections (8%) additional lymph node metastases were found. The mean observation and survival time of the 129 patients was 32.4 months (range 1-116 months). OS at 5 years was 83.4% (75.7-91.9%). Stratifying by nodal status, OS at 5 years was 87.1% (77.7-97.7%) in nodal negative, 87.5% (67.3-100%) in ITC, and 73.7% (59.1-91.8%) in nodal positive patients. The difference between N0 and N+ stages in survival time was significant (log rank test,  $P=0.035$ ) whereas no difference between patients with ITC and N0 could be found. Overall Tumor control rate at 5 years was 81.7% (71.6-93.2%) in N0- and 68.1% (54.0-85.8%) in N+-stages respectively ( $P=0.026$ ).

**Conclusion(s):** SNB is a valuable diagnostic method in patients with early OSCC and clinically negative neck with a negative predictive value for negative SNB of 95%. Patients with positive SNB showed a statistically significant worse overall survival rate and higher risk for recurrence.

**Keywords:** Sentinel Node Biopsy, Squamous Cell Cancer, Head and Neck

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[O19-09]

## Role of Risk Factors in Oral Cancer

**Imtiaz ather Siddiqui\***

*Ear Nose Throat Head & Neck Surgery,  
Jinnah Post Graduate Medical Centre, Pakistan*

**Objective:** Risk factors(Habits) in oral cancer like Beetle nut, Smoke less tobacco chewing, gutka, manpuri are common in our part of the globe. Beetle nut is a substance, or mixture of substances, placed in the mouth or chewed that remains in contact with the oral mucosa. Usually containing one or both of the two basic ingredients, tobacco and/or areca nut in raw or any manufactured or processed form. The betel quid refers to any quid wrapped in betel leaf and is therefore a specific variety of quid. Betel quid chewing is popular in Pakistan, India, Nepal, Srilanka, Bangladesh, Myanmar, Vietnam, Taiwan, South China, and all the areas of world where these people have migrated. Gukta/manpuri is basically a flavored and sweetened dry mixture of areca nut, slaked lime with tobacco. These are common in younger population that is why perhaps there is rise diagnosis of oral cancer in younger age groups. To investigate the role of these risk in oral cancer was the objective of this study.

**Method(s):** A two years hospital based retrospective observational study on oral cancer proved pathologically at Department of Ear Nose Throat, Head & Neck Surgery and Oncology Department of Jinnah Post Graduate Centre-Karachi Pakistan From Jan, 2006 to Dec, 2008. Such patients records were analyzed in respect of indulgence in these risk factors with duration of Habit.

**Result(s):** Beetle quad chewing was the top most habit among oral cancer patients and cigarette smoking, gutka, manpuri in descending order respectively. The average duration was two years indulgence leading to oral cancer.

**Conclusion(s):** Avoidance of these risk factors which are social habits also, can reduce the incidence of oral cancer.

**Keywords:** Oral Cancer, Beetle Quad Chewing, Risk Factors in Oral Cancer

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## O20. Clinical (I) : Others

Chairs : Ryuichi Hayashi (Japan)

Dan Fliss (Israel)

15:50 - 17:20 SBR I

[O20-01]

### Metabolic Tumor Volumes by [18F]-Fluorodeoxyglucose PET/CT Correlate with Occult Metastasis in Oral Squamous Cell Carcinoma of the Tongue

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**Objective:** To investigate the correlation between pretreatment metabolic tumor volume (MTV) as determined by [18F]-fluorodeoxyglucose positron emission tomography/computed tomography (PET/CT) and occult metastasis (OM) in oral squamous cell carcinoma (OSCC) of the tongue.

**Method(s):** Forty-three clinically node-negative (cN0) OSCC patients, diagnosed by preoperative workups (biopsy, physical examination, CT, and PET/CT) were enrolled. All patients had undergone primary tumor resections and elective neck dissections. MTVs were measured for tumors showing standardized uptake value (SUV) of (2.5 by an automated contouring program. Pretreatment variables [age, sex, clinical T stage, maximal SUV {SUVmax} and MTV] and posttreatment variables [pathologic T stage, depth of invasion, lymphovascular invasion, pathologic tumor volume, and histological differentiation]) were analyzed to identify their correlation with OM.

**Result(s):** Twelve (27.9%) of 43 patients were found to have OM in pathologic specimen of neck dissections. A cutoff of 6.0 ml for the MTV was determined to be the most discriminative value for predicting OM. By univariate analysis, the patients with an MTV of [6.0 mL had significantly higher number of occult metastases than those with an MTV of B6.0 mL (57.1% vs. 13.7%, hazard ratio, 8.33, 95% confidence interval, 1.95–35.6,  $P=0.009$ ). Lymphovascular invasion and SUVmax showed only trends toward significance ( $P=0.08$  and 0.05, respectively). By multivariate analysis, only MTV had a significant correlation with OM (hazard ratio 54.66, 95% confidence interval, 1.05–2842.86,  $P=0.04$ ).

**Conclusion(s):** MTV as determined by PET/CT demonstrated a statistically significant correlation with OM in patients with cN0 OSCC of the tongue.

**Keywords:** PET/CT, Metabolic Tumor Volume, Occult Metastasis

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[O20-02]

### Validation of the Role of Fluorescent Spectroscopy in Non-Invasive Early Diagnosis of Oral Mucosal Malignant and Potentially Malignant Lesions

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<sup>2</sup>Biomedical Laser Division, RRCAT, India

<sup>3</sup>Biomedical Laser Division, INDORE, India

**Objective:** To validate the potential role of fluorescent spectroscopy in non-invasive early diagnosis of oral mucosal malignant and potentially malignant lesions in a country with high prevalence of oral cancers.

**Method(s):** Patients visiting our hospital with oral mucosal malignant and potential malignant lesions underwent clinical examination, spectroscopic examination and biopsy. The spectroscopy was done using Laser induced fluorescence on abnormal mucosa in addition to other clinically normal looking sites like lip, vermillion, buccal mucosa, tongue, hard and soft palate. The resulting data was analyzed statistically.

**Result(s):** There were 299 cases of biopsy proven oral cancer with 267 healthy volunteers as controls. In detecting oral cancer this device had a sensitivity of 78.6%, specificity of 83.9%. The positive and negative predictive values were 84.2% and 77.5% respectively. When leukoplakia (90 cases) and submucous fibrosis (88 cases) were compared with normal subjects (267 cases) the sensitivity, specificity, positive predictive value and negative predictive values were 83.2%, 87.3 %, 92.1% and 74.4% respectively.

**Conclusion(s):** The clinical study presented here demonstrates the ability to distinguish neoplastic / pre-neoplastic and normal oral mucosa in vivo objectively using low cost portable imaging system. The results of this pilot study suggest that this device can potentially improve oral screening efforts in low resource settings where clinical expertise and resources are limited. However, further work is needed to test the efficacy of this device in screening of oral mucosal malignant and potentially malignant lesions in the community at large.

**Keywords:** Fluorescent Spectroscopy, Potentially Malignant, Oral Cancers

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[O20-04]

## Radiofrequency Ablation in the Combined Treatment of Cancer of Tongue

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Russian Federation

**Objective:** We have available the experience of the treatment of 30 patients with the localization of the tumor process in the region of tongue. During supervision at 2 patients the continued growth of a tumor with distribution on muscles a mouth floor (that is caused initially by great volume of a tumor) is noted. At other patients the period without relapse of a tumor of supervision has made from 2 till 24 months.

**Method(s):** The primary histology of tumor was evaluated taking into account data of ultrasonic inspection, CT and biopsy. On histogenesis of tumor process all - planocellular cancer, from them 20 man and 10 women. On the age classes the patients were distributed as follows from 28 to 78 years. Depending on the prevalence of the tumor process of interference they were carried out in 10 cases under the overall endotracheal anesthesia, into 20 under the local infiltration anesthesia with the involution. The period of observation in this group is from 3 to 36 months.

**Conclusion(s):** The obtained first positive clinical results of the combined treatment of patients with the malignant tumors of tongue the use of a radio-wave complex "Metatom-2" testify about the prospect of method. The wide spectrum of the possibilities of instrument the variety of electrodes make it possible to use it with different sizes and localizations of tumor process both in the independent version and in the combination with the standard procedures of beam and chemotherapy. As a whole an improvement in the results of treating the sick localizations indicated must be examined in the plane of integral approach and the procedure of radio-frequency thermo-ablation can become one of the important contemporary it is sectional in the therapeutic chain.

**Keywords:** Radiofrequency Ablation, Combined Treatment

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[O20-05]

## Interstitial Photodynamic Therapy (iPDT) of Recurrent Advanced Tongue Base Carcinoma

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**Objective:** To evaluate effectiveness of interstitial photodynamic therapy (iPDT) as salvage treatment of previously irradiated advanced tongue base cancers.

**Method(s):** Patients with previously irradiated recurrent tongue base tumors were offered to participate in the study. The participating patients were injected intravenously with mTHPC (Foscan®) at a dose of 0.15 mg/kg. After an interval of 96 hours brachytherapy catheters were brought via skin at a distance of 15 mm to each other to cover the whole volume of tumor and 5 mm normal tissue margin. Light was delivered via a 652 nm diode laser at a dose of 30J/cm diffuser length. Response was evaluated using world Health Organization (WHO) criteria and disease related survival.

**Result(s):** Fifteen patients were included in the study. Thirteen patients had objective tumor regression; 6 patients had complete clinical response; 7 patients had partial response; 1 patient had progressive disease; 1 patient has died of non-tumor/treatment related reasons before evaluation. The overall median survival time is 17 months (1-69). The 6 patients with a CR had a median disease free period of 32 months (4-69). After a median follow up of 17 months (1-69), 4 patients are still free of disease.

**Conclusion(s):** iPDT can offer a curative option to and prolong life of a patient group with recurrent advanced tongue base tumors, who have very low life expectancy.

**Keywords:** Photodynamic Therapy, Tongue Base Cancer, Palliative Treatment

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[O20-06]

## Radiation Induced Trismus - Incidence and Severity in a Prospective Radiotherapy Head and Neck Trial

**Ulrika von Buxhoeveden**<sup>1\*</sup>, **Ola Garskog**<sup>2</sup>, **Elisabeth Kjellen**<sup>1</sup>,  
**Goran Laurell**<sup>2</sup>, **Eva Levring Jaghagen**<sup>3</sup>, **Peter Wahlberg**<sup>4</sup>,  
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**Objective:** The objectives of this study were to investigate the incidence and severity of radiation-induced trismus and to assess the correlation between extent of mouth opening and absorbed dose distribution.

**Method(s):** The patients were recruited from the Swedish prospective multicenter ARTSCAN trial where patients were randomized during 1998-2006 to either conventional (CF) or accelerated (AF), radical radiotherapy (RT); 68 Gy during 7 and 4.5 weeks, respectively. No chemotherapy was given. 124 patients (57 received CF and 67 AF RT) agreed to a clinical ENT examination 20 to 122 months (median 63) after termination of treatment. Patient reported scores related to trismus (e.g. restricted mouth opening, pain in jaw) were assessed, and TheraBite® range of motion scale was used to measure maximum vertical dimension (MVD).

**Result(s):** No significant differences in patient reported trismus or TheraBite® ranges were found between the two groups. Before start of RT, 5% of the patients reported moderate to high scores regarding restricted mouth opening and 11% for "pain in the jaw". The corresponding figures at termination of RT were 37% and 29%, respectively. At the clinical ENT examination 26% stated moderate to high scores regarding restricted mouth opening, whereas pain was assessed close to base level (11%). TheraBite® measurements (mean MVD 38 mm, range 12-58 mm) correlated significantly to patient self-reported scores of ability to open the mouth. Preliminary results indicate that trismus is correlated to the absorbed dose distribution in the masticatory apparatus.

**Conclusion(s):** Trismus is a radiation side effect that manifests early. There is a high incidence of severe trismus after RT, and the number of affected patients decreases only slightly up to 5 years after RT. Measures to decrease this side effect should be considered in the RT treatment planning process.

**Keywords:** Radiotherapy, Trismus, Prospective

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[O20-07]

## Metastasis of Distant Cancers to the Oral Cavity

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**Objective:** Metastasis of distant malignancies to the oral cavity remains an unusual entity and accounts for only 1% of all malignant tumors of the oral cavity. Usually these lesions are evidence of widespread disease thus indicate grave prognosis, but still they had to be managed as they produce distressing symptoms such as pain and interference with chewing and speaking. They may be the initial presentation of a distant cancer, a sign of recurrence of wide spread disease or as part of a widespread disease. The aim of our study was to review the metastatic malignant lesions to the oral cavity diagnosed at King Hussein cancer center Amman- Jordan during the years 2008-2009, and analyzing their clinical characteristics including oral cavity site, age , sex, histology, presenting symptom and management.

**Method(s):** Review of medical and pathological records of cancer patients with metastasis to the oral cavity at king Hussein cancer center in the years 2007-2008, and analysing their clinical characteristics.

**Result(s):** Most common cancer to metastasize to the oral cavity were breast and lung, this could be attributed to the fact that these are the two most common cancers in Jordan, all indicated a widespread disease and were difficult to manage.

**Conclusion(s):** It is important for the oral surgeon to consider metastatic malignancy in the differential diagnosis of any oral cavity pathological lesion. The aim of the treatment is palliative but mandatory to give the patient a better quality of life. Reviewing these cases may help understand more in the future about the behavior of cancer.

**Keywords:** Oral Cavity, Metastasis, Distant Cancers

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[O20-08]

## How Big Should a Tracheostomy be in the Era of Minimally Invasive Surgery?

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**Objective:** To present a new technique of surgical tracheostomy, with mini-incision, reducing surgical manipulation, offering technical simplicity, safety and low complication rate.

**Method(s):** Between May 2006 and September 2009 were performed 73 consecutive tracheostomies by the same Head and Neck surgeon. Fifty two patients were operated on an elective basis, while 21 were operated under urgency conditions. Local anesthesia was used in all cases of urgency and in 32 elective cases. The technique used consisted of incision size equal to the tube to be used (internal tube diameter between 7.0 and 8.0mm) and vertical dissection direct toward the trachea, without the classic dissection of pre-tracheal muscles. The trachea was opened without the need for tracheal ring resection or suture, also not used skin sutures.

**Result(s):** All cases were performed with the proposed incision. There were no cases of bleeding, infection, or tracheal stenosis. Two patients developed subcutaneous emphysema of the neck and superior chest, without any clinical compromise, regressing spontaneously.

**Conclusion(s):** The technique proved to be safe, with less tissue dissection than the classical technique. As minimally invasive thyroidectomy, a more complex procedure that can be done on 1.5cm incision, we believe that tracheostomy must be performed in a less invasive way.

**Keywords:** Tracheostomy, Minimally Invasive

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[O20-09]

## Tracheostomy after Resection of Trachea and Soft Tissues in Patients with Relapse of Head and Neck Cancer

**Igor Reshetov, Sergey Kravtsov\*, Valery Chissov, Evgeny Trofimov**

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**Objective:** Radical removing of malignant tumors of head and neck is impossible without use reconstructive and plastic technology. These methodologies apply for planning of incision, isolating of important anatomical structures or forming stomas, especially in treatment of recurrence disease. Situation is considerably complicated if necessary the formation of end tracheostoma under the conditions of the deficit of soft tissues of neck, in the absence larynx and the fragment of trachea (about 10 rings). For this reason, to patients with the recurrence tumors usually reject the surgical aid, or performed deliberately palliative operations.

**Method(s):** We apply original method of tracheostomy on the level retrosternal area for advanced/recurrence cancer of larynx and hypopharynx involved trachea and paratracheal zone, especially in lack of soft tissues. After remove tumor and resection of trachea, we use fasciacutaneous flap with two pedicles, which is formed on the chest. Vascular supply of flap provide from cutaneous branches of thoracoacromial and lateral chest's vessels. For good result upper chest aperture is wide due to partial resection of superior border of manubrium and clavicles. Total number of patients is 20.

**Result(s):** Necrosis of flap, biomechanical problems of chest, mediastinal adverse events and death were absence. Follow-up period is from 6 months to 6 years. Disease-free survival is 40% for 3 years, and 20% for 5+years. Four patients had relapse for 3 years. Two patients needed correction of flap because of excess of tissue.

**Conclusion(s):** This method of tracheostomy is more optimal for use in critical surgeon situation. In case of remission disease patients have possibility reconstructive operation, voice rehabilitation and good quality of live.

**Keywords:** Flap, Tracheostomy, Recurrent Tumour

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## O21. Nose & Paranasal

**Chairs : Goran Laurell (Sweden)**

**Ehab Hanna (USA)**

15:50 - 17:20 SBR II

[O21-01]

### Role of Endoscopic Surgery in the Management of Sinonasal Malignancies: Experience on 275 Patients

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**Maurizio Bignami<sup>2</sup>, Paolo Battaglia<sup>2</sup>, Andrea Bizzoni<sup>1</sup>,**  
**Alberto Schreiber<sup>1</sup>, Paolo Castelnuovo<sup>2</sup>**

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<sup>2</sup>ENT, University of Varese, Italy

**Objective:** The increasing expertise acquired in transnasal endoscopic surgery has led to an expansion of its indications and now include the management of sinonasal malignancies. We review our experience in the endoscopic management of naso-ethmoidal malignancies with or without involvement of the adjacent skull base, with the aim of better defining its indications and critically evaluating oncologic outcomes.

**Method(s):** Retrospective analysis of patients treated by an exclusive endoscopic resection (EER), endoscopic transnasal craniectomy (ETC), and crano-endoscopic resection (CER) from 1996 to 2009. Indications, complication rate, and the need for adjuvant treatment were assessed. Five-year overall (O), disease-specific (DS), and recurrence-free (RF) survivals were calculated by the Kaplan-Meier method.

**Result(s):** EER was performed in 126 cases, ETC in 92, and CER in 57. The most frequent histologies were adenocarcinoma (42%), squamous cell carcinoma (11%), and olfactory neuroblastoma (11%). The complication rate was 13%, with cerebrospinal fluid leak being the most frequent (n=14). Overall, 132 (48%) patients received some form of adjuvant treatment. Patients were followed for a mean of 44 months (range 2-156). The 5-year OS was 84%, 79%, and 51% ( $P<0.01$ ) for the EER, ETC, and CER groups, respectively. DSS and RFS for the three groups were 83%, 84% and 59% ( $P<0.01$ ) and 76%, 67% and 54% ( $P<0.01$ ), respectively.

**Conclusion(s):** To our knowledge, this is the largest series reported to date of malignant tumors of the sinusal tract and adjacent skull base treated with EER, ETC, and CER. DS and RF survivals seem to indicate that endoscopic surgery, when properly planned and in expert hands, plays a relevant role in the management of sinusal malignancies, and should be included in the armamentarium of available surgical approaches.

**Keywords:** Endoscopic Sinus Surgery, Transnasal Craniectomy, Endoscopic Dural Repair

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[O21-02]

### Endoscopic Transnasal Craniectomy (ETC) in the Management of Selected Sinonasal Malignancies: Surgical Technique and Morbidity

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**Alberto Schreiber<sup>1</sup>, Maurizio Bignami<sup>2</sup>, Andrea Pistocchini<sup>2</sup>,**  
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**Objective:** This study critically reviewed the surgical technique of endoscopic transnasal craniectomy (ETC), its indications and morbidity in the management of selected sino-nasal malignancies.

**Method(s):** From April 1996 to December 2009, 219 patients affected by malignant tumors of the sinusal tract were treated by endoscopic resection at two referral University Hospitals. Starting from 2004, 92 patients underwent ETC, which extended antero-posteriorly from the frontal sinus to planum sphenoidale and latero-laterally from the nasal septum to the lamina papyracea (unilateral resection, n=33) or from papyracea to papyracea (bilateral resection, n=59). Whenever a lateral extension over the orbital roof or involvement of the frontal sinus was detected, subfrontal or frontal craniotomy was performed. Fluorescein was administered before intervention. Duraplasty with a “3-layer” technique was carried out using the ilio-tibial tract and fat tissue harvested from the lateral thigh. All patients underwent a CT scan of the brain the day after surgery to rule out complications, and intravenous blood-brain crossing antibiotic therapy was administered for 5 days. Overall (O), disease-specific (DS), and recurrence-free (RF) survivals were calculated with the Kaplan Meier method.

**Result(s):** The most frequent histotypes were adenocarcinoma (54%) and olfactory neuroblastoma (18%). Seventy (76%) patients were previously untreated. The overall complication rate was 14%. Cerebrospinal fluid leak was observed in 8 (8.6%) cases. The mean hospitalization time was 10.5 days (range, 5-32). The dura was involved in 26 (28%) cases. Overall, 55 (60%) patients received adjuvant treatment. After a mean follow-up of 21.4 months (range, 1-109), 83 (90%) patients had no evidence of disease, with 5-year OS, DSS, and RFS of 78.6%, 84.1% and 66.5% respectively.

**Conclusion(s):** ETC is a safe procedure with an acceptable complication rate, and allows a wide resection of the dura with a correct assessment of its involvement. Whenever required, the surgeon must be able to switch to an external approach.

**Keywords:** Endoscopic Sinus Surgery, Complications, CSF Leak

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[O21-03]

## Preservation of Olfactory Function in Select Endoscopic Endonasal Resections of the Anterior Skull Base for Malignancies of the Sinonal Tract

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<sup>2</sup>Otolaryngology, Medical College of Georgia, USA

**Objective:** Elucidate the feasibility of preservation of olfactory function in select patients undergoing unilateral anterior skull base resection via endonasal endoscopic approach.

**Method(s):** A retrospective case series review. Postoperatively, all patients underwent a comprehensive standardized 40 sample smell identification tests using a commercially available product (Sensonics Inc., Haddon, NJ).

**Result(s):** Ten patients underwent an endoscopic resection of sinonal malignancies including esthesioneuroblastoma (6 patients), squamous cell carcinoma (1 patient), melanoma (1 patient), adenocarcinoma (1 patient) and hemangiopericytoma (1 patient). During this period the senior author endoscopically resected 15 ENB, 4 melanomas, 3 adenocarcinomas, 1 HPC, 2 chondrosarcomas, 3 SNUCS, 1 Ewing sarcoma and 3 SCCA; therefore olfactory preservation was attempted in 10 of 32 patients. All patients who underwent an olfactory sparing surgery had tumors with unilateral extension and most arose within the superior nasal vault. In 8 patients, the resection involved the ipsilateral resection of the anterior skull base, dura and olfactory nerve, preserving the contralateral middle and superior turbinates. Another 2 patients underwent the resection of the lateral nasal wall and resection of the olfactory epithelium as the superior limit of the tumor resection. Six patients received adjuvant radiotherapy. The mean follow-up period was 41.5 months (range 5.5–94 months; median=41 months). Postoperatively, we documented preservation of olfaction function in 7 patients (3 normosmic, 4 patients microsmic). Eight patients have no evidence of recurrence. One patient with melanoma had a recurrence 3 years after surgery at a non-contiguous site. She underwent endoscopic resection and remained disease free 3 years after this surgery. A patient with an esthesioneuroblastoma had cervical lymph node recurrence requiring bilateral neck dissections 4 years after surgery. She is currently undergoing chemoradiation.

**Conclusion(s):** In highly select cases, it is feasible to preserve olfactory function without compromising oncologic outcomes.

**Keywords:** Olfaction, Paranasal Sinus Malignancy, Endoscopic Resection

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[O21-04]

## Results of Minimal Invasive Segmental Resection Combined with Radiotherapy and Regional Chemotherapy for the Maxillary Sinus Malignancies

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Katsumi Kawada, Keiichi Ichimura

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**Objective:** The current goals for the treatment of maxillary malignant tumor include preservation of vision, mastication, and speech, as well as quality of life and survival. Resection the tumor tissue by minimal safety surgical margin with good survival are bound to get the good quality of life.

**Method(s):** Treatment regimen include irradiation followed by regional chemotherapy and surgical resection (Cancer 89: 1925-32). After 10 Gy irradiation, a first surgery is performed. At the time of surgery, a catheter first is inserted into the external carotid artery from the superficial temporal artery. The tip of the catheter is positioned where the internal maxillary artery branches. After fixation of the catheter, 250 mg of 5-fluorouracil is infused. The maxillary cavity then is opened and the lateral wall of the nasal cavity is removed though a gingivobuccal sulcus incision. Any necrotic tumor mass in the maxillary sinus underwent curettage. After surgery, an intra-arterial infusion of 250 mg of 5-fluorouracil is given for 5 doses simultaneously with 10 Gy/ 5f irradiation. A month later, a second surgery is performed to resect residual tumor tissue through the gingivobuccal sulcus incision. All residual tumor was segmentally resected with minimal adjacent healthy tissue. The margin is within a few millimeters. In T4a cases of orbital involvement the orbital contents can be spared.

**Result(s):** One hundred and twenty one Japanese patients with maxillary sinus malignant tumor between 1979 and 2005 underwent segmental resection with the above-mentioned combined therapy. The 5-year locoregional disease free survival rate was 78%. As for patients with squamous cell carcinoma, the 5-year locoregional disease free survival rate was 90% for T2 and T3 lesions, and 62% for T4 lesions.

**Conclusion(s):** The segmental resection combined with irradiation and intra-arterial 5-fluorouracil infusion was effective method for local control and preservation of ocular function.

**Keywords:** Maxillary Sinus Malignancy, Segmental Resection, Regional Chemotherapy

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[O21-05]

## Open Surgical Access to the Nasopharynx? Is There an Optimum Route?

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*The Chinese University of Hong Kong, Hong Kong*

<sup>2</sup>Department of Clinical Oncology, *The Chinese University of Hong Kong, Hong Kong*

**Objective:** To determine whether there is an optimum route for open surgical access to the nasopharynx to salvage nasopharyngeal carcinoma radiation failures.

**Method(s):** Eighty four consecutive patients (M:F 64:20) underwent a nasopharyngectomy for residual or recurrent nasopharyngeal carcinoma. The nasopharynx was accessed via a transoral-transpalatal, transmandibular-transpalatal, midfacial degloving, or maxillary swing route. The surgical wound sequelae of each access were assessed. General perioperative complications were excluded. Overall survival was estimated using the Kaplan-Meier method and differences between surgical accesses were assessed using the log-rank test.

**Result(s):** The transpalatal access resulted in wound sequelae in 81% of cases, the maxillary swing in 88% of cases, and the midfacial degloving in 9% of cases. Overall, 54% of patients undergoing a nasopharyngectomy developed wound sequelae of the operation. The 2-year overall survival rate of patients undergoing the transoral-transpalatal access (n=7) was 71%, of the transmandibular-transpalatal access (n=15) was 60%, of the maxillary swing access (n=27) was 74%, and of the midfacial-degloving access (n=35) was 80%.

**Conclusion(s):** Common long-term sequelae of the transpalatal access include palatal dehiscence and fibrosis; of the midfacial degloving access, nasal saddling; and of the maxillary swing access, ectropions and palatal fistulas. The midfacial degloving access was associated with the least long-term sequelae and the maxillary swing access with the most. There was no significant difference in overall survival of patients undergoing a nasopharyngectomy for residual or recurrent nasopharyngeal carcinoma between the four surgical access routes used.

**Keywords:** Nasopharyngeal, Carcinoma, Salvage

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[O21-06]

## Adenocarcinoma of the Nasal Cavity and Sinuses Primarily Treated with Endoscopic Resection Followed by Radiotherapy: Long Term Follow-Up of 44 Patients

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**Objective:** To evaluate long-term outcome of patients with adenocarcinoma of the sinuses primarily treated by combined endoscopic resection followed by radiotherapy.

**Method(s):** 44 consecutive patients primarily treated by an exclusively endoscopic approach followed by radiotherapy from 1992 to 2004 at the Department of Otorhinolaryngology, Head and Neck surgery of the University Hospitals Leuven, Leuven, Belgium are examined for oncological outcome and prognostic factors, with update of follow-up to 2008.

**Result(s):** Median follow-up was 61 months. Median follow-up of the patients alive at the end of follow-up was 100 months. For the 5-year follow-up, the overall survival, disease-specific survival, and recurrence-free percentages were 63% ( $\pm 7\%$  standard error), 82% ( $\pm 6\%$ ) and 60% ( $\pm 8\%$ ), respectively. The overall survival, disease-specific survival and recurrence-free survival after 100 months of follow-up were respectively 53% ( $\pm 8\%$ ), 72% ( $\pm 9\%$ ) and 54% ( $\pm 9\%$ ). Of the factors studied, 5 factors significantly influenced the disease-specific survival: gender of the patient ( $P=<0.0001$ ), development of regional ( $P=0.003$ ) and distant metastasis ( $P=<0.0001$ ), occurrence of a first recurrence ( $P=0.025$ ) and occurrence of a second recurrence after a first salvage surgical attempt ( $P=0.002$ ).

**Conclusion(s):** The findings in this homogeneous cohort of patients with sinonasal adenocarcinoma treated by endoscopic resection and postoperative radiotherapy, with a long follow-up, confirms that in experienced hands, endoscopic resection is a valid alternative to open resection in treating adenocarcinoma of the ethmoid sinus.

**Keywords:** Adenocarcinoma, Sinonasal Tract, Endoscopic Surgery

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[O21-07]

## The Posterior Pedicle Middle Turbinate Emucoperiosteum Flap-An Innovative Vascularized Flap for Locally Recurrent Nasopharyngeal Carcinoma after Endoscopic Nasopharyngectomy

**Ming-Yuan Chen\***

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**Objective:** Endoscopic nasopharyngectomy is allowing extensive and en bloc resections of recurrent nasopharyngeal carcinoma (rNPC) with a result of bone exposure which lead to a persistent headache that lasted for about 3–6 months and even longer. Reconstruction with skin or mucosa grafts is undesirable to facilitate rapid healing due to the Prior radiation.

**Method(s):** We have developed a new technique to resurface the nasopharynx after endoscopic nasopharyngectomy with a posterior pedicle middle turbinate emucoperiosteum flap (PPMTEF) based on the posterior middle turbinate artery, a branch of the sphenopalatine artery.

**Result(s):** From September 2004 to September 2008, 41 patients with rNPC received endoscopic nasopharyngectomy. Four patients of them who have received two circles of external beam radiotherapy (EBRT) failed to recover, but the two patients who underwent the reconstruction of PPMTEF achieved the complaint of headache release in 24 and 32 weeks post-operation, the rest 2 patients suffered persistent headache that underwent the reconstruction of free autogenic muscle mesh or nothing resurfaced. All of the rest 37 patients who have received one circle of EBRT healed uneventfully with the wound covered. 13 of them resurfaced with the PPMTEF and recovered in 8–16 weeks (median: 10 weeks). 5 patients sealed with free autogenic muscle mesh or nasal mucosa grafts and recovered in 14–36 weeks (median: 18 weeks). The rest 19 patients with nothing resurfaced recovered in 11–32 weeks (median: 16 weeks). No flap necrosis was observed in all 15 patients resurfaced with the PPMTEF, but all free autogenic muscle mesh or nasal mucosa grafts failed in 6 patients.

**Conclusion(s):** The PPMTEF is a viable reconstructive option for endoscopic nasopharyngectomy. It's helpful to recover the nasopharyngeal wound for rNPC patients who have received one circle of EBRT or release the headache for ones received two circle of EBRT.

**Keywords:** Nasopharyngeal Carcinoma, Nasopharyngectomy, Flap

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[O21-08]

## Transmandibular Approach for Resection of Maxillary Sinus Tumors Extending to Pterygopalatine and Infratemporal Fossae

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<sup>2</sup>*Surgical Oncology, Dharmshila Cancer Centre, Delhi, India*

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*Amrita Institute of Medical Sciences and Research Centre, India*

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<sup>5</sup>*Surgical Oncology, Majumdar Shaw Cancer Centre, Bangalore, India*

**Objective:** En bloc resection of maxillary sinus tumors that extend through the posterior wall necessitates resection of maxilla along with pterygopalatine and infratemporal fossae contents. This cannot be readily performed by conventional anterior maxillectomy approaches. The objective of this study is to evaluate the effectiveness of transmandibular approach for the excision of maxillary sinus tumors extending to pterygopalatine and infratemporal fossae. We also describe the technique.

**Method(s):** This is a retrospective review of 15 consecutive patients who underwent maxillectomy with transmandibular approach for tumors with posterior extension, between January 2004 and February 2008. The principal outcome parameter was the margin status on final histopathology report. In addition, evaluable patients were reviewed to assess the morbidity of the procedure using pre-defined parameters.

**Result(s):** All the patients had negative margins at the infratemporal fossa region. Varying degree of trismus was present in all patients. The cosmetic outcome of the procedure was excellent. Other anterior and transcranial approaches could be combined with this procedure when indicated.

**Conclusion(s):** We conclude that transmandibular approach is an effective technique for resection of maxillary tumors with posterior extension to the pterygopalatine and infratemporal fossae. The procedure has acceptable morbidity and the aesthetic and functional results are satisfactory.

**Keywords:** Mandibulotomy, Maxillectomy, Infratemporal Fossa

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[O21-09]

## Clinical Management of Sinonasal Inverted Papilloma

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Yasuhiko Shimizu, Ichiro Morikura

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**Objective:** We investigated the clinical outcomes of 20 patients with nasoparanasal sinus inverted papilloma, who had been admitted and undergone intensive treatments. Out of 17 patients who underwent preoperative biopsy for the histopathological examination, inverted papilloma was confirmed in biopsied specimens. This finding suggests that preoperative histopathological examination with biopsied specimen is useful for making an appropriate treatment protocol for these patients.

**Method(s):** Consistency of the occupied lesion determined by MRI before surgery was compared with the intraoperative findings or postoperative histopathology. As a result, the consistency rate was 85.7%, suggesting that MRI is useful for a preoperative diagnosis in order to properly evaluate the extending occupied lesion of inverted papilloma or combined squamous cell carcinoma. The serum SCC Ag level increased in 11 of 12 patients. But on the other hand, The CYFRA21-1 level increased in 3 patients, and cancer complication was noted in 2 of these. SCC-Ag may be a useful marker for diagnosis of this tumor as reported by other researchers. In addition, CYFRA21-1 may also serve as a useful marker for patients with cancer complication.

**Result(s):** The outcomes of treatments were examined particularly in a consideration of occupied lesions and the corresponding surgical intervention. Postoperative recurrence was noted in 4 of the 20 patients. In 3 of these, limited operation had been performed without histopathological examination.

**Conclusion(s):** In conclusion, very importantly, for the better prognosis of these patients, we should pay much attention to select and prepare an appropriate surgical procedure after definite preoperative pathological diagnosis and image (CT & MRI)-guided localization of the extending tumor lesions as well.

**Keywords:** Inverted Papilloma, SCC-Ag, CYFRA21-1

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**O22. Clinical (II) : Others****Chairs : Kai-ping Chang (Taiwan)****Jochen Werner (Germany)**

15:50 - 17:20 SBR III

[O22-01]

**Antibiotics in Head and Neck Surgery**Ali Sepehr\**Otolaryngology, Dontknow, Korea*

**Objective:** The objectives of this study are to compare short vs. long antibiotic prophylaxis in the setting of malnutrition, diabetes, and tracheotomy.

**Study Design:** Retrospective chart review.

**Method(s):** The charts of 407 patients undergoing clean-contaminated head and neck surgery were reviewed for disease type, operation performed, length of antibiotic prophylaxis, wound complications, and length of hospital stay. Three intrinsic patient risk factors for infection (malnutrition, diabetes mellitus, and tracheotomy) were evaluated for an effect on the optimal length of antibiotic prophylaxis. The data was statistically analyzed using the two-tailed Fisher's exact test rate in the overall group or in any subgroup.

**Result(s):** Overall, the incidence of infection was 7% in short-course antibiotics and 13% in long-course antibiotics ( $P=0.06$ ). The incidence of infection was 18% in malnourished patients and 3% in well-nourished patients ( $P<0.0001$ ). In malnourished patients, the incidence of infection was 16% in short-course antibiotics and 19% in long-course antibiotics ( $P=1$ ). The incidence of infection was 11% in diabetics and 23% in nondiabetics ( $P=0.13$ ). In diabetic patients, the incidence of infection was 0% on short-course antibiotics and 16% on long-course antibiotics ( $P=0.55$ ). The incidence of pneumonia was 14% in patients with tracheotomy and 5% in patients without tracheotomy ( $P=0.0014$ ). In patients with tracheotomy, the incidence of pneumonia was 8% on short-course antibiotics and 15% on long-course antibiotics ( $P=0.6931$ ).

**Conclusion(s):** Malnutrition and tracheotomy were associated with a higher infection rate while diabetes was not found to be a risk factor. Prolonged antibiotics were not associated with a lower infection.

**Keywords:** Antibiotic Prophylaxis, Malnutrition, Diabetes, Tracheotomy

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[O22-02]

**Treatment Indication for Advanced Head and Neck Cancer Associated with Psychiatric Disease**

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**Objective:** The therapeutic course is uncertain in patients with advanced head and neck cancer associated with severe psychiatric diseases, which poses a problem in determining treatment options. Therefore I reviewed what kind of influence psychiatric diseases impacted the treatment of carcinoma.

**Method(s):** We reviewed patients with severe psychiatric diseases seen during the 5-year period from January 2004 to December 2008. We report herein a representative case as an example.

**Result(s):** The incidence of post-treatment complications was 75%. No deaths occurred due to complications. It was difficult to obtain patient's cooperation with treatment because of underlying alcohol addiction or dementia, and their postoperative course was often problematic. For example, a 46-year-old male patient was found to have neck swelling during his stay in a neuropsychiatric hospital for atypical psychosis and referred to our department for detailed examination. The patient was diagnosed with hypopharyngeal cancer (T2N3M0). He was treated with curative intent (total laryngectomy, partial pharyngectomy, and right cervical lymph node dissection in combination with skin excision). However, the patient developed multiple postoperative complications such as bleeding and pharyngocutaneous fistula. Four months after surgery, he was able to eat ordinary food. Delirium and other psychiatric disorders were treated in cooperation with the liaison team during hospitalization. Efforts were also made to gain cooperation of the patient's family members and social support after discharge from the hospital.

**Conclusion(s):** When highly reliable healthcare is sought, we medical professionals are required to provide safe and efficient healthcare while striving to surpass therapeutic limitations. Cancer staging, general performance, and social backgrounds should be comprehensively evaluated to determine treatment options for patients with head and neck cancer.

**Keywords:** Head and Neck Cancer, Psychiatric Disease, Complication

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[O22-03]

## The Effects of Potassium, Magnesium and Phosphate on Renal Failure in Head and Neck Cancer Patients at Risk of Refeeding Syndrome

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**Objective:** Head and neck malignancies often render patients unable to meet nutritional requirements either as a direct result of the disease process or secondary to treatment. They often require the insertion of nasogastric tubes or gastrostomies in order to re-start enteral feeding. Many of these patients are at risk of developing refeeding syndrome, a disorder causing failure of multiple organs including the kidneys. The electrolytes potassium, magnesium and phosphate have been postulated as being important in this process. We aimed to investigate the effects of both pre-feeding and post-feeding potassium, magnesium and phosphate concentrations on renal failure in head and neck patients at risk of developing refeeding syndrome.

**Method(s):** All head and neck cancer patients requiring nasogastric or gastrostomy tube feeding during a 2 year period who fulfilled risk factors for refeeding syndrome were included in the study. They were segregated into different groups according to pre-feeding and post-feeding serum levels of potassium, magnesium and phosphate. The measured end-point was the maximal % increase in creatinine concentration and whether the maximal increase was >50% over the 4 weeks following re-feeding.

**Result(s):** Out of 110 subjects, a total of 68 patients were identified (mean age 60.6 years, 75% male). Statistical analyses were carried out to compare the effects of pre-feeding and post-feeding concentrations of potassium, magnesium and phosphate on creatinine increase. Nine out of the 68 (13.2%) subjects developed a creatinine increase >50% post-feeding. All nine of these patients had post-feeding hypokalaemia ( $P=0.001$ ) following pre-feeding normokalaemia. Mean maximal % increase for post-feeding hypokalaemic patients was 38.44% compared to 30.32% for normokalaemic patients ( $P=0.08$ ).

**Conclusion(s):** In head and neck cancer patients at risk of refeeding syndrome, a post-feeding drop in serum potassium is associated with an increased risk of renal dysfunction within the first 4 weeks of feeding.

**Keywords:** Refeeding Syndrome, Renal Failure, Potassium

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[O22-04]

## Healing of Bisphosphonate-Associated Osteonecrosis of the Jaw with Intermittent Parathyroid Hormone (rhPTH[1-34])

Kuo-yang Tsai\*

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**Objective:** Bisphosphonates (BPs) are commonly used to manage osteoporosis, Paget disease, and treat hypercalcemia of malignancy or metastatic bone lesions. Among oral medication for osteoporosis (in addition to calcium and vitamin D), BPs predominated the market. Since 2003, some cases of ONJ also have been described among users of oral BPs. At the present time, treatment options for patients with bisphosphonate-associated osteonecrosis of jaw (BRONJ) are limited and mostly symptomatic. We will report a case of BRONJ, who are treated successfully with intermittent parathyroid hormone (rhPTH 1-34).

**Method(s):** A 72-year-old female, sustained a painful fistula after dental implants 6 months before. She had receiving weekly Alendronate for 4 years. She undertook sequestrectomy of necrotic bone, oral antibiotics and oral irrigation with aqueous iodine solution. After 5 months of therapy, the situation did not improve and deteriorated. She was stared on anabolic therapy with Teriparatide (20 µg Eli Lilly) in May 2006. After 5 months of Teriparatide therapy, significant bone regeneration was found and mandibular fistula being healed. At 10 months follow-up the panoramic radiograph showed complete resolution of necrotic region and she undertook another dental implantation.

**Result(s):** At 10 months follow-up the panoramic radiograph showed complete resolution of necrotic region and she undertook another dental implantation.

**Conclusion(s):** The purpose of this report is to introduce a possible treatment option that may be beneficial to the BRONJ.

**Keywords:** Bisphosphonate, Osteonecrosis, Intermittent parathyroid hormone [rhPTH(1-34)]

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[O22-05]

## Neck Ultrasound for Evaluation of the Etiology of Adult Unilateral Vocal Fold Paralysis

**Cheng-ping Wang<sup>1</sup>, Pei-Jen Lou<sup>2</sup>, Tsung-Lin Yang<sup>2</sup>,  
Tseng-cheng Chen<sup>3</sup>, Ming-Jium Shieh<sup>1</sup>, Jenq-Yuh Ko<sup>2</sup>,  
Ya-Ling Hu<sup>2</sup>, Tzu-Yu Hsiao<sup>2\*</sup>**

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**Objective:** Unilateral vocal fold paralysis can be idiopathic, but may be a presentation of serious underlying diseases. Extralaryngeal neoplasm involving the vagus nerve from the brainstem and skull base to the recurrent laryngeal nerve must be excluded first when unilateral vocal fold paralysis is diagnosed. This study evaluated the role of the ultrasound of the neck in diagnosis of underlying neoplasms for adult unilateral vocal fold paralysis.

**Method(s):** Between May 2004 and December 2009, forty-nine adult patients with unilateral vocal fold paralysis received ultrasound examination, which evaluated the thyroid gland, cervical portion of the vagus nerve and the supraclavicular regions. Patients with laryngeal/hypopharyngeal cancer, or previously known thyroid/esophageal/lung cancer were all excluded. Vocal fold paralysis with known iatrogenic etiology was also excluded.

**Result(s):** There were 24 men and 25 women. Their ages ranged from 22 to 88 years, with a mean age of 62. Ultrasound examination revealed non-palpable thyroid papillary carcinoma in six (12.2%) patients, which were all proved by fine needle aspiration cytological examination; vagus nerve schwannoma in two (5%) patients, which were demonstrated again by MRI; high nodular goiter in one patient; malignant supraclavicular nodes in five (10%) patients, which were metastasized from esophageal cancer in two patients, lung cancer in two patients and thymic carcinoma in one patient. The other thirty-five patients had no obvious neoplasm causing their unilateral vocal fold paralysis.

**Conclusion(s):** Ultrasound is a useful tool to detect subclinical neoplasms in the neck, which cause unilateral vocal fold paralysis. Thyroid papillary carcinoma involving the recurrent laryngeal nerve is the most common neoplastic etiology of adult unilateral vocal fold paralysis.

**Keywords:** Ultrasound, Vocal Fold Paralysis, Thyroid Cancer

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[O22-06]

## Narrow Band Imaging and High Definition Television for Better Detection, Definition and Surveillance of Head and Neck Cancer: A Prospective Study on 551 Patients

**Cesare Piazza\*, Daniela Cocco, Francesca Del Bon,  
Stefano Mangili, Piero Nicolai, Giorgio Peretti**

*Otolaryngology - Head and Neck Surgery,  
University of Brescia, Italy*

**Objective:** Narrow band imaging (NBI) is an optical technique in which a filtered light enhances the mucosal neoangiogenetic pattern of superficial neoplasms. Its accuracy is implemented by a high definition television (HDTV) camera giving 1080 lines of resolution. Aim of the present paper is to evaluate the diagnostic gain of these techniques in the pre-, intra-, and postoperative evaluation of head and neck cancer (HNC).

**Method(s):** 551 patients with squamous HNC of nasopharynx, oropharynx, hypopharynx, oral cavity, and larynx or previously treated for them were prospectively evaluated by white light (WL) and NBI±HDTV between April 2007 and December 2009 at our institution. Patients were divided in Group A (180 subjects submitted to pre- and intraoperative WL and NBI endoscopy) and Group B (371 patients evaluated at least 6 months after treatment). Tumor resection was performed taking into account NBI information to evaluate its catch rate. Sensitivity, specificity, positive, negative predictive values, and accuracy were calculated.

**Result(s):** Overall, 115 out of 551 patients (21%) showed adjunctive findings with NBI and HDTV when compared to standard WL endoscopy. Among them, 102 (89%) received histopathologic confirmation (false positive rate 13%). Sensitivity, specificity, positive, negative predictive values, and accuracy for NBI without HDTV were 74%, 97%, 87%, 97%, and 78%; for WL-HDTV were 50%, 100%, 86%, 88%, and 62%; for NBI-HDTV were 98%, 97%, 88%, 97%, and 92%, respectively.

**Conclusion(s):** NBI coupled to HDTV showed its value in better defining tumor extension (upstaging of 59 neoplasms), detection of 5 synchronous lesions, evaluation of incomplete response to radiotherapy before planned neck dissection in 2 cases, and identification of 2 unknown primaries. NBI had a role also in the post-treatment setting for early detection of 29 recurrences and 5 metachronous tumors.

**Keywords:** Narrow Band Imaging, Endoscopy, Head and Neck Cancer

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[O22-07]

## Post-Operative Drainage in Head and Neck Surgery

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**Objective:** Most head and neck (H&N) surgeries require drain insertion. Routinely, the decision for removal is based on the total amount of drainage measured the morning after surgery. Anecdotally, most drainage occurs in the first few post-operative hours (POHs) and decreases dramatically after this period. This study aims to determine whether measurement at shorter intervals using drainage-rate rather than next morning total amount is a better basis for decisions on drains removal.

**Method(s):** A 6-month prospective observational study was performed. Inclusion criteria were H&N surgery patients with closed suction drain inserted and anticipated discharge the day after surgery. Drainage-rates were measured at 8-hourly intervals. Drains were removed when drainage-rate was  $\leq 1$  mL/hour over an 8-hour period.

**Result(s):** 43 patients were evaluated. The highest drainage-rate occurred in the first 8 POH and decreased significantly in the subsequent POHs. The median drainage-rates at 8, 16, 24, 32 and 40 POHs were 3.375, 1, 0, 0 and 0 mL/hour respectively. Using the new removal criteria of  $\leq 1$  mL/hour drainage-rate, the drains were removed in 22 (51%) patients at 16th POH; 37 (86%) were removed by 24 hours after operation. Using previous 24-hour measurement and discharge criteria of  $\leq 25$  mL/24hour, only 9 (20.5%) patients could potentially be discharged the day after surgery

**Conclusion(s):** Our 8-hourly drainage-rate monitoring has facilitated safe earlier discharge in additional 28 (63.6%) patients on the day after surgery. This has led to improvement in patient care, better optimisation of hospital resources and positive economic implications.

**Keywords:** Drainage, Head and Neck Surgery, Patient Discharge

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[O22-08]

## Rehabilitation by Means of the Distraction Method and Dental Implants of the Patients after Oncology Operations

**Alexey Drobyshyev\***

*Maxillofacial Department, Moscow State University of Medicine and Dentistry, Russian Federation*

**Objective:** The aim of our investigation was working out the main principles of the use of the distraction method, dental implantation and fixation of the denture construction on the implants with the aim of restoring of the chewing ability and speech function of the patients with partial jaw resection.

**Method(s):** The method described was used in 58 cases with defects of the lower and the upper jaws, 44 patients with defects of the lower jaw and 14 patients with defects of the upper jaw. The planning of operations with this class of patients was strictly individual. Computer programmes, lithographic models were used. During the operations distraction apparatus and dental implants of foreign and home production were made use of.

**Result(s):** 44 patients who had the previous resection of the lower jaw were fixed 123 implants at different time after the operation on the primary nidus. Distraction method was applied to 26 patients. 42 dental screw implants were fixed to 14 patients.

**Conclusion(s):** The free choice of the number of implants and their position is impossible in case of jaw defects which are conditioned by the new anatomy in the oral cavity after the oncology operations. While fixing implants there arise difficulties which are connected with the quantity and quality of the bone tissue after the operation. We used different methods of distraction and osteoplastics directed to optimizations of the alveolar part of the upper and lower jaws. The methods of distraction osteogenesis and dental implantation are the most effective, popular and forward looking in maxillo-facial surgery. Their use makes it possible to equip patients with jaw defects with a prosthetic appliance qualitatively, which prevents the development of cicatrice deformation, preserves the function and improves the aesthetic effect.

**Keyword:** Rehabilitation

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[O22-09]

## **Endoscopic Transseptal Trans Sphenoidal Hypophysectomy**

**Thomas Havas\***

*Otolaryngology Head and Neck Surgery, Prince of Wales Hospital/  
University of New South Wales., Australia*

**Objective:** Since the early 1990's a combined team of Otolaryngologist and Neurosurgeons has pioneered the introduction of Endoscopic Transseptal Trans sphenoidal Hypophysectomy at the Prince of Wales Hospital campus in Sydney, Australia.

**Method(s):** Nome

**Result(s):** Nome

**Conclusion(s):** We have performed over 150 cases and this presentation will illustrate the key points of our approach and a discussion of our results. Special emphasis will be on the relevant instrumentation focusing on appropriate telescopes and cameras, preparation of the nose, management of the middle and inferior turbinates, the transseptal approach to the sphenoid, bloodless sphenoidotomy, tumour exposure, removal of the floor of the sphenoid with powered instrumentation, tumour removal, the role of angle telescopes and powered instrumentation in tumour removal, management of CSF leaks, peri-operative management and a detailed analysis of our results.

**Keywords:** Endoscopic, Trans Sphenoidal, Hypophysectomy

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## O23. Chemoradiation (II)

Chairs : Seong Yul Yoo (Korea)

Dora Kwong (Hong Kong)

15:50 - 17:20 SBR IV

[O23-01]

### Primary Tumor and Nodal Volume Predicts Outcome and Need for Surgery after Primary Chemoradiation of Head and Neck Cancer

Summit Kundaria<sup>1</sup>, David Cognetti<sup>2</sup>, Jonas Johnson<sup>3</sup>,  
Dwight Heron<sup>4</sup>, Robert Ferris<sup>5\*</sup>

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**Objective:** To determine whether pre-treatment tumor volume can predict the need for post-treatment neck dissection and likelihood of locoregional recurrence following primary chemoradiation therapy.

**Method(s):** Eighty-two patients from 2003–2006 with resectable head and neck squamous cell carcinoma were treated with primary chemoradiation. Three-dimensional volumetric calculations were generated from the radiation planning computed tomography (CT) scans, outlining primary and nodal tumor volumes, separately. Mean follow-up was 22 months. Statistical correlation of primary tumor or nodal volumes with need for surgical salvage and overall patient outcome was performed.

**Result(s):** Volumes of the primary tumor (oropharynx, n=34; larynx, n=22; hypopharynx, n=9; nasopharynx, n=7; oral cavity, n=6; unknown primary, n=4; sinus, n=1) and nodal metastases were measured and analyzed separately. Eighty-nine percent of patients had stage III or IV disease, including N0 (n=18), N1 (n=17), N2 (n=37) and N3 (n=6). Mean volume of largest tumor-involved node was 20.4 cm<sup>3</sup> for those that required post-treatment neck dissection, versus 10.4 cm<sup>3</sup> for those that did not ( $P=0.05$ ). Primary tumor volumes correlated significantly with local recurrence ( $P=0.05$ ), and were 55.5 cm<sup>3</sup> for those who required surgical salvage, versus 37.2 cm<sup>3</sup> for those that did not ( $P=0.08$ ).

**Conclusion(s):** Significant prediction was found using primary tumor or nodal volume for the need for surgical salvage after chemoradiation therapy of head and neck cancer. In patients with high tumor volume, upfront neck dissection may be warranted to reduce neck recurrence. In lower volume patients PET/CT may reserve neck dissection only for those with evidence of residual disease.

**Keywords:** Tumor Volume, Surgery, Chemoradiation

**Corresponding Author** Robert Ferris (ferrisrl@upmc.edu)

[O23-02]

### A Randomized Trial of Induction Chemotherapy Followed by Accelerated Fractionation Radiotherapy or Concomitant Chemoradiotherapy in Advanced Head and Neck Cancer

Tarek Shouman<sup>1\*</sup>, Rania Faris<sup>2</sup>,  
Ibrahim Ezzat<sup>3</sup>, Moustafa Elserafi<sup>4</sup>

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<sup>2</sup>Radiation Oncology, Cairo University, Egypt

<sup>3</sup>Radiation Oncology, National Cancer Institute, Egypt

<sup>4</sup>Medical Oncology, National Cancer Institute, Egypt

**Objective:** To evaluate the therapeutic gain and the related toxicities with the use of gemcitabine cisplatin regimen as a neoadjuvant treatment, followed by concomitant chemoradiotherapy or accelerated fractionation radiotherapy in the treatment of locally advanced head and neck cancer.

**Method(s):** Between April 2005 and February 2008, sixty patients with locally advanced head and neck cancer stages III and IV (including oropharynx, oral cavity and larynx) were recruited in this trial. We used 2 cycles of neoadjuvant chemotherapy (gemcitabine 1,000 mg/m<sup>2</sup> d1&8 and cisplatin 70 mg/m<sup>2</sup> d1 every 3 weeks). This was followed by either concomitant chemoradiotherapy (CCR) in the form of conventionally fractionated radiotherapy (6,840 cGy/38f/7½ weeks) concomitant with weekly gemcitabine (100 mg/m<sup>2</sup>) or accelerated fractionation (AF) radiotherapy (6,840c Gy/38f/6½ weeks) using 6 fractions per week schedule.

**Result(s):** All 60 patients were evaluable for toxicity and treatment response. Evaluation of response following 2nd cycle of chemotherapy showed that two patients achieved CR (3.3%), Partial remission occurred in 49 patients (81.6%), while the disease remained stable in 8 patients (13.3%) and progression occurred in 1 patient (1.7%). After end of radiotherapy, an overall response rate of 94.3% (95% CI; 80.8-99.3) was seen with a partial response rate of 51.4% and complete response rate of 42.9 % (95 %CI; 10.4-40.1). Grade 3 mucositis was seen in 38 patients (63.3%). Grade 4 mucositis was seen in 4 patients (6.6 %). Pharyngeal toxicity was the second-most common toxicity. No significant difference in toxicity between the two therapeutic groups. The treatment response was higher in the concomitant chemoradiotherapy group compared to AF group but the difference was statistically insignificant.

**Conclusion(s):** Neoadjuvant chemotherapy using gemcitabine-cisplatin regimen was well tolerated. It yielded a comparable response rate to the other neoadjuvant regimens. Integration of gemcitabine (100 mg/m<sup>2</sup>) concurrently with conventional radiotherapy tends to be effective and not more toxic than accelerated radiotherapy alone.

**Keywords:** Gemcitabine, Accelerated Fractionation Radiotherapy, Advanced Head and Neck Cancer

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[O23-03]

## Selective Post-Operative Radiotherapy in Head and Neck Squamous Cell Carcinoma (HNSCC) : The Universite Catholique De Louvain, ST-LUC University Hospital Experience

**Alexandre Coutte<sup>1\*</sup>, Marc Hamoir<sup>2</sup>, Jean-Pascal Machiels<sup>3</sup>, Herve Reyhler<sup>4</sup>, Birgit Weynand<sup>5</sup>, Vincent Grégoire<sup>1</sup>**

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Hospital, Belgium; <sup>5</sup>Department of Pathology, St-Luc University Hospital, Belgium

**Objective:** Analysis of locoregional failures and their relationships to selective target volume delineation and planned dose distributions in patients who underwent post-operative IMRT (PORT) for HNSCC at a single cancer center.

**Method(s):** Between January 2000 and November 2007, 105 patients with oral cavity (n=59), oropharyngeal (n=7), hypopharyngeal (n=8), laryngeal (n=14) and unknown primary (n=17) HNSCC were treated with selective post-operative radiotherapy (60 to 64 Gy) according to pathologic information. Surgery was performed on the primary tumor and/or on the neck. Irradiation was focused on the tumor bed and/or on the ipsilateral node positive neck only (levels I to V). From June 2005 on, concomitant chemotherapy (cisplatin 100 mg/m<sup>2</sup>, d1, d22, d43) was also delivered in case of extracapsular spread (ECS) or positive margins (n=23). Location of locoregional failures was compared with the dose distribution. The recurrent volume was defined as : "In-Field (IF)", "Extending Outside the Field (EOF)" or "Out-of-Field (OF)" if it had received ≥95%, 20 to 95% or <20% of the prescribed dose, respectively.

**Result(s):** Post-operative analysis showed 88% of p-stage III and IV. After a median follow-up of 34.6 months, the 5-year overall survival, disease-free survival and locoregional control were 52.4, 52.3 and 78.1%, respectively. No significant difference was observed for tumor location, tumor stage, nodal stage, ECS and positive margins. A borderline significant ( $P=0.08$ ) difference in survival was observed for patients having more than 50 days between surgery and the start of radiotherapy. Out of the 105 patients, 24 had locoregional failures (2-year actuarial incidence of 20%). The majority of these recurrences (n=14) occurred IF. Recurrences occurred OF in 8 patients and EOF in 2 patients.

**Conclusion(s):** Providing adequate surgery and pathologic examination was performed, selective PORT could be delivered without jeopardizing patient's outcome.

**Keywords:** Irradiation, Post-Operative, Selective, Locoregional Failure, IMRT

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[O23-04]

## Radiotherapy of the Patients with Oropharynx Zone Cancer with the Use of Radiomodifiers

**Pavel Polyakov\*, Oleg Bychenkov, Dmitry Rogatkin**

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**Objective:** Increase of effectiveness in treatment of oropharynx cancer.

**Method(s):** For increase of radiotherapy effectiveness in treatment of locally spread forms of oropharynx cancer, new methods of radiotherapy were worked out: radiotherapy in combination with chemical radiosensibilizers—5-FU and PT, and with low-intensive laser radiation (LILR). Remote gamma-ray therapy was held using dynamic doze multi-fractionating by the split course, total doze 69,6 Gr. Pt and LILR were used with enlarged fractions 3,6 Gr.

The research included 769 patients with oropharynx zone cancer, aged 28-75 y.o. Tongue cancer was in 27,8% cases, 37,3% had oral cavity mucous cancer, 34,9% had cancer of oropharynx. The prevalence of primary tumor with symbol T2 - 21,6% of cases, T3 in 49,2%, T4 in 29,2%. Metastasis affection of lymph nodes of region zones N1-N3 ascertained for 51,8%. Radiotherapy was held for 199 patients in combination with 5-FU. For 237 patients 5-FU and PT were used together as poliradiomodification. 56 patients received radiotherapy after preliminary influence of LILR. Control groups included 257 patients receiving radiotherapy without radiosensibilizers. Remote gamma-ray therapy was carried out for 545 patients. Because of the use of 5-FU, 5-FU with PT and LILR, recovery figure improved from 38,7%-40,8% in control groups to 61,9%, 73,1% and 75,0% correspondingly. Number of patients without recurrence and metastases during 5 years raised from 30,8-38,8% in control groups to 56,8%, 66,5% and 58,3%.

**Result(s):** The best result was reached using poliradiomodification, that was promoted by reduction of recurrences from 24,5+4,9% to 11,4+2,5% ( $P<0,005$ ), and of regional metastases from 36,7+5,4% to 22,1+3,2% ( $P<0,01$ ). Poliradiomodification and LILR showed equal radiosensibilization influence.

**Conclusion(s):** Strengthening of the antitumoral effect using both variants of radiochemotherapy wasn't accompanied by expressed toxic reactions, change of nature and degree of local ray reactions of the skin and mucosa.

**Keywords:** Oropharynx Cancer, Radiomodifiers, Radiotherapy

**Corresponding Author** Pavel Polyakov (pup47@mail.ru)

[O23-05]

## Dysphagia and Trismus after Chemo-Radiotherapy for Head & Neck Cancer: Dose-Effect Relationships

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Maya Van Rossum<sup>3</sup>, Coen Rasch<sup>2</sup>, Frans Hilgers<sup>1\*</sup>

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The Netherlands Cancer Institute, Netherlands

<sup>2</sup>Departement of Radiation Oncology,  
The Netherlands Cancer Institute, Netherlands

<sup>3</sup>Departement of Ear, Nose, Throat,  
University Medical Centre Leiden, Netherlands

**Objective:** Head and neck patients treated with Intensity Modulated Radiotherapy (IMRT) are at risk for dysphagia and decreased maximum mouth opening (MMO). In this study the relationship between these toxicity endpoints and dose received by muscles/structures involved in swallowing, chewing and opening the mouth was analyzed.

**Method(s):** Fifty-five patients with advanced head and neck cancer were treated with concurrent cisplatin and IMRT (CCRT). Of 48 patients toxicity endpoint measured by videofluoroscopy, mouth opening and a study specific questionnaire were available at 10 weeks posttreatment. The mean dose was calculated for the delineated swallowing muscles (inferior, middle and superior constrictor), and the jaw structures involving chewing and opening the mouth (masseter-, temporalis-, pterygoid muscle, and mandibular condyle). The objective and subjective endpoints studied were dysphagia and decreased MMO (defined as >10 mm reduction compared to baseline).

**Result(s):** Objective dysphagia (occurrence of aspiration or laryngeal penetration) was found in 12 patients (25%). This result correlated significantly with the mean dose to the Inferior Constrictor. Twenty-six patients (55%) reported problems with swallowing solid food, but there was no correlation with the studied dose parameters and this subjective dysphagia complaint. Decreased MMO was objectively measured in seven patients (15%). This result significantly correlated with the mean dose of all jaw structures studied. Perceived decreased MMO was reported by 11 patients (23%), but this subjective parameter did not correlate with any of the dose parameters.

**Conclusion(s):** A significant correlation between the mean dose to the inferior swallowing structure and objective dysphagia was found. Decreased MMO was significantly related to the mean dose of the structures involved in chewing and opening the mouth. Objective endpoints seem, more reliable than subjective outcomes. More extensive analysis of long-term (up to one and two years) data is planned.

**Keywords:** Head and Neck Cancer, Dose-Effect, Toxicity Endpoints

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[O23-06]

## Prospective, Randomized Study of Objective Parotid Function in Non-Nasopharyngeal Head & Neck Squamous Cell Cancer (HNSCC) Patients Treated with 3-Dimensional Conformal Radiotherapy (3-DCRT) versus IMRT

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Jai Prakash Agarwal<sup>1</sup>, Debnarayan Dutta<sup>1</sup>, Tejal Gupta<sup>1</sup>,  
Sneha Shah<sup>2</sup>, Ashwini Budrukkar<sup>1</sup>, Vedang Murthy<sup>1</sup>,  
Rituraj Upreti<sup>3</sup>, Shyamkishore Shrivastava<sup>1</sup>

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<sup>3</sup>Medical Physics, Tata Memorial Hospital, India

**Objective:** Prospective evaluation of parotid function in HNSCC patients treated with radical 3D-CRT vs IMRT.

**Method(s):** From August 2005 to September 2007, sixty, untreated, non-nasopharyngeal, HNSCC (T1-3, N0-2b, except T1 glottic larynx) were randomized to 3D-CRT or IMRT. Planning Target Volumes of the primary and lymph nodes, organs at risk were delineated as per standard guidelines. OARs included spinal cord, parotids amongst others. Patients were planned using the ECLIPSE planning system. Parotid functions were estimated by 99m-Tc- Salivary scintigraphy & correlated with QOL instrument (EORTC QLQC-30 & HN-35) and mean parotid dose.

**Result(s):** All patients completed treatment as planned. At median follow up of 16.5 months 46 patients were alive. Mean ipsilateral and contralateral parotid dose in 3DCRT was 56.7 Gy and 48.2 Gy; 40.5 Gy and 34.1 Gy in IMRT, respectively ( $P=0.001$ ). Ipsilateral and contralateral parotid volume receiving <20 Gy in 3DCRT was 8.1% and 4.5%; 15.7% and 6.5% respectively ( $P=0.005$ ) in IMRT. Pre-RT, stimulated and unstimulated parotid functions were similar in both arms. At follow-up, unstimulated and stimulated parotid functions were impaired in both arms but 2 month post-RT, stimulated parotid function was better preserved with IMRT (% excretory function in 3DCRT and IMRT in ipsilateral parotid 18.2 vs. 32.9;  $P=0.019$ ; contralateral 26.3 vs. 14.7;  $P=0.184$ ). At 6 month and one year follow up there was no significant change in unstimulated parotid function and stimulated parotid function continued to remain better for IMRT. There was significant correlation between mean parotid dose and change in stimulated function (Correlation coefficient 0.43-0.91), but no correlation with subjective parotid function (QOL scores).

**Conclusion(s):** Post-RT there was deterioration in parotid function in both 3DCRT and IMRT. However, there was significant preservation of stimulated objective parotid function in both ipsilateral and contralateral parotids with IMRT vs. 3DCRT. Objective parotid function did not correlate with subjective scores.

**Keywords:** HNSCC, Parotid Function, Randomized, 3-DCRT, IMRT

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[O23-07]

## Superselective Intra-Arterial Cisplatin Infusion with Concomitant Radiotherapy for Laryngeal Cancer

**Akihiro Homma\***, Fumiuki Suzuki, Nobuhiko Oridate, Takatsugu Mizumachi, Satoshi Kano, Jun Furusawa, Naoya Inamura, Shigenari Taki, Tomohiro Sakashita, Satoshi Fukuda

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Hokkaido University Graduate School of Medicine, Japan

**Objective:** The purpose of this study was to evaluate the efficacy of superselective intra-arterial cisplatin infusion with concomitant radiotherapy (RADPLAT) for patients with laryngeal cancer.

**Method(s):** From 2003 to 2008, 14 patients with untreated, laryngeal cancer were given superselective intra-arterial infusion of cisplatin ( $100 \text{ mg/m}^2/\text{week}$ ) with simultaneous intravenous infusion of thiosulfate to neutralize cisplatin toxicity and conventional external-beam radiotherapy (65-70 Gy). All patients had squamous cell carcinomas. Primary tumor stages included T2 (1 case), T3 (10) and T4a (3). N stages included N0 (8), N1 (1), N2b (4) and N2c (1).

**Result(s):** The median follow-up period was 31 months (range 12-74 months). All patients completed radiotherapy although one patient interrupted radiotherapy 10 days because of sepsis. Thirteen patients received 3 or more arterial infusions. No patient died as a result of treatment toxicity. Twelve patients are surviving without disease but one patient died of lung metastasis, and another died of other cause. No patient had primary recurrence so far. All patients except one patient who had swallowing disturbance prior to therapy are able to have oral intake without feeding-tube support. No severe late complications such as cartilage necrosis and pharyngoesophageal stenosis happened so far.

**Conclusion(s):** We confirmed the efficacy of RADPLAT, which can concentrate the attack of supradose cisplatin on locally advanced laryngeal cancer. The majority of patients are able to take oral intake after the therapy. We consider that some patients with advanced laryngeal cancer who are selected carefully are good indication to be treated by RADPLAT.

**Keywords:** Superselective, Intra-arterial, Laryngeal Cancer

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[O23-08]

## Larynx-Preserving Treatment by Chemoradiotherapy for Hypopharyngeal Cancer

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<sup>2</sup>Radiology, University of Tokyo, Japan

**Objective:** The present study was undertaken to evaluate the results of chemoradiotherapy for hypopharyngeal cancer at our hospital.

**Method(s):** Sixty-three patients who received chemoradiotherapy for hypopharyngeal cancer were analyzed retrospectively.

**Result(s):** There were 61 males and 2 females between 41 and 93 years of age (median: 61 years). The primary tumor location was PS in 48 cases, PC in 9 and PW in 6. According to T classification, the tumors were T1, T2, T3 and T4 in 14, 25, 16 and 8 cases, respectively. The disease stages were I, II, III and IV in 5, 14, 13 and 31 cases, respectively. The mean follow-up period was 24 months. These patients received chemoradiotherapy (median radioactivity dose: 70 Gy, median total CDDP and 5FU dose levels: 190 mg and 7000 mg). Ten of the patients underwent neck dissection (ND) before chemoradiotherapy. The response to therapy was rated as a complete response (CR) in 53 cases and partial response (PR) in 6 cases. The tumor recurred in 31 cases (local recurrence in 21, cervical lymph node recurrence in 15 and distant metastasis in 8). There was no cervical recurrence in the patients who underwent ND first. Of these 31 recurrent cases, only 8 survived. The larynx preservation rates, analyzed according to T classification at 2 years, were 67%, 71%, 75% and 48% for T1, T2, T3 and T4 cases, respectively. The cause-specific survival rates at 2 years, analyzed according to disease stages, were 100%, 61%, 61% and 37% for stage I, II, III and IV cases, respectively.

**Conclusion(s):** Larynx-preserving rates were acceptable, but the survival rate was low for patients with cancer recurrence. We consider it essential to continue strict follow-up for all surviving patients.

**Keywords:** Larynx Preservation, Hypopharyngeal Cancer, Chemoradiotherapy

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[O23-09]

## Single Institutional Experience with Electron Conformal Therapy (ECT) and Modulated Electron Radiotherapy (MERT) for Superficial Head and Neck Tumors

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**Objective:** Skin cancers are generally treated with electron therapy. For electron therapy the simulation is not a regular practice. The selection of electron energies and electron applicators is normally based on the clinical judgment of depth of tumor and available imaging (CT/MRI). With current advances in X rays (conformal and intensity modulated radiotherapy), the electrons have gained less attention; only few centers are using the electron conformal therapy (ECT) and modulated electron radiotherapy (MERT). We share our experience of ECT and MERT with merits and demerits.

**Method(s):** Seventeen patients of superficial head and neck cancers were treated with conformal and modulated electron therapy in four steps (a) virtual simulation using CT scanner followed by (b) data acquisition and transfer for contouring of skin, tumor and organs at risk (OARs), (c) conformal and modulation treatment planning interconnected with computer assisted fabrication device for lead cut outs and wax blocks and finally (d) quality assurance and modified treatment delivery.

**Result(s):** In comparison to conventional techniques, ECT and MERT plans showed, better tumor delineation, appropriate energy selection, optimal tumor dose coverage, maximal sparing of OARs without any dose inhomogeneity. Phantom and in vivo dosimetric measurements showed excellent agreement with calculated doses with difference  $\pm 2\%$ . Segmented electron delivery with cutouts and in house custom made multileaf collimators in applicators (eMLC) did not show any significant difference.

**Conclusion(s):** ECT and MERT can safely be utilized for superficial targets to improve the electron radiotherapy and treatment outcome. Efforts are required to make commercially available eMLC in modern linear accelerators supported with current treatment planning systems.

**Keywords:** Skin Cancers, Head and Neck Region, Radiotherapy Techniques, Planning

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[T2-01]

## Combined Cetuximab and Genistein Treatment Shows Additive Anti-Cancer Effect on Oral Squamous Cell Carcinoma

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**Objective:** The purpose is to evaluate the potency of EGFR pathway inhibition achieved by combining cetuximab, an anti-EGFR monoclonal antibody, genistein, a tyrosine kinase inhibitor, which target extracellular and intracellular domains of the receptor, respectively, in oral squamous cell carcinoma(OSCC) *in vitro* and *in vivo*.

**Method(s):** Two OSCC cell lines, HSC3 and KB, were treated with cetuximab (C,0–400 µg/mL), genistein (G,0–80 µM), or a combination of both at a range of concentrations. Downstream protein expression of EGFR, p-EGFR, and p-Akt were evaluated by Western blot. Cell proliferation and apoptosis indices were calculated to assess anti-cancer effects *in vitro*. The *in vivo* effects of cetuximab and genistein on tumor cell growth were examined using an OSCC xenografted nude mouse model and immunohistochemical analyses of proliferation (PCNA) and microvessel density (CD31).

**Result(s):** Treatment of cells with dual anti-EGFR agents reduced the expressions of p-EGFR, and p-Akt in HSC3 cell line, but there was no significant difference in downregulation between cetuximab alone and combination with genistein in KB cells. HSC3 and KB cells showed a dose-dependent decrease in cell proliferation with single agent treatment and combination ( $P<0.05$ ). In low concentration, combined cetuximab and genistein therapy resulted in additive growth inhibition and more apoptosis compared to that achieved with single-agent exposure in both cell lines. A combination of cetuximab and genistein significantly inhibited tumor growth and caused a substantial growth delay in *in vivo* models of both cell lines while each single-agent exposure caused no delay of tumor growth. Immunohistochemical staining with PCNA revealed that the group receiving combined cetuximab and genistein exhibited the lowest number of proliferating cells and microvessel density ( $P<0.05$ ).

**Conclusion(s):** Combined therapy with genistein and cetuximab can add the potency of EGFR signaling inhibition. Because not all OSCC cell types appear to respond uniformly, selective targeting of distinct molecular pathways is required for effective clinical response.

**Keywords:** Cetuximab, Genistein, Epidermal Growth Factor Receptor

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[T2-03]

## A Phase II Study of Combination Chemotherapy with Capecitabine and Cisplatin in Patients with Metastatic or Recurrent Squamous Cell Carcinoma of Head and Neck

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**Objective:** The purpose of this study was to assess the efficacy and toxicity of capecitabine and cisplatin (XP) combination chemotherapy in patients with metastatic or recurrent squamous cell carcinoma of head and neck (SCCHN).

**Method(s):** The study design was a prospective, open-label, non-blind, non-randomized single center, and phase II study. Between May 2003 and December 2006, 36 patients with histologically confirmed metastatic or recurrent SCCHN were enrolled. One chemotherapy cycle consisted of capecitabine 1,250 mg/m<sup>2</sup> orally twice a day on day 1 to 14 and cisplatin 60 mg/m<sup>2</sup> intravenously on day 1. Each cycle was repeated every 3 weeks. Maximum cycles of treatment were 6 cycles. Immunohistochemical studies against thymidylate synthase (TS), thymidine phosphorylase (TP) and excision repair cross-complementation group 1 (ERCC1) were performed to seek predictive markers for treatment response.

**Result(s):** Of the 36 patients, 33 patients were evaluable for tumor response. 18 patients achieved partial response, and 5 patients had stable disease. On an intent-to-treat analysis, the overall response rate was 50.0%. The median progression free survival was 3.7 months (95% CI, 2.1–5.3 months), with the median response duration of 4.9 months (range, 1.6–18.6 months). And the median overall survival and 1-year survival rate were 10.3 months (95% CI, 8.5–12.1 months) and 43.3%, respectively. Common grade 3 or 4 non-hematologic adverse events were anorexia (8.8%), fatigue (4.4%), diarrhea (4.4%), stomatitis (3.6%) and hand-foot syndrome (1.5%). The most common grade 3 or 4 hematologic adverse event was neutropenia (14.6%), followed by anemia (1.5%). There was no treatment-related death. The expression of TP, TS and ERCC1 were not correlated with treatment response.

**Conclusion(s):** The results showed that XP regimen is a practical and tolerable treatment option in patients with metastatic or recurrent SCCHN without the serious complications and inconvenience associated with the central venous catheter access.

**Keywords:** Capecitabine, Cisplatin, Squamous Cell Carcinoma of Head and Neck  
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[T2-02]

## Chemotherapy of Locally Advanced Nasopharyngeal Carcinoma

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**Objective:** To evaluate efficiency of induction chemotherapy for treatment of locally advanced nasopharyngeal carcinoma.

**Method(s):** 40 pts (27 males, 13 females), age 20–77 years (median 42 years). Undifferentiated nasopharyngeal carcinoma was diagnosed in 26 pat, low differentiated squamous cancer in 14 patients. T2N1-3M0-7 pts, T3N0-2M0-2 pts, T4N0M0-19 and T4N1-3M0-12 pts. Treatment regimen: docetaxel 75 mg/m<sup>2</sup>-1 day, cisplatin 75 mg/m<sup>2</sup>-1 day, doxorubicin 45 mg/m<sup>2</sup>-1 day. Interval between cycle was 21 days. Altogether 227 maintenance chemotherapy courses were carried out (from 2 to 4 courses-5 pts, 6–17 pts, 8 courses-17 and 13 pts, 5 pts are still being treated). The efficiency was evaluated based on the CT and MRI, endoscopic and ultrasound examinations, and biopsy following every even-numbered course.

**Result(s):** Overall response (RECIST) was 72.5%-29 patients (CR 47.5%-19 pts including those referred to T4N2, PR was in 10 pts-25%). After of the chemotherapy all the patients were subjected to radiotherapy, and if positive lymph nodes were found out in the neck, they were subjected to lymphadenectomy. Stabilization of disease 3 (7.5%) and inefficiency of chemotherapy at 2 (5%) pts, accordingly. One patient, 77 years, was excluded from the study because of severe toxicity development. Progression-free survival rates were: 12 months-7 pts, 12-24 months-4 pts, more than 24 months-4. Disease-free survival is 17 patients, the maximum period of follow-up in this group 68 months (median 21.8).

**Conclusion(s):** This trial demonstrated the significant efficiency of induction chemotherapy in the first stage of a combination therapy on patients with locally advanced nasopharyngeal carcinoma.

**Keywords:** Nasopharyngeal Carcinoma, Radiotherapy

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[T2-04]

## Docetaxel in Complex Treatment of Locally-Advanced Squamous Cell Carcinoma of Pharynx and Oral Cavity

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**Objective:** To establish efficiency and toxicity of combination docetaxel, cisplatin, 5-fluorouracil and carboplatin for locally-advanced squamous cell carcinoma of pharynx and oral cavity.

**Method(s):** Patients (pts.) with locally-advanced squamous cell carcinoma of pharynx and oral cavity received an induction-concurrent variant of treatment (3 cycles of induction and 7 cycles of concurrent chemoradiotherapy). Pts. were divided into 2 groups. I group (15 pts.) received three cycles of induction chemotherapy with docetaxel 75 mg/m<sup>2</sup>, cisplatin 100 mg/m<sup>2</sup> in the first day, infusion of 5 -fluorouracil 1,000 mg/m<sup>2</sup> each 24 hours within 1-4 days. II group (16 pts.) received the same chemotherapy, but without docetaxel. Radiotherapy was with weekly introduction of carboplatin 130-180 mg (7 cycles).

**Result(s):** 31 pts. have been entered on the study. Residual tumors in regional lymph nodes and primary site are found out at 18 (58%) pts., with 5 (33.4%) in I group and 8 (50%) in II group. Disease relapses are revealed at 8 (44.4%) pts, with 4 (40%) in I group and 4 (50%) in II group. The distance metastasis - at 4 (12.9%) patients, with 1 (6%) in I group, 3 (18.7%) in II group. Four pts. of I group are executed salvage surgery, 3 with residual tumors, 1 with regional relapse. Five years survival among all studied group of patients (31) was 36±10%, in I group-59.9±10%, in II group-13.8±12.5% respectively. Late post therapeutic complications are revealed only in group with docetaxel-ulceration soft tissues of pharynx, osteonecrosis.

**Conclusion(s):** The received results testify to high possibilities of docetaxel (in combination with cisplatin, 5 -Fluorouracil and carboplatin) for locally-advanced squamous cell carcinoma of pharynx and oral cavity.

**Keywords:** Docetaxel, Chemoradiotherapy, Salvage Surgery

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[T2-05]

## Concurrent Chemoradiotherapy for Oropharyngeal Cancer: A Retrospective Comparison of Superselective High-Dose Cisplatin Infusion and Systemic Chemotherapy

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**Objective:** Concurrent systemic chemotherapy and radiotherapy (IV-CRT) is considered a standard therapy for advanced oropharyngeal cancer, while intra-arterial superselective high-dose cisplatin infusion with concomitant radiotherapy (IA-CRT) provides remarkable local control for advanced head and neck cancer. The aim of the current study is to compare the efficacy of IA-CRT with IV-CRT in patients with oropharyngeal cancer.

**Method(s):** A retrospective analysis of patients with oropharyngeal cancer who were selected to undergo IV- or IA-CRT at Hokkaido University Hospital between 1998 and 2007 was performed. Eligibility for inclusion in the study was based on the following criteria: previously untreated oropharyngeal cancer of the lateral or the anterior wall,  $\geq T2$ , histologically proven squamous cell carcinoma or undifferentiated carcinoma, no distant metastasis, and potential for follow-up for more than two years.

**Result(s):** Seventy-three patients were enrolled in this study. Thirty-three patients (45%) were diagnosed with T2, 25 (34%) with T3, and 15 (21%) with T4 disease. Forty-four and 29 patients had the lateral and the anterior wall carcinoma, respectively. Twenty patients were treated with IA-CRT and 53 with IV-CRT. Cisplatin (n=21), docetaxel (n=23), and carboplatin (n=9) were used as systemic agents for IV-CRT. During the median follow-up period of 4.5 years (range, 2.0–11.0 years), the 5-year disease specific survival rate in T2 was 66.7% for IA-CRT (n=6) and 74.0% for IV-CRT (n=27), while that in T3-4 was 65.3% for IA-CRT (n=14) and 56.2% for IV-CRT (n=26). The 5-year local control rate in T3-4 was 90.9% for IA-CRT and 67.6% for IV-CRT. In patients with anterior wall carcinoma, there was a statistically significant difference in the disease specific survival rate between IA-CRT and IV-CRT (71.1% vs. 22.2%,  $P<0.05$ ).

**Conclusion(s):** The results of the current study suggest that IA-CRT has an impact on the management of a subgroup of patients with advanced oropharyngeal cancer.

**Keywords:** Intra-Arterial, Cisplatin, Chemoradiotherapy

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[T2-07]

## Thymidylate Synthase Expression as a Predictor of Clinical Response to 5-FU-Based Chemotherapy in Patients with Maxillary Sinus SCC

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**Objective:** It is important to preserve organs and function and improve the cure rate for the patients with maxillary sinus SCC. Many studies indicated that the TS, which is the target enzyme of 5-FU, is an indicator for response to 5-FU-based chemotherapy.

**Method(s):** We constitutively expressed an antisense TS cDNA in the HNSCC cell line. We examined the effects of TS expression on 5-FU cytotoxicity and the value of immunohistochemical TS expression as a predictive indicator for 5-FU efficacy in patients with maxillary sinus SCC.

**Result(s):** Antisense TS transfection increases the cytotoxicity of 5-FU in vitro. Maxillary sinus SCC patients with negative TS expression had significantly better response rates for 5-FU based chemotherapy compared with those with positive TS expression in immunohistochemical findings.

**Conclusion(s):** These results indicate that TS expression plays an important role in the sensitivity to 5-FU chemotherapy, and TS expression affects the chemotherapeutic effect of 5-FU in patients with maxillary sinus SCC. The assessment of TS expression level might be useful both in the management and in the treatment of maxillary sinus SCC.

**Keywords:** Thymidylate Synthase, 5-FU, Maxillary Sinus SCC

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[T2-06]

## Comparison the Efficiency of Two Schedules of Combined Treatment for Oropharyngeal Cancer

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**Objective:** To compare the efficiency of two schedules of combined treatment for oropharyngeal cancer.

**Method(s):** The study included 182 patients with locally-advanced squamous cell carcinoma oropharyngeal cancer. Patients were divided into two groups: I group (43 patients) received surgery followed by radiotherapy, II group (102 patients) - radiotherapy and surgery. Radiation therapy was carried out with daily fractionation 2 Gy to total dose 46-50 Gy.

**Result(s):** The overall five-year survival rate in group I was 41.2%, in group II-37.3%. With the localization of tumor in tongue 5-years survival in both groups was 41.2% and 40.6% respectively. For patients with others localization of cancer of mucosa membrane in oral cavity five-year survival rate was -41% in I group and 33.4% in II group. In stage III the five-year survival rate was 42.3% and 44% according to groups. In stage IV, five-year survival rate was 37% and 25% respectively. Depending on the nature of tumor growth results were as follows. When endophytic tumors, five-year survival rate in group I was 25%, in II -0%, with ulcerated-infiltrative nature of tumor growth 38.7% and 28.2%, respectively. According to the tumor differentiation-high and moderate differentiated tumors no significant difference was found. In poor differentiated tumors, five-year survival rate in group I was 36% in II-23%.

**Conclusion(s):** Combined treatment with surgery in the first stage squamous cell carcinoma of the oral cavity is shown in tumors of stage IV and endophytic nature of tumor growth.

**Keywords:** Oropharyngeal Cancer, Radiotherapy, Surgery

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[T2-08]

## Sunitinib Inhibits Papillary Thyroid Carcinoma with RET/PTC1 Gene Rearrangement

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**Objective:** Sunitinib is one of receptor tyrosine kinase inhibitors that is commercially available and used for renal cell carcinomas. However, the effect of sunitinib on thyroid papillary carcinoma has not been elucidated yet and we wanted to evaluate the effect of sunitinib on thyroid papillary carcinoma and to find out the underlying mechanism of its effect.

**Method(s):** The effect of Sunitinib on cell proliferation and cell signaling was evaluated in vitro using BHP10-3SCmice cell line. CKK8 assay was used for analysis of cell proliferation and immunoblot was used for evaluation of cell signaling of MEK and ERK phosphorylation with respect to different time and concentration. The antitumor effect of sunitinib was also evaluated in vivo using orthotopic mouse model.

**Result(s):** The concentration needed for 50% tumor growth inhibition was 0.21 mol/L for sunitinib and this concentration is easily achievable serum concentration. The inhibition of phosphorylation of MEK and ERK, which are downstream molecules of MAPK pathway, was observed at the concentration of 0.1 M and more and the effect persisted more than 24 hours. Oral administration of sunitinib for 3 weeks inhibited tumor growth by 80% compared with that of control group in mouse model of thyroid cancer, showing that excellent antitumor effect in thyroid cancer.

**Conclusion(s):** These data showed that sunitinib, a tyrosine kinase inhibitor, exerted remarkable antitumor effects in vitro and in vivo in tumorigenesis of thyroid carcinoma.

**Keywords:** Sunitinib, Tyrosine Kinase Inhibitor, Thyroid Cancer

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[T2-09]

## Association of Body Mass Index with Oral Cancer Risk

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**Objective:** Although obesity is well-established risk factor for many cancers, the effect of body mass index on oral cancer risk remains controversial and requires further investigation. So, we investigated the effect of BMI on oral cancer risk in a hospital-based case-control study in Korea. In particular, we explored how these effects were influenced by onset of age, smoking behavior and alcohol consumption.

**Method(s):** Patients with oral cavity and oropharyngeal cancers henceforth referred to as oral cancer, were recruited at the National Cancer Center and the Seoul National University Dental Hospital in Korea between 2004 and 2006. 364 cases (242 men and 122 women) with an initial histopathologic diagnosis of invasive oral cancer were selected.

**Result(s):** Mean BMI did not differ between experimental and control in either gender. The mean body weight for the male cases was less than the control, but no significant relationship to body weight was determined in either gender. As for BMI, we found no overall significant evidence of association between oral cancer risk and BMI in either gender. However, when the relationship between BMI and oral cancer risk was examined according to female age groups (<50 and ≥50 years), there was a significant association between oral cancer risk and high BMI in female subjects younger than 50 years old, but not in older (≥50 years) female subjects.

**Conclusion(s):** Etiologic factors for oral cancer may differ between males and females, especially in Korea. Most Korean women do not smoke, nevertheless the yearly trends for oral cancer incidence have been increasing among both males and females. This implies that risk factors other than cigarette smoking may present an oral cancer risk for females. For now, the other risk factors in the non-smoking and/or non-drinking group remain unknown. We attempted to determine the effect of other etiologic factors in female patients, particularly non-smokers, on the risk for oral cancer.

**Keywords:** Oral Cancer Risk, Body Mass Index, BMI

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[T2-11]

## Pretreatment FDG-PET/CT Can Predict Outcome in Head and Neck Cancer Patients Treated with Concurrent Chemoradiation

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**Objective:** Concurrent chemoradiation (CCRT) has had a significant improvement for organ preservation and survival in the treatment of head and neck cancer. FDG uptake intensity in head and neck cancer has some prognostic value. The aim of study was to evaluate role of FDG uptake intensity as a prognostic value in the head and neck cancer.

**Method(s):** We reviewed pretreatment FDG-PET/CT of 49 patients taken from January 2007 to May 2008 retrospectively. Maximal FDG uptake intensity of primary site was estimated as a prognostic value with 1-year disease free survival (DFS) as a primary endpoint.

**Result(s):** The median SUV of maximal intensity of primary site was 15.7 (3.2-41.8). The primary treatment were composed of surgery followed by radiation (n=20, 40.8%), induction chemotherapy followed by radiation (ICT, n=11, 22.4%), concurrent chemoradiation (n=18, 36.8%). 24 patients (49%) had SUV <15 compared with 25 patients (51%) with SUV ≥15. 1-year DFS was significantly better in low SUV group than high SUV group (100% [11/11] vs. 57.1% [4/7], P=0.021) in patients treated with CCRT. However 1-year DFS in all patients (CCRT+ICT+SURGERY) showed also increasing trend in the low SUV group but was not statistically significant (75% [18/24] vs. 68% [17/25], P=0.592). 1-year overall survival (OS) was significantly better in low SUV group than high SUV group (100% [11/11] vs. 57.1% [4/7], P=0.021) in patients treated with CCRT. 1-year OS in all patients showed also increasing trend in the low SUV group but was not significant (83.3% [20/24] vs. 72.0% [18/25], P=0.347).

**Conclusion(s):** SUV of primary site was significantly associated with outcome in head and neck cancer patients treated with CCRT. However there was no significant association in all patients treated with CCRT, ICT followed by radiation and surgery followed by radiation. This may be due to small sample size and short follow up duration.

**Keywords:** Induction Chemotherapy, Docetaxel, Capecitabine  
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[T2-10]

## Perineural Spread in Head and Neck Malignancies: Key Radiological Findings and Pitfalls

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**Objective:** Perineural spread (PNS) often restricts surgical treatment of head and neck malignancies and has a major influence on therapy and prognosis. PNS commonly affects the facial nerve and the maxillary and mandibular divisions of the trigeminal nerve. Since symptoms are often a late manifestation of PNS, developing as late as several years after PNS starts, early radiological diagnosis can assist in the appropriate selection of effective treatment, such as wider resection, adding radiation therapy, or expanding the radiation area.

**Method(s):** The imaging findings of 8 patients with typical radiological findings of PNS are described. The patients included 2 with facial squamous cell carcinoma, 2 with non-Hodgkin's lymphoma, 2 with maxillary cancer and 2 with parotid cancer. Their clinical charts were reviewed to check the symptoms and follow-up data. Noteworthy pitfalls in making the diagnosis of PNS and the normal anatomy of these nerves are also described.

**Result(s):** The radiological diagnostic points on CT, MRI, and RI leading to a clinical diagnosis of PNS were: enlargement or destruction of the foramen/canal through which nerves pass; enhanced tissue between the pterygoid muscles; replacement of normal fat tissue below the foramen; thickening and enhancement of the affected nerve; lateral protrusion of the cavernous sinus due to a thickened trigeminal branch; and an enlarged Meckel's cave replaced with enhanced soft tissue encasing CSF. The pitfalls, involving different conditions that could be misidentified as PNS, included: pterygoid venous plexus asymmetry; venous-vascular malformation; vasa nervosa; prominent and calcified internal maxillary arterial branch; Schwannoma; neurofibroma; meningioma; and carotid-cavernous fistula.

**Conclusion(s):** Being familiar with the typical radiological diagnostic points and pitfalls of PNS can provide early clinical diagnosis of PNS, leading to an effective clinical approach to treatment.

**Keywords:** Perineural Spread, Trigeminal Nerve, Facial Nerve

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[T2-12]

## Additional Value of MRI/PET Fusion Compared with MRI and PET/CT in the Assessment of Masticator Space Invasion in Advanced Squamous Cell Carcinoma of Buccal Cancer

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**Objective:** We evaluated the additional diagnostic value of magnetic resonance imaging/positron emission tomography (MRI/PET) fusion compared with MRI and positron emission tomography/computed tomography (PET/CT) in the assessment of masticator space invasion in advanced squamous cell carcinoma of buccal cancer (BSCC).

**Method(s):** Sixteen consecutive patients (15 men, 1 woman; mean age, years 54; age range, 25-82 years) who were suspected of having MS invasion on CT images from BSCC prospectively underwent both MRI and PET/CT before surgery were included in this study. Two radiologists assessed the contrast-enhanced CT and MRI images. A nuclear medicine physician assessed PET/CT images at first, and then a second analysis was performed with PET/MRI fused images that focused on the additional information obtained from the MR images. On the basis of tumor extent, pterygoid muscle or masseter muscle biopsy or maxillectomy or mandibulectomy were performed to obtain adequate surgical margins as the reference standard. The maximal lengths of tumor on images were also compared with the pathologic maximal gross tumor lengths.

**Result(s):** With histologic findings as the standard for reference, the accuracy of PET/CT (55% [11 of 20 lesions]) was lower than that of PET/MRI and MRI (83.3% [15 of 18 lesions]) and (66.7% [12 of 18 lesions]). Sensitivity and specificity were highest with PET/MRI (82.4% [14 of 17 lesions]) and 89.7% [35 of 39 lesions]).

**Conclusion(s):** Fluorine 18 fluorodeoxyglucose (FDG) uptakes fused with MRI was a helpful imaging pattern for better identifying soft tissue invasion in patients with suspicious MS invasion on CT scans in advance BSCC.

**Keywords:** PET/MRI, PET/CT, Squamous Cell Carcinoma of Buccal Cancer

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[T2-13]

## Assessment of Head and Neck Cancer Using Dynamic Contrast-Enhanced MR Imaging

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**Objective:** Dynamic contrast-enhanced MR imaging (DCE-MRI) can be used to measure microcirculation and tumor angiogenesis which may correlate with therapeutic effect and patient prognosis. The purpose to this study is to identify correlations between tumor stage and parameters of dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) in head and neck cancer before treatment.

**Method(s):** MRI was prospectively performed before treatment in 23 patients (men 21, women 2; mean age: 53.78±10.94 years) with various head and neck tumors (Buccal: 12; tongue: 3; oropharynx: 7 and nasopharynx: 1). After bolus injection of contrast material, a dynamic study was performed using a spoiled gradient-recalled imaging sequence. Calculated values included time to peak, peak enhancement, peak in-slope, out-slope, and area under the curve. Correlations between DCE-MRI parameters and cancer stage (TNM) were examined by using Spearman's correlation coefficient.

**Result(s):** There were significant positive correlations found between DCE-MRI parameters and cancer stage. Peak enhancement was positive correlated with tumor size ( $\gamma=0.690$ ,  $P=0.000$ ), node involvement ( $\gamma=0.453$ ,  $P=0.030$ ) and cancer stage ( $\gamma=0.603$ ,  $P=0.002$ ). Time to peak was positive correlated with tumor size ( $\gamma=0.595$ ,  $P=0.003$ ) and cancer stage ( $\gamma=0.596$ ,  $P=0.003$ ). Area under the curve was positive correlated with tumor size ( $\gamma=0.690$ ,  $P=0.000$ ) and cancer stage ( $\gamma=0.553$ ,  $P=0.006$ ). Peak in-slop was positive correlated with tumor size ( $\gamma=0.569$ ,  $P=0.005$ ). Peak out-slop was positive correlated with tumor size ( $\gamma=0.656$ ,  $P=0.001$ ) and cancer stage ( $\gamma=0.624$ ,  $P=0.001$ ).

**Conclusion(s):** Analysis of dynamic contrast-enhanced MR imaging can effectively evaluate cancer stage in patients with squamous cell carcinoma of the head and neck.

**Keywords:** DCE-MRI, Head and Neck Tumor, Cancer Stage

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[T2-15]

## A Report on the Use of Sydney Swallow Questionnaire (SSQ) in Head-Neck Cancer Patients

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**Objective:** To test the utility of SSQ in evaluating swallowing impairment in head-neck cancer (HNC) patients.

**Method(s):** Sixty-two consecutive follow-up patients for oral cavity (OC) or oropharyngeal (OP) cancer were recruited for this study. Statistical analyses were done using Mann-Whitney U-test (for two patients subgroups) and Kruskal-Wallis test (three or more subgroups);  $P$ -value <0.05 were taken as significant.

**Result(s):** The mean total SSQ scores (SD) for patients having base of tongue cancers, oral tongue cancers and tonsillar cancers were 663.8 (382.8), 456.2 (407.6) and 283.0 (243.1) respectively ( $P<0.005$ ). Patients with late T-stage (T3 and T4) had mean total SSQ scores of 918.1 (319.5) as against 344.8 (292.1) for those presenting with early T-stage (T1 and T2) disease. Younger patients (<60 years) reported more swallowing problems than their older counterparts ( $\geq 60$  years), with mean total SSQ scores of 549.3 (415.1) vs. 314.0 (247.3). The mean total SSQ scores for patients with  $\geq 2$  years in follow-up were significantly higher 486.7 (375.5) than those having <2 years in the follow-up, 259.5 (256.7). Total mean SSQ scores were found to be significantly higher for patients undergoing reconstruction, 676.5 (410.5) as compared to those having had no reconstruction 331.9 (286.5). Difficulty in swallowing dry foods and difficulty in swallowing hard foods were two most important problems noticed by the patients with mean SSQ scores ranging between 38.9 and 52.4. Other important issues causing swallowing impairment were feeling of food getting stuck in the throat, need to swallow more than once and coughing and choking when swallowing solid food.

**Conclusion(s):** SSQ is a valuable tool in the assessment of swallowing impairment in HNC patients. Site of cancer, T-stage, age of the patient, duration of follow-up and reconstruction may directly affects post-treatment swallowing function in OC/OP cancer patients.

**Keywords:** Swallowing, Sydney Swallow Questionnaire (SSQ), Head-Neck Cancer

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[T2-14]

## Unsedated Transnasal Esophagogastrroduodenoscopy in Diagnosis of Hypopharyngeal Cancer

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**Objective:** This study evaluates the efficacy of unsedated transnasal esophagogastrroduodenoscopy (EGD) in diagnosis of hypopharyngeal cancer and screening of simultaneous esophageal lesions.

**Method(s):** Between May 2007 and August 2009, eighty-three consecutive patients with newly diagnosed hypopharyngeal cancer were evaluated by transnasal EGD without conscious sedation.

**Result(s):** There were 79 men and 4 women. Their ages ranged from 36 to 85 years, with a mean age of 58. Sixty-seven (80.7%) hypopharyngeal cancers arose from the pyriform sinus, and the other 16 (19.3%) tumors were from the posterior hypopharyngeal wall. Sixty-seven (80.7%) tumors were classified as T3-T4. Only nine (10.8%) tumors were difficult to be obtained adequate specimen for cancer diagnosis, the other seventy-four hypopharyngeal tumors were pathologically proved malignancy by this technique. Regarding simultaneous esophageal lesions, esophageal dysplasia was noted in 9 (10.8%) patients and invasive esophageal cancer occurred in 16 (19.2%) patients. Among 16 invasive esophageal cancers, seven (43.8%) tumors were classified as T1-T2, which percentage was significantly higher in Taiwan. The procedures were performed without difficulty except in 1 patient with huge posterior wall tumor. The entire procedure time including evaluation and biopsies ranged from 8 to 52 minutes with a mean duration of 18.4 minutes. All patients tolerated the procedure well, without significant bleeding or respiratory distress during examination.

**Conclusion(s):** Unsedated transnasal EGD is a safe, tolerable, and accurate endoscopic technique for diagnosis of hypopharyngeal cancer and screening of simultaneous esophageal cancer during a single session. It is particularly useful in patients with locally advanced tumor, trismus, stiff neck, or previously treated primary head and neck cancer.

**Keywords:** Hypopharyngeal Cancer, Esophageal Cancer, Transnasal Esophagoscopy

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[T2-16]

## Oropharyngeal Mucositis Prophylaxis In Combined Radioimmunochemotherapy

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**Objective:** Experience with the treatment of head & neck cancer patients showed that most patients display strong oropharyngeal adverse reactions (grade 3/4) additional to other side effects. In severe cases the mucositis leads to a therapy interruption or even to a discontinuation caused by secondary local or systemic infections with associated pain symptoms. To prevent or reduce the mucositis we treated 98 patients additionally with a polyvinylpyrrolidone (PVP) and sodium hyaluronate containing oral gel (Gelclair®).

**Method(s):** 98 patients were getting the oral gel as a mouth rinsing solution 3 times daily 10 min after antimycotics and panthenol. The treatment started simultaneously with radiotherapy and was discontinued 4 weeks after the end of the radiotherapy.

**Result(s):** In consequence we observed in all 98 patients only mild cases of mucositis. There were no specific side effects of the oral gel observed and all patients were compliant. No therapy had to be interrupted or stopped because of a severe mucositis. 10 patients had therapy interruptions or discontinuation for other reasons.

**Conclusion(s):** A prophylactic treatment of head & neck cancer patients receiving a combined radioimmunochemotherapy with a polyvinylpyrrolidone (PVP) and sodium hyaluronate containing oral gel additionally to antimycotics / panthenol seems advised.

**Keywords:** Polyvinylpyrrolidone, Mcositis, Sodium Hyaluronate Oral Gel

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[T2-17]

## Definitive Radiotherapy for Oropharyngeal Carcinoma

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**Objective:** To evaluate the treatment outcome in patients with oropharyngeal carcinoma treated with definitive radiotherapy.

**Method(s):** Between 1997 and 2005, 33 patients with oropharyngeal carcinoma were treated with definitive radiotherapy. The median age was 64 years (range, 41-89 years). All patients had previously untreated squamous cell carcinoma. The clinical stage distribution was 7 for stage2, 6 for stage3, 14 for stage4a, and 16 for stage4b. The T classification distribution was 1 for T1, 17 for T2, 8 for T3, 5 for T4a, and 2 for T4b. The N classification distribution was 9 for N0, 6 for N1, 15 for N2, and 3 for N3. The primary sites included 21 lateral wall, 6 posterior wall, 4 superior wall, and 2 anterior wall. The median total prescribed dose was 64Gy (range, 60-68Gy) with 1.8-2Gy per fractionation. Nine patients underwent a planned neck dissection. Twenty-one patients received induction (9 patients) or concomitant (12 patients) chemotherapy. Median follow-up time was 56 months (range, 19-134 months).

**Result(s):** The 5-year local control rates were as follows: T1-2 100%, T3 89%, T4 47%, and overall 83% ( $P<0.005$ ). The 5-year overall and cause-specific survival rates were 61% and 67%, respectively. The 5-year cause-specific survival rates by clinical stage were as follows: stage2 100%, stage3 80%, and stage4 51% ( $P<0.05$ ). The 5-year cause-specific survival rates by T classification were as follows: T1-2 100%, T3 56%, and T4 0% ( $P<0.001$ ). No severe adverse effects were observed.

**Conclusion(s):** Based on our data, definitive radiotherapy except for T4 is an effective method of achieving good treatment outcome.

**Keywords:** Oropharyngeal Carcinoma, Radiotherapy, Treatment Outcome

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[T2-19]

## The Impact of Postoperative Radiotherapy on Survival for the Patients with Early Primary Oral Tongue Cancer and Pathologic N1 Neck

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**Objective:** The benefit of postoperative radiotherapy for early squamous cell carcinoma of the tongue (SCCOT) with pathologic N1 disease remains unclear.

**Method(s):** The medical records of all patients with pathological T1-T2/N0-1 SCCOT who underwent wide excision of the primary tumor and neck dissection between 1997 and 2002 were reviewed.

**Result(s):** 59 patients were analysed, including 28 patients with and 31 patients without postoperative radiotherapy. The 5-year disease-free survival rates were 85.7% and 61.3% for the patients with and without postoperative radiotherapy, respectively ( $P=0.03$ ). The overall 5-year survival rates were 85.7% and 74.2% for the patients with and without postoperative radiotherapy, respectively ( $P=0.33$ ). Multivariate analysis showed that postoperative radiotherapy had the only protective effect ( $P=0.01$ ), and extracapsular spread (ECS) was the only significantly adverse factor for locoregional recurrence ( $P=0.03$ ).

**Conclusion(s):** Around one-third of the patients who received only operation had locoregional recurrence. Postoperative radiotherapy significantly improved the disease-free survival.

**Keywords:** Tongue Cancer, Adjuvant Radiotherapy, Recurrence

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[T2-18]

## Clinical Results of Alternating Chemoradiotherapy for Nasopharyngeal Cancer

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**Objective:** Nasopharyngeal cancer (NPC) is a disease with poor prognosis because it is difficult to identify the cancer in its early stage, and local recurrence and late cervical metastasis occur frequently. It has been reported that irradiation with chemotherapy could improve the prognosis of NPC because most cancers show squamous cell carcinoma, which is very sensitive to irradiation. Recently, a considerable number of studies have been conducted on concomitant chemoradiotherapy (CCRT), including alternating chemoradiotherapy, for NPC.

**Method(s):** Thirty patients with nasopharyngeal cancer from 1995 to 2008 were analyzed to compare conventional CCRT and alternating chemoradiotherapy. Their mean age was 54.5 years, ranging from 16 to 83. The patients consisted of 22 males and 8 females. The clinical stage was I in 4, IIa in 2, IIb in 2, III in 9, IVa in 7, and IVb in 5. Histological classification by WHO was type I in 1, type II in 22 and type III in 7. Until 2004, neoadjuvant chemotherapy with CDDP and 5FU was performed for 20 cases prior to irradiation and CCRT with CBDCA in 2 cases. Eight out of 30 cases were made with alternating chemoradiotherapy as of 2005. As for the course of alternating chemoradiotherapy, after 5FU (800 mg/m<sup>2</sup>/24h, day 1-5), CDDP (50 mg/m<sup>2</sup>, day 6-7) were administered, irradiation (1.8-2.0 Gy five days a week) was performed for next 4 weeks. The second chemotherapy was performed, and irradiation was performed again for 3 weeks. After finishing the full dose of irradiation (mean; 69.8Gy), the third course of chemotherapy was performed.

**Result(s):** The survival rate in 22 cases with NAC and CCRT was 50% at five years, and 8 cases with alternating chemoradiotherapy was 100% at 2 years.

**Conclusion(s):** Although observation time for alternating chemoradiotherapy has been not sufficient for reaching a conclusion, alternating chemoradiotherapy may show better prognosis than ever before.

**Keywords:** Nasopharyngeal Cancer, Alternating Chemoradiotherapy, Concomitant Chemoradiotherapy

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[T2-20]

## Expression of Excision Repair Cross-complementation Group 1 (ERCC1) as a Predictive Marker for Nasopharyngeal Cancer Treated with Concurrent Chemoradiotherapy

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**Objective:** Cisplatin-based concurrent chemoradiotherapy (CCRT) is the standard treatment for nasopharyngeal cancer. The expression of excision repair cross-complementation group 1 (ERCC1) has been reported to be associated with resistance to platinum-based chemotherapy. We evaluated whether ERCC1 expression could predict the treatment response and survival outcome in patients with locally advanced nasopharyngeal cancer that were treated with cisplatin-based CCRT.

**Method(s):** Immunohistochemistry was used to examine the expression of ERCC1 in nasopharyngeal tumor tissue. Patients were categorized into either a resistant or sensitive group depending on their treatment response outcome. A total of 77 patients were assessed in this study.

**Result(s):** The resistant and sensitive groups comprised of 25 and 52 patients, respectively. ERCC1 expression was positive in the tumor tissue for 39 of the patients (51%). There were significantly more ERCC1-negative tumors in the sensitive group, as compared to the resistant group ( $P=0.035$ ). In terms of survival outcome, univariate analysis determined that patients with ERCC1-negative tumors had a longer disease-free survival rate ( $P=0.076$ ) and overall survival rate ( $P=0.013$ ) than patients with ERCC1-positive tumors. Multivariate analysis determined that negative ERCC1 expression in tumors was an independent predictor for prolonged overall survival (Hazard ratio=0.14; 95% CI, 0.03-0.71).

**Conclusion(s):** These results suggested that ERCC1 expression might be a useful predictive marker in patients with locally advanced nasopharyngeal cancer that are under consideration for treatment with cisplatin-based CCRT.

**Keywords:** ERCC1, Nasopharyngeal Cancer, Concurrent Chemoradiation

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[T2-21]

## Reconstruction of Mid-facial Defect with Free Tissue Transfer after Surgery of Nasal Cavity and Maxillary Sinus Cancer

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**Objective:** Postoperative defect of nasal cavity cancer has a difficulty in reconstruction because of its large and complicated defects. Large defects of the head and neck are challenging to reconstruct since there may be a 3-dimensional requirement of both volume and multiple surfaces of oral lining and external skin.

**Method(s):** We conducted a retrospective review of 35 patients who underwent reconstruction between 1999 and 2008. Free flaps were used in 21 patients and local advancement flaps (12 palatal and 2 temporalis muscle) were transposed in 14 patients. Outcome measures included free flap types, flap success and post-operative functional result.

**Result(s):** Anterolateral thigh flap were used in 13 of the 20 patients (65%), rectus abdominis free flap in 4 patients (20%), fibular osteocutaneous free flap in 2 patients (10%) and radial forearm free flap in 1 patients (5%) respectively. Free flap survival was 100 percent with partial flap necrosis in one patient. Return to regular diet was seen in 14 patients (70%), a soft diet in 4 (20%), and a liquid diet in 2 (10%). Speech was accessed as normal in 12 patient (60%), near normal in 6 (30%), intelligible in 2 patients (10%).

**Conclusion(s):** Free tissue transfer provides the most effective and reliable form of immediate reconstruction for mid-facial defect after maxillectomy.

**Keywords:** Free Tissue Transfer, Mid-Facial Defect

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[T2-23]

## Plastic Material for Closure of Defects on Head and Neck Region

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**Objective:** The vast majority of patients treated in specialized institutions after radiation or chemotherapy. As the results of various studies damaging tissue factor most unsuitable for surgical treatment in 6 months. Following an earlier chemotherapy or radiation treatment-surgical treatment should be conducted on the basis of existing violations of tissue renewal processes. When equal volumes of operations after the pre-exposure, often with a view to preventing postoperative complications have to perform the primary plastic. There is quite a large number of plastic materials including autotransplants. However, the presence of contraindications for a fence of any kind of flap in the individual case makes the search for variants of plastics.

**Method(s):** For this purpose, we performed anatomical studies on cadavers, in which revealed the possibility of a fence and transplanting the new sero-muscular fibers autotransplantata the rectus abdominis muscle of the lower epigastric vessels. After a branch of the lower epigastric artery from the iliac artery, it enters the vagina and the rectus abdominis muscle runs through the rectus abdominis muscle on its inner portion, giving collaterals perpendicularly to the parietal peritoneum and through the muscle and aponeurosis to the skin. Serous component of the flap, submitted parietal peritoneum, is active regeneration capacity, as manifested in the active phase of inflammation and fibrosis in response to the impact. Muscular component fills the defect of soft tissues.

**Result(s):** Four patients with this type of autotflaps compensated facial deformities, in one case made of plastic esophagostomy. Complications from the donor and the recipient areas were not identified. All patients were rehabilitated. Maximum follow-up was 3 years minimum 1,5 month.

**Conclusion(s):** Despite the short time observations, the findings suggest the possibility, and in some cases and the need for both primary and secondary plasty in this type of autotflap.

**Keywords:** Sero-Muscular, Epigastric

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[T2-22]

## Comparison of Total and Subtotal Nasal Reconstruction with Forehead Flap

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**Objective:** The massive tumor on the nose needs the wide resection and reconstruction. The unique properties of the nose make reconstruction need the "esthetic subunit" principles. Especially in Asian patients, outcomes in use of traditional aesthetic subunit can involve unfavorable color mismatching and unnatural contours because the asian nose have little distinctive nasal subunits. We need "nasal aesthetic unit" concepts different from traditional aesthetic subunit usually applying for caucasians. We analyzed outcomes using our nasal aesthetic unit concept.

**Method(s):** Our concept is that nose in Asians should be considered as a one aesthetic unit in the face. Our modified aesthetic subunit principles were applied. From 2005 to 2009, in the 11 patients with massive tumor on the nose were treated with this concept. Subtotal or total nasal reconstruction with a forehead flap after wide resection was performed according to our aesthetic subunit concept. The minor nasal tumor which could be reconstructed with local flap transposition were omitted in this investigation. Massive basal and squamous cell carcinoma, vascular tumor and the deformities after the tumor resections on the nose were included.

**Result(s):** Satisfactory results were achieved for 11 patients. Any local recurrences were not noted except 1 patient. Furthermore, color matching and nasal contouring were satisfactory in all cases using our aesthetic unit concept. There were no major complications such as serious infection, bleeding or flap failure. All patient responses were overwhelmingly positive.

**Conclusion(s):** Our aesthetic unit concept was successfully applied for nasal massive tumor cases ranging from subtotal to total nasal reconstructions associated with nasal tumors. For Asians, our modified aesthetic subunit concept would be better for reconstruction of the nose.

**Keywords:** Nose, Forehead Flap, Aesthetic Subunit

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[T2-24]

## Different Types of Free Flaps in Mandible Reconstruction after Segmental Mandibulectomy in Patients with Maxillofacial Tumor Pathology

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**Objective:** Surgery is the main part of anticancer treatment of advanced maxillofacial tumor pathology. Combined defects of mandible, oral mucosa, skin of low part of the face and submandibular trigonum are the difficult problem of reconstructive surgery. We estimate the indications, functional and esthetic results of different types free flaps in mandible reconstruction.

**Method(s):** 49 patients (pt.) with oral cancer (13), alveolar ridge (5), retromolar trigonum (4), cheek (8), lip (5) and mandible sarcomas (14) were treated. Locally advanced tumors were diagnosed in 16 pt. (32.7%) and recurrence after ineffective radiation or chemoradiation therapy in 33 pt. (67.3%).

**Result(s):** Indications to the free flaps application are anterior or subtotal defects of the mandible, high dose of previous radiation, combined mucous and skin defects, acceptable oncological prognosis and satisfactory health condition. We apply 2 free flaps in mandible replacement. Ileum crest (36 pt.) was used in anterolateral mandible and considerable mucous defect (25pt.), limited lateral defect in primary bone tumors (6pt.), complex defect of mandible, mucous and skin (5pt. –with pectoralis major flap). Fibular flap (13pt.) is the method of choice in subtotal mandible defect (ramus [with joint]-body-chin, body-chin-body). We apply fibular flap with skin island in 5pt. and with pectoralis major flap (2 pt.) in combined defect. We observed 2 cases of partial skin flap necrosis (4.1%) and 6 cases (12.2%) of transplant necrosis due to previous considerable radiation dose, neck skin necrosis and venous thrombosis. 26 pt. (53.1%) are alive without evidence of disease during 2 years. Local recurrence is the main cause of death (15 pt. - 65.2%).

**Conclusion(s):** Free flaps are more relevant in complex soft tissues and bone defects, especially in anterior and subtotal mandible defects. Different methods of reconstruction and types of free flaps allow to achieve satisfactory esthetic results.

**Keywords:** Reconstruction, Free Flap, Maxillofacial Defect

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[T2-25]

## Reconstruction of the Pharyngeal Wall Using Contralaterally-Pediced Infrahyoid Myocutaneous Flap Following Partial Pharyngolaryngectomy

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**Objective:** The infrahyoid myocutaneous flap (IHF) is an axial pattern local flap pedicled by the superior thyroid artery and vein. Since first introduced by Wang in 1986, IHF has been successfully applied to the reconstruction of a wide range of moderate-sized head and neck oncologic defects. However, usefulness of IHF as an alternative to free flap in reconstructing pharyngolaryngeal defects after partial pharyngolaryngectomy has not been well assessed. We aimed to evaluate the functional outcomes and reliability of the procedure to reconstruct the pharyngeal wall defects with IHF pedicled on the contralateral side of the neck.

**Method(s):** Five patients with advanced pyriform sinus carcinoma underwent partial pharyngolaryngectomy with the ipsilateral neck dissection and tracheostomy followed by reconstruction using IHF. To avoid oncological risk due to possible latent lymph node metastasis around the vascular pedicles, IHF was elevated on the contralateral side in this series. To overcome a limitation in length of the pedicle, IHF was transferred to the other side by tunneling through the prevertebral space. The records of the patients were retrospectively reviewed.

**Result(s):** Pathological T staging was pT2 in 2 cases, pT3 in 1, and pT4 in 2. Flaps were harvested with lengths of 70 to 90 mm and widths of 35 mm, which were large enough for the reconstruction. All donor sites were closed primarily and none of them had any functional morbidity. Only one patient developed a pharyngeal leakage that subsequently resolved with conservative management alone. Oral ingestion was resumed on 6th to 13th post-operative day, with a mean of 10th day. Tracheal stoma was closed in all patients with a median time to decannulation of 5 weeks post-operatively.

**Conclusion(s):** Based on the favorable functional results, contralaterally-pediced IHF can be one of the reliable options for pharyngeal reconstruction after partial pharyngolaryngectomy.

**Keywords:** Infrahyoid Flap, Pharyngeal Reconstruction, Partial Paryngolaryngectomy

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[T2-26]

## Internal Jugular Vein Reconstruction: Application of Conventional Type A and Newly Invented Type K Methods

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**Objective:** In accordance with current organ preservation trend, the internal jugular vein (IJV) is spared in a majority of cases during neck dissection (ND). However, the sacrifice of both IJVs is required in rare cases. It is well known that simultaneous excision of bilateral IJVs frequently causes fatal complications, but even staged, the sacrifice of bilateral IJVs could lead to fatal complications (2%). In this context, we reconstructed unilateral IJV in two cases, whose IJVs were sacrificed during bilateral ND.

**Method(s):** The first patient was a 78-year-old man with supra-glottic laryngeal cancer (cT-3N2cM0). We reconstructed the left IJV employing conventional type A method: end-to-end anastomosis of the IJV to the external jugular vein (EJV), according to the Katsumo's classification (Laryngoscope 110; 1578-1580, 2000). The second patient was a 77-year-old man with subglottic laryngeal cancer (cT2N1M0). In this case, we anastomosed the IJV to the anterior jugular vein preserving the flow of EJV, which we termed as Type K method, mainly expecting two benefits. First, the preserved EJV might reduce the facial edema. Second, the venous networks between the IJV and EJV (e.g. via the facial vein) might work as a safeguard.

**Result(s):** In both cases, the reconstructed IJV was patent and functional and the postoperative course was uneventful with no severe complications. However, Case 1 demonstrated prominent facial edema lasted for a few weeks. This was probably because facial drainage was markedly reduced due to the sacrifice of bilateral EJVs during ND and IJV reconstruction. On the contrary, no apparent facial edema was observed with Case 2.

**Conclusion(s):** In conclusion, we successfully applied two types of IJV reconstruction and found that Type K method might be advantageous compared to conventional procedures with respect to post-operative facial drainage and reinforced safety.

**Keywords:** Internal Jugular Vein Reconstruction, Intracranial Pressure, Facial Edema

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[T2-27]

## To Investigate the Clinical Significance and Functional Roles of the Expressions of Fibulin-5 in Nasopharyngeal Carcinoma Tissue and Cell Lines

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**Objective:** The study is compared the gene and protein expression levels of fibulin-5 in nasopharyngeal carcinoma (NPC) and cell lines. Furthermore, we investigated the clinic pathologic factors and the functional roles of fibulin-5 in NPC and cell lines.

**Method(s):** Standard semiquantitative RT-PCR, Q-RT-PCR, western blot and IHC techniques were used to evaluate fibulin-5 mRNA and protein expression in the specimens of NPC patients. Immunohistochemistry (IHC) analysis of fibulin-5 expression was assessed in 50 NPC patients. Results were correlated with clinic-pathologic characteristics using univariate and multivariate analyses. Human NPC cell lines with overexpressing fibulin-5 or fibulin-5-mediated siRNA to repress endogenous fibulin-5 were generated by transfection. Transwell chamber assay was used to determine the migration and invasion assay. Western blot analysis was done to evaluate the signaling pathways that were involved.

**Result(s):** The expression of fibulin-5 mRNA and protein were significantly lower in cancer tissues of NPC patients than in normal tumor tissues. The positively of fibulin-5 expression by IHC was correlated with non-aggressive features such as lower tumor (T) stage ( $P<0.001$ ), lower TNM stage ( $P<0.001$ ), negative lymph nodal status ( $P<0.001$ ). The unfavorable cumulative 5-year overall survival rate significantly correlated with lower expression of fibulin-5 ( $P<0.001$ ) with Kaplan-Meier analysis. Fibulin-5 had the abilities to decrease cell migration and invasion in NPC cells, such as TW02, TW04 and Hone1. Furthermore, fibulin-5 can inactivate p-AKT, which was known to play a role in cell migration and invasion. On the contrary, fibulin-5-mediated siRNAs not only enhanced NPC cell motility, but also up-regulated p-AKT expression in NPC cells.

**Conclusion(s):** These results suggest that fibulin-5 might play a role of metastasis suppressor in NPC patients and cell lines.

**Keywords:** Fibulin-5, Nasopharyngeal Carcinoma (NPC), Migration

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[T2-28]

## Apelin /APJ Signaling Stimulates Cell Migration through Mitogen-Activated Protein Kinase in Oral Squamous Cell Carcinoma

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**Objective:** Apelin/APJ signaling is novel angiogenic factor in physiologic and tumor angiogenesis. But there was no information about the role of apelin/APJ signaling in oral cancer. Therefore, we studied the expression and possible role of apelin/APJ signaling in oral cancer cells and tissues.

**Method(s):** We confirmed the expression level of apelin and APJ by quantitative real-time PCR, immunohistochemistry and western blot analysis in oral cancer cell lines and tissues. To establish the role of apelin in cell migration in oral cancer cell lines, migration assays were performed using transwell chamber.

**Result(s):** Very weak apelin staining was observed in the supra basal layer of normal oral squamous cell epithelium. In oral cancer tissues, apelin /APJ immunoreactivity was localized in carcinoma cells at various intensities. Accordingly, we examined the effects of apelin on migration in oral cancer cell line (HSC3). Apelin could promote in vitro migration in HSC3. Furthermore, apelin induced activation of ERK1/2. In addition, cell migration could be partially blocked by PD98059, a specific inhibitor of mitogen-activated protein kinase kinase.

**Conclusion(s):** These results suggest that apelin may play an important role in invasion and metastasis of oral squamous cell carcinoma.

**Keywords:** Apelin, APJ, Oral Squamous Cell Carcinoma

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[T2-29]

## Assessment of the Role of Mcl-1 Splice Variants in the Pathogenesis and Treatment of Oral Cancers

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**Objective:** Expression of Bcl-2 family proteins in tumors can modulate apoptosis, influencing tumor behavior and treatment. Mcl-1, an anti-apoptotic member of Bcl-2 family has been reported as a chemo-resistance factor in several cancers. The present study aimed to investigate the role of Mcl-1 splice variants in oral cancer pathogenesis and radiation response.

**Method(s):** Time course expression of the Mcl-1 isoforms was assessed post-radiation treatment by RT-PCR & Western Blotting and apoptosis by FACS analysis in the oral cell lines (FBM, AW8507 & AW13516) of differing radio sensitivities. Further using quantitative real time PCR, the expression of Mcl-1 splice variants was quantitated and compared in 52 oral tumors from different subsites.

**Result(s):** An inverse correlation was observed between Mcl-1L expression and apoptosis induction in AW8507 cell line post-radiation treatment supporting its pro-survival role. A rapid and short induction of Mcl-1L versus a sustained induction of Mcl-1S was observed in the relatively more radiosensitive FBM versus AW8507 respectively. PCR analysis revealed predominant expression of anti-apoptotic Mcl-1L over the pro-apoptotic Mcl-1S in the oral cancer cell lines and tumors. A 0.5-6.5 fold increase in Mcl-1L transcript was observed in buccal mucosa and tongue tumors while alveolar tumors exhibited 0.2-2.0 fold increase.

**Conclusion(s):** The over expression of anti-apoptotic Mcl-1L isoform in >95% of oral tumors and tongue cancer cell lines suggests an important pro-survival role for Mcl-1L in oral cancer pathogenesis and in protecting cells from radiation-induced apoptosis. The sustained expression of Mcl-1L protein in the more radio-resistant cell line indicates a possible role for Mcl-1L in radio-resistance and as a potential therapeutic target in oral cancers.

**Keywords:** Mcl-1, Apoptosis

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[T2-31]

## Prognostic Significance of Vitamin D Receptor Polymorphisms in Head and Neck Squamous Cell Carcinoma

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**Objective:** Many studies demonstrate associations between UVB rays and a lower risk of developing various cancers, implying that UVB rays induce vitamin D synthesis, which suppresses growth and induces differentiation/apoptosis of cancer. In patients with non-small-cell lung cancer, vitamin D receptor (VDR) polymorphisms and haplotypes are reported to be associated with survival. We hypothesized that a similar association would be observed in other type of cancers. In this study, we focused on head and neck squamous-cell carcinoma (HNSCC).

**Method(s):** DNA was extracted from the frozen tumor and the VDR polymorphisms (Cdx2, FokI and BsmI) in 97 patients with HNSCC were genotyped by sequencing. Disease-free survival was compared between VDR polymorphisms using Kaplan-Meier survival with log-rank tests and using the Cox proportional hazard model adjusted for age, gender, primary tumor site, and postoperative stages. Adjusted hazard ratios (AHR) and 95% confidence intervals (95% CI) were determined.

**Result(s):** Tumor recurrence occurred in 41/97 (42%) patients during a median follow-up of 603 days. Genotype frequencies of the VDR polymorphisms were as follows: FokI: C/C, 39 (40%); C/T, 48 (50%); TT, 10 (10%); for Cdx2: G/G, 16 (17%); G/A, 41 (42%); A/A, 40 (41%) Bsm I: A/A, 5 (5.2%); A/G, 16 (16.5%); and G/G, 76 (78.3%). The FokI T/T genotype was associated with poor prognosis: median survival for T/T was 265 days compared with 959 days for C/C or C/T (log-rank:  $P=0.015$ ; AHR, 2.65; 95% CI, 1.18 to 5.96;  $P=0.018$ ). In contrast, Cdx2 and BsmI showed no significant association with survival. The G-T (Cdx2-FokI) haplotype was associated with worse disease-free survival compared with other haplotypes: median disease-free survival for G-T was 238 days compared with 959 days for other haplotypes (log-rank:  $P=0.0008$ ; AHR, 6.67; 95% CI, 2.23 to 20.0;  $P=0.001$ ).

**Conclusion(s):** These results suggest that VDR polymorphisms and haplotypes may be associated with prognosis of patients with HNSCC.

**Keywords:** Vitamin D Receptor (VDR), Polymorphisms and Haplotypes, Head and Neck Squamous-Cell Carcinoma

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[T2-30]

## Expression of Embryonic Lethal Abnormal Vision (ELAV)-like Protein HuR associated with Peroxisome Proliferator-Activated Receptors Gamma in Oral Squamous Cell Carcinoma

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**Objective:** HuR is a member of the family of ELAV (embryonic lethal abnormal vision)-like proteins that stabilize several cellular mRNAs by binding to AU-rich elements (AREs) in the 3' untranslated region (3' UTR) of the mRNA. Peroxisome proliferator-activated receptor gamma (PPAR-gamma) involved in physiological adipocyte differentiation and differentially expressed in a variety of tumor types, has AREs in the 3'UTR of the mRNA. The aim of this study was to investigate the correlation between HuR and PPAR-gamma in oral squamous cell carcinomas (OSCCs).

**Method(s):** The expression patterns for HuR and PPAR-gamma were assessed via immunohistochemical analysis of 102 OSCC samples and immunoblotting of OSCC cell lines treated with HuR small interfering RNA (siRNA) and Leptomycin B (LMB).

**Result(s):** Nuclear HuR expression was observed in 95 (93.1%) of 102 tumors and cytoplasmic HuR expression was seen in 71(69.6%) of 102 tumors. Cytoplasmic PPAR-gamma expression was seen in 92 (90.2%) of 102 and nuclear PPAR-gamma expression was observed in 58 (56.9%) of 102 tumors. The expression of cytoplasmic HuR was significantly associated with nuclear PPAR-gamma expression ( $P<0.004$ ). Cytoplasmic expression of HuR showed a correlation with lymph node metastasis ( $P<0.050$ ) and nuclear PPAR-gamma expression showed a correlation with grade ( $P=0.026$ ), T stage ( $P=0.006$ ), and clinical stage ( $P<0.012$ ). In multivariate analysis, cytoplasmic HuR expression and nuclear PPAR-gamma expression were identified as independent prognostic parameters for reduced overall survival. The inhibition of HuR expression by siRNA or LMB caused a reduction in the inducibility of COX-2 in oral cancer cells.

**Conclusion(s):** Our results indicate that the cytoplasmic expression of HuR is associated with nuclear PPAR-gamma expression in OSCCs. Moreover, a correlation between nuclear PPAR-gamma expression and cytoplasmic HuR expression through direct mRNA stabilization can be suggested.

**Acknowledgement:** This study was supported by the Korea Research Foundation Grant funded by the Korean Government (MOEHRD), Basic research promotion fund (KRF-2009-0094030).

**Keywords:** HuR, PPAR-Gamma, Oral Squamous Cell Carcinoma

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[T2-32]

## Enhancer of Zeste Homolog 2 Expression is Correlated with p53 and Ki-67 in Head and Neck Cancer Using Tissue Microarray

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**Objective:** Polycomb group proteins are transcriptional repressors that silence specific sets of genes through chromatin modification. The enhancer of zeste homolog 2 (EZH2), considered a member of the polycomb group proteins, is overexpressed in aggressive forms of several malignancies. However, the role of EZH2 expression in head and neck cancer has not yet been fully determined. This study was conducted to investigate the clinical significance of EZH2 expression in head and neck cancer and its correlation with Ki-67 and p53 expression.

**Method(s):** Expression of EZH2, Ki-67, and p53 was determined by immunohistochemical staining of tissue microarrays from specimens of 132 cases of head and neck squamous cell carcinoma.

**Result(s):** High EZH2 expression was observed in 57.6% and 45.5% were positive for p53. The percentage of Ki-67 staining was significantly greater in the EZH2 positive group than in the EZH2 negative group ( $P<0.001$ ). EZH2 expression was significantly correlated with p53 expression ( $P=0.003$ ). However, we found no significant differences in other clinicopathological parameters such as age, sex, primary tumor size, and lymph node metastasis and survival between the EZH2 positive and negative groups.

**Conclusion(s):** These results suggest that high EZH2 expression might be involved in tumor cell proliferation and cell cycle regulation of squamous cell carcinoma of head and neck cancer.

**Keywords:** EZH2, p53, Head and Neck Cancer

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[T2-33]

## Antitumor Effects of Inhibitors of Nitric Oxide Synthase or Cyclooxygenase-2 on Human KB Carcinoma Cells Overexpressing COX-2

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**Objective:** Inducible nitric oxide synthase (iNOS) and cyclooxygenase (COX)-2 are major inflammatory mediators. Nitric oxide (NO) produced by iNOS has been shown to have an important role in carcinogenesis. Recent studies have suggested that COX-2 expression also contributes to carcinogenesis, as well as tumor growth, invasion, and metastasis. We investigated possible relations between COX-2 and NO with the use of a human epidermoid carcinoma cell line, designated KB, in which overexpression of COX-2 protein was induced by gene transfer. We also assessed the effect of using NOS inhibitor as an antitumor drug.

**Method(s):** We isolated a COX-2 transfected clone (KB/COX-2) and used a neomycin-transfected clone (KB/neo) as control. NG-nitro-L-arginine-methyl ester (L-NAME) was used as an NOS inhibitor, dihydrochloride (1400W) as an iNOS inhibitor, and celecoxib as a selective COX-2 inhibitor. Cell growth was assayed by MTT, and PGE2 production from the cells were assayed by ELISA. After cells were inoculated subcutaneously into the flanks of nude mice, the mice were treated with inhibitors. COX-2, iNOS, and eNOS were detected by western blot and immunohistochemical examination.

**Result(s):** All agents inhibited the cell growth to similar extents in dose-dependent manners. PGE2 production and COX-2 expression in KB/COX-2 were inhibited not only by celecoxib, but also by L-NAME and 1400W. The decreases in PGE2 production and COX-2 expression were most prominent with celecoxib and L-NAME. In vivo, L-NAME and celecoxib significantly inhibited the proliferation of xenografted tumors. Immunohistochemically, KB/COX-2 xenografted tumors expressed COX-2, iNOS, and eNOS. Such expression was suppressed by treatment with L-NAME and celecoxib.

**Conclusion(s):** These results suggest that L-NAME and celecoxib significantly inhibit the proliferation of murine squamous cell carcinoma in vivo. L-NAME as well as celecoxib might thus be useful for the design and development of new antitumor drugs.

**Keywords:** Cancer, NOS, COX-2

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[T2-35]

## The Relationship between HPV Status and p16, p53, EGFR Expression in Squamous Cell Carcinoma of Tonsil

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**Objective:** HPV infection has been known to be one of the risk factors for carcinogenesis of head and neck squamous cell carcinoma (HNSCC), especially tonsil cancer. The goal of our study was to investigate the relationship between HPV status and p16, p53, EGFR expression and to evaluate the prognostic impact of these markers in tonsil cancer.

**Method(s):** Eligibility criteria included the patients who were diagnosed as SCC of tonsil and received curative radical resection with available tumor tissue samples. In situ hybridization for HPV and immunohistochemistry for p16, EGFR, and p53 were performed.

**Result(s):** Among 66 tonsil cancer patients, 24 (36.3%) patients showed HPV positivity. There were no statistically significant differences in clinical characteristics including sex, age, smoking history, TNM stage and treatment modalities between HPV-positive and -negative patients. The over-expression and high intensity of p16 had significant correlation with HPV positivity ( $P=0.003$ , 0.017). However, no correlation was found between p53 and HPV infection. There was a trend that the proportion of EGFR over-expression was greater in HPV-negative than in HPV-positive patients ( $P=0.082$ ), and no or low EGFR intensity was observed in the patients showing p16 over-expression ( $P=0.015$ ). Among the HPV-positive patients, the frequency of EGFR over-expression was significantly higher in ex- or current smokers ( $P=0.005$ ). There was meaningful difference of three years disease-free survival between never smokers showing both over-expression of p16 and low expression of EGFR and the others (90.0% and 73.5%, respectively,  $P=0.082$ ). On univariate analysis, the significant clinicopathologic factors affecting disease-free survival were smoking history and EGFR intensity ( $P=0.020$  and 0.017, respectively).

**Conclusion(s):** Taken together, p16 was a good surrogate marker for HPV infection. The expression of EGFR was inversely correlated with HPV positivity. In the HPV-positive tonsil cancers, high p16 and low EGFR expression should be considered as favorable prognostic markers.

**Keywords:** HPV, Tonsil Cancer, EGFR

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[T2-34]

## Therapeutic Effect of TERT Promoter Inserted- E1B Gene Attenuated Replicating Adenoviruses (Ad-TERT-D19) on Head and Neck Squamous Cell Carcinoma

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**Objective:** For the specific tumoral replication of oncolytic adenovirus, we invented the human telomerase reverse transcriptase (TERT) promoter. TERT promoter is highly active in most tumor and immortal cell lines but inactive in normal somatic cell types. The purpose of this study is to investigate the possibility of enhanced oncolytic and replication effect of these engineered replication-competent adenoviruses on head and neck cancer model.

**Method(s):** Five human head and neck squamous cell carcinoma (HNSCC) cell lines were utilized in this study. Cells were infected with E1B19 deleted adenovirus (Ad-D19), or E1B19 deleted adenovirus with TERT promoter (Ad-TERT-D19) vectors at a multiplicity of infection (MOI) of 1 to 10. Cytotoxicity assay was performed for 5 days. For in vivo experiments, athymic nude mice were randomly divided into 4 groups and one of the following preparations was treated: group I (control): PBS injection, group II (control): wild adenovirus injection (1×108 pfu), group III: Ad-D19 (1×108 pfu) injection, group IV: Ad-TERT-D19 (1×108 pfu) injection

**Result(s):** All HNSCC cell lines tested demonstrated an increased susceptibility to the Ad-TERT-D19 as compared with control or Ad-D19. Clonogenic assays showed that average increase in cytotoxic potentials were 21.5% as compared to the control group. Also, Ad-TERT-D19 replicated more efficiently than wild-type adenovirus. The direct injection of Ad-TERT-D19 suppressed xenografted tumor growth significantly as compared with control or Ad-D19 modality. (Day 21 Tumor volume, control: 223mm<sup>3</sup>, Ad-D19: 124mm<sup>3</sup>, Ad-TERT-D19: 47mm<sup>3</sup>, ANOVA and Tukey multiple comparison test,  $P<0.05$ ).

**Conclusion(s):** Ad-TERT-D19 showed a better and efficient antitumor effect than wild or Ad-D19 in head and neck cancer. It suggests that insertion of TERT promoter function to adenovirus may potentiate the tumor specificity and oncolytic activity in head and neck cancer.

**Keywords:** Squamous Cell Carcinoma, Adenovirus, Gene Therapy

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[T2-36]

## Human Papillomavirus Prevalence in Oral Squamous Cell Carcinoma of Brazilian Young Patients

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**Objective:** High risk human papilloma virus (HR-HPV) infections might play an important role in etiology of oral squamous cell carcinoma (OSCC) in young group. The HPV E7 oncoprotein inactivates the Rb protein that increases p16INK4 expression. Objectives: to investigate a possible relationship between OSCC from young patients, HR-HPV DNA infection and p16 expression.

**Method(s):** Paraffin-embedded tumors block from 47 OSCC of young patients were evaluated. The presence of HPV DNA infection in tumor specimens was analyzed by polymerase chain reaction (PCR) using GP5+/GP6+ specific primers (L1 region) and by dot blot hybridization for HPV genotyping. In addition, the presence of HPV16 was confirmed by PCR HPV 16 E7 specific primers. These cases were compared with 72 oral SCC from patients older than 50 years (controls). Demographic and clinical data were collected to analyze patient outcomes. The p16INK4 expression was evaluated by tissue microarray technique and immunohistochemical reaction.

**Result(s):** HPV 6 and 11 were not detected in any sample. The HPV was detected in 22 (19.2%) cases; being 15 (68.2%) in young and 7 (31.8%) in control patients; the difference was statistically significant ( $P=0.01$ ). HPV16 was the prevalent type. One (1.7%) specimen of young was detected coinfection with HPV16 and 18. Nuclear p16 expression was observed in 6 cases (13.6%) of the young and in 11 (19.6%) of the control group ( $P=0.42$ ). The p16 expression was not correlated with HR-HPV presence from these tumors.

**Conclusion(s):** The HR-HPV DNA was more frequent in young than in control and the HPV infection might contribute to oral SCC in young.

**Keywords:** Human Papilloma Virus, Young, Oral Cancer

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[T2-37]

## Human Papillomavirus in Oral and Oropharyngeal Squamous Cell Carcinoma: A Risk Factor for Disease – and for Recurrence after Treatment?

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**Objective:** To investigate the prevalence of high- and low-risk HPVs (human papillomavirus) in a consecutive series of oral and oropharyngeal squamous cell carcinoma (OOSCC) matched with population-based, healthy controls.

**Method(s):** 131 patients with OOSCC, samples were taken from tumour surface and from tonsillar fossa by cotton tipped swabs and investigated with exfoliated cells collected through a mouthwash. From 320 matched controls, tonsillar fossa and mouthwash specimens were identically collected. All samples were tested for HPV DNA by nested PCR, positive findings HPV type-determined by DNA sequencing.

**Result(s):** High-risk HPV was a strong risk factor for OOSCC (OR=63; 95% CI 14-480). Forty-seven (36%) cancer patients had one or more specimens positive for a high-risk HPV (81% HPV 16), while three (0.94%) controls were high-risk HPV positive. Seven (5.3%) cancer patients and 13 (4.1%) controls were positive for one low-risk mucosal, muco-cutaneous, or cutaneous HPV type. In total, 128 patients had planned curative treatment. After median follow-up time of 22 months (range 0–36 months), 30 patients experienced recurrence, 2 had an SPT, 12 were lost to follow-up, and there were 21 DICD (death from intercurrent disease). High-risk HPV-positive cases had an almost threefold increased relative rate (RR) of recurrence/SPT, but a lower RR of DICD compared to high-risk HPV-negative cases. There was no increased RR of recurrence/SPT related to smoking, but there was an association between smoking and DICD.

**Conclusion(s):** These results demonstrate a strong association between infection with high-risk HPV types and OOSCC, suggesting that they have a key role in the carcinogenesis. The estimated proportion of OOSCC cases attributable to high-risk HPV infections was 35%. High-risk HPV-positive cases had an almost threefold increased RR of recurrence/SPT. However, since DICD, is a competing risk, the RR for high-risk HPV-negative cases might be underestimated due to DICD.

**Keywords:** HPV, Oropharyngeal Cancer, Oral Cancer

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[T2-39]

## Results of Laryngeal Preservation Surgery to Treat Hypopharyngeal Cancer

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**Objective:** Results of laryngeal preservation surgery to treat hypopharyngeal cancer.

**Method(s):** Endoscopic membrane resection (EMR) was the first choice of treatment if deemed possible for superficial tumors without neck lymph node metastases. Patients provided informed choice to surgery or radiotherapy when EMR was not deemed possible or tumors were invasive. However, we generally recommended surgery for tumors that had metastasized to the lymph nodes of the neck. The larynx was surgically preserved as much as possible. However, when tumors had deeply invaded the post cricoid region, concurrent chemoradiotherapy was selected for patients who hoped to preserve the larynx because surgery can't maintain swallowing functions. We reviewed the postoperative records of the patients after laryngeal preservation surgery for HPC performed between July 2007 and August 2009, and investigated the duration from operation to full oral intake, as well as the prognosis and quality of life (QOL).

**Result(s):** Twenty patients underwent laryngeal preservation surgery, 24 patients received radiotherapy and 20 patients had surgery with total laryngectomy during this period. Among the 20 patients who had laryngeal preservation surgery, nine had EMR (T1N0, n=7; T2N0, n=2). The mean duration from surgery to full oral intake was two days. Eleven had undergone laryngeal preservation surgery by the open method. Among them, primary closure was applied to five patients (T1N0, n=4; T2N0, n=1) and a free flap was grafted in six (T2N0, n=3; T2N+, n=3). The flap donor site was the radial forearm in four patients and the jejunum in two. The mean duration from surgery to full oral intake was 6.5 days. Despite the short follow-up period, all of the patients remained free of disease and had a good QOL.

**Conclusion(s):** Laryngeal preservation surgery was not lengthy and resulted in excellent outcomes with a satisfactory QOL.

**Keywords:** Hypopharyngeal Cancer, Laryngeal Preservation Surgery, Quality of Life

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[T2-38]

## Wide Vertical Hemilaryngopharyngectomy (WVHLP) for Locally Advanced Pharyngolaryngeal Cancer and Its Classification

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**Objective:** WVHLP is a surgical procedure for the resection of laterally extended pharyngolaryngeal tumors which needs to sacrifice the whole larynx. We have evaluated the surgical technique and reconstructive method according to the extent of pharyngolaryngeal cancer and established the classification.

**Method(s):** Through the retrospective review of the records of 25 consecutive patients who underwent WVHPL in selected pharyngolaryngeal cancer, we evaluated the oncologic and functional results. Mean follow up periods are 33.6months. we made the classification of this procedure into three types according to the extent of defect and reconstruction method for proper reconstruction: a WVHPL (Type I) – resect hemilaryngopharynx lateral to the conus elasticus , a WVHPL (Type II), WVHPL (Type III) – resect cricoid (IIIa) or contralateral supraglottis (IIIb).

**Result(s):** There were no perioperative mortalities and there was a 100% free flap survival rate. According to our guidelines, 6 cases were in type I, 8 cases type II, 6 cases type IIIa and 5 cases were type IIIb. There was no invasion of tumor at resection margin by postoperative pathologic examination. After ablative surgery, there were one (4.0%) patient who had local recurrences. Two (8.0%) patients developed glottic stenosis associated with the procedures. Sufficient oral dieting was achieved as a mean postoperative period of 34.5 days (16-91 days) without aspiration after proper swallowing training. Tracheotomy weaning was achieved at a mean postoperative period of 44.2 days (13-271 days). Except 3 cases, most of them regained speech and swallowing function within a month. Ten patients with more than N2 stage had postoperative adjuvant therapy without functional complication.

**Conclusion(s):** WVHPL provides a wider resection with promising functional result for laryngopharyngeal cancer. The classification of WVHPL which we proposed according to the extent of the pharyngolaryngeal cancer can offer the guidelines for the better functional reconstruction.

**Keyword:** Wide Vertical Hemilaryngopharyngectomy

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[T2-40]

## Combined Video-Endoscope Resection Laryngeal Cancer

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**Objective:** To improve the treatment results of patients with locally advanced cancer of the larynx with the use of modern surgical techniques.

**Method(s):** Since 2006 in the department of microsurgery Herzen Moscow R&D oncological institute performed video-endoscope endolaryngeal resection with radiofrequency ablation using video-endoscope complex and apparatus ablation in the amount fronto-lateral resection with preservation of the thyroid cartilage, after the imposition of tracheostomy.

**Result(s):** The surgical procedures performed in 14 patients with laryngeal cancer stage T1-3N0M0 in terms of self-surgery or combined treatment with preoperative or postoperative radiotherapy. Detubation patients performed at 2-3 days after surgery. Since 2006 monitoring study of patients not seen a continuation of growth, or recurrence of the tumor of the larynx.

**Conclusion(s):** The method allows you to save the skeletal, respiratory, voice function of the larynx, reduce the likelihood of postoperative bleeding, stenosis, strictures, prevent lymphogenous and hematogenous dissemination of tumor cells, reduce the healing time.

**Keywords:** Larynx, Cancer, Video-Endoscope

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[T2-41]

## Stomal Recurrence after Total Laryngectomy: A 10-Year Review in Universiti Kebangsaan Malaysia Medical Center (UKMMC)

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**Objective:** To determine the incidence of stomal recurrence in patients following total laryngectomy in our center and to compare the incidence of previously reported risk factors such as pre-operative tracheostomy, subglottic invasion and the level of lymph node metastases, from other center.

**Method(s):** A ten year retrospective review from January 1998 until December 2007. Clinical records of patient with carcinoma of the larynx who presented to UKMMC Otorhinolaryngology and Oncology clinics were reviewed. All patients that underwent total laryngectomy were included in this review.

**Result(s):** 18 all male patients underwent total laryngectomy for carcinoma of the larynx between January 1998 and December 2007. Stomal recurrence developed in only 1 out of these patients. 13 patients were of Chinese descent, 3 were Malay and 2 were Indian. The youngest patient was 49 years old and the eldest was 79 years old with mean age of 63 years. 12 patients had tracheostomy done prior to the total laryngectomy. Median duration from tracheostomy to definitive surgery was 28.5 days. Mean duration of follow up was 3.9 years.

**Conclusion(s):** The duration from tracheostomy and total laryngectomy was significantly longer than what is accomplished in the developed countries but the incidence of stomal recurrence was still comparable to the rest of the world. The incidence of other previously reported risk factors namely subglottic invasion and lymph nodes metastases was comparably low.

**Keywords:** Carcinoma of Larynx, Stomal Recurrence, Total Laryngectomy

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[T2-43]

## A Clinical Consideration on Therapeutic Modality-Related Outcomes in Early Glottic Cancer and Supraglottic Cancer

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**Objective:** The author et al. comparatively analyzed the curative results of patients with early glottic cancer and supraglottic cancer according to therapeutic modalities, as well as comparatively analyzed the curative results of patients with early glottic cancer according to pathologic confirmations.

**Method(s):** All the cases were distinguished as to T stage and affected sites, and primary therapeutic modalities were distinguished as to radiotherapy and surgery. Patients with glottic cancer were assigned to two groups; 1. cordectomy was performed after frozen pathologic confirmation. 2. bronchoscopic biopsy was performed. The two groups were compared with in 5-year survival rate.

**Result(s):** Out of 156 patients with glottic cancer, 134 (85.89%) were classified as T1 or T2 stage. From the standpoint of 5-year survival rate, 63 patients (92.65%) who underwent only radiotherapy and 61 patients (92.42%) who underwent only surgery were completely recovered. Out of 102 patients with supraglottic cancer, 52 (50.98%) were classified as T1 stage and T2 stage. From the standpoint of 5-year survival rate, 9 patients (75.0%) with who underwent only radiotherapy and 37 patients (92.50%) who underwent only surgery were completely recovered. In 38 patients with early glottic cancer who underwent radiotherapies or surgeries after cordectomy, 5-year survival rate reached 97.37% (37/38). But in 88 patients who underwent treatments after being confirmed through bronchoscopic biopsy, 5-year survival rate reached 87.5% (77/88).

**Conclusion(s):** In patients with early glottic cancer, the primary therapeutic modalities showed similar outcomes. But in patients with early supraglottic cancer, the surgery showed better results in 5-year survival rate. And the group, to which cordectomy was performed at the first pathologic confirmation, showed better results. To conclude, it may be advisable to perform laryngomicrosurgery in the early diagnosis of glottic cancer because macroscopic lesion may be completely removed and survival rate may be heightened.

**Keywords:** Laryngeal Cancer, Glottis, Supraglottis

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[T2-42]

## The Role of Partial Laryngectomy for Recurrence after Primary Radiotherapy

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**Objective:** The aim of this retrospective study was to compare the postoperative outcomes, complications and survival in suprarecroid partial laryngectomy (SCPL) and vertical partial laryngectomy (VPL) for recurrence after primary radiotherapy of laryngeal cancer.

**Method(s):** Thirty-five patients who underwent partial laryngectomy (SCPL 15, VPL 20) at the Department of Head and Neck Surgery of Aichi Cancer Center from 1998 to 2008 were reviewed. All patients were irradiated.

**Result(s):** The cannula could not be removed from two patients. The median time before decannulation was 42.0 days (SCPL) and 48.5 days (VPL). There was no significant difference between the two groups. No patients had feeding tube dependence when they were discharged home. Median time first oral feeding (SCPL 38.0 days, VPL 19.5 days) was significantly shorter in the VPL group. Six patients (40.0%) in the SCPL group had wound infection and three of them needed an operation for the complication (one patient underwent total laryngectomy). Fistula was observed in 12 patients (60.0%) in the VPL group and five of them needed operation. The functional preservation rate was 87% (SCPL) and 95% (VPL), respectively. Five-year survival was 89% (SCPL) and 95% (VPL). Local tumor control was obtained in 93% of group SCPL and 100% of group VPL.

**Conclusion(s):** SCPL and VPL are valuable techniques for patients who received irradiation because it presents good laryngeal function without altering long-term survival. But there must be more care for complications.

**Keywords:** SCPL, VPL, Laryngeal Cancer

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[T2-44]

## Clinical Analysis of Squamous Cell Carcinoma of Anterior Wall of Oropharynx Treated by Surgery

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**Objective:** To evaluate disease control, survival and functional outcome after surgery for squamous cell carcinoma (SCC) of the anterior wall of the oropharynx,

**Method(s):** We conducted a retrospective study of patients with SCC of anterior wall of oropharynx treated by surgery as the initial therapy at the National Cancer Center East Hospital over a period of 15 years, from 1994 to 2008.

**Result(s):** Sixty-one patients (52 males, 9 females) were included. The mean age was 60.9 years. The clinical stages were Stage II in 9 cases (14.6%), Stage III in 15 cases (24.6%), and Stage IV in 37 cases (60.7%). The overall 5-year survival rate was 50.3% and the cause-specific 5-year survival rate was 56.0%. Twenty four cases (39.3%) died of the cancer studied (T: 6 cases, N: 6 cases, M: 12 cases), 4 cases (6.6%) died of other cancers, and 1 case died of other diseases. The cause-specific five-year survival rates of patients at Stage II, III, IV were 87.5%, 77.8%, and 35.5%, respectively. The surgical approaches after resection were primary closure in 29 cases (47.5%), defect restoration with cervical flap in 13 cases, and free graft transplantation in 19 cases (31.1%). The transplanted grafts were the rectus abdominis myocutaneous flap in 10 cases, the anterolateral thigh flap in 5 cases, and the jejunum in 4 cases. Laryngeal function was preserved in 35 cases. In the other 26 cases, 13 underwent total laryngectomy simultaneously or later, 13 required gastrostomy and/or tracheostomy owing to decreased swallowing function.

**Conclusion(s):** The results suggest that surgery can provide good survival and functional outcome in certain patients. However, patients in the advanced stage, Stage IV, the survival and functional outcome were significantly poor compared with those in Stage II / III.

**Keywords:** Anterior Wall of Oropharynx, Base of Tongue, Surgery

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[T2-45]

## Laser Resection of the Oropharynx-Alternative to Chemo-Radiation

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**Objective:** The pendulum of management of oropharyngeal squamous carcinoma in the last decade has swung from primary surgery towards combined radiation and chemotherapy. A viable alternative to this treatment especially for small primary tumors combines the organ sparing modality of transoral laser microsurgery and selective neck dissection in the N0 neck and modified radical neck dissection in the N positive neck.

**Method(s):** At the University of California Davis Dept. Of Otolaryngology we have been using this treatment algorithm since 1998 for most T1, T2 and selected T3 carcinomas of the oral cavity and oropharynx. Since that time 130 patients have been treated thus; 53 patients had tumors of the oropharynx of which 4 had tumor in both the oropharynx and oral cavity.

**Result(s):** The majority of patients (44) had either T1 or T2 lesions. Nodal involvement was seen in 10 patients. Laser excision combined with selective neck dissection was used in the majority of patients. Radiation therapy was reserved for patients with multiple adenopathy or extracapsular spread of tumor. Survival rates, complications and days in hospital will be reported.

**Conclusion(s):** Primary laser resection will be seen to be an excellent treatment option in limited lesions of the oropharynx sparing the patients the inevitable unfavorable side effects of chemotherapy and radiation as well as the prolonged period of treatment that this combination requires.

**Keywords:** Laser Resection, Oropharynx, Cancer

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[T2-46]

## Paramedian Mandibulotomy for Squamous Cell Carcinoma of Oral Tongue with Supraomohyoid Neck Dissection/MRND-I

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**Objective:** The study is being done to evaluate the Paramedian Mandibulotomy for the exposure and easy approach, as it provides to the entirety of the primary tumor for its consequent excision and its added ability to remove the primary tumor and the neck disease in monoblock fashion.

**Method(s):** 174 patients of Oral Tongue Cancer were admitted at SMS Hospital, Jaipur from January- 2007 to January-2010. They were clinically examined and investigated as per routine. CT/MRI were done and patients were biopsied. 51 patients were subjected to Surgery with/without adjuvant Radiotherapy. Per Oral Excision of primary with supraomohyoid neck dissection/ MRND-I was done on 39 pts. 12 pts(stage III & IV, posteriorly located) were subjected to Paramedian Mandibulotomy with SOND/MRND-I. The free margin of the primary tumor was recorded. Periodically clinical examination and follow up was done for 3 years to 6 months.

**Result(s):** All 12 pts with Paramedian Mandibulotomy were disease free/healthy till date. 39 pts with per oral excision had varied results: Primary Recurrence -3 pts, Regional Recurrence -6 pts, Lost to follow up - 9 pts, submental sinus(temporary osteoradionecrosis) - 1 pts and 20 pts are disease free till date. No patient had any non-union/delayed-union with paramedian mandibulotomy.

**Conclusion(s):** Paramedian Mandibulotomy is a most suitable and appropriate approach to Stage III and Stage IV Oral tongue cancer especially the posteriorly located lesions. It provides an excellent exposure and has few/no complications.

**Keywords:** SOND-Supraomohyoid Neck Dissection, Pts-Patients, MRND-I Modified Radical Neck Dissection

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[T2-47]

## Differential Diagnosis of Adenoid Cystic Carcinoma and Pleomorphic Adenoma Using of MAGE A

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**Objective:** Despite the fact that of the salivary gland tumors, pleomorphic adenoma and adenoid cystic carcinoma are starkly different from one another, showing clinically huge differences, their histological diagnoses are extremely similar, which has resulted in many cases in which we must go through great difficulties in diagnosing them, even by means of entirely harvesting a tumor, not to mention biopsy and partial excision. As a result, many researchers have proposed valuable markers to discriminately diagnose these tumors, but these have not been practical. To address this problem, I attempted to determine the efficacy of MAGE as a diagnostic method by applying it in the discriminative diagnosis of PA and ACC.

**Method(s):** Immunohistochemical stain was conducted for examples of paraffin-embedded tissue specimen 48 diagnosed as PA (n=31) and ACC (n=17), using MAGE A and MAGE-A4. In addition, real time RT-PCR was conducted for examples of PA and ACC, fresh frozen tissues, to analyze out the MAGE gene, through which I tried to prove the validity of immunohistochemical stain.

**Result(s):** In 84% of the immunohistochemical stain of MAGE A and PA there was no revelation, but there was revelation in 100% of ACC. In 97% of the immunohistochemical stain of MAGE-A4 and PA there was no revelation, but there was revelation in 100% of ACC. Revelation of MAGE gene didn't take place in PA in Real time RT-PCR, but MAGE-A3 and -A4 were meaningfully revealed in ACC.

**Conclusion(s):** Accordingly, this research proposes that the immunohistochemical stain using MAGE could be a useful diagnostic instrument in diagnosing PA and ACC.

**Keywords:** MAGE A, Adenoid Cystic Carcinoma, Pleomorphic Adenoma

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[T2-48]

## Management of Cervical Lymph Node Metastasis in Tonsillar Squamous Cell Carcinoma: Is It Necessary to Treat Contralateral cN0 Neck?

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**Objective:** To investigate the proper management of cervical lymph node metastasis in tonsillar squamous cell carcinoma (SCC) patients.

**Method(s):** The medical records of forty-nine patients who were treated with tonsillar SCC were evaluated retrospectively. Preoperative and postoperative stages, clinical factors affecting the nodal metastasis, and its relationship with survival were examined.

**Result(s):** Among 49 ipsilateral neck dissection (ND) specimens, 34 necks (69%) showed pN+. Out of 17 cases which underwent ipsilateral elective ND, 4 cases (24%) turned out to have pN+ neck. The disease-specific survival of 34 patients with pN+ and 4 patients with occult metastasis was worse than that of each remaining ones with pN0 ( $P=0.049$  and  $P=0.023$  respectively). Even though whether contralateral nodal metastasis was present did not affect the survival, all cases (100%) which underwent contralateral therapeutic ND showed pN+. Two (less than 10%) out of 21 cases which underwent contralateral elective ND turned out to have pN+ neck and did not show any difference in survival compared to remaining cases with pN0 neck. Except for the histologic grade, any significant clinical factors which were related with nodal metastasis were not found. The histologic grade was identified as a factor to affect the contralateral nodal metastasis.

**Conclusion(s):** For the neck treatment of tonsillar SCC patients, ipsilateral neck has to be thoroughly treated because of high probability of nodal metastasis and close relationship between lymph node metastasis and survival. Contralateral neck also has to be treated for cN+ cases, but we cautiously suggest the possibility to preserve the contralateral cN0 neck. However, caution is advised when preserving contralateral cN0 neck in cases of poorly differentiated primary tumors and ipsilateral cN+ neck.

**Keywords:** Tonsillar Cancer, Lymph Node Metastasis, Contralateral Neck

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[T2-49]

## The Lower Cheek Flap Combined with Neurosurgical Approach for Infratemporal Fossa Tumour. UKMMC Experience

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**Objective:** To describe our experience in using the lower cheek flap originally reported by Balm et al for the access to the infratemporal fossa in combination with the neurosurgical approach.

**Method(s):** Two rare tumours involving the infratemporal fossa and the middle cranial fossa is excised with this approach. The first tumour is an extensive clival chordoma extended to temporal fossa, infratemporal fossa and maxilla. The second case is extracranial meningioma at the temporal fossa with extension into infratemporal fossa. In both cases, the tumour was excised using combined approach where the infratemporal fossa was accessed via lower cheek flap while the intracranial portion was resected from above via craniotomy. Details of both approach is described.

**Result(s):** In the first case, clival chordoma, the portion of tumour in the temporal and infratemporal fossa was excised completely. However, the intracranial portion was too extensive for complete removal. This patient has third, fourth, fifth and seventh cranial nerves palsy before surgery. In the second case, the tumour in temporal and infratemporal fossa was removed completely via this approach. Post operatively, no cranial nerve palsy. Both patient has only minor complaint of trismus after the operation.

**Conclusion(s):** The lower cheek flap in combination with the neurosurgical approach allows optimal exposure to tumours with extension in both regions. This method allows single skin incision by extending the lower cheek flap incision with the craniotomy incision for better aesthetic outcome.

**Keywords:** Lower Cheek Flap, Infratemporal Fossa

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[T2-51]

## Wound Complications after Surgery for Laryngeal and Hypopharyngeal Cancers

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**Objective:** To identify incidence and the risk factors for the development of major wound complications in patients with after the radical operation for laryngeal and hypopharyngeal cancers.

**Method(s):** The medical records of 107 laryngeal and hypopharyngeal cancer patients requiring laryngectomy or pharyngo-laryngectomy were reviewed. Primary surgery was indicated for 71 patients. The salvage surgery after radiation (13 cases) or chemoradiation (23 cases) was undergone for 36 patients. The incidence of the wound complication and the correlation of the complication and clinicopathological factors were investigated by univariate and multivariate analysis.

**Result(s):** Overall incidence of post-operative complication was 33.6%. The complication incidence was 35.2% for primary surgery group, 21.7% for radiation group, and 46.2% for chemoradiation group, respectively. Bleeding from a large vessel occurred in 4 patients. Systemic complication (diabetes mellitus) and bilateral paratracheal nodded dissection were significantly correlated with the postoperative complications. They both were independent risk factors by multivariate analysis. Salvage surgery after chemoradiation was significantly correlated with lethal hemorrhage from large vessels.

**Conclusion(s):** Preoperative chemoradiation was not a significant risk factor of wound complication. However, once wound complications occurred after salvage surgery, they tended to yield lethal outcome. Salvage surgery after chemoradiation failure should be indicated in consideration of possibilities of severe complications such as lethal hemorrhage.

**Keywords:** Chemoradiotherapy, Complication, Multivariate Analysis

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[T2-50]

## The Present of Endoscopic Surgery

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**Objective:** We studied cancer of pharynx in Shizuoka Cancer Center Hospital with endoscopic surgeries. The object is endoscopic pharynx surgery at our institution, 35 patients, 44 tumors(SCC). 40 tumors Cancer of hypopharynx, 4 tumors oropharyngeal cancer.

**Method(s):** We conducted a retrospective study. In general anesthesia, we remove tumor with endoscope assist.

**Result(s):** Half of these tumors are found with digestive canal endoscopic test. We were difficult to confirm tumor by fiberoptic endoscopic evaluation. Multiple cancer at the same time was found, 21 cases were cancer of the esophagus, 18 cases were head and neck cancer, 2 cases were stomach cancer. Multiple cancer at another time was found, 13 cases were cancer of the esophagus, 6 cases were head and neck cancer. We needed tracheostomy 7 cases. Average of take food is for 4.2days, 16.6days were demanded out of hospital. The plural surgery, 3 times administered 2 cases, twice was 5 cases.

**Conclusion(s):** Use digestive canal endoscope for diagnosis and treatment is useful for head and neck cancer.

**Keywords:** Cancers of Pharynx, Endoscopic Surgery

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POSTERS

[T2-52]

## The Prognosis of Skull Base Malignancies with Dural, Brain and Cavernous Sinus Invasion

**Paul Donald\***

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**Objective:** Patients with upper aerodigestive tract malignancies that extend into the intracranial cavity when invading dura brain, and especially the cavernous sinus, were for many years considered to be incurable. The dura mater offers a stout barrier to the spread of cancer to the underlying cerebral tissue. Because of the pushing nature of these cancers, most of which are of epithelial origin, they can in most cases of dural invasion be completely encompassed by taking a margin of surrounding healthy uninvolvled tissue. However, some of the more aggressive lesions will eventually spread to the underlying brain, which has less resistance than dura to further progression. Despite this, the tumors are more compact, and less invasive than traditional brain tumors. As they progress they are generally preceded by a layer of necrosis and edema. A satisfactory margin of resection can be achieved as long as the brain substance removed is an area of "non-elusive" brain. Attempts at surgical excision of head and neck malignancies that extend to the cavernous sinus remain controversial. Treatments by any other method such as various combinations of radiotherapy and chemotherapy almost uniformly fail. Because of its remote location in the geographical center of the head and its rich vascularity as well as its intimate relationship to the internal carotid artery the cavernous sinus is extremely difficult to operate upon. In our experience of resecting over 162 head and neck tumors with intracranial extension of which 140 were malignant, we have had 118 patients with skull base cancers who could be followed for 2 years and 88 for 5 years. Dural invasion was seen in 89 patients and intracranial spreads without dural involvements in 65. The 2-year survival with dural invasion was 41.6% and without was 50.0%.

**Keywords:** Skull Base Tumors, Dural and Brain Invasion, Cavernous Sinus Invasion

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[T2-53]

## Clinico-Pathological Study of Mucoepidermoid Carcinoma of Salivary Gland

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**Objective:** To determine the clinico-pathological features of mucoepidermoid carcinoma (MEC) of the salivary gland with respect to treatment outcomes.

**Method(s):** A retrospective review of all patients treated for MEC of salivary gland between 1995 and 2009 in a tertiary referral hospital.

**Result(s):** 27 patients (18 males, 9 females, mean age 57 years) were diagnosed with MEC during the study period. 18 patients had major (3 submandibular and 15 parotid) and 9 had minor (7 palate, 1 retromolar trigone and 1 ethmoid sinus) salivary gland disease. 15 patients had fine-needle aspiration cytology, of which 9 were true positive, 4 were false negative and 2 were inconclusive. 19 patients presented with T1 (48%) and T2 (22%) disease. 8 patients were staged as T3 (4%) and T4 (26%). 3 patients (11%) had cervical lymph node metastasis and none had distant metastasis. The mean follow up period was 50 months (range from 7 to 156 months). All the patients had surgery as primary treatment and 21 patients (78%) had post-operative adjuvant radiotherapy. 2 patients had local and 2 patients had regional recurrence. All the 4 recurrence (14.8%) were in patients with major salivary gland disease (2 parotid and 2 submandibular). Among them, 2 patients had positive and 1 had close tumour resection margin. 2 (7.4%) patients died of recurrent MEC and both had stage T4 and one of them had N1 disease at presentation. The 10 years disease specific survival rate is 95.5% (C.I.: 0.55 to 1.36).

**Conclusion(s):** T stage at presentation and tumour resection margin are important predictors for loco-regional recurrence and survival. MEC has a low preponderance for cervical lymph node metastasis. The treatment is primary surgery with a good tumour resection margin and therapeutic neck dissection. The additional clinical benefit of post-operative adjuvant radiotherapy is uncertain in achieving loco-regional disease control.

**Keywords:** Mucoepidermoid Carcinoma, Salivary Gland, Clinicopathologic Correlation

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[T2-55]

## Clinical Outcome and Prognostic Factors in Adenoid Cystic Carcinoma of the Head and Neck

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**Objective:** Adenoid cystic carcinoma (ACC) is a relatively uncommon salivary gland malignancy that accounts for approximately 10% of all salivary gland cancers. ACC has been characterized as an indolent tumor, but late onset of metastases to the lung is frequent. Therefore 5-year survival rates are relatively high, but 10- to 20-year survival rates are low. The aim of this study is to investigate the impact of various clinicopathological parameters on disease-specific and disease-free survival.

**Method(s):** We retrospectively reviewed the records of the patients with ACC of the head and neck who had undergone treatment in our institution between 1985 and 2007. Survival analyses were performed with the Kaplan-Meier method and log-rank test. Multivariate analysis of prognostic factors was performed using the Cox regression model.

**Result(s):** Forty patients (20 males and 20 females with a median age of 54.5 years) received curative treatment. The 5- and 10-year disease-specific survival was 83.8% and 73.7%, respectively, whereas the 5- and 10-year disease-free survival was 62.7% and 52.1%, respectively. By univariate analysis, higher T-stage ( $P=0.001$ ) and positive surgical margin ( $P=0.006$ ) were shown as statistically significant prognostic factors associated to disease-free survival. Multivariate analysis demonstrated that only higher T-stage ( $P=0.047$ ) was significant factor associated to disease-free survival.

**Conclusion(s):** T-classification and surgical margins were predictive of local recurrence and distant metastasis, respectively. In cases with higher T-stage and/or positive surgical margin we should consider adjuvant radiotherapy after surgical resection of tumor. Moreover, to prevent distant metastasis, effective systemic therapies are required. Therefore, much more research is necessary to identify new regimens of chemotherapy treatment for distant metastasis of ACC.

**Keywords:** Adenoid Cystic Carcinoma, Prognosis, Head and Neck

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[T2-54]

## The Treatment Results for Acinic Cell Carcinoma (ACC) of Minor Salivary Glands (MSG)

**Oxana Saprina\***

*Head and Neck, N.N.Blokhin Cancer Research Center, Russian Federation*

**Objective:** O.A. Saprina, M.A. Kropotov, T.T. Kondratyeva, V.L. Lyubayev, V.Z. Dobrokhotova, A.S. Taneeva

Moscow, N.N.Blokhin Cancer Research Center, Head and Neck Department

The treatment results for Acinic cell carcinoma (ACC) of minor salivary glands (MSG).

**Objective:** To evaluate the efficiency of surgical and combined treatment for ACC MSG.

**Method(s):** During 1969 to 2008 we observed 6 patients with ACC MSG, 5 patients were followed up for 10 years and 1 patient for a year. In three cases tumor were located on mucous membrane of the cheek and others on the hard palate, tongue and lips. The tumor size was less than 2,0 cm–4 patients, more than 2,0 cm–2 patients. Regional lymph nodes were noted in two cases. According to the method of treatment patients were divided into two groups. Surgical treatment (I group)-4 patients, combined treatment (II group) with preoperative radiotherapy-2 patients.

**Result(s):** During 10 years, all patients are alive. Recurrences were observed at one patient in I and one patient in II groups. The tumor size and method of treatment did not affect the relapse-free survival.

**Conclusion(s):** The ACC MSG is highly differentiated malignant tumor of the salivary glands with a slow flow. There are no statistically significant differences in relapse-free survival in Groups I and II. The main treatment approach for ACC MSG is surgical treatment.

**Keywords:** Acinic Cell Carcinoma, Minor Salivary Glands

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[T2-56]

## Fine Needle Aspiration Biopsy of Parotid Lesions: Comparison with Specimen Histological Analysis

**Alfredo Rios, Roberto Araoz, Edgardo Franciosi, Juan Jose Larranaga, Eduardo Mazzaro, Marcelo Figari\***

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**Objective:** To determine the overall accuracy, sensitivity, specificity, positive predictive value (PPV) and negative predictive value(NPV) of fine needle aspiration biopsy (FNAB) of parotid tumors compared to definitive specimen anatomopathological analysis results.

**Method(s):** Retrospective review of clinical database records. 112 parotid resections performed during the period between January 2004 and May 2009 were assessed. 84 patients that had been preoperatively studied with FNAB were included in this study.

**Result(s):** The histopathological specimen exam diagnosed 73 benign tumors and 11 malignant tumors of the parotid gland. FNAB was considered in 12 cases (14.3%) as non-diagnostic: the final histopathology revealed that 6 of them were benign lesions, whereas the rest were malignant ones. Out of the remaining 72 samples where malignant tumors were sorted, there were 67 true negatives, 4 true positives, 1 false negative and no false positive cases. Overall accuracy, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) found were 98%, 80%, 100%, 100% and 98%, respectively, in terms of malignant parotid tumor detection.

**Conclusion(s):** FNAB is a valuable preoperative diagnostic evaluation for parotid lesions, since recognizing malignant tumors prior to surgery optimizes treatment planning and patient warning of possible sequelae. It is worth highlighting that half of non diagnostic FNAB samples were reported malignant in the final pathology.

**Keywords:** Parotid Gland Neoplasms, Fine Needle Aspiration Biopsy

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[T2-57]

## Primary Squamous Cell Carcinoma in the Sublingual Grand; A Case Report

**Eiji Hirai<sup>1\*</sup>, Kozo Yamamoto<sup>1</sup>, Hirotoshi Yonemasu<sup>2</sup>, Hideo Kurokawa<sup>1</sup>**

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<sup>2</sup>Pathology, Oita Red Cross Hospital, Japan

**Objective:** Primary squamous cell carcinoma (PSCC) on the salivary gland is extremely rare. 80% of PSCC arise in the parotid gland and 20% in the submandibular gland. PSCC of the sublingual gland is quite unusual.

**Method(s):** We present a case of PSCC in the sublingual gland. The case is a 76-year-old Japanese man who present with painful mass in the left oral floor. The mass was 25 m×10 mm, and elastic hard, and oral mucosa of floor of the mouth was normal.

**Result(s):** An incisional biopsy was performed and was reported primary squamous cell carcinoma histopathologically. We did clinical exclusion of metastasis from primary disease elsewhere. The patient underwent local resection with the sublingual gland.

**Conclusion(s):** The patient remains good health and free of disease after operation.

**Keywords:** PSCC, Sublingual Grand

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[T2-58]

## The Rare Form of the Melanoma of Oral Cavity: Diagnostic and Treatment

**Igor Reshetov\*, Matorin O.V., Arutyunyan L.S, A.V. Koritskiy**

*Head and Neck, P.A. Hertzen Moscow Cancer Research Institute, Russian Federation*

**Objective:** Melanoma of the head and neck skin according to 22 – 46 %. Very rarely diagnosed the melanoma of oral cavity mucous. It is known, that in spite of the same histogenesis the tumors of different organs have a number of characteristics because of the topographo-anatomical localization. The aim of our investigation was establishment of oral cavity pigment tumor management.

**Method(s):** From 2000 to 2009 in our hospital entered 13 patients with melanoma of oral cavity (aged from 27 to 64 years). The sites of melanoma localized on upper lip mucous-1, hard palate mucous-7, alveolar process of lower jaw-4, bottom lip mucous - 1. To evaluate the tumor spread the modern methods of patients examination were used, included CT, PET, MRI and fluorescence detection. It was not the dates of tumor generalization.

**Result(s):** In all the cases the tumor was removed within the limits of healthy tissues with plastic surgery: in 1 case microsurgery, in 1 case was used pedicle flap, in 2 cases- for plastic were used local tissues. In postoperative period all the patients were treated using immunochemotherapy, in 1 case combined with photodynamic therapy.

**Conclusion(s):** In all the cases histological detected the infiltrative growth of the tumor into the adjacent bone, vessels and nerves. The follow-up period is from 6 years to 2 months. During the 1-st year of follow-up it was no recurrence of the tumor. In 3 years we diagnosed the recurrences and made repeated operation, it was no neck lymph node metastases. Melanoma of oral cavity mucous is a rare morphological form. The main strategy of management is surgical treatment. Necessity of lymphadenectomy is need to be discussed.

**Keywords:** Diagnosed the Melanoma of Oral Cavity m, Oral Cavity Pigment Tumor Management, Mmuonochemotherapy

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[T2-59]

## Radiofrequency Ablation in the Combined Treatment of Cancer of Tongue

**Igor Reshetov\*, V.I. Chissov, O.V. Matorin, A.V. Koritskiy**

*Head and Neck, P.A. Hertzen Moscow Cancer Research Institute, Russian Federation*

**Objective:** We have available the experience of the treatment of 30 patients with the localization of the tumor process in the region of tongue.

**Method(s):** The primary histology of tumor was evaluated taking into account data of ultrasonic inspection, CT and biopsy. On histogenesis of tumor process all - plancellular cancer, from them 20 man and 10 women. On the age classes the patients were distributed as follows from 28 to 78 years. Depending on the prevalence of the tumor process of interference they were carried out in 10 cases under the overall endotracheal anesthesia, into 20 under the local infiltration anesthesia with the involution. The period of observation in this group is from 3 to 36 months.

**Result(s):** During supervision at 2 patients the continued growth of a tumor with distribution on muscles a mouth floor (that is caused initially by great volume of a tumor) is noted. At other patients the period without relapse of a tumor of supervision has made from 2 till 24 months.

**Conclusion(s):** The obtained first positive clinical results of the combined treatment of patients with the malignant tumors of tongue the use of a radio-wave complex "Metatom-2" testify about the prospect of method. The wide spectrum of the possibilities of instrument, the variety of electrodes make it possible to use it with different sizes and localizations of tumor process both in the independent version and in the combination with the standard procedures of beam and chemotherapy. As a whole an improvement in the results of treating the sick localizations indicated must be examined in the plane of integral approach and the procedure of radio-frequency thermo-ablation can become one of the important contemporary it is sectional in the therapeutic chain.

**Keywords:** Malignant Tumors of Tongue, Metatom-2, Radio-Frequency Thermo-Ablation

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[T2-60]

## Adenoid Cystic Carcinoma of the External Auditory Canal

**Junn-Liang Chang<sup>1\*</sup>, Chih-Hung Wang<sup>2</sup>**

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<sup>2</sup>Department of Otolaryngology-Head and Neck Surgery, Tri-Service General Hospital / National Defense Medical Center, Taiwan

**Objective:** Adenoid cystic carcinoma occurring in the external auditory canal (EAC) is very rare. One case is being reported.

**Method(s):** A 78-year-old man who presented with a 5 months history of right-sided intermittent otalgia and ear fullness. Case reports and literatures review concerning the management of EAC adenoid cystic carcinoma tumor are presented.

**Result(s):** An en bloc lateral temporal bone resection, total parotidectomy and selective neck dissection (level I–III) were performed. The defect left over the lateral temporal region was reconstructed by rotation sternocleidomastoid (SCM) muscle and temporalis muscle flap with excellent aesthetic and structural support results. Patient then received the adjuvant radiotherapy. The postoperative course was uneventful after 1 year follow-up.

**Conclusion(s):** Malignant tumors of the external auditory canal are rare and most are squamous cell carcinoma in histopathology. Adenoid cystic carcinoma (ACC) is a specific variant of adenocarcinoma of the salivary and mucous glands. ACC arising in the EAC is exceedingly rare and appear to arise from the ceruminous glands, sweat glands or ectopic salivary gland tissue. Contrasting with the low (8%) metastatic potential of cutaneous adenoid cystic carcinomas of other locations, adenoid cystic carcinoma of the EAC present a 30% metastatic risk, similar to those or adenoid cystic carcinoma of salivary glands. Therefore, an initial aggressive wide "en bloc" surgical resection is mandatory.

**Keywords:** Adenoid Cystic Carcinoma, External Auditory Canal, Histopathology

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[T2-61]

## Schwannoma in Head and Neck: Preoperative Imaging Study and Intracapsular Enucleation for Functional Nerve Preservation

**Hong-shik Choi\***

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Gangnam Severance Hospital, Korea

**Objective:** In treating schwannoma patients, it is critical to determine the origin of the tumor to preserve the nerve function. We evaluated the validity of preoperative imaging studies in distinguishing the neurological origin of the schwannomas of the head and neck, and the efficacy of intracapsular enucleation in preserving the nerve function.

**Method(s):** In 7 cases of schwannomas in the head and neck region, we predicted whether the tumor originated from the vagus nerve or the cervical sympathetic chain through imaging studies including CT and MRI. All patients were performed intracapsular enucleation, and the function of the vagus nerve and the sympathetic nerve was evaluated preoperatively and postoperatively.

**Result(s):** Preoperative imaging studies showed 6 cases where the tumor located between the carotid artery and the internal jugular vein, and 1 case where the tumor located posteriorly displacing the carotid artery and the internal jugular vein anteriorly. At the time of operation, we confirmed schwannoma originating from the vagus nerve on the first 6 cases, and schwannoma originating from the sympathetic nervous system on the last 1 case. All patients went through successful intracapsular enucleation, and of the seven schwannoma cases, 6 patients maintained normal postoperative neurological function (85.7%).

**Conclusion(s):** Preoperative imaging studies offer valuable information regarding the location and origination of the tumor, and intracapsular enucleation helped us to preserve the nerve function.

**Keywords:** Schwannoma, Vagus Nerve, Sympathetic Nerve, Nerve Function, Intracapsular Enucleation

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[T2-63]

## Juvenile Nasopharyngeal Carcinoma under 30 Years of Ages: Retrospective Study from the Biology to Treatment

**Marlinda Adham<sup>1\*</sup>, Lisnawati<sup>2</sup>, Soehartati Gondhowiardjo<sup>3</sup>,  
Djumhana Atmokusumah<sup>4</sup>, I. Bing Tan<sup>5</sup>, Jaap. Middeldorp<sup>6</sup>**

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<sup>3</sup>Radiation Oncology Department, Medicine University of Indonesia Jakarta, Indonesia

<sup>4</sup>Medical Oncology Department, Medicine University of Indonesia Jakarta, Indonesia

<sup>5</sup>Head and Neck Surgery Department Antonie van Leeuwenhoek, Netherland Cancer Institute, Indonesia <sup>6</sup>Pathology Department, Vrije Universiteit Medisch Centrum, Indonesia

**Objective:** This prospective study was designed to evaluate the level of local EBV-DNA in NP brushings, plasma/serum EBV IgA VCA P18/EBNA1 at diagnosis for patients under 30 years of ages. The differences of EBV-LMP1 expression in NPC between patients below and above 30 years of age.

**Method(s):** One hundreds two patients (8.3% from total 1,121) under 30 years of ages diagnosed with nasopharyngeal carcinoma in ENT Department Faculty Of Medicine University of Indonesia between 1996-2005. With Male and Female distribution was 55 (4.9%): 47 (2%). From Those patients we evaluated (52) patients with DNA viral load from Nasopharyngeal brushing and Serology IgA VCA P18/EBNA1 at diagnosis. The differences of EBV-LMP1 expression in NPC between patients <30 years (n=24) and >30 years of age (n=24), matched for sex and tumor TNM-stage.

**Result(s):** There were (31) males and (21) females at diagnosis. At the time of diagnosis around 75% of patients were at advanced stage (stages III and IV) and 46 of 52 patients (88.5%) had WHO type III according UICC 2002. At diagnosis log DNA viral load of Nasopharyngeal brushing with mean 5.7811 (SD: 1,4821; 95% CI: 5,3358-6,2264), the average of mean of Serology IgA VCA P18 : 3,7515 (SD: 5,3511 ; 95% CI: 1,3790- 6,1240) and EBNA 1: 2,9837 (SD: 4,6716; 95% CI: 0,9124-5,055). LMP1 expression was found in 75% cases with a staining intensity score range between 0,2 to 11,7.

**Conclusion(s):** Nasopharyngeal carcinoma in children is a rare chemosensitive tumor. The intensity score of EBV-LMP1 expressions in this study is somewhat lower than others, possibly relating to race, health and immunity status, and method and material used. Higher LMP1 expression in patients<30 years was associated with more loco-regional progressivity at young age.

**Keywords:** Juvenile Nasopharyngeal Carcinoma, Biological Marker

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[T2-62]

## Giant Neurilemmoma of the Vagal Nerve

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<sup>2</sup>Department of Otorhinolaryngology-Head & Neck Surgery,  
Universiti Kebangsaan Malaysia Medical Centre, Malaysia

<sup>3</sup>Ear, Nose & Throat-Head & Neck Consultant Clinic,  
KPJ Seremban Specialist Hospital, Malaysia

**Objective:** Schwannomas, also known as neurilemmomas, are benign encapsulated neoplasms of nerve sheath origin arising from perineurial Schwann cells and occur along any somatic or sympathetic nerve. About 25 % of the cases occur in the head and neck region.

**Method(s):** A 50-year old male presented with history of progressive huge left neck swelling for 5 years. It was not associated with pain and any compression symptom. Examination revealed left neck swelling extending from angle of the jaw to the supraclavicular region. The mass was non-tender, soft to firm in consistency, and non-pulsatile. Intraorally there was fullness of the left tonsillar fossa. Other examinations were unremarkable.

**Result(s):** Computed tomography (CT) scan and Magnetic resonance imaging (MRI) of the neck showed a well defined oval shaped solid mass seen in the left carotid space measuring 6.3×4.1 (axial)×11.5 cm (height) splaying the left carotid artery and the left jugular vein. The left common carotid artery was displaced medially. He underwent an excision of the mass under general anesthesia. Intraoperatively, the vagal nerve was thinned out and splayed over the mass. The nerve was sacrificed as it was thinned out and adherent to the tumour mass without a clear plane for dissection. Post-operatively she developed hoarseness with left vocal palsy in paramedian position. Histopathological examination and immunohistochemical staining studies revealed vagal schwannoma.

**Conclusion(s):** Diagnosis is suggested by history and physical examination as well as CT scanning with intravenous contrast. Surgery is the treatment of choice for this invariably benign lesions.

**Keywords:** Neurilemmoma, Schwannoma, Vagal Nerve

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[T2-64]

## A Ten Year of Clinicopathological Survey of Odontogenic Cyst and Tumors, and Tumor Like Lesions of the Jaw in Government Dental College, Trivandrum, Kerala, India

**Satheesh kumar Poolakkad sankaran<sup>1\*</sup>, Anita Balan<sup>2</sup>,  
Beena V T<sup>3</sup>, Minu P Mohan<sup>4</sup>**

<sup>1</sup>Oral Medicine and Radiology, Govt.Dental College, India

<sup>2</sup>Oral Medicine and Radiology, Trivandrum, India

<sup>3</sup>Oral Pathology, Kerala, India; <sup>4</sup>Prosthodontics, Govt.Dental College, India

**Objective:** To Evaluate and compare the Relative Frequency, Distribution, Sites of presentations, Radiologic variation and Histological variations of Odontogenic cyst and tumors and tumor like lesions in cases reported to Government Dental college, Trivandrum from the year 2000-2009.

**Method(s):** A retrospective analysis was done on 3,222 Biopsy cases reported to Oral Medicine and Radiology Department, Government dental college, Trivandrum dating from January 2000 to May 2009 and the Biopsy records were evaluated from the Department of Oral medicine and from the department of oral Pathology and Microbiology.

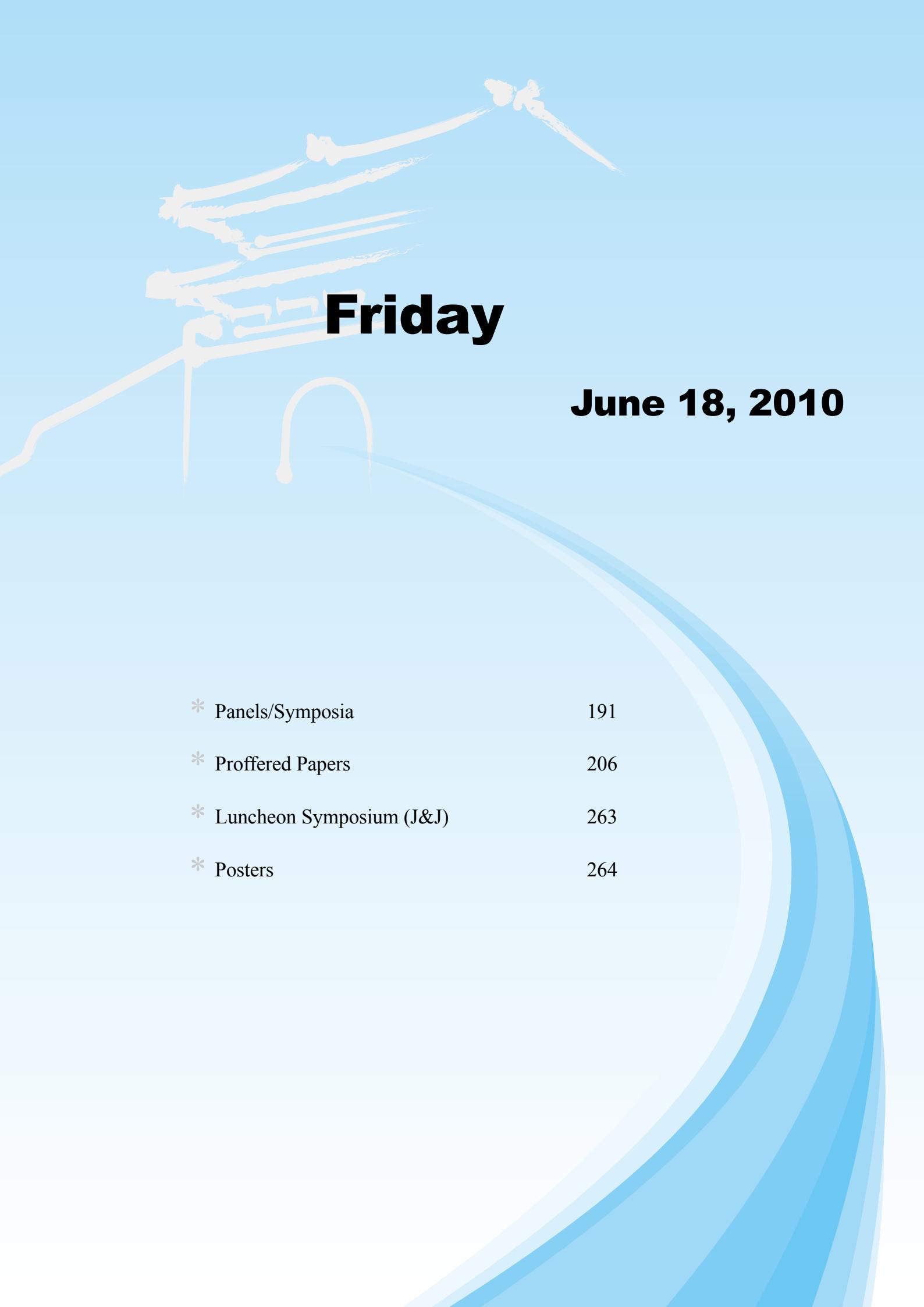
**Result(s):** Out of 3,222 biopsy cases reported to Oral Medicine and Radiology Department, Government dental college, Trivandrum, 1,082 cases were diagnosed as odontogenic cysts and tumors and tumor like lesions of the jaw. Out of 1082 case, higher frequency were the, cyst of inflammatory origin (periapical and radicular cyst) n=589,54.4%, Ameloblastoma (n=141, 13.03%), Dentigerous cyst (n=98, 9.05%), keratinizing Odontogenic tumor (n=74,6%), Fibrous dysplasia (n=25, 2%) N=25, females=19 (75%), males=6 (24%), Dentigerous cyst showing ameloblastoma transformation (n=24, 2%)Eruption cyst (n=55,5%), osteoma (n=22, 2%),Central ossifying fibroma (n=20, 1.8%) N=20, females=13 (65%), males=7 (35%), odontome (n=16, 1.4%), Adenomatoid odontogenic tumor (n=6, 0.5%), Central giant cell granuloma (n=9, 0.8%), central odontogenic fibroma (n=6, 0.5%), cementoblastoma (n=8, 0.8%), Pindborgs tumor (n=5,0.4%), Benign fibrous histiocytoma (n=3, 0.2%), and other rarities which accounted for only less than 0.2%were juvenile ossifying fibroma, Ameloblastic fibrodontoma, chondrosarcoma, central odontogenic myxoma, Plasma cell myeloma.

**Conclusion(s):** The relative frequencies and sites of presentation of odontogenic cysts tumors and tumor like lesions of jaw in different geographic backgrounds are essential for the early diagnosis and management of these potentially destructive benign lesions.

**Keywords:** Odontogenic Cyst and Tumors, Odontogenic Tumor Like Lesions, Relative Frequency of Jaw Lesions

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# **Friday**

**June 18, 2010**

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## P13. Salivary Gland Cancer

**Chair : Eugene Myers (USA)**

**Moderator : Khee-chee Soo (Singapore)**

08:00 - 09:30 CBR I + II

[P13-01]

### Avoidance and Management of Complications in Parotid Cancer Surgery

**Robert Witt\***

*Surgery/Otolaryngology, Christiana Care/  
Thomas Jefferson University, USA*

Avoidance and Management of Complications in Parotid Cancer Surgery

Pediatric Solid Neoplasms

3% of salivary neoplasms occur in children.

Most involve the parotid gland.

A solid mass is more likely to be malignant in a child.

Ultrasound can help in FNA of a lesion with cystic and solid features and surveillance of the neck.

To date, no prospective, randomized, controlled clinical study has demonstrated the efficacy of continuous intraoperative facial nerve monitoring during parotid gland surgery with respect to morbidity of the facial nerve.

Consider expert pathology opinion outside your institution because of the vast array of pathologic subtypes.

20.8% less likely to have undergone malpractice litigation for inadvertent nerve injury if they used the monitor in their current practice.

Best Surgical Practices can include Facial Nerve Monitoring.

Tympano-Mastoid Suture and Digastric in Cadaver and Live Parotidectomy. Tympano-Mastoid Suture 2mm Post Belly Digastric M. 13 mm.

Focal Capsule Exposure is near universal regardless of extent of procedure.

We perform a partial enucleation even with a total parotidectomy.

Superficial parotidectomy with a wide cuff of gland generally provides an adequate excision.

Total parotidectomy is not indicated for all malignant parotid gland neoplasms unless the tumor arises within the deep lobe or there is direct extension from the superficial to deep lobe.

Preservation of the posterior branches of the GAN does not assure freedom from sensory alterations in all cases. A significant number of patients (54%) did not have sensory deficit after preservation of posterior branches of the GAN, without significantly prolonging operative time or increasing recurrence or morbidity.

Sialocele will resolve with or without aspiration in 4-6 week.

If the facial nerve functions pre-operatively attempt should be made to preserve it.

Gross tumor invasion of the facial, hypoglossal or lingual nerves precludes preservation. First Bite Syndrome-With oral intake, parasympathetic neurotransmitters are released and cross-stimulation of sympathetic receptors cause a supramaximal response of the myoepithelial cells.

**Keywords:** Complications, Parotid, Surgery

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[P13-02]

### Multidisciplinary Team Approach to the Management of Malignant Parotid Neoplasms

**David Eisele\***

*Department of Otolaryngology-Head and Neck Surgery,  
University of California, San Francisco, USA*

Malignant parotid neoplasms are a diverse group of uncommon tumors. These neoplasms demonstrate varied clinical behavior and their management is complex. Optimal treatment outcomes and follow-up are best achieved with multidisciplinary team of specialists with expertise in the management of these tumors. A thorough preoperative assessment is important. Surgical resection is mainstay of treatment with complete surgical resection as the goal. Adjuvant postoperative radiation therapy is recommended for select tumors. Salvage surgery may be feasible for tumor recurrence. Future directions include a better understanding of tumor biology, improved extent of disease detection, better chemotherapeutic agents, and novel targeted therapies.

**Keywords:** Parotid, Cancer, Management

**Contact Information** David Eisele (deisele@ohns.ucsf.edu)

[P13-03]

## Management of Submandibular Salivary Gland Tumors

**Randal Weber**

*Head and Neck Surgery, University of Texas MD Anderson Cancer Center, USA*

Tumors arising in the submandibular gland have a 50% chance for being malignant. The common clinical presentation for submandibular salivary gland tumors is a painless mass. Pain is infrequent but is a symptom concerning for malignancy. Other signs of malignant behavior include cranial nerve neuropathy including, anesthesia of the tongue or weakness of the tongue with atrophy. Commonest histologies are pleomorphic adenoma, adenoid cystic carcinoma and mucoepidermoid carcinoma. Because submandibular sialadenitis is common and neoplasia involving the gland is rare, errors in diagnosis are common. When a tumor is suspected imaging with CT or MRI should be obtained along with fine needle aspiration biopsy before surgery is undertaken. The minimal surgery for patients with a neoplasm is a block dissection of Levels IA and IB. If the lingual or hypoglossal nerves are encased by the tumor they should be resected until clear margins are obtained. Extended surgery due to local infiltration may require mandibulectomy, resection of the digastric and mylohyoid muscles. The extent of regional lymphadenectomy is guided by the presence of clinically positive lymph nodes.

Radiation therapy should always be considered as an adjunct treatment for salivary gland tumors. Indications for radiation include extraglandular spread, high-grade histology, advanced T stage, perineural invasion, positive margins, and lymphnode metastasis. While survival for patients with salivary gland cancers is initially favorable, patients with high-grade mucoepidermoid carcinoma and salivary duct cancer usually developed distant metastasis within 24-36 months following treatment.

In summary, management of salivary gland tumors requires a thorough understanding of their histologic diversity, their patterns of spread, facility with surgery involving the cranial nerves. A comprehensive treatment plan includes management of the primary tumor, regional lymphatics at risk, and reconstruction, as indicated. Radiation therapy as an adjunct to surgery is an important modality for improving local regional control.

**Keywords:** Submandibular Gland, Neoplasms, Surgery

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[P13-04]

## Management of the Neck in Major Salivary Gland Carcinoma

**Peter Zbaeren**

*ENT, Head and Neck Surgery, University Hospital, Switzerland*

The presence of neck metastasis in salivary gland carcinomas implies a worse prognosis. Positive nodes decreased mean survival by more than 50%.

There is considerable controversy regarding the management of clinically negative necks.

At initial presentation, the rate of clinically detectable neck lymph node metastasis is from 13% to 28%. However, the average frequency of regional metastasis varies considerably according to the histological types. Even T1 and T2 carcinomas as well as low grade carcinomas can present with lymph node metastasis but unequivocally at a lower rate than advanced and high grade carcinomas.

The following factors lead to a high prediction of occult metastasis: histology, grade, tumor stage, presence of facial paralysis, age, extra parotid extension and perilymphatic invasion. The rate of occult metastasis in cNO salivary gland carcinomas treated by elective neck dissection is reported between 12% and 45%. Occult metastases were not only detected in neck dissection specimens of advanced and high grade carcinomas, but, at a lower rate, also in T1/T2 carcinomas and low grade carcinomas.

Neck recurrences were observed in 8–15%, in most cases in high grade carcinomas with initially untreated necks. Most recurrences tended to occur within the first 3 years.

There is no controversy over the need to perform a radical or modified radical neck dissection for the N+ neck. In selected cases, a selective neck dissection may be appropriate.

There is a controversy on the current management of clinically negative neck nodes in patients with parotid carcinomas. The possible management of the NO neck in parotid carcinomas includes observation, elective neck dissection and elective irradiation.

Most authors suggested performing an elective neck dissection on the basis of the characteristics of the primary salivary gland carcinoma, such as histologic tumor type, grade, tumor size, facial nerve infiltration and lymphangiosis. In relatively many cases, several of these characteristics are not known at time of surgery. Therefore a few authors advocate in the recent literature, a routine elective neck dissection in all parotid carcinomas.

**Keywords:** Salivary Gland, Neck Metastasis, Neck Treatment

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## P14. Molecular Biology in H&N Cancer

**Chair : Thomas E. Carey (USA)**

**Moderator : Dong moon Shin (USA)**

08:00 - 09:30 CBR III

[P14-01]

### Molecular Based Chemoprevention with Natural Compounds in Head and Neck Cancer

**Dong moon Shin**

*Hematology and Medical Oncology, Emory University, USA*

Previous evidence suggests that a substantial percentage of cancer incidences can be prevented by simple lifestyle modifications such as increased dietary consumption of fruits and vegetables. While many investigators are currently focused on molecular targeting agents including those targeting EGFR, cyclo-oxygenase-2 and others, natural agents have drawn a great deal of attention both from researchers and the general public because of their potential ability to suppress carcinogenesis with minimal side effects. In vitro and animal studies over the past decades have suggested the cancer preventive potential of several natural compounds including those found in green and yellow vegetables, citrus fruits, berries and spices: green tea polyphenols (such as EGCG), curcumin and its analogs, resveratrol, pomegranate, luteolin, genistein, ellagic acid, triterpenes (such as lupeol, betulinic acid, ginsenosides and oleanolic acid), polyunsaturated fatty acid and ginkolide B. The molecular targets for natural agents include the tumor suppressor p53 genes, which are frequently activated during carcinogenesis and play a pivotal role in controlling the cell cycle, apoptosis, genomic integrity and DNA repair in response to various genotoxic stresses. Nuclear factor-kappa B (NF- $\kappa$ B) is a master transcription factor consisting of closely related proteins that generally exist as dimers and bind to a common DNA sequence within the promoters of target genes, the  $\kappa$ B site, to promote transcription of the target genes. Most natural agents, including curcumin, resveratrol, EGCG, lycopene, genistein and luteolin act as inhibitors of NF- $\kappa$ B pathways, other molecular pathways such as those involving STAT proteins, growth factors and their receptors and others. Because of the advances in molecular carcinogenesis of head and neck cancer, the introduction of new technologies for screening and early detection, and the emergence of promising molecularly targeted agents, prevention and therapy are beginning to converge. The future of full convergence of prevention-therapy will open new avenues for natural compounds in reducing the public health burden of major cancers including head and neck cancer. However, more preclinical and biomarker-driven clinical studies are certainly needed to validate the usefulness of these agents either alone or in combination with existing compounds.

**Keywords:** Chemoprevention, Natural Compound, Molecular Targets

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[P14-02]

### Targeted Immunotherapy of Head and Neck Cancer: What Have we Learned and Where Are we Going?

**Robert Ferris**

*Departments of otolaryngology and of Immunology University of Pittsburgh Cancer Institute, USA*

Cancer immunotherapy, including tumor antigen specific vaccines and monoclonal antibodies (mAb) have recently enjoyed a renaissance due to enhanced clinical efficacy in the head and neck cancer (HNC) patients. Therapy with the tumor antigen-specific mAb, cetuximab, is clinically effective for advanced HNC but only in a subset (20-30%) of patients. Indeed the magnitude of the benefit is similar to that observed with standard chemotherapeutic agents, but with substantially lower toxicity. Unfortunately, the mechanism of antitumor activity in those patients who demonstrate clinical responsiveness is poorly understood. These clinical findings have stimulated interest in determining the mechanisms underlying the anti-tumor effects of therapeutic mAbs, in order to explain the differential clinical responses that have been observed, and to optimize the selection of patients to be treated. This presentation will review the recent advances in cancer immunotherapy, focusing on antigens targeted, and agents in clinical trials in HNC, with a focus on novel combination approaches.

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[P14-03]

## Regenerative Potential of Head and Neck Cancer - Signaling Cascades in Tumor Stem Cells

**Barbara Wollenberg**

*ENT/ Head and Neck Surgery University of Lübeck, Germany*

Recent literature clearly opens the understanding that tumor progression in head and neck cancer (HNSCC) is attached to tumor stem cells. In difference to other cancer entities it still remains difficult to clearly identify the most aggressive subpopulations as reliable markers are missing. So far CD44+, CD59+, lin-, CD24-, ALDH1+ could be identified as possible markers, but they remain to be expressed on different cells at different stages not allowing to characterize one single tumor stem cell.

In our experiments we analyzed all entities of stem cell marker carrying cells in HNSCC by flow cytometry. By protein expression analyses the stemness factors in solid HNSCC, HNSCC derived cell lines as well cell lines of metastases of HNSCC were characterized. In longterm culture experiments, the cells were exposed to chemo- or radiotherapy and factors like growth kinetics or expression of stemness factors were correlated to survival of cells.

We found that various stem cell marker expressing cells are present in HNSCC showing that not only tumor stem cells but quite a few other cells attracted to the HNSCC carry the regenerative potential by e.g. building the vessel system and other very relevant structures of HNSCC.

We also found many stemness factors expressed in tumor cell lines and solid HNSCC. The differences of expression can be very well related to the survival under the influence of toxic agents and the regenerative potential of HNSCC.

A better understanding of the tumor biology will lead to a better understanding of how to treat the tumor. Stem cell biology ? not only of cancer stem cells- will help to further understand how we can directly influence the regenerative potential of cancer.

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[P14-04]

## Adaptive Immune Reactivity and Homeostasis in Head and Neck Squamous Carcinoma

**Gregory T. Wolf**

*NCI Head and Neck Cancer Specialized Program of Research Excellence, Department of Otolaryngology University of Michigan Hospitals, USA*

Deficits in cellular immunity (CMI) and demonstrations of an immune response to cancer that correlate with prognosis have been long recognized in patients with head and neck squamous carcinoma (HNSCC). These observations have supported investigations of immune modulation in HNSCC. Unfortunately, prior attempts at non-specific immune stimulation in such patients have failed. It has been assumed that failure of adaptive and innate immune surveillance contributes to carcinogenesis and cancer progression. There is increasing evidence that the immune system and immune recognition of cancer cells reflects a delicate balance between positive and negative effects. In some instances, the immune system can enhance tumor growth and in others, effect tumor regression. Although attempts at immune stimulation in patients have generally failed, some modest successes have been reported in isolated studies. Tumor regressions have occurred after immune modulation using cytokines such as IL2, Interferon alpha, prostaglandin inhibitors, H2 receptor blockers and combinations of unpurified cytokines. Major current research efforts are directed at better characterization of the various homeostatic components involved in an immune response to neoplasia and efforts at restoring or reconstituting elements of the immune response that are identified as incompetent. These deficiencies and enhancements may include immune effects on tumor angiogenesis, migration and retention of tumor infiltrating regulator and effector cells, recognition of tumor antigens by dendritic cells, the microenvironment at metastatic sites and non-specific effects of inflammation on epithelial to mesenchymal transition. This presentation will focus on general measures of immunocompetence and correlations with survival that form the basis for better understanding immune restorative therapeutic strategies. Results of several Phase II trials will be discussed and new findings relative to the favorable prognosis of Human Papillomavirus-16 associated HNSCC will be discussed.

This work was supported in part by: NIH, NCI, P50 CA097248: The Molecular Basis of Head and Neck Cancer Biology, Treatment and Prevention.

**Keywords:** Immunity, Head and Neck Cancer, Immunotherapy

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## P15. Recurrent Larynx Cancer

**Chair : Liang Zhou (China)**

**Moderator : Patrick James Bradley (UK)**

13:30 - 15:00 CBR I + II

[P15-01]

### Total Laryngectomy and Prevention of Complication

**Giuseppe Spriano**

*otolaryngology head and neck surgery,  
national cancer institute, Italy*

The management of advanced laryngeal cancer has evolved in the last century, from total laryngectomy to chemoradiation. Both induction chemotherapy followed by irradiation and concurrent chemotherapy and radiotherapy have been reported as valuable alternatives to total laryngectomy in patients with advanced larynx or hypopharynx cancer. Although chemoradiation is a well codified treatment for advanced laryngeal carcinomas, the surgical management of local recurrence after failed radiotherapy or radiochemotherapy remains a clinical challenge. The role of salvage total laryngectomy for local recurrence/persistence of head and neck cancer is clinically well described. Many patients with recurrence after failed radiation therapy present with advanced tumors, and nearly one half of patients have transglottic rT3 or rT4 lesions. Total laryngectomy remains the standard of care for surgical salvage of radiation failure in laryngeal cancer. However, in carefully selected patients, conservation laryngeal surgery is an oncologically sound alternative to total laryngectomy. Total laryngectomy following radiation therapy or concurrent chemoradiation therapy is associated with high complication rates because of wound healing difficulties. With an ever increasing reliance on organ preservation protocols as primary treatment for advanced laryngeal cancer, the surgeon must develop techniques to minimize postoperative complications in salvage laryngectomy surgery.

We studied some factors potentially associated with postoperative complications. 106 patients undergoing total laryngectomy as salvage surgery for laryngeal squamous cell carcinoma were considered for this study. The rate of postoperative complications was about 30% according with the literature. Even in the absence of extralaryngeal disease, primary closure of laryngeal defects can result in protracted wound care problems. We hypothesize that even when sufficient mucosa is present to close the defect primarily, introduction of vascularized tissue to close the defect may improve outcomes. With pectoralis myofascial flap reinforcement or the use of free tissue transfert, pharyngocutaneous fistula rate after salvage laryngectomy are low. This is a simple, reliable technique that prevents postoperative pharyngocutaneous fistula and its associated morbidity after salvage laryngectomy.

**Keywords:** Laryngeal Cancer, Recurrence, Total Laryngectomy

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[P15-02]

### Imaging and Surveillance after Laryngeal Cancer Treatment: What Modalities and How Frequent?

**Michiel van den Brekel**

*Head and Neck Surgery, Netherlands Cancer Institute, Netherlands*

Follow-up after treatment of laryngeal cancer serves different purposes. Patient coaching, supportive care of side effects, treatment evaluation and early detection and possible treatment of recurrences and second primaries are the main goals. More than 80% of all tumor recurrences occur in the first 2 years, so in general the frequency of visits is highest in this period.

Many aspects concerning the follow-up of patients treated for laryngeal cancer matter in decision making. Apart from the aspects of rehabilitation and psychosocial coaching, the main concern for the patient is the treatment outcome. If a residual cancer or recurrence is potentially treatable, which is often the case in laryngeal cancer after organ preservation, or in the neck after laryngectomy, early detection might be beneficial. Therefore, the routine use of imaging as well as microlaryngoscopy with possibility to take biopsies is often advocated, especially for advanced tumors. However, so far, it has not been proven that survival is improved using this routine. At the moment, unfortunately no sensitive tumor markers are available in head and neck cancer, neither serological nor in sputum. As a consequence, apart from direct laryngoscopy, PET, PET-CT, MRI and CT are being used to evaluate treatment response. In general, PET and PET-CT are reported to be the most reliable tests, with a high negative predictive value when used 9-12 weeks post-treatment. Unfortunately, none of these imaging techniques is very reliable in patients with a lot of post-treatment edema and necrosis, in which only biopsies can be used to differentiate post radiotherapy necrosis and residual cancer.

In the period after initial response evaluation, the usefulness of routine visits and repeated imaging in patients without complaints is controversial and there is no evidence for better survival. Most cost-effectiveness studies did not show any survival benefit as late recurrences or second primaries are rarely detected before they cause symptoms and most distant metastases are untreatable. However, we all know patients who were saved by early detection of disease during follow-up and these rare cases might be worth the enormous workload related to the follow-up visits.

**Keywords:** Larynx, PET, Surveillance

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[P15-03]

## Transoral Laser Microsurgery: Surgical Salvage following Radiation Failure

**Chris Holsinger**

*Dept of Head & Neck Surgery, UT M D Anderson Cancer Center,  
UNit 1445, USA*

Transoral Laser Microsurgery (TLM) provides an “organ-preservation” surgical approach for the treatment of patients with previously untreated larynx cancer. Although first described by Jako and Strong in 1972, TLM is now accepted as a “standard of care” within the multidisciplinary care of head and neck cancer.

The optimal tissue handling properties of the carbon dioxide laser combined with the precise visualization afforded by the use of the operating microscope facilitated complete tumor excision with good functional and oncologic outcomes. While CO<sub>2</sub> laser resection has been used for 30 years, the dedicated work of Steiner and other surgeons has expanded its role beyond limited resection for early stage disease. Its role as salvage surgery after radiation therapy remains controversial.

However, there is now a burgeoning literature describing TLM as salvage surgery for recurrent supraglottic and glottic laryngeal cancer. In general, laryngeal preservation rates vary from 70-100% depending on the initial stage of the tumor and disease extent at the time of recurrence. In more than a dozen papers from Europe and North America, patients with early staged recurrent carcinomas had lower rates of local recurrences and salvage laryngectomies than did patients with advanced recurrent cancers.

Resection margins are confounded by post-radiation treatment effects, necessitating wider margins than in primary TLM, since the tumor border may be more difficult to determine, both grossly and microscopically. For supraglottic carcinoma, in particular, the need for nasogastric and percutaneous gastrostomy is common, due to diminished pharyngeal sensation and fibrosis seen after radiation therapy. Other commonly reported complications include persistent laryngeal edema, anterior commissure webbing and granuloma formation, as well as laryngotracheal stenosis and chondroradionecrosis.

Despite these risks and expected post-RT complications, TLM appears to be safe option for salvage of radiation failure, with good oncologic and functional outcomes. As with any surgical salvage of recurrent cancer after radiation, close-observation and frequent endoscopic exam is warranted after salvage TLM.

**Keywords:** Transoral Laser Microsurgery, Radiation, Salvage

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[P15-04]

## Function Preserving Reconstruction after Partial Laryngo-Pharyngeal Resection

**Kazuyoshi Kawabata**

*Head and Neck, Cancer Institute Hospital, Japan*

In laryngeal cancer most radiation or chemoradiation failures at the primary site result in salvage laryngectomy. Conservation surgery for recurrent laryngeal cancer is indicated only in a few selected patients. Initial T1/T2 and rT1/T2 disease may be the main candidate for conservation laryngeal surgery. There are many types of conservation surgery (partial laryngectomy) already established as standard methods but as for the recurrent laryngeal cancer majority of patients are not indicated for conservation surgery. Options for the management of recurrent laryngeal cancer highly dependent on the extent of the recurrence, postoperative functional recovery is also one of the most significant factors for the choice of the treatment.

In case with small lesion, there may be no postoperative functional impairment but in surgery for large tumor, significant functional disorders usually occur. Extensive resections can affect speech and swallowing and laryngectomy is often thought to be imperative to prevent postoperative aspiration.

If recurrent laryngeal cancer extend into the pharynx partial laryngopharyngectomy may be required. In such a case post-operative function, especially swallowing will be impaired significantly. For the good swallowing in advanced head and neck cancer, we usually use free flap reconstruction. In this presentation I would like to show our recent methods for function preserving reconstruction after partial laryngopharyngectomy.

Between January 1982 and August 2004, 3,025 head and neck reconstructions (2,232 free flap reconstructions) were underwent in our hospital (330 oropharyngeal and 835 hypopharyngeal reconstructions including 48 partial pharyngolaryngectomy). Making use of these experiences we have gradually improved our methods of function preserving reconstruction for oropharyngeal and hypopharyngeal cancer. The point is to reconstruct pharyngeal defect as the flap cover the larynx on deglutition. As for the laryngeal cancer function preserving reconstruction is the same in concept.

Recently we think with good reconstruction laryngectomy can be saved in many of these patients. I would like to show our methods for function preserving surgery and also mention about the limitation and remaining problems of this surgery.

**Keywords:** Reconstruction, Partial Laryngopharyngectomy, Laryngeal Cancer

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## P16. Oropharynx

**Chair : Khee-chee Soo (Singapore)**

**Moderator : Sheng-Po Hao (Taiwan)**

13:30 - 15:00 CBR I + II

[P16-01]

### Response Evaluation after Chemoradiation for Advanced Oral and Oropharyngeal Carcinoma with MRI and FDG-PET

**Remco de Bree**

*Otolaryngology/Head and Neck surgery, VU University Medical Center, Netherlands*

**Purpose:** Evaluation of the accuracy of FDG-PET and MRI as a function of test criteria and interobserver variation to assess response to chemoradiation for oral and oropharyngeal carcinomas.

**Methods:** In a retrospective study PET and MRI scans of 23 patients with functionally inoperable oral and oropharyngeal carcinomas treated with chemoradiation were assessed by 3 nuclear physicians and 2 radiologists (individually and in consensus) using several interpretation systems to detect local residual tumor. Histopathology and 6 months follow-up served as reference standard.

**Results:** Four patients had local residual tumor. When the only options were 'residual tumor' or 'no residual tumor', a sensitivity of 100%, specificity of 37%, positive predictive value of 25% and negative predictive value of 100% was found for MRI after consensus reading and for PET after consensus reading 50%, 84%, 40% en 89%, respectively. Accuracy of MRI was in consensus better than individually, while accuracy of PET was individually better. For MRI 'scoring system according to Ojiri' was a significant test criterion, and for PET focally enhanced uptake at initial primary tumor site. False-positive findings on MRI were mostly seen in patients with a primary tumor in vallecula or base of tongue. Joint reading of PET and MRI had a sensitivity of 75% and a specificity of 50%.

**Conclusions:** If validated, the high negative predictive values may justify avoidance of invasive diagnostics (endoscopy under general anesthesia with taking of biopsies) if MRI or PET are negative. Accuracy of FDG-PET and MRI for evaluation of tumor response after chemoradiation was moderate. Interobserver agreement was fair.

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[P16-02]

### Epidemiology, Etiology and Prevention

**Pankaj Chaturvedi**

*Head and Neck Department, Tata Memorial Hospital, Parel, Mumbai, India*

Oropharyngeal cancer is an uncommon disease and along with hypopharynx cancers it accounts for an estimated 123,000 new cases per year in the world. Since, majority of the patients present in advanced stages, it has an estimated mortality of 79,000 deaths per year. In the USA , oropharyngeal cancers increased significantly from 17.6% during 1974 to 1976, to 22.6% during 1998 to 1999. A similar increase was also reported in Scandinavian countries, despite a significant decline in tobacco use. Typically, it involves patients in the fifth to seventh decades of life. Men are afflicted 3 to 5 times more often than women. Tobacco (in any form such as cigarette, smokeless tobacco, cigar), Alcohol and HPV are the three most established etiological agents. These agents may have independent action or may act synergistically. Recently, Human papillomavirus (HPV), in particular HPV16, has emerged as a causative agent with more than half of these cancers contain HPV DNA. Having said that, these cancers are ideal for prevention researches. Cigarette smokers have a lifetime increased risk that is 5 to 25 fold increased over the general population. The ex-smoker's risk begins to approach the risk in the general population 20 after complete cessation. Certain occupational exposures such as nickel refining, exposure to textile fibers and asbestos exposure have also been reported as possible causative agents. Excessive intake of mate (a stimulant beverage taken in latin america) processed meats or red meat are also associated with increased rates whereas consumption of vegetables seems to offer protection. Vitamin E and beta carotene have not been found to be of any use in chemo-preventive strategy. Betel nut chewing is strongly associated with oral cancers but not with oropharyngeal cancer. There is a possible role of ethnicity with African American men in the U.S. carry a 50% higher risk of pharyngeal cancers than caucasian men. Defective elimination of alcohol related acetaldehyde (a carcinogen) due to genetic mutation is also reported to be a risk factor. A recent study showed that the annual incidence rates of potentially HPV-associated cancers of the tonsil and base of tongue both increased significantly from 1998 through 2003, whereas the incidence rates of non HPV related cancers generally decreased. The incidence rates were highest among blacks, and higher among non-Hispanics and men than among Hispanics and women. As human papillomavirus (HPV) vaccination becomes widely available in the US for cervical cancer prevention, its potential usage in prevention of oropharyngeal cancer is a hot topic of debate.

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[P16-03]

## Current Uses of Radiotherapy in the Care of Locoregionally Advanced Oropharyngeal Cancer

**James Bonner**

*Department of Radiation Oncology,  
The University of Alabama at Birmingham, USA*

Topic of Interest:

Oropharyngeal carcinoma.

**Objective / Methods :** Radiotherapy and chemoradiotherapy regimens emerged as important organ preserving strategies for locoregionally advanced oropharyngeal carcinomas following the work by early investigators suggesting that radiotherapy-based regimens resulted in comparable survival compared to initial surgical resection (Bryce and Ryder; Laryngoscope, 81:148-1490, 1971). Over the last forty years, investigators have sought to optimize radiation fractionation and the best integration of radiotherapy and chemotherapy (and new targeted therapies) for these patients with oropharyngeal tumors. These investigations and the advances in this area will be reviewed.

**Results:** During the latter part of the twentieth century, several thousand patients were entered on trials exploring either chemoradiotherapy or altered fractionated radiotherapy in comparison to conventional radiotherapy alone. Meta-analyses have revealed survival advantages for both of these tested treatments (Bourhis, Current Opinion in Oncology, 19:188-194, 2007). Therefore, studies are being conducted to optimize radiation fractionation in chemoradiotherapy regimens. Recent studies suggest that altered fractionated radiotherapy may not be necessary in chemoradiotherapy regimens. Also, it is noteworthy that targeted agents (primarily anti-EGFr agents) have entered the treatment armamentarium in recent years. The integration of various targeted agents with chemoradiotherapy regimens is the subject of much investigation. In addition to studies exploring targeted agents and the optimization of concurrent chemoradiotherapy, ongoing trials are exploring whether new taxane-based induction chemotherapy regimens enhance the outcomes of concurrent chemoradiotherapy.

**Conclusions:** Patients with locoregionally advanced oropharyngeal cancers have benefited from treatment options that offer organ preservation. These options are currently undergoing further investigations in order to optimize the integration of radiotherapy, chemotherapy and targeted therapies.

**Keywords:** Head and Neck Cancer

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[P16-04]

## De-escalation of Chemoradiation following Trans Oral Robotic Surgery for Oropharyngeal Carcinoma(TORS)

**Eric Genden**

*Otolaryngology – Head and Neck Surgery,  
The Mount Sinai Medical Center, USA*

The toxicity associated with concomitant chemoradiation for the management of oropharyngeal carcinoma has been well documented. Similarly, the morbidity associated with transmandibular surgical approaches has also been well established.

Minimally invasive surgical techniques offer the potential to extirpate the malignancy and provide essential information that may direct therapy. In select patients, radiation doses may be deescalated and systemic chemotherapy may be withheld if tumor free margins can be achieved. This presentation demonstrates that in preliminary data, TORS provides an excellent means for surgical extirpation of oropharyngeal malignancy and that in select cases, radiation doses can be reduced, and systemic chemotherapy can be withheld. This results in improved functional outcomes and quality of life without a compromise in overall or disease specific survival.

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[P16-05]

## Non Microvascular Replacement of the Pharynx

**Khee-chee Soo**

*Director's Office, National Cancer Centre Singapore, Singapore*

Oropharyngeal and hypopharyngal resections require in a significant proportion of patients new vascularised tissues to be brought in to help close the pharyngeal defects. For a defect that is not full circumferential, a pedicled myocutaneous flap will be sufficient and appropriate in most instances. However for a full circumferential defect, reconstruction can be achieved through microvascular free grafts e.g. jejunum or through pedicled stomach or colon. To be discussed will be non microvascular options in full circumferential defects. These techniques are useful in situations when there is shortage of microvascular expertise or when the operating time needs to be shortened to reduce surgical morbidity and mortality.

**Keywords:** Oropharyngeal Defect, Free Graft, Pedicled Graft

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## P17. Advanced Oral Cavity Cancer

**Chair : Richard E. Hayden (USA)**

**Moderator : Ashok Shenoy (India)**

15:30 - 17:00 CBR I + II

[P17]

### Advanced Oral Cancer - A Global Challenge Indeed!

**Ashok Shenoy**

*Dept of H&N Surgery, Kidwai Memorial Inst.of Oncology,, India*

Oral cancers remains a worldwide problem despite exhaustive and convincing epidemiological data that clearly establish link between tobacco use and other co- carcinogens and disease. More importantly it is surprising that despite this knowledge, even in affluent countries like the UK, mortality, morbidity and survival remains stable and unchanged over the last 4 decades. This is a cause for major concern as UK is one of the countries with well organised health care system where colleagues from various multidisciplinary specialities are actively involved in the care of the oral cancer patient. Advanced stage cancer is a difficult proposition to the best of oncologic facilities worldwide because it challenges the resources to the utmost, only to succeed in controlling the disease in realms, of 35-55% of those subjected to curative treatment. Advances in microvascular reconstruction with improved soft tissue and bone replacement have really not fulfilled the much anticipated improvements in functional restoration . Rather this has forced care providers to reflect over the logistics and financial aspects of these complex reconstructions and critically appraise their impact on the QOL and rehabilitation issues . Also the issue of ‘field changes’ and troubling entity of co existent oral submucous fibrosis especially in the asian population has driven home the ground reality of a more widespread and diffuse carcinogenic (often difficult to identify) process that may not lend itself to ‘safe’ surgical extirpation . Hence adjuvant treatment to surgery may be necessary. The temporal sequence of these modalities need to be worked out so as to enhance optimal disease control with minimal functional deficit at an affordable cost !

**Keywords:** Oral Cancers - A Global Problem, ‘Field’ Changes, Multimodal Approach, Rehabilitation And Qol Issues -Important

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[P17-01]

### Advanced Oral Cavity Cancer

**Ayman Amin**

*Surgical Oncology, National Cancer Institute,  
Cairo University, Egypt*

Microvascular free fibular graft has become the state of the art for mandible reconstruction. However, it is a technically demanding long procedure, with a high cost. In addition, multiple stages of prosthodontic work are occasionally needed to achieve complete dental rehabilitation.

Despite the advancement in treatment modalities, prognosis of patients with locally advanced and recurrent oral cavity tumors is still poor. This disappointing outcome mandates that the prognosis must be taken into account in deciding the optimal technique of mandible reconstruction. So, the use of free fibula should be optimized respecting the tumor prognosis, patient condition, location of the defect, and feasibility of osseointegrated implants and subsequently the chance of the patient to get complete dental rehabilitation. A suggested algorithm for the optimal technique of mandible reconstruction in locally advanced carcinoma of the oral cavity will be presented.

Radiofrequency ablation (RFA) of malignant tumors is an established modality of treatment. It has been extensively used for ablation of liver tumor then expanded to include other organs including the tongue. We present our experience using RFA for recurrent tongue cancer after triple attacks of surgery, radiation and chemotherapy. Merits, disadvantages, and complications of this technique will be discussed.

Finally, our experience using the submental flap for reconstruction complex defect in elderly patients will be discussed.

**Keywords:** Free Fibula, Radiofrequency Ablation, Submental Flap

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[P17-02]

## Brachytherapy for Advanced (Over Stage III and/or Recurrent) Tongue Cancer

**Hitoshi Shibuya**

*Department of Radiation Oncology, Tokyo Medical and Dental University, Japan*

The efficacy of curative low-dose-rate (LDR) brachytherapy for stage III (125 cases) and post-operative/radiation recurrent (50 cases) oral tongue cancers treated between 1970 to 2005 were assessed. Prior to LDR brachytherapy, mandibular protecting acrylic resin spacer was made for each patient and treatment was continued during 6 days. There was no interrupted case during treatment. The five year local control rates for stage III patients and recurrent tongue were 60-70%. The incidence of late side effects (bone exposure and/or mucosal ulcer) was under 10%.

LDR brachytherapy for advanced/recurrent tongue cancer was effective and there was no increase in complications and most of the patients preserved good oral QOL after treatment. LDR brachytherapy was also a low invasive treatment for aged and physically poor risk patients.

**Keywords:** Advanced/Recurrent Tongue Cancer, Brachytherapy, QOL

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[P17-03]

## Advanced and Recurrent Oral Cancer

**Luiz Paulo Kowalski**

*Department of Head and Neck,  
Hospital do Cancer A C Camargo, Sao Paulo, Brazil*

The highest incidence and mortality rates due to oral cancer are registered in developing countries. In such geographic areas most patients had the cancer diagnosed at late stages. Patients with tumors at clinical stages III and IV usually are heavy smokers and drinkers. Several patients are not candidates for radical surgical treatment and postoperative chemoradiation due to low performance status or weight loss or the presence of other significant comorbidities. The surgical treatment comprises uni or bilateral neck dissection, wide resection of the primary lesion including or not mandibulectomy and or maxillectomy and complex reconstruction procedures at the same surgical procedure. Aiming to reduce loco-regional recurrences, radiotherapy or chemoradiotherapy are usually indicated. In spite of aggressive treatment only 20 to 50% of these patients will survive more than 5 years after initial treatment. The risk of treatment failures in patients with oral squamous cell carcinoma depends mainly on the tumor site, clinical stage, some pathological features (perineural infiltration, vascular embolization, pN+, positive surgical margins) and treatment. In patients with loco-regional recurrences without distant metastasis, the main arguments used in favor of attempting salvage surgery as the first option are: a) the rates of loco-regional recurrences range from 25% to 48%; b) distant metastases rarely occur as an isolated event; c) radiation therapy was usually used in the initial treatment and re-irradiation is not feasible in most cases; and d) chemotherapy is only a palliative treatment. Therapeutic planning in patients with recurrent oral squamous carcinoma is associated with significant technical challenges due to the difficulties in defining the limits of the tumor caused by the fibrosis after radiotherapy and/or previous surgery. Other significant factors that must be considered are the risk of major surgical complications, the difficulties of speech and deglutition rehabilitation, prognosis and high treatment costs. The recent advances in reconstruction techniques and in pre and postoperative care, offer the possibility of performing major surgical procedures with acceptable morbidity and low mortality rates. We recently reported a series of 246 patients submitted to radical salvage surgery for recurrent squamous cell carcinoma of the oral cavity and oropharynx. The previous treatment was surgery in 73 patients, radiotherapy in 96, combined surgery and radiotherapy in 76 and chemotherapy in 1. The clinical stage of recurrence (rCS) was rCS I/II in 51 cases and rCS III/IV in 195. The disease-free interval (DFI) was less than 1 year in 156 cases and longer than 1 year in 90. The rate of recurrence after the salvage procedure was 54.9% and the overall 5-year survival 32.3%. The independent prognostic factors in multivariate analysis were rCS ( $P=0.049$ ) and DFI ( $P=0.045$ ). In a subsequent study we showed that the most significant prognostic factor in this population was EGFR expression in recurrent tumors. Patients with recurrent oral cancer are usually considered to have a poor prognosis, even when submitted to salvage treatment. However, the 5-year overall survival over 30.0% showed in this and other series would hardly be reached with other treatment alternatives. The results suggests that patients with recurrent tumors at initial clinical stages (rCS I and rCS II) and diagnosed after 1 year of initial treatment have the most favorable prognosis. However, even selected patients with early recurrences at an advanced stage (rCS III and rCS IV) and early recurrences can have a better chance of disease control with salvage surgery. Chemotherapy, re-irradiation or supportive care should be reserved only for patients with recurrent tumors that cannot be resected and for patients with severe comorbidities that are in inadequate clinical conditions, making it impossible to perform a radical salvage surgery.

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[P17-04]

## Long-term Outcome of an Outpatient Weekly Neoadjuvant Chemotherapy Regimen — MEMOCLUB for Advanced Oral Cancer

**Jin-ching Lin**

*Department of Radiation Oncology, Taichung Veterans General Hospital, Taiwan, Taiwan*

Purpose: To evaluate long-term outcome of an outpatient weekly neoadjuvant chemotherapy (NeoCT) for previously untreated and advanced oral cancer patients.

Materials and Methods: From July 1999 to May 2008, 160 patients were enrolled to a three-combined multimodality therapy of NeoCT+surgery+radiotherapy. The NeoCT consists of Methotrexate 30 mg/m<sup>2</sup> D1, Epirubicin 30 mg/m<sup>2</sup> D1, alternating with Mitomycin-C 4 mg/m<sup>2</sup> D8, Oncovin 1 mg/m<sup>2</sup> D8, Cisplatin 25 mg/m<sup>2</sup> D8, Leucovorin 120 mg/m<sup>2</sup> D8, 5-fluoroUracil 1,000 mg/m<sup>2</sup> D8, and Bleomycin 10 mg/m<sup>2</sup> D8 (MEMOCLUB) for 8-12 weeks. Patient characteristics are as followings: median age=50 (range 31-80); male/female=154/6; performance status ECOG 0/1/2=14/141/5; T2/T3/T4=6/4/150; N0/N1/N2/N3=41/1/93/25; Stage II/III/IV=1/3/156.

Results: Patient compliance to our MEMOCLUB NeoCT is good. Each patient could finish 10-week NeoCT in average. Response evaluated after NeoCT showed 40.0% complete response and 51.3% partial response. All 160 patients received NeoCT, 76 patients agreed and 84 refused surgery after NeoCT. The median follow-up period for all the patients was 66 months from the start of NeoCT. So far, there were 99 failures. Most recurrences were in locoregional area and only 7 patients (4.4%) had distant metastasis with (4) or without (3) locoregional failures. The 5-year overall survival (OS), locoregional failure-free survival (LRFFS) and distant failure-free survival for all 160 patients were 28.1%, 35.2%, and 93.9%, respectively. The 5-year rates of OS and LRFFS for patients with initial resectable and unresectable tumors were 67.4% vs. 10.7%,  $P<0.0001$ ; and 66.0% vs. 17.7%,  $P<0.0001$ , respectively. Patients received surgery as a part of their treatment had significant better survivals than those who refused surgery (5-year OS=42.6% vs. 13.3%,  $P<0.0001$ ; 5-year LRFFS=52.3% vs. 13.6%,  $P<0.0001$ ). Patients with longer interval between NeoCT and surgery ( $>3$  weeks) showed worse survivals (5-year OS=0% vs. 56.6%,  $P<0.0001$ ; 5-year LRFFS=0% vs. 66.4%,  $P<0.0001$ ) among patients received operation. Other favorable prognostic factors included high pretreatment serum albumin level, good performance status, better clinical response and better pathological response.

Conclusions: Outpatient weekly MEMOCLUB NeoCT is an effective and well-tolerated regimen for advanced oral cancer. Surgery is strongly recommended and the optimal timing of operation is within 3 weeks after NeoCT.

**Keywords:** Oral Cancer, Neoadjuvant Chemotherapy, Surgery

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## P18. Thyroid Cancer: What's New?

**Chair : Cheong Soo Park (Korea)**

**Moderator : Ashok Shaha (USA)**

15:30 - 17:00 CBR III

[P18]

### Thyroid Cancer: What's New?

**Ashok Shaha**

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Thyroid cancer continues to be a subject of controversy. Nuances originate from better understanding of the biology of thyroid cancer, application of molecular biology, and advances in cytology and diagnostic evaluation.

Diagnostic ultrasound has been the mainstay in the evaluation of thyroid nodules. Ultrasound-guided needle biopsy and its interpretation based on the Bethesda system will be quite helpful to decide the risk of malignancy and which patient should be operated upon. There is no unanimous consensus in elective central compartment dissection, however there is clearly a high risk of complications, mainly related to temporary and permanent hypoparathyroidism. Understanding the risk group stratification is extremely important in overall management of thyroid cancer related to the extent of thyroidectomy, nodal dissection, adjuvant therapy, and postoperative follow-up. The ATA guidelines are quite helpful for a practitioner when making certain decisions in evaluation and management of thyroid nodules and thyroid cancer. Similar guidelines have been published on medullary carcinoma of the thyroid through the ATA.

The use of recombinant TSH has revolutionized postoperative management of patients with radioactive iodine ablation. This clearly has helped the quality of life for these patients, who otherwise would suffer for 6-8 weeks with severe hypothyroidism. The postoperative follow-up also includes stimulated thyroglobulin and ultrasound of the thyroid bed and neck. The understanding of the aggressive varieties of papillary carcinoma is crucial in relation to overall prognosis and follow-up of patients. Tall cell, insular and poorly differentiated thyroid cancers are generally not radioiodine avid. Follow-up is best undertaken with a PET scan in patients with aggressive histology.

The management of locally aggressive thyroid cancer continues to be an enigma, especially management of the trachea, larynx and recurrent laryngeal nerve. There appears to be considerable interest in nerve repair after sacrifice of the recurrent laryngeal nerve in selected patients. The major shift appears to be interest in minimally invasive thyroid surgery, both endoscopic transcervical, extracervical approaches, and video-assisted thyroid surgery. Whether these technological advances will be applicable in day-to-day practice needs to be determined.

**Keywords:** Thyroid Cancer, Recent Advances, Neck Dissection for Thyroid Cancer

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[P18-01]

### What is New in the ATA (American Thyroid Association) Guidelines

**Robert Witt\***

*Surgery/Otolaryngology, Christiana Care/Thomas Jefferson University, USA*

Thyroid Nodules and Differentiated Thyroid Cancer Guidelines first published in 1996.

Renewed in 2006.

Renewed in 2009.

Medullary Thyroid Cancer (ATA) Guidelines first published in 2009. The use of molecular markers (e.g., BRAF, RAS, RET/PTC, Pax8-PPAR $\gamma$ , or galectin-3) may be considered for patients with indeterminate cytology on FNA to help guide management.

Recommends the off label use of Molecular targeted agents for patients with:

Progressive, symptomatic distant metastasis that are not iodine avid in the absence of eligibility for clinical trial

Indications for fna

Hi risk Hx (XRT or fam hx, prior thyroid ca), and hi or low risk u/s features: >0.5 cm

Hypo echoic: >1.0 cm

Iso/hyperechoic >1.0-1.5 cm

Micro calcifications >1.0 cm

Mixed cystic/solid, hi risk u/s >1.5 cm

Mixed cystic/solid, lo risk u/s >2.0 cm

Purely cystic- no FNA

In the presence of two or more thyroid nodules >1 cm, those with a suspicious sonographic appearance should be aspirated preferentially. If nodule size is stable (i.e., no more than a 50% change in volume or <20% increase in at least two nodule dimensions in solid nodules) next follow-up clinical examination or US may be longer, e.g., every 3–5 years.

2009 Guidelines broken out indeterminate to (1) Suspicious for PTC and (2) Indeterminate (Hurthle Cell or Follicular Neoplasm)

2009 ATA: language has changed from “most patients” to “patients” with PTC >1 cm are Rxed with total thyroidectomy.

Indications for RAI

All patients T3, T4 or Stage III or IV

All patients with Stage II, <45

No RAI if T1 <1cm

No RAI for T1 > 1cm or T2 unless cervical mets, >45, high grade histology, multifocal, or vascular invasion

No RAI for multifocal microcarcinoma (<1 cm)

Zone VI, N0, T1, T2 no zone VI dissection

Zone VI, N0, T3, T4 ipsilateral or contralateral zone VI dissection

Medullary Thyroid Cancer (MTC)

Lateral neck dissection can be withheld for sporadic MTC patients with negative pre-operative imaging.

The present level of evidence cannot uniformly support or preclude the use of lateral neck dissection for central node positive, lateral neck image negative, sporadic MTC patients.

**Keywords:** ATA Guidelines, Differentiated Thyroid Cancer, Medullary Thyroid Cancer

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[P18-02]

## Surgery of Thyroid Cancer in the New Era

**Miljenko Bura**

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University Hospital Center, Croatia*

[P18-03]

## Recurrent Laryngeal Nerve Repair

**Kunihiko Nagahara**

*Center for Head & Neck Surgery, Kusatsu General Hospital, Japan*

Recurrent laryngeal nerve (RLN) is often invaded by invasive differentiated thyroid cancer (DTC). Then, how to handle RLN with DTC invasion? My answer is, 1) Firstly, try to preserve RLN using micro-dissection under operating microscope, 2) When RLN is sacrificed, immediately perform microsurgical reconstruction, and 3) Leave augmentation of the vocal cord as the last resort. It should be stressed that not making an easy compromise to sacrifice RLN, but preserve it with sophisticated techniques using micro-dissection under operating microscope, together with the importance of getting anatomical knowledge about the structures behind the thyroid cartilage, Berry's ligament, and Zuckerkandl's tubercle. The techniques will be shown in the panel.

As my personal experience, the first recurrent laryngeal nerve (RLN) repair was performed in 1975 using 10-0 nylon suture under operating microscope. Thereafter, more than 150 RLNs were reconstructed using the same technique, namely fascicular suture with 3 to 4 stitches. Patterns of suture to reconstruct RLN were end-to-end anastomosis, anastomosis to the ansa cervicalis nerve, and the nerve transplantation. No significant difference in the resulting voice, as estimated by the maximum phonation time (MPT) and GRBAS scale (Grade, Rough, Breathy, Asthenic, and Strained), was noted between these 3 suture patterns except the grade of hyper-abduction and the vocal fold shimmer. This technique is also valid for the reconstruction of the external branch of the superior laryngeal nerve and, furthermore, the fine intra-laryngeal branches of RLN.

The average postoperative MPT after RLN repair was 14.7 seconds. Each MPT value for the end-to-end anastomosis, the nerve transplantation, and the anastomosis to the ansa cervicalis was 14.3, 16.6 and 11.8 seconds, respectively. The time elapsed to show maximal phonetic recovery was 146 days on average. Finally, the disease specific 10-year survival of the patients underwent RLN repair with invasion by DTC was 79.8%. Local recurrence around the anastomotic site was noted in 3 patients.

**Keywords:** Recurrent Laryngeal Nerve, Reconstruction, Thyroid Cancer

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[P18-04]

## **Radioiodine Therapy of Distant Metastases in Differentiated Thyroid Carcinoma: Experience of Seoul National University Hospital**

**June-key Chung**

*Department of Nuclear Medicine,  
Seoul National University Hospital, Korea*

Koreans usually consume large amounts of food rich in iodine, and differentiated thyroid carcinoma (DTC) has been increasing in parallel with papillary thyroid carcinoma. 2,036 patients were treated for DTC in Seoul National University Hospital from 1984 to 2004, pulmonary metastasis was detected in 109 (5.4%), and bone metastasis in 25 (1.2 %). Those patients underwent I-131 therapy several times using the fixed doses of I-131, such as 100-150 mCi for lung metastasis and 150-200 mCi for bone metastasis. Of 109 patients with pulmonary metastasis, 38 patients (34.9%) achieved complete remission, and 44 (40.4%) partial remission. Lung lesions with diffuse uptake were found to respond better than lesions with nodular uptake ( $P<0.05$ ). Among 75 metastatic bone lesions treated with I-131 therapy alone, 34 lesions (45.3%) improved, but 41 lesions (55.7%) showed no change or progressed. Of 25 bone lesions treated by surgical resection and I-131 therapy, 9 lesions completely disappeared, and the others were improved. In cases refractory to the fixed dose method, we have used maximal safe dose (MSD) on the basis of bone marrow irradiation levels, which allows the delivery of a large amount of I-131 to thyroid cancer tissue. 47 DTC patients with non-responsive residual disease despite of fixed dose therapy were treated with MSD method. The mean calculated MSD was  $339.6\pm57.5$  mCi. 7 (14.9%) showed complete remission, 15 (31.9%) partial remission, 19 (40.4%) stable disease, and 6 (12.8%) disease progression. Another trial was the combined treatment of I-131 with retinoic acid (RA). We performed I-131 therapy with RA in 49 patients with papillary thyroid carcinoma. A complete response was found in one patient (2.3%), and a stable disease was observed in 19 patients (43.2%), and a progressive disease was observed in 24 patients (54.5%). I-131 therapy produces favorable results in pulmonary metastasis from Korean DTC. However, bone metastasis should be treated using a combination therapy, such as, I-131 and surgery or external radiotherapy. In refractory cases, MSD therapy and RA combined therapy can be applied with some benefits.

**Keywords:** Thyroid Cancer, I-131, Treatment

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## O24. Reconstruction (IV)

**Chairs : Soon Yuh Nam (Korea)  
Snehal Patel (USA)**

08:00 - 09:30 SBR I

[O24-01]

### The Subcutaneous Cervicofacial Flap Revisited

**Brian Parrett<sup>1\*</sup>, William Austen<sup>2</sup>, Joseph Upton<sup>2</sup>,  
Rudolf Buntic<sup>3</sup>, Mark Singer<sup>4</sup>**

<sup>1</sup>*Head and Neck Surgery and Plastic Surgery, The Buncke Clinic, California Pacific Medical Center, USA*

<sup>2</sup>*Plastic Surgery, Harvard Medical School, USA*

<sup>3</sup>*Plastic Surgery, The Buncke Clinic, California Pacific Medical Center, USA*

<sup>4</sup>*Head and Neck Surgery, California Pacific Medical Center, USA*

**Objective:** The cervicofacial flap has been the reconstruction of choice for midface soft tissue defects for over 30 years. Deep plane dissection has been advocated to decrease complication rates and improve results. However, the subcutaneous approach, as first described by Mustarde, is still widely used and we predict that outcomes are no different than the deep plan technique.

**Method(s):** Over a 20-year period, we reviewed all patients who underwent subcutaneous cervicofacial flaps for cheek defects with at least one year follow-up. Outcomes were analyzed including skin necrosis, facial nerve injury, and ectropion.

**Result(s):** Fifty-five patients (mean age, 71 years) underwent 55 subcutaneous cervicofacial flaps for cheek reconstruction after excision of skin cancer. The mean defect size was  $6.5 \times 5.3$  cm. Mean follow-up was 32 months. Only 5 of 55 flaps (9%) had minor flap tip or edge necrosis, all managed without further surgery. Smokers had a significant increase in tip necrosis when compared to non-smokers ( $P < 0.006$ ). One patient (1.8%) had minor long-term ectropion with upward gaze and there were no cases of facial nerve injury. A majority of patients surveyed were happy with their results.

**Conclusion(s):** The subcutaneous rotation-advancement cervicofacial flap remains an excellent choice for cheek reconstruction with comparable tip necrosis rates and likely lower ectropion and facial nerve injury rates when compared with the deep plane technique. The deep plan technique may be beneficial in smokers to prevent tip necrosis.

**Keywords:** Cervicofacial Flap, Deep Plane, Cheek Defects

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[O24-02]

### The Scapular Free Flap: When Versatility Is Needed in Head

**John Yoo<sup>1\*</sup>, Roger Moukarbel<sup>1</sup>, Julian White<sup>1</sup>,  
Kevin Fung<sup>1</sup>, Jason Franklin<sup>2</sup>**

<sup>1</sup>*Otolaryngology-Head and Neck Surgery,  
University of Western Ontario, Canada*

<sup>2</sup>*The Scapular Free Flap: When Versatility Otolaryngology-Head and Neck Surgery, University of Western Ontario, Canada*

**Objective:** To review the experience with scapular free tissue transfer at the University of Western Ontario and to describe the various applications using both the fasciocutaneous and osteocutaneous versions.

**Method(s):** Design: Retrospective review.

Setting: Tertiary care centre.

A retrospective review was conducted of patients who underwent a scapular free flap reconstruction between 1997 and 2007. Osteocutaneous and fasciocutaneous flaps were included. Demographic data including gender and age were collected. Defect analysis and complications were also reviewed. Main Outcome Measures: Defect analysis, flap-related complications, and non-flap-related complications.

**Result(s):** Sixty procedures, including 31 osteocutaneous and 29 fasciocutaneous flaps, were performed. Most fasciocutaneous flaps were used for large lateral skull base and facial defects (70%). The skin paddle dimensions ranged from 4 to 15 cm. All osteocutaneous flaps were used for mandibular reconstruction. The length of the bony defect ranged between 4 and 12 cm. Eleven patients required osteotomies. In most cases, the facial or external carotid arteries and internal jugular or facial veins were selected as recipient vessels. A vein graft was required in four cases. The total flap failure rate was 5%. Seven patients who had osteocutaneous flaps suffered medical complications, including one mortality.

**Conclusion(s):** The scapular free flap is a reliable reconstructive option for head and neck defects. The fasciocutaneous application is suitable for facial contouring or the complex skull base defect. The osteocutaneous flap is an acceptable option for complex oromandibular defects in patients with comorbidities.

**Keywords:** Scapular Flap, Head and Neck Reconstruction, Free Tissue Transfer

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[O24-03]

## The Scapular Tip: Applications in Head and Neck Reconstruction

**John Yoo\***, Fiona Whelan, Roger Moukarbel, Kevin Fung,  
Jason Franklin, Anthony Nichols

*Otolaryngology-Head and Neck Surgery,  
University of Western Ontario, Canada*

**Objective:** The scapular tip free flap provides versatile reconstructive options for defects in the head and neck region. The bone is based on the angular branch of the thoracodorsal pedicle while independent soft-tissue components add to the flap's versatility. Other advantages include minimal donor-site morbidity, the long pedicle length and less atherosclerosis. The aim of this study was to review and present a single institution experience with the scapular tip free flap for head and neck reconstruction following major ablative surgery. Parameters that were assessed included patient selection, defect type, donor-site morbidity, and post-operative results.

**Method(s):** Retrospective review of a single tertiary care institution. **Result(s):** The flap was useful for both maxillary and mandibular reconstruction. It may be particularly helpful for angular defects, eliminating the need for osteotomies. A novel application is also described for total glossectomy reconstructions requiring significant oral floor support.

**Conclusion(s):** The scapular tip free flap is a versatile reconstructive option for complex defects of the head and neck, and may be particularly useful for mandibular angle defects.

**Keywords:** Free Flap, Head and Neck Reconstruction, Scapular Flap

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[O24-04]

## Faciocutaneous Free Flaps Reconstruction for Squamous Cell Carcinoma of the Hypopharynx

**Young-Hoon Joo, Min-Sik Kim\*, Dong-Il Sun,  
Kwang-Jae Cho, Jun-Ook Park**

*Department of Otolaryngology-Head and Neck Surgery,  
The Catholic University of Korea, Seoul, Korea*

**Objective:** When the complex structures of the hypopharynx are disrupted after resection of hypopharyngeal cancers, an appropriate reconstructive option should be chosen in an attempt to regain maximum function. This study will examine functional and surgical outcomes after faciocutaneous free flap reconstruction of the hypopharynx.

**Method(s):** Retrospective review of the records of 48 consecutive patients who underwent hypopharyngectomy and reconstruction with faciocutaneous free flaps between 1996 and 2009. Flap donor sites included radial forearm (n=42), anterolateral thigh (n=5), lateral thigh (n=1). For tumor excision, 4 patients had partial pharyngectomy with laryngeal preservation, 31 had partial laryngectomy with partial pharyngectomy, 1 had total laryngectomy with partial pharyngectomy, 7 had total laryngopharyngectomy, and 5 had a total laryngopharyngoesophagectomy.

**Result(s):** There was no perioperative mortality, and there was a 95.8% free flap survival rate. Five (10.4%) patients developed postoperative pharyngocutaneous fistula and 3 patients of them required surgery. Among 12 patients with total laryngopharyngectomy or total laryngopharyngoesophagectomy, one (8%) patient had stricture develop in the postoperative period. Forty-four (92%) patients could be decannulated and maintain their voice. Forty-four (92%) patients were able to take oral nutrition, although four (8%) patients needed additional PEG-tube feeding. After mean follow-up of 34.7 months of 40 patients followed for more than 12 months, 29 patients were alive without disease and 10 patients died as a result of the disease, and 1 died from other cause. The 5-year overall and disease-specific survival rates were 65% and 68%, respectively.

**Conclusion(s):** Functional reconstruction of extensive laryngohypopharyngeal defects can be achieved with a faciocutaneous free flaps with favorable functional and surgical results.

**Keywords:** Head and Neck Neoplasms, Hypopharynx, Surgical Flaps

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[O24-05]

## Application of Jejuno-Mesenterial Free Flap in Pharyngeal and Soft Tissue Reconstruction

**Sergey Kravtsov\***, Igor Reshetov, Valery Chissov

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n.a. Hertzen, Russian Federation*

**Objective:** Free visceral flaps, included mucosa (gastro-omentum, segments of jejunum or colon), are optimal plastic materials for reconstruction of hypopharynx. More available is free jejunum flap. But, lack of volume of tissues for close large defect limit use it.

**Method(s):** Our experiences combine 4 patients, who underwent reconstruction of pharynx with jejuno-mesenterial free flap. All patients had squamous cell carcinoma. They had advance disease of hypopharynx: T4N1M0–2, T4N2M0–1, and larynx–T4N1M0. Two patients were operated in 6 and 12 months after remove tumor. All patients underwent laryngectomy and pharyngectomy and lymph node dissection. So, they had large defect of soft tissues of neck. Autograft consist of 2 segments: jejunum and part of mesenterium. This two segments had common vessels—jejuna artery and vein for fourth arcade. Volume of mesenterium is more than length of jejunum. It is possible because of including in the flap additional vessels for third and fifth arcades. Pharynx was restored with jejunum. Mesenterium was used for cover neopharynx, isolate vessels and mediastinum, forming contour of neck.

**Result(s):** There were no adverse events. Feeding was possible in 10–14 days after operation. Follow-up period is from 6 months to 14 months. In this period of time were no some digestive complications and disease progression.

**Conclusion(s):** Thus, our pilot trial confirms that free jejuno-mesenterial flap is acceptable plastic material in complicated surgical situation because of deficit of soft tissues in local area and preoperative treatment.

**Keywords:** Jejuno-Mesenterial Flap, Pharynx, Reconstruction

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[O24-06]

## Free Flap Reconstruction after Nasopharyngectomy to Prevent Internal Carotid Artery Blowout

**Mark Shue Cheong Leung\***, Yu-wai Chan, William I. Wei

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**Objective:** Internal carotid blowout is an uncommon but lethal complication after nasopharyngectomy in patients having recurrent nasopharyngeal carcinoma with external irradiation as primary treatment. The risk increases when resection exposed the petrosal part of internal carotid artery. Free flaps provide good coverage and vascularity to the exposed internal carotid artery and therefore prevent the lethal complication.

**Method(s):** Prospectively collected data was reviewed from Jan 2005 to Nov 2009. Patients with recurrent nasopharyngeal carcinoma underwent nasopharyngectomy by maxillary swing approached and free flap reconstruction was included in the study. They were followed up monthly in the first year and regularly thereafter with nasoendoscopy. Primary outcome measure is defined as postoperative internal carotid blowout. Secondary outcome measures include flap failure and donor site morbidity.

**Result(s):** 6 patients were included in this study. Median followup time was 20 months. Choice of free flaps included anterolateral thigh myocutaneous flap, vertical rectus myocutaneous flap and vastus lateralis muscle flap. No internal carotid blow out occurred during the followup period. All flaps survived with no salvage operation required. Post operative nasopharyngectomy showed nasal blockage by free flaps initially but resolved in 4 to 6 months with muscle shrinkage. Muscle-only flap seems to be better option since myocutaneous flaps cause encrustation due to the normal desquamation process of stratified squamous epithelium, while muscle-only flaps were mucosalized around 1 month time in nasoendoscopy. Donor site morbidity was minimal.

**Conclusion(s):** Exposure of the petrosal part of internal carotid artery after nasopharyngectomy in tumours close to the artery carries significant risk of blowout. Free flaps can provide good coverage and vascularity to the area therefore prevent the lethal complication.

**Keywords:** Free Flap Reconstruction, Nasopharyngectomy, Internal Carotid Artery Blowout

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[O24-07]

## Sensory Recovery of Noninnervated Free Radial Forearm Flap in Lower Oral Cavity Reconstruction and Its Influence on Oral Function: Longitudinal Assessment of Twenty-Five Patients

**Mohamed Ellabban**<sup>1\*</sup>, Taimur Shoaib<sup>1</sup>, John Devine<sup>2</sup>, Stephen Morley<sup>1</sup>, Jeremy McMahon<sup>2</sup>, David Soutar<sup>1</sup>

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<sup>2</sup>Regional Oral and Maxillofacial Surgery Unit,  
Southern General Hospital, UK

**Body: Introduction :** Sensory recovery of noninnervated free radial forearm flap is uncommon, unpredictable and variable. The aim of the present study was to address sensory recovery of free radial forearm flap used for lower oral cavity reconstruction and its influence on oral function.

**Subjects and Methods :** A total of 25 patients who underwent lower oral reconstruction with noninnervated free radial forearm were studied for one year postoperatively. The sensory modalities examined were pin prick, light touch, hot and cold temperature and static two-point discrimination. Oral function was assessed using Functional Intraoral Glasgow Scale and University of Washington Health Related Quality of Life questionnaire. Patients were assessed preoperatively, two months, six months and one year postoperatively.

**Results :** Our results showed gradual improvement of sensory recovery during the postoperative period up to one year except light touch. Five (20%) patients had complete sensory recovery and 13 (52%) patients didn't achieve any recovery at one year. Partial recovery was recorded in seven (24%) patients. Patients with complete sensory recovery recorded the best functional scores as compared to patients with insensate flaps.

**Conclusions :** There was a positive correlation between sensory recovery of free radial forearm flap and oral function. Therefore, the use of innervated free radial forearm flap is highly recommended for better oral function.

**Keywords:** Noninnervated Radial Forearm Free Flap, Sensory Recovery

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[O24-08]

## Prospective Functional Study in Patients with Free Flap for Soft Palate Reconstruction in Tonsillar Cancer

**Eun Jae Chung**<sup>1</sup>, Chul-Hoon Chung<sup>2</sup>, Young Soo Rho<sup>3\*</sup>

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**Objective:** The functional deficits depend on the site of the primary tumor, extent of the defect, reconstructive method or adjuvant therapy. The purpose of this study is to report prospectively collected speech, velopharyngeal function and swallowing outcomes of patients who have free flap for soft palate reconstruction after primary resection for tonsillar cancer.

**Method(s):** This is a prospective study, where data was obtained on 31 patients who had undergone resection of tonsillar cancer and microvascular reconstruction. Four grades were classified based on extent of resection of the soft palate. Three operative procedures were performed: the Patch, Denude and Gehanno. Each patient answered a specifically designed questionnaire. The evaluation of velopharyngeal function was performed with flexible nasoendoscopy. A speech-language pathologist collected data using a standard protocol. We performed our functional evaluation timely: preop, preRT, postop 1mo, postTx 6mos and 1year.

**Result(s):** Flap donor sites included radial forearm (n=21) and anterolateral thigh (n=10). Speech intelligibility remained above 90% for most patients. In the early postoperative period, patients experienced decreased intelligibility, which improved by the approximately 1 year postoperative period. 96.8% (30/31) of the patients were able to resume a soft and regular diet. Patients with resections of half or more than half of the soft palate had significantly higher nasalalance score. But, only 6.5% (2/31) of patients demonstrating nasopharyngeal incompetence. The motion of the remnant of intact palate and the lateral and posterior pharyngeal walls compensated for the reconstructed palate.

**Conclusion(s):** Patients in whom more than two-thirds of the soft palate has been resected are poor candidates for reconstruction because of the difficulty of maintaining velopharyngeal function. But, appropriate reconstructive method lead a good functional speech intelligibility, velopharyngeal function and swallowing results.

**Keywords:** Tonsillar Cancer, Reconstruction, Function

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[O24-09]

## Reconstruction of the Integumentary Tissues Using the Combination of Dermotension with Botulinum Toxin A for Patients with Scalp Malignant Tumours

Igor Reshetov<sup>1</sup>, Andrey Polyakov<sup>2\*</sup>, Ludmila Antonova<sup>3</sup>

<sup>1</sup>Microsurgery, P.A. Hertzen Cancer Research Institute, Russian Federation; <sup>2</sup>Microsurgery, P.A.Hertzen Cancer Research Institute, Russian Federation; <sup>3</sup>Plastic surgery, Nike-Med, Russian Federation

**Objective:** To improve the results of surgical treatment of skin tumors and of reconstruction integumentary tissues by the advance of controlled tissue dermotension method.

**Method(s):** There were treated locally spread skin tumours of three patients using the controlled tissue dermotension method combining with a injecton of the drug “Lantox”. There were used tissue expanders “Eurosilicone”, volumed from 250 to 500 cc. Control group was formed by 15 patients, tissue dermotension was carried out for them without Botulinum toxin A. The method is the following: before implantation of the tissue expander we made intracutaneous injection of “Lantox” into the zone of expander’s insertion spreading to the area of supposed dermotension. Injection dosage: 2.5-3.0 Un per site of injection at an interval of 1.5-2 cm and the total injection dose is 50-100 U. Ten minutes after injection, expander was inserted. One week after insertion of expander, water-filling was performed. We assessed soft tissue expansion time, painful sensations, as well as the condition of the formed skin-fascial flap and complications, connected with the failure of circulation in the implantation zone.

**Result(s):** All expanders were overloaded with water, average expansion time was 7 weeks. No painful feeling in dermotension zone was reported in BTXA patients group. In the control group 9 patients had obvious painful feelings. The botulinum toxin A make the expanded forehead flap thinner in comparison to the control group; we registered the reduction of dermotension period on average for 2 weeks. No complication during the treatment was reported. In the control group 2 patients (13 %) have got complications in the form of expander’s protrusion.

**Conclusion(s):** Combination of controlled tissue dermotension method with the botulinum toxin A (“Lantox”) reduces the expansion resistance, shortens the expansion time.

**Keywords:** Head Skin Cancer, Lantox, Dermotension

**Corresponding Author** Andrey Polyakov (appolyakov@mail.ru)

**O25. Chemoradiation (III)****Chairs : Hoon-Kyo Kim (Korea)****James A. Bonner (USA)**

08:00 - 09:30 SBR II

[O25-01]

**The Role of Continuous Intraarterial Chemotherapy with Local Hyperthermia in Treatment of Patients with Malignant Tumours of Nasal, Paranasal Sinuses and Maxilla**

**Akbar Khasanov\***

*Head and Neck, National Oncology Scientific Center of Uzbekistan,  
Uzbekistan*

**Objective:** To study the role of continuous intraarterial chemotherapy in the assessment of the effect of different methods of chemicals introduction in patients with local spread malignant tumours of the maxilla, nasal and paranasal sinuses.

**Method(s):** There treated 178 patients over 2000-2008 year. T3 stage was diagnosed in 81 patients (45,5%) and T4 stage in 97 (54,5%) patients. There revealed squamous cell carcinoma in 122 (68, 5%) patients. The patients were divided into 3 groups depending on the therapy methods: 1) continuous intraarterial chemotherapy with local UHF-hyperthermia and radiotherapy (65 patients), 2) continuous intraarterial chemotherapy and radiotherapy (58 patients), 3) systemic intravenous polychemotherapy and radiotherapy (55 patients). We used the following regimen: Cisplatin 100 mg; Fluorouracil 3,000 mg and Doxorubicin 60 mg. In 1 group, 65 patients received local UHF - hyperthermia with the frequency 40 MHz increasing the temperature up to 41-43°C in the tumour. Patients of 1 and 2 groups, received intraarterial chemotherapy with banding and catheterization of external carotid artery. All patients received telegammatherapy, summary radiation dose 40-60 Grey.

**Result(s):** In 1 group, the direct treatment results showed (complete and partial) objective effect in 61 (93,8%) of 65 patients. In 2 group, in 52 (89,6%) of 58 objective effect was. In 3 group, in 38 (69,0%) of 55 patients objective effect was. Further, in 1 group, maxilla surgery was performed on 43 patients of 65. The surgery procedure was made to 32 patients of 58 in 2 group and 31 patients of 55 in 3 group.

**Conclusion(s):** Thus, neoadjuvant continuous intraarterial chemotherapy and radiotherapy in I and II groups, particularly in I group, allowed to increase significantly direct results than in III group received systemic chemotherapy by intravenous drop injection.

**Keywords:** Malignant Tumour, Intraarterial Chemotherapy, Paranasal sinuses

**Corresponding Author** Akbar Khasanov (akbarkhasanov@mail.ru)

[O25-02]

**A Totally Implanted Intraarterial CDDP Infusion System for Advanced Maxillary Sinus Carcinoma**

**Hiroaki Nakatani\***

*Department of Head and Neck Surgery, Tochigi Cancer Center,  
Japan*

**Objective:** Since 2002, we began utilizing a novel strategy in the treatment of advanced maxillary sinus carcinomas. This consisted of superselective intraarterial cisplatin (CDDP) infusion with concurrent radiation therapy followed by a conservative resection. For this treatment we used a reservoir system to avoid some problems caused by the conventional Seldinger's method. We introduce our method and report our results of 17 patients treated with this system.

**Method(s):** Histopathological analysis of all tumors was squamous cell carcinoma. T3 disease was present in 3 patients, and 14 patients had T4 disease. The patients received intraarterial CDDP (a dose of 100 mg/m<sup>2</sup> per one or two weeks) and intravenous sodium thiosulfate (STS) infusions, and concurrent irradiation was performed to a total dose of 50 Gy before surgery. A microcatheter for intraarterial infusion was inserted into the internal maxillary artery from the facial artery in 3 patients and from the superficial temporal artery in 14 patients. A catheter for STS was also inserted into the superior vena cava and the both infusion systems were totally implanted under the skin.

**Result(s):** CDDP was infused 1 to 7 times (mean, 5.2 times). CR was observed in all T3 patients and one T4 patient. In the other T4 patients, 12 showed PR except one NC patient. The patients with CR or PR underwent partial maxillectomy except a case who refused a surgical therapy and one NC patient had an extensive resection. Tumor recurrence of the primary site was observed in two T4 patients. Two patients developed neck metastasis and one patient had distant metastasis. No patients showed grade 3 or higher adverse effects.

**Conclusion(s):** We conclude that both reservoir systems for intraarterial CDDP and intravenous STS infusions are low invasive, safe and effective procedures for treatment of advanced maxillary sinus carcinoma.

**Keywords:** Maxillary Sinus Carcinoma, Superselective Intraarterial Infusion, Cisplatin

**Corresponding Author** Hiroaki Nakatani (hnakatan@tcc.pref.tochigi.lg.jp)

[O25-03]

## Concurrent Intra-Arterial Chemoradiotherapy vs. Induction Intra-Arterial Chemotherapy in Maxillary Sinus SCC

Galim Adilbaev<sup>1</sup>, Gulzhan Kidirbaeva<sup>1</sup>, Alia Turesheva<sup>2</sup>, Akmaral Savhatova<sup>3</sup>, Georgi Kim<sup>1</sup>, Murat Kaibarov<sup>1</sup>, Daniar Akhmetov<sup>1</sup>, Dauren Adilbay<sup>4\*</sup>

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<sup>4</sup>Head and Neck Oncology, Almaty city cancer hospital, Kazakhstan

**Objective:** Randomized trials have showed a good result of concurrent chemoradiotherapy in advanced SCC of the head and neck. But there are only few trials which evaluates separately the different sites of the head and neck. The aim was to evaluate the toxicity and efficacy of concurrent intra-arterial chemo-radiotherapy of maxillary sinus SCC.

**Method(s):** In total, 54 patients with previously untreated locally advanced maxillary sinus SCC (stage III-IV) were randomized in two arms. First arm received concurrent chemoradiotherapy by followed scheme: 2 cycles of intra-arterial chemotherapy: docetaxel-80 mg/m<sup>2</sup>, cisplatin-100 mg/m<sup>2</sup>, concurrently RT (total dose-60 Gy), depending on the results surgery. Second arm received 2 cycles of intra-arterial chemotherapy: docetaxel-80 mg/m<sup>2</sup>, cisplatin-100 mg/m<sup>2</sup> followed by local treatment (RT or surgery).

**Result(s):** In the first arm, clinical effects were CR in 29,4% patients, PR in 58,8% patients and stable disease in 11,7% patients. Comparing to second arm were CR in 16,2% patients, PR in 67,5% patients and stable disease in 17,6% patients. The following main toxicities of chemoradiotherapy were observed: only in 20,3% patients grade 1-2 neutropenia, All patients have totally completed the treatment. Organ sparing surgery was possible to perform in 62,9% patients of the first arm. At a median follow up time 24 months, 83,3% patients are a life with no presence of disease.

**Conclusion(s):** This regimen of concurrent intra-arterial chemo-radiotherapy is feasible, safe and well tolerated.

**Keywords:** Maxillary Sinus, Chemoradiotherapy, Intra-Arterial

**Corresponding Author** Dauren Adilbay (adilbay82@gmail.com)

[O25-04]

## Combination of Super-Selective Arterial Injection Chemotherapy and Radiation Therapy for Tongue Squamous Cell Carcinoma

Tohru Furusaka<sup>1\*</sup>, Hiroshi Matsuda<sup>2</sup>, Akane Tanaka<sup>3</sup>, Minoru Ikeda<sup>4</sup>

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Nihon University, Japan; <sup>2</sup>Head & Neck Surgery, Tokyo University of

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**Objective:** Since histoculture response drug assay (HRDA) confirmed that squamous cell carcinoma was sensitive for DOC, CDDP, and 5FU, selective arterial injection chemotherapy, which would allow preservation of organs or the function of articulation, chewing, and swallowing, was carried out to achieve a cure of tongue carcinoma without resection, i.e., pathological CR.

**Method(s):** DOC 60 mg/m<sup>2</sup> and CDDP 60 mg/m<sup>2</sup> were infused super-selectively into the tumor feeding arteries via a 4-Fr microcatheter inserted to the femoral artery, while 5FU 750 mg/m<sup>2</sup> was continuously infused intravenously for 120 hours. When PR (1/2×1/2×1/2) was achieved in 80% or more at the end of two cycles of the super-selective arterial injection chemotherapy, the therapy was continued. When it was not achieved, doses of chemotherapeutic agents were reduced (DOC, 50 mg/m<sup>2</sup>; CDDP, 50 mg/m<sup>2</sup>; and 5FU, 600 mg/m<sup>2</sup>), and a combination of super-selective arterial injection chemotherapy and radiation therapy was employed. When CR was not achieved by 40 Gy of radiation with super-selective arterial injection chemotherapy, surgery was carried out.

**Result(s):** The follow-up period ranged from 382 to 3,385 days and the median was 1,815 days (59 months). The five-year survival was 85.8% and the organ preservation (cure without resection) rate was 82.5%.

**Conclusion(s):** The current regimen was more effective than (1) multi-drug chemotherapy by CDDP and 5FU intravenous infusion and (2) arterial injection of CDDP 100 mg/m<sup>2</sup> and 5FU intravenous infusion. Therefore, a combination of super-selective arterial infusion chemotherapy and radiation therapy was an excellent treatment regimen to achieve a cure of tongue carcinoma without resection or pathological CR.

**Keywords:** DOC, CDDP, 5FU

**Corresponding Author** Tohru Furusaka (furusaka@med.nihon-u.ac.jp)

[O25-05]

## Pre-Operative Superselective Intra-Arterial Infusion Therapy with Docetaxel and Cisplatin for Tongue Cancer Patients: First Results of a Phase II Study

**Joel Guigay<sup>1\*</sup>, Thierry De Baere<sup>2</sup>, Francois Bidault<sup>2</sup>, Odile Casiraghi<sup>3</sup>, Frederic Kolb<sup>4</sup>, Anne Marie Leridant<sup>4</sup>, Dana Hartl<sup>4</sup>, Sandrine Faivre<sup>5</sup>, Francois Janot<sup>4</sup>, Stephane Temam<sup>4</sup>**

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**Objective:** The purpose of this phase II study is to evaluate the feasibility and the efficacy of a new intra-arterial induction chemotherapy (IAC) with a taxane in tongue cancer patients (pts).

**Method(s):** Patients PS 0-1, with resectable tongue cancer (T2-T4 N0-N2 except T2N0, M0) without any prior therapy, are included since 2003. Superselective intra-arterial infusion via the femoral artery (Seldinger method) with docetaxel ( $75 \text{ mg/m}^2$ ) and cisplatin ( $75 \text{ mg/m}^2$ ) is performed one or twice before surgery.

**Result(s):** Until now, 18 pts have been included whom 7 received 2 courses. 3 pts could not be catheterized and did not receive IAC. No severe toxicity has been observed: 3 grade 4 short neutropenia without fever, 5 grade 3 alopecia, 4 grade 3 lingual painful necrosis and 1 grade 2 cutaneous necrosis. Local oedema was common. On 15 evaluable pts, we observed after chemotherapy 9 objective responses (60%), including 1 tumoral and 3 nodal complete pathological responses. All pts have been operated and 11 received post-operative radiotherapy. The follow-up is upper to 2 years for 10 evaluable pts: 7 are alive without disease (90% survival at 2 years). Follow-up is not sufficient for 5 other pts. On 11 evaluable pts, 9 pts had good functional results.

**Conclusion(s):** These first results are encouraging and the study is ongoing including patients candidate for free flap reconstruction following surgical resection.

**Keywords:** Chemotherapy, Tongue Cancer, Docetaxel

**Corresponding Author:** Joel Guigay (guigay@igr.fr)

[O25-06]

## Full-Dose Intraarterial Cisplatin Infusion for Patient of Oral Floor Carcinoma Undergoing Hemodialysis for Chronic Renal Failure

**Takehito Kishino<sup>1\*</sup>, Hiroshi Hoshikawa<sup>1</sup>, Masafumi Yonezaki<sup>1</sup>, Yoko Nishijima<sup>2</sup>, Tadashi Sofue<sup>2</sup>, Taiga Hara<sup>2</sup>, Satoshi Uchinomura<sup>3</sup>, Nozomu Mori<sup>1</sup>**

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<sup>2</sup>Division of Nephrology and Dialysis, Kagawa University, Japan

<sup>3</sup>Department of Radiology, Kagawa University, Japan

**Objective:** Treatment of malignant tumor for patient with chronic renal failure is difficult because of dose limitation of chemotherapeutic agent. Appropriate dose of cisplatin is not yet well established for patients under hemodialysis. To reduce systemic drug exposure and increase regional delivery of cisplatin, we used hemodialysis concomitant with intraarterial infusion of cisplatin. This method enabled highly efficient free (non-protein binding) platinum removal.

**Method(s):** Hemodialysis was started before intraarterial infusion of cisplatin and finished about 4-5 hours after the end of cisplatin infusion. Two courses of intraarterial cisplatin infusion ( $100 \text{ mg/m}^2$ ,  $170 \text{ mg/body}$ ) were performed at six weeks interval. These infusions were carried out concomitant with radiotherapy (2 Gy/Fr, 5Fr/week, total 70 Gy). Both free platinum and total platinum levels in plasma were measured by atomic absorption spectrometer.

**Result(s):** Treatment was completed with minimum acute toxicity. Total plasma platinum levels at the end of first infusion and second infusion were  $4.65 \mu\text{g/mL}$  and  $3.85 \mu\text{g/mL}$ , respectively. Free plasma platinum levels at the end of first infusion and second infusion were  $2.93 \mu\text{g/mL}$  and  $2.11 \mu\text{g/mL}$ , respectively. As of about three weeks after the second infusion of cisplatin, no hematological toxicity over grade 3 was observed. Non-hematological toxicity was light nausea only. At the visual examination after these therapy, the tumor was not observed.

**Conclusion(s):** These results suggest that this method can provide the possibility for full-dose infusion of cisplatin to patients undergoing hemodialysis with low risk of toxicity.

**Keywords:** Intraarterial Infusion, Cisplatin, Hemodialysis

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[O25-07]

## High Expression of Cancer Testis (CT) Antigens in Advanced Squamous Cell Carcinoma of the Larynx

**David Livingstone figueiredo<sup>1\*</sup>, Rui Mamede<sup>2</sup>, Giulio Spagnoli<sup>3</sup>, Wilson Silva jr.<sup>4</sup>, Marco Zago<sup>5</sup>, Luciano Neder<sup>6</sup>, Achim Jungbluth<sup>7</sup>, Fabiano Saggioro pinto<sup>8</sup>**

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**Objective:** The aim of this study was to analyze the expression of CT antigens in squamous cell carcinoma of the larynx (LSCC) and to correlate their potential presence with pathomorphological as well as clinical data.

**Method(s):** We evaluated by immunohistochemical the expression of CT antigens MAGE-A4 (57B), MAGE-C1 (CT7-33), MAGE-A1 (MA454), MAGE-A3 (M3H67), MAGE-C2 (CT10.5), NY-ESO-1 (E978), and GAGE (GAGE) in laryngeal squamous cell carcinoma (LSCC).

**Result(s):** A total of 63 cases of LSCC were available. Expression of at least one CT antigen was detected in 42/63 of the LSCCs. In 34/42 of positive cases there was simultaneous expression of two or more CT antigens. There was significant correlation between antigen expression and advanced tumor stage (stage III/IV) ( $P=0.01$  cases with reactivity to only one antibody;  $P=0.04$  cases with reactivity to two or more antibodies).

**Conclusion(s):** Our data indicate that CT antigens could be valuable vaccine targets in laryngeal tumors especially in those with a worse prognosis.

**Keywords:** Larynx Cancer, Tumor Antigens, Cancer Testis Antigens

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[O25-08]

## Improvement of Vocal Cord Fixation after Chemoradiation in Advanced Laryngeal and Hypopharyngeal Cancer

**Siyoun Song\*, Yongdae Kim, Changhoon Bai**

*Otorhinolaryngology-Head & Neck Surgery, Yeungnam University, Korea*

**Objective:** For preserving larynx, non-operative modalities are using for advanced laryngeal and hypopharyngeal cancer. Even though non-operative treatment is successful, adverse effects are inevitable such as late toxicity, preservation of a dysfunctional larynx, risk for second primary tumors and increased complication rate and reduced survival after salvage surgery. The purposes of this study are suggesting the factors for predicting the returning of vocal cord mobility after chemoradiation in advanced laryngeal and hypopharyngeal cancer accompanying vocal cord fixation, reducing side effects of chemoradiation and increasing success rate of salvage surgery.

**Method(s):** We undertook a retrospective study of 13 male patients treated between January, 2000 and January, 2008 for previously not treated T3 and T4 laryngeal and hypopharyngeal squamous cell carcinoma having vocal cord fixation by sequential chemoradiation primarily.

**Result(s):** Among 13 patients, vocal cord mobility was recovered in 8 patients (61.5%), but not recovered in 5 patients (38.5%). All patient with no recovery experienced local recur or progression of disease during treatment and died within 3 years after primary treatment. Age (over than 60 years old), T-stage 4, primary site (hypopharynx), positive neck node and cell differentiation (poorly) showed the trend of poor prognosis, but statistically not significant due to small number of patients. Return of mobility showed statistically significant good prognosis.

**Conclusion(s):** Return of vocal cord mobility after chemoradiation may be highly predictive factor for good prognosis. And failure to return of vocal cord mobility means to requirement for early changing of the treatment modality.

**Keywords:** Vocal Cord Fixation, Chemoradiotherapy, Laryngeal Cancer

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## O26. QOL & Supportive Care (II)

Chairs : Kang Dae Lee (Korea)

Ernest A. Weymuller (USA)

08:00 - 09:30 SBR III

[O26-01]

### A Randomized Preventive Rehabilitation Trial in Advanced Head and Neck Cancer Patients Treated with Chemo-Radiotherapy: Feasibility, Compliance and Short-Term Effects

**Lisette Van der molen<sup>1</sup>, Maya Van Rossum<sup>2</sup>, Lori Burkhead<sup>3</sup>, Ludi Smeele<sup>1</sup>, Coen Rasch<sup>4</sup>, Frans Hilgers<sup>1\*</sup>**

<sup>1</sup>Department of Head and Neck Oncology and Surgery, The Netherlands Cancer Institute, Netherlands; <sup>2</sup>Departement of Otorhinolaryngology, Leiden University Medical Centre, Netherlands; <sup>3</sup>Departement of Otolaryngology Voice and Swallowing Centre, Medical College of Georgia, USA; <sup>4</sup>Departement of Radiation Oncology, The Netherlands Cancer Institute, Netherlands

**Objective:** Given the functional consequences of concomitant chemo-radiotherapy (CCRT) the number of studies on the effect of (preventive) rehabilitation on swallowing and mouth opening after chemo-radiotherapy is disappointing. Therefore a controlled randomized trial (RCT) on preventive rehabilitation was conducted, evaluating feasibility, compliance and short-term effects of two different stretch and strength exercise programs.

**Method(s):** Forty-nine patients with advanced oral cavity, oropharynx, hypopharynx and larynx, or nasopharynx cancer treated with CCRT were randomized into the standard (S-group; regular SLP exercises), or the experimental arm (E-group; exercises based on the TheraBite yaw motion device). All patients were assessed by means of a structured multidimensional assessment protocol (i.e. videofluoroscopy, mouth opening measurements, functional oral intake scale, BMI, and trial specific questionnaires) before and approximately 10 weeks after CCRT. All exercises started before onset of the CCRT.

**Result(s):** In both S- and E-group feasibility was good (all patients could execute the exercises within a week), and compliance was satisfactory (mean practicing 4 days a week). Still, there was a significant decreased mouth opening, oral intake and weight ( $P<0.01$ ,  $P=0.023$ , and  $P<0.01$ , respectively). Compared with an earlier CCRT study in our Institute less patients were still tube-dependent at 10 weeks after CCRT (70%; 64/92 versus 37%; 18/49, respectively). Patients in the E-group practiced significantly fewer days in total and per week as the S-group ( $P=0.04$ ), without differences in outcome parameters.

**Conclusion(s):** Preventive rehabilitation in head and neck cancer patients, despite advanced stage and burdensome treatment, is feasible with good compliance and seems helpful to reduce extent and/or severity of various functional short-term effects of CCRT with either of the two rehabilitation regimes applied. These findings justify further investigation of the role of pretreatment exercises on the long-term.

**Keywords:** Head and Neck Cancer, Concomitant Chemo-Radiotherapy, Preventive Rehabilitation

**Corresponding Author** Frans Hilgers (f.hilgers@nki.nl)

[O26-02]

### Reliability and Validity of a New Speech Evaluation Tool “Speech Handicap Index” for English Speaking Head-Neck Cancer Patients

**Raghav Dwivedi\*, Suzanne St. Rose, Justin Roe, Edward Chisholm, Christopher Nutting, Peter Clarke, Cyrus Kerawala, Peter Rhys-Evans, Kevin Harrington, Rehan Kazi**

*Head-Neck Unit, Royal Marsden Hospital, UK*

**Objective:** Although there are many voice-specific scales, surprisingly there is no speech-specific questionnaire for English-speaking head and neck cancer (HNC) patients. The aim of this study is to validate the Speech Handicap Index (SHI) as the first speech-specific questionnaire in the English language.

**Method(s):** Sixty-three consecutive English-speaking patients in follow-up for oral or oropharyngeal cancers at The Royal Marsden Hospital, London, UK were recruited for this study. The English version of SHI consists of 30 well-constructed questions to evaluate the patient's speech and psycho-social functions. For the purpose of validity, we have utilized the speech and social function domains of the UWQOL V.04. A randomly selected subset of thirty-two patients was asked to complete both the questionnaires again after four weeks in order to assess test-retest reliability. Internal consistency and test-retest reliability were assessed using Cronbach's alpha and Spearman's correlation coefficient, respectively. Construct and group validity were determined using the Mann-Whitney U-test using SPSS-15.

**Result(s):** The internal consistency reliability for Total SHI and SHI speech domain as calculated by Cronbach's alpha coefficient was 0.98 and 0.95, respectively. For SHI psycho-social domain alpha coefficient was 0.98. Test-retest reliability of Total SHI and SHI speech domain as calculated by Spearman's rank correlation coefficients were 0.92 and 0.88, respectively. For SHI psycho-social domain the coefficient was 0.89. The correlation coefficients between Total SHI score, the SHI speech domain, the SHI psycho-social domain and overall SHI speech assessment question, and speech domain of UWQOL were 0.72, 0.72, 0.71 and 0.68, respectively. The correlations between Total SHI score, the SHI speech domain, the SHI psycho-social domain and overall SHI speech assessment question, and social domain of the UWQOL were 0.44, 0.44, 0.43 and 0.35, respectively.

**Conclusion(s):** The SHI is a precise, highly reliable and valid speech assessment tool for HNC patients.

**Keywords:** Speech Handicap Index (SHI), Validation, Head-Neck Cancer

**Corresponding Author** Raghav Dwivedi (raghav\_dwivedi@rediffmail.com)

[O26-03]

## **Incidence and Risk Factors of Hypothyroidism after Thyroid Lobectomy in the Early Post-Operative Period**

**Choakchai Metheetrairut\***, Apaporn Eiamkulvorapong, Piboon Surepong

Otolaryngology, Siriraj Hospital, Mahidol University, Thailand

**Objective:** To evaluate the incidence and contributing factors of hypothyroidism after hemithyroidectomy.

**Method(s):** A prospective study was performed in patients with single site thyroid nodule and had hemithyroidectomy. Anti-thyroglobulin and anti-microsomal antibody titer were measured in the pre-operative period. All patients were followed at the sixth week after surgery. The patients were interviewed for the symptoms of hypothyroid and had thyroid function test. In addition, the information in relation to the histopathology was reviewed by one pathologist.

**Result(s):** One hundred patients were recruited in our study. The incidence of post hemithyroidectomy hypothyroidism was 27%. Clinical hypothyroidism was found in 6% whereas 21% was found to be subclinical hypothyroidism. In our study, high grade lymphocytic thyroiditis was found in 9 of 27 patients in the hypothyroid group and 6 of 73 in the euthyroid group ( $P=0.002$ ). Elevation of pre-operative antimicrosomal antibody was found in 3 of 13 in the hypothyroid group and none in the euthyroid group ( $P=0.016$ ). Preoperative antithyroglobulin Ab elevation was found in 1 of 13 patients in the hypothyroid group and none in 23 patients in the euthyroid group ( $P=0.177$ ). However, there was no correlation between hypothyroidism and the patients' sex, age and tumor size.

**Conclusion(s):** In our study, the incidence of post-hemithyroidectomy hypothyroidism was 27%. Pre-operative antimicrosomal antibody elevation was associated with the increased risk of post hemithyroidectomy hypothyroidism. Therefore, post thyroidectomy follow-up and thyroid function evaluation is recommended. Antimicrosomal antibody elevation before surgery and histopathology of high grade lymphocytic infiltration are correlated with a higher opportunity for the development of hypothyroidism after hemithyroidectomy.

**Keywords:** High Grade Lymphocytic Thyroiditis, Antimicrosomal Ab, Antithyroglobulin Ab, Hypothyroidism

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[O26-04]

## **Functional Outcome after Reconstruction of Partial and Hemiglossectomy Defects - Comparison of Free Flaps, Pedicled Flaps and No Reconstruction**

**Subramania Iyer<sup>1\*</sup>, Moni Abraham Kuriakose<sup>2</sup>, Shilpa Chatni<sup>3</sup>, Mayuri Rajapurkar<sup>1</sup>, Bibitha KB<sup>1</sup>, Pattatheyil Arun<sup>1</sup>, Paul Sebastian<sup>4</sup>, Sajith R<sup>4</sup>, Swapna Sebastian<sup>4</sup>, Shaji Thomas<sup>5</sup>**

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<sup>4</sup>Head and Neck Surgery, Regional Cancer Center, Thiruvananthapuram, India

<sup>5</sup>Head and Neck Surgery, Regional Cancer Centre, Thiruvananthapuram, India

**Objective:** Reconstruction of defects after resection of more than a third of the mobile tongue has been controversial with regards to their effect on tongue movements and speech. Studies comparing the different methods of treatment are not available and what has been reported consist of non homogenous study population and methods of reconstruction. A prospective multicenter study was conducted to study the effect no reconstruction, reconstruction using a pedicled submental flap and free flaps of the defects of more than 1/3rd and less than 2/3rd of the mobile tongue after resection of cancers.

**Method(s):** This prospective study included 15 patients each who had no reconstruction or reconstruction using pedicled flaps (submental) and free flaps (lateral arm or radial forearm). The defects of the tongue after resection of the cancers was between 1/3rd and 2/3rds of the tongue. The evaluations were done preoperatively, in the immediate post operative period and after six months. The speech was analyzed using a specially developed tool in a blinded fashion by independent speech analysts. The tongue protrusion was graded and the effect of radiation therapy on the functions were also noted and analyzed.

**Result(s):** The speech analysis tool allowed the independent observer to objectively grade the results in speech production in these groups.

**Conclusion(s):** The results in the articulation scores, production of syllables, words and paragraphs will be reported in each group. The tongue movements and the effect of radiation therapy on the movement and speech will also be reported.

**Keywords:** Speech Outcomes, Glossectomy, Carcinoma Tongue

**Corresponding Author** Subramania Iyer (subu@aims.amrita.edu)

[O26-05]

## Functional Sequelae and Quality of Life after Sentinel Node Excision versus Modified Radical Neck Dissection in Patients with Oropharyngeal and Supraglottic Cancer with Clinically Negative Neck

**Georges Lawson<sup>1,\*</sup>, Stephane Kesch<sup>1</sup>, Nayla Matar<sup>1</sup>, Jacques Jamart<sup>2</sup>, Marc Remacle<sup>1</sup>, Jean-baptiste Watelet<sup>3</sup>, Hubert Vermeersch<sup>3</sup>**

<sup>1</sup>ENT&Head Neck, Cliniques Universitaires Mont-Godinne, Belgium

<sup>2</sup>Biostatistic, Cliniques Universitaires Mont-Godinne, Belgium

<sup>3</sup>ENT&Head Neck, Ghent University Hospital, Belgium

**Objective:** Compare the functional sequelae and quality of life (QOL) in two groups of patients with oropharyngeal or supraglottic carcinoma with clinically negative neck (N0): the first group treated with modified radical neck dissection (RMND) after analysis of the sentinel node (positive node), the second treated with sentinel node (SN) resection alone (negative node).

**Method(s):** We prospectively included 58 patients (47 men and 11 women; Mean age 63 years) with oropharyngeal or supraglottic carcinoma without clinical or radiological evidence of neck metastasis. All of them had SN resection. Those with immunohistologically positive nodes had a RMND. Patients with previous cervical or scapular disease were excluded. QOL was assessed using EORTC questionnaires: QLQ-C30, QLQ-H&N35. Functional sequelae were evaluated using the objective and subjective criteria of Hiroyuki. Assessment was performed at least 3 months after the end of the treatment.

**Result(s):** Twenty patients (34,5%) had SN resection alone. Thirty eight (65,5%) had SN resection followed by neck dissection. Twenty one patients had bilateral neck dissection and 17 had unilateral neck dissection. Histological lymph node staging showed: 44pN0 (75,9%); 6pN1 (10,3%), 5pN2a (8,6%), 2pN2b (3,45%), 1pN2c (1,7%). In the first group, 50,4% of the patients presented with functional sequelae. None of the second group patients presented with scapular pain or limitation ( $P<0,000$ ). health-related QOL appear to differ between patients undergoing SNB and RMND ( $P<0,002$ ).

**Conclusion(s):** Sentinel node detection permits a good staging of cervical node involvement while reducing the morbidity related to neck dissection. Oncological results are as good as those with primary MRND. It has the advantage of a better QOL and less functional sequelae in patients with N0 neck without reduction of survival.

**Keywords:** Sentinel Node, Quality of Life, Neck Dissection

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[O26-06]

## The Influence of Breathing Resistance on Breathing Pattern in Laryngectomized Individuals and the Effect of Different Heat and Moisture Exchangers on Endotracheal Temperature and Humidity

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**Objective:** Assessment of the short-term endotracheal climate changes of two frequently used HME's and of a recently developed HME with integrated antimicrobial filter, and determination of the influence of breathing resistance of heat and moisture exchangers (HME's) on endotracheal climate and breathing pattern.

**Method(s):** Measurement of endotracheal temperature and humidity and tidal volumes in 13 laryngectomized patients breathing through a regularly used HME with 'standard' breathing-resistance (Provox Normal HME; R-HME), a low breathing-resistance HME (Provox HiFlow HME; L-HME), and an HME with integrated antimicrobial filter (Provox Micron HME; F-HME) and breathing through an open stoma.

**Result(s):** Both R-HME and L-HME increase end-inspiratory humidity (+5.8 and 4.7 mgH2O/L, respectively) and decrease end-inspiratory temperature (-1.6 and -1.0 C, respectively). Although the moistening capacity of the F-HME equals the L-HME, it increases the end-inspiratory temperature instead (+1.1 C). All HME's prolong the exhalation breath length with approximately 0.5 s. The R-HME enlarges tidal volumes significantly (0.07 L;  $P<0.05$ ).

**Conclusion(s):** All HME's improve tracheal humidity significantly and the F-HME also improves tracheal temperature, probably due to the additional antimicrobial filter acting as a heat exchanger. The R-HME has better moistening properties and a small, but significant positive effect on tidal volume. Therefore, if the higher resistance is tolerated, the R-HME is the preferred pulmonary rehabilitation device. The L-HME is indicated if lower breathing-resistance is required, e.g. during physical exertion or when used in combination with a trachea cannula. The F-HME also increases endotracheal temperature and provides extra airway protection.

**Keywords:** Total laryngectomy, Heat and Moisture Exchanger, Breathing Resistance

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[O26-07]

## Quality of Life Following Endoscopic Skull Base Surgery

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**Objective:** This paper provides prospective data on QOL outcomes and sinonasal morbidity in patients that underwent endonasal cranial base surgery for management of skull base tumors.

**Method(s):** We examined the QOL outcomes and the nasal morbidity in patients undergoing the endonasal approach for a variety of skull base lesions at our institution at different time points following surgery. We employed the multidimensional disease-specific questionnaire for anterior skull base neoplasms developed by Gil and associates and the disease-specific validated sinonasal outcome test (SNOT)-22 questionnaire that provides a symptom score for parameters relating to sinonasal function.

**Result(s):** There were 51 patients that participated in this study. Overall, patients had good to very good QOL scores following the endonasal approach. There was no statistically significant difference in the mean overall QOL score over the time periods. The overall and domain-specific QOL scores were significantly higher in patients undergoing primary surgery compared with those undergoing secondary operations and significantly higher in patients undergoing transellar approach compared with those who underwent non-transellar approaches. The overall QOL score across various time points was also significantly better in patients that did not have nasal septal flap reconstruction compared with those that did. A statistically significant improvement in the SNOT-22 score was observed between the periods 1-3 and 6-12 months after surgery. The scores were significantly better in patients undergoing transellar approach compared with those undergoing other approaches. The SNOT-22 scores were also significantly better in patients who did not have nasal septal flap reconstruction compared with those who did.

**Conclusion(s):** QOL is very good following endonasal skull base surgery and is dependent on the endonasal approach and method of reconstruction. QOL stabilizes by 3 months following surgery.

**Keywords:** Quality of Life, Skull Base Surgery, Endoscopic Surgery

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[O26-08]

## Mitomycin-C Local Application in Endoscopic Dilatation for Refractory Pharyngo-Esophageal Stenosis Post Multi-Modal Head and Neck Cancer Treatment

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**Objective:** The aim of this study was to assess the efficacy and safety of local application of Mitomycin C (MMC) at the time of dilatation in refractory pharyngo-esophageal strictures post head and neck multi-modal cancer treatment.

**Method(s):** This pilot prospective study was designed to include 25 patients with refractory pharyngo-esophageal stenosis. Refractory strictures are defined as any kind of luminal cicatricial or fibrosis that results in clinical symptoms of dysphagia that could not be successfully remediate with endoscopic dilatation over 3 sessions at 3-weeks interval. After an endoscopic dilatation, MMC (0,5 mg/mL) was applied onto the stenotic segment for 5 minutes. All patients underwent videofluoroscopic study, a swallowing-related quality of life evaluation measured by the Swal-QOL inventory and measure of the interval time until recurrence of dysphagia symptoms after MMC local application

**Result(s):** Before dilatation and local application of MMC the interval between dilatations were always 21 days. After the treatment the interval varied from 21 to 100 days (mean of 68,8 days). With 7 patients, there was already a statistical significant difference between the interval time inter dilatation ( $P=0,0101$ ), with no complications. That fact allows us to reduce the sample size of the present study. Statistical analyses were performed in the Swal-QOL and in the videofluoroscopic study scores with improvement in both.

**Conclusion(s):** MMC was safe and effective in enlarging the interval time between dilatations in refractory pharyngoesophageal stenosis post multimodal head and neck cancer treatment. However to determine whether MMC local application could be an option as a medical adjunct for endoscopic management in all upper-cervical strictures, a randomized, controlled trial is needed.

**Keywords:** Dysphagia, Refractory Stenosis, Mitomicyn C

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[O26-09]

## **Early Decannulation before Starting SwallowingI Trainning In Supracricoid Partial Laryngectomy: Preliminary Results**

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Giovanni Cristalli<sup>2</sup>**

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**Objective:** The major laryngeal responsibilities are phonation, deglutition, respiration, and airway protection. In healthy subjects the admittance of substances under glottic plane is about 50% during the sleep (Huxley, 1978). Partial laryngectomy used to profoundly alter the anatomy of the cervical region. Furthermore, in recent decades, the widespread diffusion of the supracricoid laryngectomy in the treatment laryngeal cancer, allow to treat even selected advanced cases, elderly patients or radiotherapy failure. The swallowing recover and the decannulation are the main target of this surgery but nowadays there is not a standard rehabilitation protocol or a single conduct about the tracheostoma permanence. The tracheal tube positioned during supracricoid laryngectomy (CHP, CHEP) opposes the movement of the larynx and desensitizes the tracheal mucosa making inefficient the cough reflex. The aim of this randomized study is to show that the early decannulation improves swallowing rehabilitation time.

**Method(s):** From January to September 2008, were randomized 20 patients underwent to supracricoid partial laryngectomy (11 CHP and 9 CHEP). The patients were divided in two arms depends on the rehabilitation modality: A (deglutition training without tracheostomy tube) and B (deglutition training with tracheostomy tube).

**Result(s):** The mean time for naso-gastric feeding tube removing was 17.8 days for A group and 21.1 days for B group.

**Conclusion(s):** Early decannulation in supracricoid laryngectomy improves swallowing training with rapid naso gastric-feeding tube removing.

**Keywords:** Supracricoid Partial Laryngectomy, Swallowing Training

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**O27. Thyroid Gland (I) : Node**

**Chairs : Hang-Seok Chang (Korea)**  
**Anatoly Romanchisen (Russian)**

08:00 - 09:30 SBR IV

[O27-01]

## Is BRAF Mutation Always Predictive of Lymph Node Metastasis in Patients with Papillary Thyroid Carcinoma, Irrespective of Tumor Size?

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**Objective:** Lymph node (LN) metastasis is known to increase with tumor size in papillary thyroid carcinoma (PTC). T1799A BRAF mutation has been reported to be associated with LN metastasis, but not with tumor size. The goal of this study was to investigate relationship between BRAF mutation and LN metastasis, according to tumor size.

**Method(s):** From January 2009 to August 2009, we prospectively enrolled 71 patients with unifocal PTC. BRAF mutation status was tested on preoperative fine-needle aspiration biopsy specimen. Patients were classified into three groups according to tumor size: group I with tumors  $\leq 0.5$ cm, group II with tumors  $> 0.5$ cm,  $\leq 1$ cm, and group III with tumors  $> 1$ cm.

**Result(s):** Frequency of LN metastasis increased significantly with tumor size; 4.8% in group I, 50.0% in group II, and 66.7% in group III ( $P<0.001$ ). However, frequency of the BRAF mutation was not different among the three groups; 61.9% in group I, 56.3% in group II, and 72.2% in group III ( $P=0.536$ ). Only in group II, BRAF mutation was predictive of LN metastasis ( $P=0.026$ , Odds ratio=12.730).

**Conclusion(s):** BRAF mutation status is not predictive of LN metastasis in very small or significantly large PTCs.

**Keywords:** Thyroid Carcinoma, BRAF Mutation, Lymphatic Metastasis

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[O27-02]

## The Prognostic Value of Preoperative CT Mapping for Neck Node Metastases in Papillary Thyroid Carcinoma with Neck Lymph Node Metastases

Soliman El-shakhs\*

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**Objective:** Significant risk factors for papillary thyroid cancer included the numbers of LN metastases, extracapsular extension, tumor size, and LN metastases location (central). The most important risk factors for recurrent disease included the numbers of LN metastases. In-spite of total thyroidectomy with central and ipsilateral or bilateral neck dissection, the uptake outside the thyroid bed, demonstrate persistent disease, on the post-ablation total body scan (TBS) in 50% of the 52 patients, Operated at the university hospital between 1998-2003.

**Method(s):** To evaluate the prognostic impact of the extent of lymph node (LN) dissection based on a preoperative CT mapping for all nodal level, and tumor extension beyond the thyroid capsule. We studied a group of 44 consecutive papillary thyroid cancer. Initial treatment, performed, between 2003 and 2008, in all patients a total thyroidectomy with central and ipsilateral or bilateral en bloc neck dissection followed by radioactive iodine ablation.

**Result(s):** Uptake outside the thyroid bed, demonstrating persistent disease, was found on the postablation total body scan (TBS) in only 20% of the patients. Five-year disease-specific survival rate was 99% in comparison to 93%.

**Conclusion(s):** The most important risk factors for recurrent disease included the numbers of LN metastases, the preoperative CT mapping adds a significant improvement of treatment results based on more accuracy in identification of node metastases.

**Keywords:** Pre-operative CT, Papillary Thyroid Cancer, Neck Node Metastases

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[O27-03]

## Papillary Thyroid Carcinoma and Lateral Cervical Metastases

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**Objective:** Papillary thyroid carcinoma is characterized by a high rate of cervical metastases, especially due to paratracheal lymph node involvement. The aim of our study is to determine the pattern of lateral cervical nodal metastases from papillary thyroid carcinoma, the extent of surgery in patients with lateral cervical metastases, the frequency of skip metastasis and the utility of level IIb neck dissection in regard to risk of shoulder dysfunction, and reduced risk of recurrence of disease.

**Method(s):** In a prospective study from 2004 to 2009 we have operated 43 previously untreated patients with concomitant diagnosis of papillary thyroid carcinoma and metastatic lateral neck disease. All patients underwent preoperative ultrasonography and had FNAB-confirmed diagnosis of primary tumor and lymph node metastases. All patients underwent neck dissections of levels II-VI and level VII. In 9 patients bilateral dissection was performed.

**Result(s):** Total number of evaluated LNs was 1894 with metastases found in 229 LNs. The most common region of lateral neck metastasis was level III (80% patients), followed by level IV (64%), level II (37%), and level V (23%). 64.7% of patients presented with multiple-level nodal involvement. LN level IIb was involved in 3 patients. All patients with level IIb involvement had also level IIa metastasis. One patient (2%) had false positive FNAB of LNs, showing no metastatic LNs on histological examination. Three patients had lateral neck metastasis without level VI nodal disease.

**Conclusion(s):** The most common region of metastasis is level III, and more than 2/3 of patients had more than one level involved. We have confirmed the pattern of lateral and central nodal metastasis in papillary thyroid carcinoma similar to that reported previously Level III was the most frequently involved. The number of skip metastases was low.

**Keywords:** Thyroid Carcinoma, Papillary Carcinoma, Neck Metastases

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[O27-04]

## Clinical Characteristics of Regional Recurrence in Papillary Thyroid Carcinoma with Lymph Node Metastasis

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**Objective:** Optimal treatment of regional lymph node metastasis (LNM) and regional recurrence is important. However, the optimal extent of lymph node dissection is in dispute. The aim of this study is to investigate predisposing factors that are associated with regional lymph node (LN) recurrence and clinical characteristics of recurrent regional LN.

**Method(s):** Patients who had papillary thyroid carcinoma (PTC) with LNM between 2000 and 2008 were retrospectively analyzed. Total of 117 patients were included. All study groups underwent total thyroidectomy with central neck dissection, radioactive iodine ablation therapy and thyroid hormone suppression therapy. Among these patients, 95 patients had lateral neck metastasis. When LNM was in single level of lateral neck, neck dissection was performed only in the involved single level (n=22), and in cases with more than two levels, neck dissection was performed in multi-levels (n=73). Age, gender, tumor size, multiplicity of primary tumor, extrathyroid spread, T stage, N stage, AJCC stage, AMES score, multiplicity of LNM level, neck dissection extent, location of regional recurrence were analyzed.

**Result(s):** Overall regional recurrence rate was 23.1%. Only contralateral multiplicity of LNM was statically significant in univariate/ multivariate analysis. In 84 patients with unilateral tumor, contralateral metastasis rate was 22.6% and among them, lateral neck metastasis was 6%. We didn't find any difference according to the extent of lateral neck dissection. In-field recurrence rate was 8.5% and out-field recurrence was 14.5%. Average recur time was 20.4 months. The most common levels were level VI in infield recurrence and level IV in outfield recurrence.

**Conclusion(s):** Only LNM in contralateral multiple level was significant predisposing factor to predict regional recurrence. Most of recurrence occurred on ipsilateral side, infield recurrence on level VI, and outfield recurrence on level IV. Selective neck dissection is a good treatment strategy. However, when contralateral LNM is expected, we should perform relatively comprehensive ND.

**Keywords:** Regional Recurrence, Lymphatic Metastasis, Thyroid Neoplasms

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[O27-05]

## Is It Necessary to Perform Routine Dissection of Superior Paratracheal Lymph Nodes (SPTLN) during the Central Compartment Neck Dissection for Thyroid Cancer Surgery?

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**Objective:** The prophylactic central compartment neck dissection (CCND) for the surgical treatment of papillary thyroid carcinoma (PTC) is ongoing controversy. The most common reasons of opposition for prophylactic CCND is serious perioperative complications such as permanent hypoparathyroidism or recurrent laryngeal nerve (RLN) palsy. It is well-known that SPT area is not LN-bearing, however, there is no evidence-based study sustaining this fact. In this study, we evaluated the existence of LN around SPT area through routine SPTLN dissection during thyroid surgery for PTC.

**Method(s):** From Apr. 2009 to Oct. 2009, 273 patients with papillary thyroid cancer have been enrolled in this study and performed thyroidectomy with CCND including SPTLN dissection. SPTLN was defined as the area marginated by inferior thyroidal artery, common carotid artery, lateral border of thyroid gland and the level of superior thyroidal vascular pedicles.

**Result(s):** The mean age of patients was  $45.2 \pm 11.1$  years and gender ratio (male to female) was 51:222 (1:4.4). Less than total and bilateral total thyroidectomies were performed in 65 and 208 patients, respectively. Additional MRND was performed in 32 patients. Central L/N metastasis was seen in 112 (41%) cases. The SPTLN was identified in 18 (6.5%) patients and the number was 34 (mean number  $1.88 \pm 0.96$ ). Among them, metastatic L/N was observed in 6 cases. In the cases with metastatic SPTLN, it is statistically related with the facts of lateral neck node metastasis ( $P < 0.0001$ ), lesion located at upper pole (83.3%,  $P = 0.033$ ), diffuse sclerosing variant of PTC (33.3%,  $P = 0.024$ ) and multiple central neck node metastasis ( $P = 0.044$ ).

**Conclusion(s):** In our study, SPTLN is not identified except in 18 (6.5%) cases. So, routine SPTLN dissection is not needed during CCND for the surgical treatment of PTC. We suggest that SPTLN dissection is necessary only in the cases with lateral neck node metastasis, diffuse sclerosing variants, superiorly located lesion and clinically multiple nodes metastasis in central area.

**Keywords:** Superior Paratracheal Lymph Node, Central Compartment Neck Dissection, Papillary Thyroid Carcinoma

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[O27-06]

## Clinical Implication of Bilateral Lateral Cervical Lymph Node Metastasis in Papillary Thyroid Cancer: Risk Factor for Lung Metastasis

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**Objective:** Distant metastasis to the lung in papillary thyroid cancer (PTC) is rarely detected but has been known to be one of the important prognostic factors associated with survival. We investigated risk factors for lung metastasis in PTC.

**Method(s):** The patients, who were treated with PTC from January, 2006 to August, 2009 were 977 and were reviewed. We excluded the patients who underwent hemithyroidectomy or no further examination of metastasis. Enrolled patients received radioablation therapy followed by radioiodine whole body scan (WBS). Lung metastasis was screened out with WBS or PET/CT and confirmed with chest CT. Age, gender, extrathyroidal extension, central lymph node metastasis, lateral lymph node metastasis (LNM) and bilateral lateral cervical lymph node metastasis (BLNM) were investigated to define the relationship with lung metastasis.

**Result(s):** Enrolled patients were 949. The median age was 49 years ( $\pm 13$ ) with 829 females. Lung metastasis was found in 20 patients (2.1%). Young patients (<45 years) were 35.5%. Tumor size was divided into 3 groups ( $\leq 1$  cm, 1-2 cm,  $> 2$  cm) and each group was 47.3%, 28.5% and 24.1%. Extrathyroidal extension and multifocal primary tumors were observed in 54.3% and 24.8%. Central-and lateral cervical lymph node metastasis were presented in 53.0% and 16.9%. BLNM was identified in 4.4% (n=43). In a chi-square test, male, old age, large tumor, extrathyroidal extension, LNM and BLNM were significantly related to lung metastasis ( $P < 0.05$ ). But in a multiple logistic regression, BLNM appeared to be only risk factor for lung metastasis ( $P = 0.026$ , odds ratio=10.219).

**Conclusion(s):** BLNM may be regarded as one of the risk factors related with lung metastasis. This infers that careful exams including chest CT and PET are recommended during follow-up period when bilateral lateral cervical lymph node metastasis are suspicious. Additionally, further study for dose adjustment in case of lateral cervical lymph node metastasis needs.

**Keywords:** Papillary Thyroid Cancer, Bilateral Lateral Cervical Metastasis, Lung Metastasis

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[O27-07]

## Clinical Effectiveness of Sentinel Node Biopsy Using Methylene Blue Dye in Papillary Thyroid Carcinoma

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**Objective:** Sentinel lymph node biopsy (SLNB) has recently been utilized to detect occult lymph node metastasis in the treatment of some solid tumor. We prospectively performed this study to determine feasibility and effectiveness of SLNB in treatment of clinically node negative papillary thyroid carcinoma.

**Method(s):** Forty seven patients who underwent thyroidectomy and SLNB from Jan 2009 to Dec 2009 were enrolled. After exposure of thyroid gland, 0.2 cc of 1% methylene blue was injected around the tumor. After 10 minutes, the dissection was performed carefully until blue stained lymph nodes were found and identified as sentinel lymph node (SLN) in central neck compartment. After obtain sentinel lymph node specimen, central neck dissection and thyroidectomy were completed. We assessed nodal metastasis in SLNs and the other central compartment lymph nodes. metastasis in SLNs and the other central compartment lymph nodes.

**Result(s):** SLNs were identified in 33 of 47 patients (70.2%). Mean number of SLN was 1.9 and its localization was 17 in pretracheal group (25.4%), 38 in ipsilateral paratracheal group (56.7%), 3 in contralateral paratracheal group (4.5%) and 9 in Delphian node (13.4%). Central lymph node metastasis was detected in 4 patients among 14 patients whose SLN were not identified. Among 33 patients whose SLN were identified, metastasis to SLN was found in 8 patients and 5 of them had other central node metastasis. The other 19 patients whose SLN was identified had no metastatic foci in SLNs, but 5 of them had other central node metastasis. Thus, the sensitivity, specificity, positive and negative predictive values of SNLB was 47.1% (8/17), 83.3% (25/30), 62.5% (5/8), and 76.9% (30/39), respectively. There was no serious complication for the detection of SLN.

**Conclusion(s):** Based on these results, it is suggested that the clinical application of SLNB using methylene blue is not recommended in the management of clinically node negative papillary thyroid carcinoma patients.

**Keywords:** Papillary Thyroid Carcinoma, Sentinel Lymph Node Biopsy, Methylene Blue

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[O27-08]

## Sentinel Lymph Node Biopsy in Papillary Thyroid Cancer

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**Objective:** To investigate the reliability and feasibility of sentinel lymph node biopsy (SLNB) of papillary thyroid carcinoma using combination of lymphoscintigraphy, the gamma probe and blue dye technique.

**Method(s):** Twenty-three consecutive patients were entered in the study between August 2007 and August 2009. All were papillary carcinomas without clinical evidence of cervical lymph node involvement. The 99Tcm-Dextran of 37-74 MBq (2mCi) was injected intratumorally under ultrasound guidance about 2h to 5h before surgery. Methylene blue dye was injected around the tumor during surgery. Preoperative lymphoscintigraphy, intra-operative hand-held gamma probe detecting and blue dye technique were used to detect the sentinel lymph node (SLN). SLNs were sent to frozen-section and the results were compared with specimen of routine selective neck dissection.

**Result(s):** The SLN were identified in all cases with combination techniques. SLN identification rate were 87% and 100% with methylene blue dye technique and lymphoscintigraphy plus with probe scanning respectively. Metastases in SLNs were revealed by frozen-section histology in 12 patients. One with false-negative SLN metastases and another with false-negative non-SLN metastases were revealed on standard histology. The overall accuracy of the SLN biopsy was 91.3%, positive predictive value 100% and negative predictive value 81.8%.

**Conclusion(s):** The results seem the SLN biopsy technique is a feasible and valuable method for detecting cervical lymph node metastasis and is help to decide performing neck dissection in patients with cN0 papillary thyroid carcinoma.

**Keywords:** Sentinel Node Biopsy, Thyroid Neoplasms, Lymphatic Metastasis

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[O27-09]

## Usefulness of Thyroglobulin Measurement in Fine-Needle Aspiration (FNA) for Diagnosing Metastatic Cervical Lymph Nodes from Papillary Thyroid Cancer; Establish the FNA Thyroglobulin Cutoff Values

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**Objective:** Ultrasound (US)-guided fine needle aspiration cytology (FNAC) is one of the most useful techniques for diagnosing metastatic cervical lymph nodes from papillary thyroid cancer. Recently, measurement of thyroglobulin in the wash-out of the fine needle aspiration (FNA-Tg) has been proposed. The diagnostic FNA-Tg cutoff value, however, has not been established yet, and seems to be controversial. The purpose of this study is to evaluate the usefulness of FNA-Tg and to determine an appropriate diagnostic FNA-Tg cutoff value.

**Method(s):** US-guided FNAC was performed on 84 enlarged lymph nodes of 79 patients of papillary thyroid cancer. FNA-Tg level was measured in FNA washout fluid from March 2007 to July 2009. Among them, 62 patients were investigated during follow-up after total thyroidectomy, and 17 patients were prior to surgery. Diagnostic sensitivity, specificity and accuracy for metastasis were investigated, and compared with the results of FNAC. FNA-Tg cutoff value was established with receiver operator characteristics (ROC) analysis.

**Result(s):** The diagnostic sensitivity of FNAC alone was 75.9%, specificity was 98.2%, and diagnostic accuracy was 90.5%. The sensitivity of FNA-Tg was 100%, specificity, 94.5%, and diagnostic accuracy was 96.4% with the threshold of FNA-Tg level at 10 ng/mL. The sensitivity of FNA-Tg was 100%, specificity 100%, and diagnostic accuracy was 100% with the threshold of FNA-Tg level at 100 ng/mL.

**Conclusion(s):** Thyroglobulin measurement in fine-needle aspiration is a useful technique for diagnosing lymph node metastasis of papillary thyroid cancer. We recommend that the cutoff value of FNA-Tg would be 100> ng/mL.

**Keywords:** Thyroglobulin, Thyroid Cancer, Fine Needle Aspiration

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## O28. Clinical (III) : Others

**Chairs : Christopher Goh (Singapore)**  
**Vinay Sharma (South Africa)**

13:30 - 15:00 SBR I

[O28-01]

### Parapharyngeal Space Masses: A Systematic Review of Over 1,000 Cases and Retrospective Study

**Mong-Loon Kuet<sup>1\*</sup>, Anand Kasbekar<sup>2</sup>, Piyush Jani<sup>2</sup>**

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<sup>2</sup>Department of Otolaryngology-Head and Neck Surgery, Addenbrooke's Hospital, UK

**Objective:** Parapharyngeal space (PPS) masses are rare and most clinicians will only see a small number during their career. Analysis of the histology, presentation, and treatment of PPS masses was performed.

**Method(s):** A systematic review of 1,118 PPS masses published in the last 20 years (1989-2009) was performed and data on histology, presentation, surgical approach and postoperative complications was reviewed. We also analyze our own experience of 32 cases (1996-2010).

**Result(s):** The systematic review identified 17 studies (1,118 primary lesions) matching the inclusion criteria; in aggregate 82% were benign and 18% were malignant. The commonest presentation was an intraoral mass (47%) or cervical mass (50%) and the commonest lesion was a pleomorphic adenoma (34%). 95% of patients underwent surgery. The most frequent approach and complication was the cervical approach (48%) and vagus nerve injury (14%) respectively. In the authors' series 32 cases were identified. 75% of cases were benign and 25% were malignant. The mean age was 47 years. The commonest presentation was a cervical mass (75%) or an intraoral mass (41%). The commonest diagnosis was a carotid body tumor (19%). Ultrasound-guided core biopsy was performed in 15 cases of which 80% gave the correct diagnosis. All patients underwent imaging and surgical excision. The cervical-parotid approach was most frequently used (50%). 25% of cases had planned cranial nerve sacrifice due to involvement of a neurogenic lesion.

**Conclusion(s):** A PPS mass is an uncommon tumor and requires careful preoperative assessment, including magnetic resonance imaging, computed tomography and angiography if a vascular lesion is suspected. Definitive treatment is usually surgery. These patients should be managed in a tertiary referral centre using either the infratemporal, cervical or cervical-parotid approach with or without a midline mandibulotomy. The choice of surgical approach is determined by the size of the lesion, its histology and its superior extent.

**Keywords:** Parapharyngeal Space, Surgical Treatment, Salivary Gland

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[O28-02]

### Effect of Different Chemotherapy Methods on Oxidative Processes and Microcirculation of Bulbar Conjunctiva in Patients with Malignancies of Nasal and Paranasal Sinuses

**Akbar Khasanov<sup>1\*</sup>, B.Yu. Yusupov<sup>1</sup>, H.Ya. Karimov<sup>2</sup>,  
F.H. Inoyatova<sup>3</sup>, B.U. Iriskulov<sup>2</sup>**

<sup>1</sup>Head and Neck, National Oncology Scientific Center of Uzbekistan, Uzbekistan; <sup>2</sup>Pathophysiology, Tashkent Medical Academy of Uzbekistan, Uzbekistan; <sup>3</sup>Biochemistry, Tashkent Medical Academy of Uzbekistan, Uzbekistan

**Objective:** To study the effect of different chemotherapy methods on oxidative processes and microcirculation of bulbar conjunctiva in patients with locally advanced malignancies of nasal, paranasal sinuses and maxilla.

**Method(s):** There examined 57 with T3 and T4 stages. Patients were divided in 3 groups versus therapy methods: 1) intraarterial chemotherapy with local UHF - hyperthermia with the frequency 40 MHz increasing the temperature up to 41-43C in the tumour and radiotherapy (20 patients), 2) intraarterial chemotherapy and radiotherapy (15 patients), 3) systemic polychemotherapy and radiotherapy (22 patients) (scheme: Cisplatin 100 mg; Fluorouracil 3,000 mg and Doxorubicin 60 mg). There determined content of malondialdehyde (MDA) and activity of antioxidant difference-superoxide dismutase (SOD) and catalase. Biomicroscopy of bulbar conjunctiva was made by telecapillaroscopy TM-1 (Russia). Morphometric measures of microcirculation were estimated with digital teleanalyzator.

**Result(s):** Growth and generalization of tumour process result in intensification of lipid peroxidation against a background of inhibition of activity of antioxidant difference enzymes and increase of body microcirculatory disorders. Positive correlation between the change of microcirculation, dilation of capillary diameter and bulbar conjunctiva venua and MDA level was noted, but SOD content and catalase negative connection. Decrease of blood flow rate in capillaries and venua and MDA level was noted negative correlation but in low SOD activity and catalase positive correlation was observed. Findings testified less marked change in 1 group, particularly, in 2 group of patients who received chemotherapy throughout intraarterial method. In our opinion, it is associated with their concentration increase in lesion focus and maximal damage of tumour cells in minimal effect of chemicals in different body organs and systems as well as decrease of chemicals toxicity.

**Conclusion(s):** Neoadjuvant therapy of patients in 1 and 2 group allows reducing significantly negative response of polychemotherapy and increasing direct results than in 3 group.

**Keywords:** Malignancies Paranasal Sinuses, Oxidative Processes, Microcirculation Bulbar Conjunctiv

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[O28-03]

## An Objective Guide to the Endoscopic Assessment of the Nasopharynx

**Alexander C Vlantis<sup>1\*</sup>, Wendy F Bower<sup>2</sup>, John KS Woo<sup>1</sup>, Michael CF Tong<sup>1</sup>, C Andrew Van Hasselt<sup>1</sup>**

<sup>1</sup>*Department of Otorhinolaryngology, Head and Neck Surgery, The Chinese University of Hong Kong, Hong Kong*

<sup>2</sup>*Department of Surgery, The Chinese University of Hong Kong, Hong Kong*

**Objective:** To develop an objective endoscopic score of abnormality of the nasopharynx for the quantification of irregularity within the nasopharynx. The aim was then to determine the threshold of abnormality at which a biopsy may be indicated.

**Method(s):** A score-sheet with 44 variables was developed. Patients planned for a nasopharyngeal biopsy were recruited for assessment. The nasopharynx was assessed endoscopically and scored according to the 44 variables on the score sheet. The scores were compared to the biopsy results.

**Result(s):** Seventeen patients had a carcinoma and 60 a benign lesion or no pathology. The mean score of patients with a nasopharyngeal malignancy was 24.1 (range 12-37) and of patients with a benign lesion or no pathology 9.5 (range 1-37). No patient with a malignant lesion scored less than 12.

**Conclusion(s):** No malignancy was found in patients with a score of less than 12 on the objective endoscopic assessment of the nasopharynx. The score sheet proved to be a useful tool in guiding which patients should undergo a nasopharyngeal biopsy based on the endoscopic appearance of the nasopharynx.

**Keywords:** Endoscopy, Carcinoma, Nasopharyngeal

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[O28-04]

## Diagnostic and Treatment with Endoscopy in Secondary Oncopathology of Orbit

**Igor Reshetov<sup>1</sup>, Dmitri Davydov<sup>2</sup>, Alexei Komarov<sup>1\*</sup>**

<sup>1</sup>*Microsurgery, P.A. Herzen Moscow Cancer Research Institution, Russian Federation*

<sup>2</sup>*Ophthalmooncology, State Research Institution of Eye Disease, Russian Federation*

**Method(s):** Within a combined or complex treatment 100 patients with diagnosed neoplasm of orbit underwent endovideo assisted intervention in the volume of orbital exenteration in 14 cases, orbital facial resection in 40 cases, cranial orbital facial resection in 46 cases.

**Result(s):** A clinical characteristic of cranial orbital facial tumors depending on their topographic localization is determined in 4 groups. In all groups of localization an ophthalmic symptomatology is significantly pronounced, an otorhinolaryngologic and a neurologic symptomatology is more pronounced in larger lesions. The analysis of exophthalmos symptom showed its more typical values up to 5 mm in patients with tumors of cranial orbital facial localization. The analysis of diplopia symptom demonstrated a presence of various types of diplopia in patients with tumors of cranial orbital facial localization with a predominance of the 2nd type of peripheral diplopia (47%). An access through the maxillary sinus with gel injection is informative with limitation in superior segments, it is possible in out-patient conditions, there is a possibility to use additional instruments. An access through the median nasal passage and the ethmoidal labyrinth is dangerous because of a profuse hemorrhage possibility in postoperative period and available endoscopes cannot provide a free manipulation in the nasal cavity.

**Conclusion(s):** In all groups of localization an ophthalmic symptomatology is significantly pronounced, an otorhinolaryngologic and a neurologic symptomatology is more pronounced in larger lesions. Endoscopic methods in orbital oncologic pathology can significantly increase the informative ability of diagnostic stage and allow to perform necessary manipulations. The endoscopic access to the orbit is possible and most safe through the maxillary sinus.

**Keywords:** Orbital, Sinonasal Tumor, Endoscopy

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[O28-05]

## The Lymphatic Drainage of the Nasal Fossae, Pharynx and Soft Palate: An Anatomical and Radiological Study for Clinical Implication

**Wei-ren Pan\***, Russell Corlett, Mark Ashton

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Royal Melbourne Hospital/ The University of Melbourne, Australia*

**Objective:** The lymphatic pathways of the nasal fossae, nasopharynx and soft palate are of clinical importance.

**Method(s):** Eight halves combination specimens of tissues of the head and neck from six fresh human cadavers were studied. Using the 6% hydrogen peroxide to find the inflated initial lymph vessels. A suitable vessel was injected with a suspension of radio opaque lead oxide and powdered milk. The specimen was then photographed and radiographed.

**Result(s):** Capillary networks arise from the mucous membrane of the atrium, the three turbinates, the floor of the nasal cavity, the pharynx and soft palate. They drain to the lateral pharyngeal and retropharyngeal lymph nodes via the lymph collectors descending in the wall of the pharynx. The lymphatic vessels originating in the soft palate drain to the lateral pharyngeal lymph nodes via the lymph collector running in the lateral wall of the oropharynx. One initial lymphatic connection is at the junction of the lateral wall of the posterior turbinates and the nasopharynx. Another lymph connection is between two groups of lymph nodes situated between the origin of the facial artery and the bifurcation of the carotid artery.

**Conclusion(s):** A rich avascular lymph capillary network exists in the mucous membrane and two major groups of lymph collectors, diverging and converging run in the parapharyngeal space laterally and posteriorly ending in multiple first tier lymph nodes. These results will help with the treatment of patients with cancer of the nasal fossae, pharynx and soft palate.

**Keywords:** Lymphatic Vessel, Retropharyngeal Node, Lateral Pharyngeal Node

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[O28-06]

## Differentiation of the Lymphatic Drainage Pattern in the Integument of the Head and Neck: Anatomic Study and Clinical Implications

**Wei-ren Pan<sup>1</sup>\*, Cara Le Roux<sup>1</sup>, Christopher Briggs<sup>2</sup>**

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Royal Melbourne Hospital/ The University of Melbourne., Australia*

*<sup>2</sup>Department of Anatomy and Cell Biology, The University of Melbourne, Australia*

**Objective:** There is an increasing clinical need for accurate evaluation of the lymphatic anatomy of the head and neck.

**Method(s):** Fourteen halves of the superficial tissues of the head and neck and six specimens of the anterior superficial neck tissue from thirteen unembalmed human cadavers were studied. 6% hydrogen peroxide was used to find the lymphatic vessels, then they were injected with a radio-opaque mixture, dissected, photographed and radiographed. Final results were transferred to the computer for analysis.

**Result(s):** Lymph collecting vessels were found in the scalp, the face and the cervical region, dense in the scalp and lateral neck area, but sparse in the facial, anterior and posterior neck. Two layers of lymphatic vessels were found in the anterior superficial neck tissue coursing in different directions.

**Conclusion(s):** A map of the lymphatic drainage patterns upgrading our anatomical knowledge that will help with the clinical management.

**Keywords:** Lymphatic Drainage Pattern, Head and Neck, Lymphoscintigraphy

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[O28-07]

## Patterns of Regional Metastasis in Patients with Periorbital Cancer

**Donghwan Roh, Chang Hyun, Ik Joon Choi,  
Tack-Kyun Kwon, Myung-Whun Sung,  
Kwang Hyun Kim, J. Hun Hah\***

*Department of Otorhinolaryngology - Head and Neck Surgery,  
Seoul National University Hospital, Korea*

**Objective:** This study aimed to identify the patterns of regional metastasis according to primary tumor location and to assess the treatment outcomes of the metastasis to the parotid gland and the cervical lymph nodes in the patients with malignant periorbital tumors.

**Method(s):** We retrospectively reviewed the medical records of the patients with malignant tumors of the periorbital area from January 1997 to January 2008. We analyzed demographic data, pathologic diagnosis, primary tumor site, lymph node metastasis, primary and adjuvant treatment modalities and recurrences.

**Result(s):** Ninety five patients with periorbital cancer were reviewed and their mean duration of follow-up was 33.1 months. Sixteen patients (16.8%) out of 95 had regional metastasis. There were 7 male and 9 female patients with a mean age of 57.0 years and the follow-up duration was 46.2 months on average. Nine tumors located in the medial half, 2 tumors in the lateral half and 5 in both the medial and lateral halves. The most common site of regional metastasis was the parotid gland lymph nodes even if the tumor located medial half. Elective neck dissection and elective parotidectomy were performed in 4 and 2 patients, respectively. Although there had been no occult metastasis in elective parotidectomy and neck dissection specimens, 5 out of 6 patients showed metastasis later.

**Conclusion(s):** The parotid area is crucial for medially located periorbital tumor as well as for laterally located one. When a malignant periorbital tumor is diagnosed, whole cervical and parotid lymph nodes should be investigated carefully. The role of elective neck dissection or parotidectomy requires more investigation.

**Keywords:** Periorbital Tumor, Regional Metastasis

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[O28-08]

## Successful Surgical Treatment of 3 Lingual Goiter Patients

**Anatoly Romanchishen, Sergey Klimshin\***

*Hospital Surgery, Saint-Petersburg State Pediatric Medical Academy, Russian Federation*

**Objective:** Dystopia of thyroid gland is the result of embryogenesis disorders. Lingual goiter emerge in

1 patients of 100,000 population and in 1 of 3,000 thyroid diseases patient. Indications for surgical treatment of lingual goiter patients include relapse or profuse bleeding, aggressive growth of tumor with dyspnea and dysphagia, suspicions of malignancy and thyrotoxic lingual goiter.

**Method(s):** During 35 years of our practice 7 (0.03%) lingual goiter of 23,067 thyroid patients we observed and 3 of them were operated on.

**Result(s):** Those were women of ages 39, 42, 48 years. Reasons for surgical treatment (1998, 2002, 2009) were breathing and swallowing disorders, changes in the voice. Step-by-step swallowing was accomplished with increasing difficulty. Lingual goiters were found by palpation, laryngoscopic examination, CT, radioisotope scanning. In 2 women goiters were situated above and in front of the tongue and in 1 it was intralingual only. Every part of dystrophic gland had an adenoma. Tumors were removed through submandibular approaches. Tongue mucosa was resected in every patient. In 1 case the hyoid bone was resected. In other one temporary (3 days) tracheostomy was performed because of oral tissue edema happened. In all cases there was full recovery. Patients received hormonal replacement therapy.

**Conclusion(s):** Wait-and-see policy of lingual goiter patients treatment sometimes can be dangerous because suffocation might occur. Lingual goiter would be removal successfully through neck approach.

**Keywords:** Lingual Goiter, Surgery

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[O28-09]

## A Review of The Management of Lymphangiomas

**Jennifer Ha\***, Francis Lannigan

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**Objective:** Lymphangioma is a rare benign cyst caused by congenital malformation of the lymphatic systems that often occurs in the cervicofacial region. There is no consensus on its management: Observation, aspiration, injection, cryotherapy, electrocautery, radiation, laser, ligation and excision.

**Method(s):** We performed a literature search with the keywords “cystic hygroma”, “lymphangioma”, “management”, “OK 432” and “picibanil” from Medline, Embase and PubMed databases.

**Result(s):** We present a review of the history, natural history, signs and symptoms, diagnosis, histology, classification and management options of lymphangiomas.

**Conclusion(s):** Whilst conservative therapy may lead to recurrence, aggressive resection may lead to unacceptably high morbidity. Therefore, management should be individualised depending on the size of the lesion, anatomic localization and complications.

**Keywords:** Lymphangioma, Cystic Hygroma, Management

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## O29. Radiotherapy (I) : Sequelae / Others

**Chairs : Hong-gyun Wu (Korea)**

**Allen M. Chen (USA)**

13:30 - 15:00 SBR II

[O29-02]

### Shrinkage of Volumes of Parotid and Submandibular Glands but Elevated Radiation Doses during Intensity Modulated Radiation Therapy (IMRT) for Nasopharyngeal Carcinoma

**Victor Ho Fun Lee<sup>1\*</sup>, Sherry Ng<sup>1</sup>, Daniel Tsin Tien Chua<sup>1</sup>, Dora Kwong<sup>1</sup>, Pek Lan Khong<sup>2</sup>, To Wai Leung<sup>1</sup>, Gordon Kwok Hung Au<sup>1</sup>**

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<sup>2</sup>Diagnostic Radiology, Queen Mary Hospital, The University of Hong Kong, Hong Kong

**Objective:** To investigate the changes in volumes and radiation doses to parotid and submandibular glands during IMRT for nasopharyngeal carcinoma in an attempt to justify re-planning in the mid-course of IMRT to minimize radiation-induced xerostomia.

**Method(s):** 18 consecutive patients with stage III to stage IVB nasopharyngeal carcinoma (AJCC Staging Manual 6th Edition) who received concurrent chemoradiation were included in this study. Computed tomography (CT) scans were performed for IMRT planning purposes (PLCT) and at mid-course of IMRT (MCCT) with head and neck immobilized by the same thermoplastic cast. Volumes of parotid and submandibular glands were outlined in both sets of CT images. Treatment plans were generated by computer planning systems for PLCT. PLCT of all patients were then co-registered with their corresponding MLCT. The treatment plans for PLCT were then copied to MCCT preserving the same beam shapes, angles and energies of PLCT. Dose distribution on MCCT was then re-calculated using this re-normalized plan so that differences in radiation dose will be due to anatomical changes rather than differences in dose calculation algorithms. Volumes of parotid and submandibular glands on PLCT and MCCT together with dosimetric parameters including D95, D50, D05, D01 and minimum, mean, maximum doses were compared by paired sample t-tests.

**Result(s):** All 18 patients had their volumes of parotid and submandibular glands statistically significantly reduced in the middle of the course of IMRT as shown on MCCT (all  $P$ -values  $\leq 0.002$ ). On the contrary, the dosimetric parameters were all significantly increased on MCCT as compared with PLCT except D50 of right submandibular glands.

**Conclusion(s):** The major salivary glands shrink while receiving a higher radiation dose during IMRT for nasopharyngeal carcinoma. This signifies that adaptive radiotherapy with re-planning should be seriously considered during course of IMRT as normal organs can receive an unexpected higher dose leading to more profound complications.

**Keywords:** Intensity Modulated Radiation Therapy, Salivary Glands, Adaptive Radiotherapy

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[O29-03]

### Long Term Results of Phase III Randomized Study Comparing Oral Pilocarpine vs. Submandibular Salivary Gland Transfer Procedure for the Management of Radiation Induced Xerostomia

**Naresh Jha<sup>1\*</sup>, Hadi Seikaly<sup>2</sup>, Jeffrey Harris<sup>2</sup>, David Williams<sup>3</sup>, Khalil Sultanum<sup>4</sup>, Michael Hier<sup>5</sup>, Sunita Ghosh<sup>6</sup>, Martin Black<sup>5</sup>, James Butler<sup>7</sup>, Donna Sutherland<sup>8</sup>**

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**Objective:** To report results (median follow up 3.3 years) of phase III multicenter study comparing Pilocarpine with submandibular salivary gland transfer procedure (SGP) for management of radiation (XRT) induced xerostomia.

**Method(s):** Eligibility criteria included squamous cell carcinoma of Larynx, Hypopharynx, Oropharynx and unknown primaries with neck nodes. Patients with carcinoma of Nasopharynx, Oral cavity, level 1, bilateral & N3 neck nodes, pre-epiglottic involvement were ineligible. Treatment strategies included either surgery as prime modality of treatment followed by chemoradiation treatment or chemoradiation treatment as prime modality with or without planned neck dissection. Patients in Pilocarpine arm received Pilocarpine 5 mg three times a day for 3 months. Salivary functions were evaluated by measuring salivary flow and quality of life using Univ. of Washington Quality of Life (QOL) Questionnaire, preoperatively, 1, 3, 6, 12 & 24 months after treatment. Primary end point was the salivary functions (amount & consistency of saliva) at 6 months after XRT.

**Result(s):** This study was closed at interim analysis as the intent to treat analysis of all patients showed significantly superior results in the gland transfer arm. The median follow up of these patients now is 3.3 years and results at 2 years follow up are presented. Gland transfer arm showed superior results as compared to Pilocarpine arm: for median baseline and stimulated salivary flow,  $P=0.152$  and  $0.0003$  respectively, for patients reporting none or minimal xerostomia (score 10 or 20 as per VII A [amount of saliva] of Univ. of Washington QOL),  $P=0.003$  and for consistency of saliva,  $P=0.008$ .

**Conclusion(s):** Salivary gland transfer procedure remains superior to Pilocarpine in the management of radiation induced xerostomia.

**Keywords:** Xerostomia, Radiation, Prevention

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[O29-04]

## Efficacy of Triclosan in the Management of Radiation Induced Oral Mucositis- A Randomized Clinical Trial

**Satheesh kumar Poolakkad sankaran**<sup>1\*</sup>, **Anita Balan**<sup>1</sup>,  
**Moideen shah Chamba**<sup>1</sup>, **Minu P Mohan**<sup>2</sup>,  
**Bhattathiri V N**<sup>3</sup>, **Sreelatha K T**<sup>1</sup>

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<sup>2</sup>*Prosthodontics, Government Dental College, India*

<sup>3</sup>*Department of Radiotherapy, Regional Cancer Centre, India*

**Objective:** To find out the Efficacy of Triclosan in the management of Radiation induced oral mucositis and to compare the efficacy of the Triclosan mouth rinse with conventional sodium bicarbonate mouth rinse.

**Method(s):** The trial group comprised of 24 patients who underwent radiation therapy for oral cancer and who developed oral mucositis, were randomly allocated into two groups of 12 patients each. Patients in Group I was administered sodium bicarbonate mouth rinse and constituted the control group. Group II was the study group who were given Triclosan mouth rinse.

**Result(s):** The mean number of days taken for a change in the grades of mucositis occurring due to radiotherapy was compared in the two groups. Initially it took an average of 10 days for the onset of grade I mucositis in both the groups. Till the change from grade 2-3 there was no appreciable statistical difference between the study and the control group ( $P>0.05$ ). while only one patient (8%) in the study group progressed on to grade 4 mucositis, in the control group it was 10 patients (83%). Thus the control group was 10 times inferior to the study group if the occurrence of grade 4 mucositis is being considered. A definite change was noticed in the severity of mucositis, food intake and weight loss. The control group took more than 45 days to resolve, while the study group took only less than 28 days.

**Conclusion(s):** It can be concluded that from the results of the study that Triclosan mouth rinse is effective and better when compared to the sodium bicarbonate mouth rinse in the control of radiation induced mucositis with regard to its severity and duration.

**Keywords:** Oral Cancer, Oral Mucositis, Triclosan

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 (drsatheeshkumar@gmail.com)

[O29-05]

## Immunohistochemical Study to Identify Biomolecular Markers for Prediction of Outcomes of Radiotherapy for Nasopharyngeal Carcinoma

**Yeon-joo Kim**<sup>1</sup>, **Hong-Gyun Wu**<sup>1\*</sup>, **Heounjeong Go**<sup>2</sup>,  
**Yoon Kyung Jeon**<sup>2</sup>, **Seung Hee Lee**<sup>3</sup>

<sup>1</sup>*Radiation Oncology, Seoul National University Hospital, Korea*

<sup>2</sup>*Pathology, Seoul National University Hospital, Korea*

<sup>3</sup>*Cancer Research Institute, Seoul National University College of Medicine, Korea*

**Objective:** We performed immunohistochemical study with pre-treatment biopsy specimens to identify biomolecular markers which can be used as a predictive assay for nasopharyngeal carcinoma (NPC).

**Method(s):** From January 1998 through December 2006, 68 patients were histologically diagnosed as non-metastatic NPC and treated with RT at Seoul National University Hospital. Only 38 patients had the paraffin block for the immunohistochemical study. Thirty-two patients (84%) had advanced stage NPC (2002 AJCC Stage III-IV). All patients, except for 6, were treated with induction chemotherapy with two or three cycles of cisplatin based regimen followed by either radiotherapy alone or concurrent chemoradiotherapy with cisplatin. Immunohistochemical staining was done for Met, COX-2, EGFR, nm23-H1, p63, Cathepsin-D, p53, C-erbB2, CD138, STAT5, Egr1, CSE1L, STAT3 and LIN28 with the usual methods.

**Result(s):** The median follow-up time was 30 months (range, 11-83 months). Thirty-five patients were Met positive and 22 patients showed high expression (58%). Twenty-seven patients exhibited CD138 and 17 patients showed high grade (45%). Twenty-two patients showed Egr1 expression (58%). High Met and CD138 expression were statistically significant negative prognostic factors on survival. The expression of Egr1 had a positive prognostic effect on progression-free survival and overall survival. The combined score (CS) of these three prognostic factors, Met (0, low; 1, high) plus CD138 (0, negative; 1, low; 2, high) minus Egr1 (0, negative; 1, positive), was a strong prognostic factor. The median survival curve was distinctly separated according to this combined score (median survival : CS -1 or 0, 76 mo; CS 1, 71 mo; CS 2, 42 mo; CS 3, 24 mo,  $P=0.001$ ). No prognostic value was revealed in COX-2, EGFR, nm23-H1, p63, Cathepsin-D, p53, C-erbB2, STAT5, CSE1L, STAT3 and LIN28.

**Conclusion(s):** The combined score of Met, CD138 and Egr1 could be used to stratify biomolecular risk groups.

**Keywords:** Nasopharyngeal Carcinoma, Biomolecular Markers, Immunohistochemical Staining

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[O29-06]

## Treatment Results of Major Salivary Gland Cancer by Surgery with or without Postoperative Radiation Therapy

**Jae Myoung Noh<sup>1</sup>, Yong Chan Ahn<sup>1\*</sup>, Heerim Nam<sup>1</sup>, Chung-Hwan Baek<sup>2</sup>, Young-Ik Son<sup>2</sup>, Man Ki Chung<sup>2</sup>, Su Woon Kim<sup>3</sup>**

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<sup>2</sup>Otorhinolaryngology-Head and Neck Surgery, Samsung Medical Center, Sungkyunkwan University School of Medicine, Korea

<sup>3</sup>Radiation Oncology, Princess Margaret Hospital, Canada

**Objective:** This is to report treatment results of major salivary gland cancer by surgery with or without postoperative RT (PORT).

**Method(s):** Between March 1995 and January 2006, 94 patients with primary major salivary cancer underwent curative surgical resection at Samsung Medical Center. The parotid gland was the most commonly involved (73, 77.7%), followed by the submandibular and the sublingual. Neck dissection was added in 28 patients, and PORT was individually recommended to those with risk factors. 75 (79.8%) patients received PORT. PORT volume included primary tumor bed and pathologically involved regional lymphatics with, and no additional effort was made for elective nodal irradiation. The median total doses were 56.0 Gy to primary site and 58.7 Gy to regional lymphatics.

**Result(s):** After median follow-up of 49 months, 21 patients had relapsed: 20 in PORT; and one in surgery alone group. As the first site of failure, distant metastasis was the most common (17 patients). Local recurrence occurred in three, and regional relapse in one. The lung was the most common site (10 patients), followed by the bone, and the brain. 5-year DFS, LC, and OS rates were 74.4% and 94.7%, 96.0% and 100%, and 78.2% and 100% in PORT and surgery alone groups, respectively. On multivariate analysis, DFS was significantly affected by pN+ (HR 3.624,  $P=0.0319$ ), while OS was by pN+ (HR 7.138,  $P=0.0034$ ) and perineural invasion (HR 5.073,  $P=0.0187$ ).

**Conclusion(s):** Based on our experience, the patients with early stage major salivary gland cancer with low risk can be effectively treated by surgery alone, and those who with risk factors can achieve excellent local and regional control by adding PORT. Omitting ENI in patients with pN0 disease seems a feasible strategy under accurate clinical evaluation. An effort is needed to decrease distant metastasis through further clinical trials.

**Keywords:** Salivary Cancer, Surgery, Radiation Therapy

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[O29-07]

## Role of Radiotherapy in the Treatment of Epithelial Myoepithelial Neoplasm of the Parotid Gland

**James Fortson\***

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**Objective:** This presentation describes an epithelial myoepithelial carcinoma (EMEC) of the partoid gland. EMEC's are unusual and rare tumors that make up less than 1% of salivary gland neoplasms. They tend to show female predominance, with peak occurrence in the seventh decade. The case is of a 53 year old african american female that presented with facial pain and swelling 1 year ago. Her initial CT showed nodular and enhancing masses involving the majority of the left parotid with scattered calcifications. Follow up FNA was suggestive of pleomorphic adenoma. She underwent a superficial left parotidectomy with final pathological diagnosis of EMEC. This paper will discuss the diagnostic and therapeutic role of radiation in treatment of EMEC's.

**Method(s):** This presentation represents a case report of an unusual salivary gland neoplasm.

**Result(s):** Pt is status post surgery followed by radiotherapy with no evidence of persistent or recurrent disease.

**Conclusion(s):** The usual treatment of EMEC is wide surgical resection. The role of radiotherapy in EMEC is adjuvant. It has been used in this case when the patient refused to have any further surgical intervention. It is not been used as primary treatment is this disease. Because this tumor is so rare, the role of radiotherapy is not completely understood.

**Keywords:** Epithelial Myoepithelial Neoplasm, Salivary Gland Neoplasm, Radiotherapy

**Corresponding Author** James Fortson (jkfortson1@pol.net)

[O29-08]

## Recurrence Risk Factors after Radiotherapy in Early Glottic Cancer and Outcome of Salvage Treatment

**Eun-Jae Chung<sup>1</sup>, Se-Woo Lee<sup>1</sup>, Moo-pil Kim<sup>1</sup>, Jeong-Soo Woo<sup>1</sup>, Seung-Kuk Baek<sup>1</sup>, Soon-Young Kwon<sup>1</sup>, Chul Yong Kim<sup>2</sup>, Kwang-Yoon Jung<sup>1\*</sup>**

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<sup>2</sup>Department of Radiation Oncology,  
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**Objective:** The aim of this study was to find risk factors for recurrence after curative radiotherapy in early glottic cancer and to analyze the result of treatment between salvage total laryngectomy and salvage conservation laryngectomy for recurrent glottic cancer.

**Method(s):** A retrospective analysis was performed for patients of 45 cases of early glottic cancer who were treated with curative radiotherapy from 1997 to 2004. The risk factors analyzed for recurrence in early glottic cancer were gender, age, anterior involvement, bilaterality, T stage and radiotherapy interruption. Fourteen patients who underwent salvage laryngectomy for recurrent glottic cancer were analyzed by Kaplan-Meier method to assess the results of salvage total laryngectomy and salvage conservation laryngectomy.

**Result(s):** Forty-two patients were male and only 3 patients were female, with the median age of 62.4 years. Radiotherapy interruption was found to be a risk factor significantly influencing recurrence in univariate and multivariate analyses. The 5-year overall survival rate in salvage total laryngectomy was 77% and that in salvage conservation laryngectomy was 75%.

**Conclusion(s):** When a curative radiotherapy was interrupted in early glottic cancer before total dosage irradiation, the possibility of recurrence must be considered. In such cases, by choosing an adequate patient group combined with a proper surgical technique, optimal treatment results can be obtained by salvage conservation laryngectomy.

**Keywords:** Laryngeal Neoplasms, Radiotherapy, Salvage Therapy

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[O29-09]

## Ruthenium 106 Plaque Brachytherapy: Indications and Outcome in Ocular Tumors

**Vijay anand reddy Palkonda\*, Santosh Honavar G, Surbhi Joshi, Milind Naik N, Javed Ali Mohd, Padma Ganesan**

*Consultant Oncologist,  
Ocular Oncology Department, L.V. Prasad Eye Institute, India*

**Objective:** To evaluate Ruthenium 106 (Ru-106) plaque brachytherapy in the management of intraocular and adnexal tumors.

**Method(s):** A retrospective review of 84 patients of Ocular Tumors treated with Ru-106 Plaque Brachytherapy at the L.V.P.E.Institute (Jan' 2001–Aug' 2009).

**Result(s):** The tumors included uveal melanoma (28), ocular surface squamous neoplasia (19), choroidal hemangioma (19), retinoblastoma (15) and choroidal metastasis (2). Uveal melanoma: A notch plaque was used in 71%. The mean tumor apex dose was 9,528 cGy. Tumor regression rate was 67.8%, eye salvage was achieved in 82%, and 71.42% had useful residual vision (>20/200). Ocular surface squamous neoplasia (n=19): The mean tumor apex dose was 5,626 cGy. Tumor regression rate was 84.21%, eye salvage was achieved in 78%, and 63.15% had useful residual vision (>20/200). Choroidal hemangioma (n=19): The mean tumor apex dose was 3,246 cGy. Tumor regression rate was 89.6%, eye salvage was achieved in all and 57.9% had improvement in visual acuity (>2 Snellen lines). Retinoblastoma (n=15): The mean tumor apex dose was 4,699 cGy. Tumor regression rate was 68.75%, eye salvage was achieved in 60%, and 33.3% had useful residual vision (>20/200). Choroidal metastasis (n=2): Plaque brachytherapy was used to treat solitary choroidal metastasis. The mean tumor apex dose was 4,995 (range, 4,992-4,998) cGy. Tumor regression was seen in both, eye salvage was achieved in 100%, and 100% had useful residual vision (>20/200).

**Conclusion(s):** Ruthenium 106 plaque brachytherapy is a reasonable treatment option for the primary management of choroidal melanoma and choroidal hemangioma with diffuse subretinal fluid, and for the management of residual or recurrent ocular surface squamous neoplasia and retinoblastoma. It provides for good tumor regression and eye salvage. Complications seem dose-dependant.

**Keywords:** Ruthenium 106, Plaque Brachytherapy, Ocular Tumors

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**O30. Basic Science (IV) : Thyroid****Chairs : Piero Nicolai (Italy)****Soon-Hyun Ahn (Korea)**

13:30 - 15:00 SBR III

[O30-01]

## Cytokine Secretion Following OK-432 in Vitro Stimulation of Human Monocytes is Dependent on MAPK ERK and p38 Phosphorylation

**Hans Aarstad\***, Carla Olsnes, Jan Olofsson

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**Objective:** OK-432, penicillin-killed Streptococcus pyogenes, is used in treating carcinomas, but also of lymphangiomas. OK-432 probably exerts its effect through stimulation of the innate immune system, and the present investigation studies the mechanisms of OK-432 stimulation on the immune system.

**Method(s):** We have studied the role of monocytes (MOs) in the immune response to OK-432 by examining IL-6, TNF-alpha, MIP-1alpha/beta and MCP-1 secretion after in vitro MO stimulation with OK-432. We also examined MAPK ERK, p38, and JNK2 signaling pathways by Western blot analyses.

**Result(s):** Western blot (Wb) analysis shows that ERK, located downstream of MEK1/2, becomes phosphorylated following MO adherence, but is not additional activated following OK-432 stimulation. Addition of the MEK inhibitor U0126 inhibited IL-6, TNF-alpha, MCP-1 and MIP-1alpha secretion in a dose-dependent manner. Western blot analysis showed that p38 kinase is activated following MO isolation, but is decreased phosphorylated following adherence. Addition of the p38 kinase inhibitor SB202190 decreased IL-6, TNF-alpha and MIP-1alpha production upon OK-432 stimulation in a dose-dependent manner. Addition of the JNK2 inhibitor SP600125 did not systematically change the cytokine response.

**Conclusion(s):** OK-432 stimulation of MO depends on MEK, and to some extent on p38 phosphorylation, but not on JNK2 stimulation. This MEK and p38 dependence is possibly related to adherence-provided co-stimulation of the MO. This may contribute to explain why OK-432 is not generally toxic as only MOs adhered to a surface secrete cytotoxic cytokines. The experiments further support that OK-432 directly stimulates the innate immune system.

**Keywords:** Innate Immune System, Monocyte, OK-432

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[O30-02]

## A Novel Agonist Antibody to Human Death Receptor 4 Induces Apoptotic Cell Death in Head and Neck Cancer through ROS Generation

**Chul-ho Kim<sup>1,\*</sup>, Mi Hye Lee<sup>1</sup>, Sung Un Kang<sup>1</sup>, Jung Hee Pyun<sup>1</sup>,  
Hye Sook Hwang<sup>1</sup>, Yong-Sung Kim<sup>2</sup>**

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<sup>2</sup>*Department of Molecular Science and Technology,  
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**Objective:** The proapoptotic tumor necrosis factor-related apoptosis inducing ligand (TRAIL) receptors death receptor (DR) 4 and DR5 are attractive targets to develop the receptor specific agonistic monoclonal antibodies (mAb) as anticancer agents because of their tumor-selective cell death-inducing activity. Here, we describe the characterization and activity of a novel agonistic mAb (AY4) against human DR4 in head and neck cancer model.

**Method(s):** The effect of AY4 on head and neck cancer was analyzed in FaDu, KB, HN9, and SNU899. The cell viability, apoptosis (FACScan with annexin V and PI staining, TUNEL assay), ROS generation, and analysis of death receptor expression on cancer cells as well as changes in the signal pathway related to apoptosis were investigated. We checked the role of ROS in the regulation of AY4 induced apoptosis. In addition, we analyzed the anticancer effect of AY4 in nude mice xenograft model. In addition, drug toxicity of AY4 were investigated in vivo zebrafish model.

**Result(s):** AY4 decreased the viability of KB and HN9 and induced apoptosis of the cells in a dose-dependent manner. AY4 induced apoptosis was accompanied by an increase in the generation of reactive oxygen species (ROS). Pretreatment with N-acetyl-L-cysteine inhibited AY4 induced apoptosis. Despite distinct binding regions of AY4 on DR4 from those of TRAIL, AY4 as a single agent induced caspase-dependent apoptotic cell death of several tumor types through the extrinsic and/or intrinsic pathways. In vivo administration of AY4 significantly inhibited tumor growth of head and neck cancer preestablished in athymic nude mice. In addition, in a zebrafish model used for toxicity testing, a considerable dose of AY4 did not result in embryotoxicity or neurotoxicity.

**Conclusion(s):** Our results provide further insight into the DR4-mediated cell death signaling and potential use of AY4 mAb as an anticancer therapeutic agent, particularly for DR4-responsive tumor types.

**Keywords:** Death Receptor 4, Novel AY 4, Agonistic Antibody, Head and Neck Cancer

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[O30-03]

## Genetic Mapping of Susceptible Genes of Papillary Thyroid Carcinoma in Chinese Patients

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<sup>1</sup>Department of Head & Neck Surgery, Cancer Hospital, China

<sup>2</sup>Department of Genetics, Fudan University, China

<sup>3</sup>Department of Head & Neck Surgery, School of Life Science, China

**Objective:** To investigate the clinicopathological characteristics and potential predisposition genes of familial papillary thyroid carcinoma (PTC).

**Method(s):** The family members of consecutive 145 PTC patients were screened by physical and/or ultrasound examinations. A linkage analysis by using genome-wide GeneScan with 119 microsatellite markers was performed in one Chinese pedigree to identify the candidate chromosome regions for PTC. Association study of XRCC3 (X-ray repair cross-complementing group 3) polymorphism and PTC predisposition was analyzed by case-control study including the 173 PTC patients and 120 normal controls. A systematic polymorphism screening was performed in the coding regions of thyroid peroxidase (TPO), thyroid stimulating hormone receptor (TSHR) genes in 142 unrelated normal individuals and 114 PTCs. BRAF V599E mutation and RET rearrangement were screened in 125 PTCs by PCR and sequencing. The XRCC3 polymorphic status, clinicopathological characteristics of the PTC patients with BRAF mutation and RET rearrangement were analyzed.

**Result(s):** Familial PTC is an independent clinical entity which showed higher frequency of bilateral lobe involved and lymph node metastasis compared with sporadic PTC. Linkage analysis data demonstrated that gene loci conferring susceptibility to thyroid nodule were localized to chromosome 8p23( $P=0.03$ ), 14q32.33( $P=0.007$ ) and 22q12( $P=0.03$ ). XRCC3 A6410G allele G was associated with PTC ( $P=0.033$ ). Haplotype analysis showed that novel associations between the haplotypes at marker A6410G and C14304T within XRCC3 gene, G859T and G1207T within TPO gene and PTC in Chinese population. The frequency of RET rearrangement of tumor samples of XRCC3 A6410G A/G and GG cases is higher than that of XRCC3 A6410G AA cases.

**Conclusion(s):** The genetic component of PTC in the general population is very likely to be the aggregate of numerous genes with small effects. Other genes involved in the pathway of DNA damage and repair and thyroid hormone metabolism should be investigated with the PTC predisposition.

**Keywords:** Papillary Thyroid Carcinoma, Familial, Genetic Predisposition

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[O30-04]

## Clinicopathological Significance of Carcinoma Associated Fibroblasts (CAF) in Papillary Thyroid Carcinoma: The Predictive Marker of Cervical Lymph Node Metastases

**Jae-Gu Cho, Eun-Jae Chung, Soek-Jin Hong, Seung-Kuk Baek, Soon-Young Kwon, Kwang-Yoon Jung, Jeong-Soo Woo\***

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**Objective:** Fibroblast is an important component of the malignant tumor stroma. Most tumors incorporate an obvious biologically active, fibroblastic cell type known variously as carcinoma-associated fibroblasts (CAF). These cells have received increased attention because of their participation in tumor development, including invasion and lymph node metastasis and their ability to act as markers of patient prognosis in colorectal and breast epithelial neoplasm. Papillary thyroid carcinoma (PTC) is the most common thyroid malignancy with frequent cervical lymph node metastases. However, there were few studies that found the predictive marker for cervical lymph node metastases in PTC. The purposes of this study were to investigate presence of CAF in PTC with or without cervical lymph node metastases (CLN) and to verify the correlation between CAF and CLN through the immunohistochemical study.

**Method(s):** Human progenitor cell antigen, CD34, and  $\alpha$ -smooth muscle actin (SMA) were used for marker of CAF. The presence of CD34-negative,  $\alpha$ -SMA positive carcinoma associated fibroblasts was investigated in 5 PTC without CLN, and in 5 PTC with CLN. We further studied prospectively the correlations between the presence of carcinoma associated fibroblasts and CLN in 35 papillary carcinoma.

**Result(s):** Seventy eight % of papillary carcinomas without CLN showed a CD34-positive fibroblasts. In contrast, papillary carcinoma with CLN showed partial loss of CD34-positive fibroblasts, 25.4%. The expression of  $\alpha$ -SMA in PTC without CLN was detected in 22.3%, whereas 68.3% was detected in PTC with CLN. Comparison of clinicopathological parameters between PTC with or without CAF revealed significant differences in cervical lymph node metastases ( $P<0.023$ ).

**Conclusion(s):** The presence of the stromal cells with negative immunoreactivity to CD34 and positive reactivity to  $\alpha$ -SMA implicated the presence of CAF in the PTC. Furthermore, PTC with CAF showed significantly more CLN than PTC without CAF. Therefore, the CAF could be used as predictive marker for CLN of PTC.

**Keywords:** Papillary Thyroid Carcinoma, Lymph Node Metastases, Fibroblast

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[O30-05]

## **Relationship between Expression of Vascular Endothelial Growth Factor -A, -C, CD31, D2-40 and Lymph Node Metastasis in Papillary Thyroid Carcinoma**

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Jin-Hee Sohn<sup>2</sup>, Seung-Wan Chae<sup>2</sup>, Dong-Hoon Kim<sup>2</sup>

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Medicine, Korea

<sup>2</sup>Department of Pathology, Kangbuk Samsung Hospital,  
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**Objective:** To evaluate the expression of the vascular endothelial growth factor (VEGF) -A, -C, CD31, D2-40 in papillary thyroid carcinoma (PTC) in relation to lymph node metastatic features, and to determine whether immunohistochemical staining of these markers can predict lymph node metastasis.

**Method(s):** We reviewed the clinical records of the patients who had undergone surgery for thyroid cancer and follicular adenoma during January 2007 to May 2009 at our clinic. Among these cases, seventy two patients including 25 cases of thyroid nodular hyperplasia, 24 cases of PTC without lymph node metastasis and 23 cases of PTC with lymph node metastasis were selected randomly. Formalin-fixed, paraffin-embedded tissues of the each group of cases were immunohistochemically stained for VEGF-A, -C, CD31, and D2-40, and the expression levels and vessel counts were quantified blindly by three pathologists who had no clinical knowledge of the patients.

**Result(s):** The expression levels of VEGF-C was significantly higher in PTC with lymph node metastasis than without lymph node metastasis ( $P<0.05$ ). The microvessel density and lymphatic vessel density were significantly higher in PTC with lymph node metastasis than without lymph node metastasis ( $P<0.05$ ).

**Conclusion(s):** Immunohistochemical staining for VEGF-C, CD31, and D2-40 in PTC may be beneficial in the identification of a subset of tumors that have a higher probability of metastatic spread.

**Keywords:** Papillary Thyroid Carcinoma, VEGF-A, VEGF-C

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[O30-06]

## **BRAF Mutation Testing of Thyroid Fine-Needle Aspiration**

Mingzhoo Xing\*

*Otolaryngology, Korea*

**Objective:** This study investigated the utility of BRAF mutation testing of thyroid fine-needle aspiration biopsy (FNAB) specimens for preoperative risk stratification in papillary thyroid cancer (PTC).

**Method(s):** We assessed the T1799A BRAF mutation status in thyroid FNAB specimens obtained from 190 patients before thyroidectomy for PTC and its association with clinicopathologic characteristics of the tumor revealed postoperatively.

**Result(s):** We observed a significant association of BRAF mutation in preoperative FNAB specimens with poorer clinicopathologic outcomes of PTC. In comparison with the wild-type allele, BRAF mutation strongly predicted extrathyroidal extension (23% vs. 11%;  $P=0.039$ ), thyroid capsular invasion (29% vs. 16%;  $P=0.045$ ), and lymph node metastasis (38% vs. 18%;  $P=0.002$ ). During a median follow-up of 3 years (range, 0.6 to 10 years), PTC persistence/recurrence was seen in 36% of BRAF mutation-positive patients versus 12% of BRAF mutation-negative patients, with an odds ratio of 4.16 (95% CI, 1.70 to 10.17;  $P=0.002$ ). The positive and negative predictive values for preoperative FNAB-detected BRAF mutation to predict PTC persistence/recurrence were 36% and 88% for overall PTC and 34% and 92% for conventional PTC, respectively.

**Conclusion(s):** Preoperative BRAF mutation testing of FNAB specimens provides a novel tool to preoperatively identify PTC patients at higher risk for extensive disease (extrathyroidal extension and lymph node metastases) and those who are more likely to manifest disease persistence/recurrence. BRAF mutation, as a powerful risk prognostic marker, may therefore be useful in appropriately tailoring

the initial surgical extent for patients with PTC.

**Keyword:** BRAF Mutation

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[O30-07]

## Can Preoperative BRAFV600E Mutation Testing Be Used as a Novel Diagnostic Marker in Thyroid Surgery? A Preliminary Prospective Study

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<sup>4</sup>Department. of Pathology, SoonChunHyang University Hospital, Korea;

<sup>5</sup>Department. of Laboratory Medicine and Genetics, SoonChunHyang University Hospital, Korea

**Objective:** The BRAFV600E mutation is unique to papillary thyroid cancer (PTC) and is considered a marker of aggressive disease. In Western countries, the BRAFV600E mutation occurs in approximately 45% of PTC patients, while the prevalence of the BRAFV600E mutation is much higher in Korea. PTC constitutes 95% of thyroid carcinoma cases and 68–91% carry the BRAFV600E mutation. This study determined whether the BRAFV600E mutation in thyroid FNAB cytologic smears provides reliable diagnostic information and helps in planning thyroid surgery, especially for indeterminate lesions.

**Method(s):** This study enrolled 75 of the 157 thyroidectomized patients seen from June 2009 to Dec 2009 who underwent BRAFV600E mutation testing with surgically confirmed PTC in a prospective clinical trial. The mutation was identified by an allele PCR amplification method using Seeplex BRAF ACE Detection (Seegene, Seoul, Korea). The diagnostic sensitivity, specificity, and positive (PPV) and negative (NPV) predictive values of the BRAFV600E mutation, FNAB, and ultrasonography (USG) were compared with the surgical pathology report. When the results of the FNAB and USG were indeterminate, the results of the BRAFV600E mutation were also compared.

**Result(s):** The BRAFV600E mutation was detected in 74.2% of the cases. The diagnostic sensitivity, specificity, PPV, and NPV of the BRAFV600E mutation were 74.2, 100, 100, and 34.6%, respectively, while values were 69.7, 100, 100, and 16.7% for the FNAB and 94.4, 80, 98.1, and 57.1% for USG. For indeterminate cytology on FNAB, the possibility of a true answer for the BRAFV600E mutation was 72.7%. For indeterminate USG lesions, the possibility of a true answer for the BRAFV600E mutation was 68.8%.

**Conclusion(s):** Preoperative BRAFV600E mutation testing using FNA specimens may be a sufficiently reliable diagnostic marker when planning thyroid surgery, especially for indeterminate lesions.

**Keywords:** Thyroidectomy, Indeterminate, Point Mutation

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[O30-08]

## RET Proto-Oncogene Genetic Screening in Patients with Medullary Thyroid Carcinoma: The Korea Single Institutional Experience

Jong Ju Jeong, Yong Sang Lee, Sang-wook Kang, Seung Chul Lee, Kee-Hyun Nam, Hang-Seok Chang, Woong Youn Chung\*, Cheong Soo Park

Department of Surgery, Yonsei University College of Medicine, Korea

**Objective:** Genetic screening of RET proto-oncogene is powerful method for the early identification of medullary thyroid carcinoma (MTC). The incidence of MTC is very low in Korea. And Korean is unwilling to genetic test generally. Until now, Result of RET mutation in Korea were reported small series sporadically. We report the results RET proto-oncogene genetic screening in Korea single institution.

**Method(s):** We conducted a retrospective review of the medical records of 104 patients with MTC, who underwent thyroidectomy, from 1982 to October 2009. Among those, we performed DNA PCR acquired from peripheral blood leukocyte and direct sequencing of exon 10, 11, 13, 14, 15, and 16 in patients and their relatives who agreed about genetic screening test.

**Result(s):** Twenty two of 54 patients (40.7%) were identified as having RET mutation. Seven of 15 their relatives were positive of RET mutation. Ten patients had MEN 2A, 4 patients with MEN 2B, 2 patients with FMTC, and one patient had unclassification type. The remaining 5 patients were thought to have sporadic. In MEN 2A, Eight patients had RET mutation in codon 634, and codon 600, codon 611 were positive each patient. Four of patients with MEN 2B had all mutation in codon 918. Two patients with FMTC had mutation in codon 618. The five patients with sporadic MTC had mutation each codon 618, 619, 641, 691, and 790. Three relatives with MEN 2A family history had mutation in codon 634, four relatives with FMTC family history in codon 618.

**Conclusion(s):** RET proto-oncogene mutation were mainly codon 634, codon 618 in our results. No relation could be found between the genotype and phenotype, further studies will be required to verify this. Also, in order to early diagnosis and treatment, we suggest that optimal RET proto-oncogene screening and counseling should be performed in medullary patients and their relatives in Korea.

**Keywords:** Medullary Thyroid Carcinoma, Ret Proto-Oncogene

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[O30-09]

## In Vitro Preclinical Testing of Sorafenib based Combination Therapies for Medullary Thyroid Carcinoma

**Yoon Woo Koh<sup>1\*</sup>, Eun Chang Choi<sup>1</sup>, Motoyasu Saji<sup>2</sup>,  
Manisha H Shah<sup>2</sup>, Matthew D Ringel<sup>2</sup>**

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**Objective:** Medullary thyroid cancer (MTC) is an aggressive malignancy that is refractory to chemotherapy, thus posing experimental and clinical challenges. Targeted inhibition of protein kinases is now acknowledged as an effective approach for cancer therapy. However, targeted therapies probably have limited success because cancer cells have alternate pathways for survival and proliferation thereby avoiding inhibition. Combination targeted therapies are the accepted standard for most malignancies but little attention has been paid to drug interaction for MTC. We evaluated the influence of the multikinase inhibitor BAY43-9006, applied alone or combined with mTOR inhibitor RAD001 or the MEK inhibitor AZD6244, on MTC cell in vitro.

**Method(s):** BAY43-9006, RAD001, and AZD6244 were tested separately and in combination in MTC cell line for evidence of pathway inhibition, growth inhibition, apoptosis, and long-range adaptation and resistance. We used TT cell and MZ-CRC cell line which harbor a RET mutation reminiscent of that seen with MEN2A (C634W) and MEN2B (M918T), respectively and thus represents a viable cell culture model for studying MTC.

**Result(s):** Combination of BAY43-9006 and AZD6244 synergistically potentiated the antiproliferative effects on both cells. But, the combination of BAY43-9006 or AZD6244 with RAD001 couldn't potentiate the antiproliferative effects. pERK1/2 level were markedly inhibited 1h after treatment with BAY43-9006 or AZD6244. But, pERK1/2 rebounded 3h after treatment. Compensatory ERK1/2 activation was less significant with combination of BAY43-9006 and AZD6244. Interestingly, RAD001 activated RET as well as AKT while inhibiting mTOR signaling. Furthermore, RET and AKT phosphorylation were potentiated by combined treatment of RAD001 and AZD6244. RET and AKT activation during mTOR and MAPK inhibition were tightly associated with development of cell resistance to combined treatment.

**Conclusion(s):** Potent anti-tumoral activities on MTC cell of BAY43-9006, combined with AZD6244 have been demonstrated. Contrary to the previous studies, the simultaneous use of both RAD001 and AZD6244 couldn't offer distinct combinatorial benefit.

**Keywords:** Medullary Thyroid Cancer, Targeted Therapy, BAY43-9006, RAD001, AZD6244

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## O31. Thyroid (II) : Endoscopy / Robot

Chairs : Kwang-Yoon Jung (Korea)

John A. Ridge (USA)

13:30 - 15:00 SBR IV

[O31-01]

### Endoscopic Thyroidectomy via an Axillo-Breast Approach without Gas Insufflation for Benign Thyroid Nodules and Micropapillary Carcinomas

**Yoon Woo Koh<sup>1</sup>, Yooseob Shin<sup>1</sup>, So-Yoon Lee<sup>1</sup>, Jae Wook Kim<sup>2</sup>, Seung Won Lee<sup>2</sup>, Eun Chang Choi<sup>1\*</sup>**

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**Objective:** We examined the feasibility and safety of endoscopic thyroidectomy via an axillo-breast approach without gas insufflation for large thyroid tumors (>4 cm in tumor diameter) and micropapillary carcinomas.

**Method(s):** We grouped the endoscopic thyroidectomized patients into a benign group and a micropapillary carcinoma group. The patients in the benign group were separated into group 1 (n=95, <4 cm in tumor diameter) and group 2 (n=37, >4 cm in tumor diameter). Also, 57 patients in the micropapillary carcinoma group underwent an endoscopic hemithyroidectomy (HT) with ipsilateral central neck dissection (CND) (group 3) and were compared with 60 patients who received conventional open HT with ipsilateral CND (group 4).

**Result(s):** In the benign group, the mean tumor size in group 2 was significantly larger than that in group 1. There was no significant difference in mean operating time; hospital stay; or overall perioperative complications between the two groups. In the micropapillary carcinoma group, mean operating time and hospital stay in group 3 (endo group) were significantly longer than in group 4 (open group; P=0.015 and P=0.000). The overall pathological outcomes and perioperative complications did not differ significantly between either group. The postoperative cosmetic result was better in groups 1-3 (endo group) than in group 4 (open group). Difficulty with posoperative high-pitched or singing voice didn't improve in group 4 (open group) until 6 months. The voice handicap index also didn't improve until 6 months in group 3 (endo group).

**Conclusion(s):** Endoscopic thyroidectomy via a gasless axillo-breast approach seems to be a safe procedure even for benign thyroid lesions ≥4 cm and micropapillary carcinomas and produces outcomes similar to those of open thyroidectomy. Although it requires a longer operative time, it has the advantage of better cosmetic results over open thyroidectomy.

**Keywords:** Endoscopic Thyroidectomy, Cosmesis, Thyroid Tumor

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[O31-02]

### Recovery of Sensation in the Skin Flap after the Bilateral Axillo-Breast Approach Endoscopic Thyroidectomy

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**Objective:** The bilateral axillo-breast approach (BABA) endoscopic or robotic thyroidectomy is successfully used for various thyroid diseases with excellent cosmetic outcome. But there is little information about the manifestation and recovery of sensory impairment of the skin flap after endoscopic thyroidectomy. The aim of this study is to evaluate the sensory impairment after the BABA endoscopic or robotic thyroidectomy.

**Method(s):** Fifty-one patients who had undergone BABA endoscopic or robotic thyroidectomy were analyzed. Semmes-Weinstein pressure threshold test was used to assess quantitatively the sensation of 19 sites in the skin flap of the chest wall. Questionnaires were used to assess patients' subjective perception of the sensation. The assessment was performed at follow-up visits (8-115 days). The medical records of patients were reviewed including age, gender, duration of operation, method of operation, postoperative complication, breast feeding history, breast size, body weight and body mass index (BMI). There were 35 cases of robotic thyroidectomy and 16 cases of endoscopic thyroidectomy. There were 45 female and 6 male patients and the mean age was 39.2 years (22-63 years).

**Result(s):** There were no significant differences in age, gender, duration of operation, method of operation, postoperative complication, breast feeding history and breast size between the patients with sensory impairment and without sensory impairment. The quantitative data showed a marked reduction of the proportion of sensory impairment after 3 months postsurgery (P=0.0083). After adjusting age and gender, multiple logistic regression showed that the risk of sensory impairment was 1.338 times (95% CI, 1.172-1.526) higher for every 10 kg increase of body weight and 1.589 times (95% CI, 1.129-1.470) higher for every 2 kg/m<sup>2</sup> increase of the BMI.

**Conclusion(s):** It is suggested that the sensory impairment after BABA endoscopic or robotic thyroidectomy recovers after 3 months postoperatively. The outcome of this study relieves the surgeon and patient from the concerns about sensory impairment after the BABA endoscopic or robotic thyroidectomy.

**Keywords:** Endoscopic Thyroid Surgery, Endoscopic Neck Surgery, BABA

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[O31-03]

## Learning Curve of Robot-Assisted Thyroidectomy for Thyroid Cancer

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**Objective:** The learning curve means the process of gaining knowledge and skills in the field of surgical technology and is a commonly used assessment tool of training efficacy. We already have reported the feasibility and safety of robot-assisted thyroidectomy using a gasless, trans-axillary approach (RAT-TAA). In this study, we define the learning curve of a beginner surgeon and evaluate the influencing factors to develop the optimal training program for RAT-TAA.

**Method(s):** From August 2008 to July 2009, a single beginner surgeon has performed 140 cases of robotic thyroidectomy for thyroid cancer using da Vinci S robotic system. All procedures were successfully completed without conversion to the open surgery. We reviewed operation type, working space time, console time, total operation time and perioperative complications retrospectively.

**Result(s):** Eighty one patients underwent less than total and 59 underwent bilateral total thyroidectomy. Ipsilateral CCND was conducted in all cases. Mean total operation time of less than total cases and bilateral total cases were 135.8 min, 147.1 min respectively. Mean working space time of less than total cases and bilateral total cases were 31.3 min, 31.2 min respectively. Mean console time of less than total cases and bilateral total cases were 49.5 min, 72.6 min respectively. The learning curve for the total operation times has made the plateau after 20 cases in less than total thyroidectomy, 30 cases in bilateral total thyroidectomy.

**Conclusion(s):** Proficiency for less than total and total RAT-TAA was achieved after 20 cases and 30 cases respectively. Considering our institutional situation, there must be several factors which influenced to the less steep learning curve of the this study, such as well-trained surgical team, relatively many operation cases during short period and continuous communication and feed-back from the experienced surgeon (Dr. Chung).

**Keywords:** Learning Curve, Beginner Surgeon, Robot-Assisted Thyroidectomy

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[O31-04]

## A Comparative Study of Robot-Assisted versus Conventional Endoscopic Thyroidectomy in PTMC Patients

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**Objective:** Robot assisted techniques widely applied at various surgeries to overcome limitations of conventional endoscopic surgeries. The aim of this study is to compare the early surgical outcomes of the two groups who underwent robotic (RG) versus conventional endoscopic thyroidectomy (EG) for papillary thyroid microcarcinoma (PTMC) patients.

**Method(s):** From Nov. 2001 through Jul. 2009, 1175 patients with PTMC underwent endoscopic thyroidectomy using a gasless, trans-axillary approach, of these, 578 were RG and 598 were EG. The patient's clinicopathologic characteristics, early surgical outcomes were compared retrospectively.

**Result(s):** Mean age is older and M:F ratio is larger in RG than EG. RG showed larger tumor size, more frequent central node metastasis, capsular invasion and bilaterality. Tumor and nodal status of RG were more advanced than EG. Total thyroidectomy were more frequent in RG and the extent of central node dissection were wider than EG. Total operation time showed no significant differences between the two groups. But regardless of robotic docking time, the real operation time of less than total thyroidectomy was significantly shorter in RG and in cases of total thyroidectomy, there were shorter tendency in RG than EG. There were no differences in the length of post-operative hospital stay and the rate of post-operative complications except the rate of transient hypocalcemia. Transient hypocalcemia was significantly frequent in RG, but there were no permanent hypocalcemia in RG. Postoperative serum TG level showed no statistical differences between the two groups. There were no recurrence case during the short term sonographic follow-up or no abnormal uptakes at RAI therapy in both groups.

**Conclusion(s):** Robotic thyroidectomy can provide shorter operation time and wider surgical extent without increasing significant postoperative complication. So we can anticipate robotic surgery could expand the indication of endoscopic thyroidectomy for the treatment of more advanced thyroid cancer.

**Keywords:** Papillary Thyroid Microcarcinoma, Conventional Endoscopic Thyroidectomy, Robot Assisted Endoscopic Thyroidectomy

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[O31-05]

## Defining the Learning Curve for Robotic Thyroidectomy: A Multi-Center Study Comparing Experienced and Beginner Surgeons

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**Kee-Hyun Nam<sup>2</sup>, Jong Ho Yun<sup>3</sup>**

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<sup>3</sup>Surgery, Ulsan University School of Medicine, Korea

**Objective:** Robotic thyroidectomy using Chung's gasless transaxillary approach was an advanced surgical procedure requiring technical skill in endoscopic surgery. However, this new surgical technique remains in the early stage of the learning curve, lacking sufficient clinical experience and profound research. The aims of this study were to evaluate individual learning curves for a group of junior surgeons performing robotic thyroidectomy and to determine whether newly appointed surgeons are able to achieve surgical outcomes comparable to their more experienced peer.

**Method(s):** We conducted a prospective, controlled, multi-centre study by 4 endocrine surgeons at 3 academic centers. To establish the number of procedures required before achieving a stable robot technique, patients were divided into 10 series chronologically. Perioperative data were categorized according to whether surgery was carried out by an established surgeon (ES) or a newly appointed surgeon (NS). Outcome measures were demographic data, operative time, blood loss, hospital stay, pathologic result, and postoperative complication.

**Result(s):** Six hundred and forty-four robotic thyroidectomy procedures were carried out in the period September 2008 to October 2009. Of these, 267 (41.5%) robotic surgery were performed in ES and 377 (58.5%) robotic surgery in NS group. No difference of perioperative outcome was found between both groups, except for operating time which was significantly longer in the NS group ( $P<0.001$ ). However, this increase in operating time disappeared after 50 robotic surgeries in the NS group.

**Conclusion(s):** Our experience demonstrated that the first 50 cases constitute the early stage of the learning curve for robotic thyroidectomy using gasless transaxillary approach. Further research is needed to determine the surgeon's experience that is associated with improved oncologic control and long-term clinical outcome.

**Keywords:** Robotic Thyroidectomy, Learning Curve, Multicenter Study

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[O31-06]

## Robotic Thyroidectomy by Unilateral Axillo-Breast Approach in Thyroid Carcinoma; Preliminary Report

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**Objective:** Various endoscopic thyroidectomy has been performed to minimize the visible scar in the neck. But it has the limitations of poor surgical view and inaccurate manipulation of instruments. Recently robotic technology has been applied to thyroidectomy to overcome endoscopic thyroidectomy. But its usefulness was not yet proven for thyroid cancer. The aim of this study is to evaluate the feasibility and usefulness in the management of thyroid differentiated cancer with our initial experience.

**Method(s):** From October 2008 to October 2009, 32 patients with papillary thyroid carcinoma who underwent robot-assisted endoscopic thyroidectomy by unilateral axillo-breast approach using da Vinci Surgical Robot (Intuitive Surgical, Inc., Sunnyvale, CA) in Hanyang University Hospital were analyzed.

**Result(s):** Among 32 patients, women were 30, and men were 2. Mean age was 36 (27-55). All of 32 patients were papillary carcinoma. Whole surgical procedure was completed successfully in all patients. Mean operation time was 143 minutes. Mean tumor size was 1.1 cm. Unilateral lobectomy was performed in 27 patients and total thyroidectomy was performed in 5 patients. Ipsilateral anterior compartment neck dissection was performed in 30 patients. Transient vocal cord paralysis occurred in 2 patients. There was no postoperative hematoma or permanent hypoparathyroidism. Postoperative cosmetic satisfaction of patients was excellent.

**Conclusion(s):** Based on our initial experience, robot-assisted endoscopic thyroidectomy by unilateral axillo-breast approach is feasible and promising alternative in the surgery of thyroid differentiated cancer.

**Keywords:** Robot, Thyroidectomy, Endoscopic Thyroidectomy

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[O31-07]

## Robotic Thyroid Surgery by Bilateral Axillo-Breast Approach (BABA) Using Da Vinci Surgical System

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**Objective:** Robotic surgery is useful in areas with difficult access like the pelvis. The neck area, especially the thyroid gland poses a difficult challenge for many endoscopic surgeons. Robotic surgery is useful in this area due to its excellent magnification and endo-wrist function. We present our experience with robotic endoscopic thyroidectomy using the bilateral axillary breast approach.

**Method(s):** From February, 2008 to August 2009, we applied da Vinci surgical system to BABA endoscopic neck surgery for 275 patients. The male to female ratio was 1:7.33. Mean age of the patients were  $38.1 \pm 8.9$  years. After subcutaneous infiltration with diluted epinephrine solution, subplatysmal and subcutaneous space was dissected. Two circumareolar ports and 2 axillary ports were used and operative space was obtained with low pressure CO<sub>2</sub> gas insufflation. Total thyroidectomies and central node dissection were done in a manner similar to BABA endoscopic thyroid surgery.

**Result(s):** BABA robotic thyroid surgery included 9 thyroid lobectomies, 17 subtotal thyroidectomies, and 174 total thyroidectomies. The mean operation time was  $210.0 \pm 45.5$  min. The mean console time was  $126 \pm 36.5$  min. The mean operation time of total thyroidectomy was  $208.6 \pm 39.2$  min. The intraoperative loss of blood was minimal. The mean hospital stay was  $3.5 \pm 0.7$  day. The pathologic diagnosis included 187 papillary carcinoma, 1 follicular adenoma, 1 Hashimoto's thyroiditis, 1 focal fibrosis, and 4 adenomatous goiter. There was 1 case of conversion to open surgery. There were 56 (28.0%) cases of transient hypoparathyroidism and 3 cases (1.5%) of permanent hypoparathyroidism. There were 15 cases (7.5%) of transient and 1 case (0.5%) of permanent recurrent laryngeal nerve palsy. Cosmetic results were excellent and patients were all satisfied.

**Conclusion(s):** The Robot BABA endoscopic thyroid surgery would be a feasible method for thyroidectomy with a excellent visualization, optimal robotic arm mobility, minimal adverse effect, and excellent cosmetic result.

**Keywords:** Robotic Surgery, Endoscopic Thyroidectomy, Bilateral Axillo-Breast Approach

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[O31-08]

## Initial YUMC Experience of Robot-Assisted Modified Radical Neck Dissection in the Management of Thyroid Carcinoma with Lateral LN Metastasis

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**Objective:** Since the introduction of endoscopic technique to thyroid operation, several trials of endoscopic lateral neck dissection have been reported for the purpose of avoiding a long cervical scar after surgery. With the incorporation of surgical robotic system into the thyroid surgery, still and meticulous dissection have been enabled and more precise and improved endoscopic techniques have been accomplished. In this study, our initial experience of robot-assisted modified radical neck dissection (MRND) in thyroid cancer with da Vinci S robotic system is described.

**Method(s):** From Oct. 2007 to Oct. 2009, 995 patients have undergone robot-assisted thyroidectomy using a gasless, transaxillary approach (RAT-TAA) for thyroid cancer. Among them, 33 patients have been performed additional robotic MRND for lateral LN metastasis. The clinico-pathologic data of the patients were analyzed retrospectively.

**Result(s):** The mean age of the patients was  $37.2 \pm 9.2$  years and gender ratio was 7:26. Mean operation time was  $280.8 \pm 40.6$  min. and mean post operative hospital stay was  $5.4 \pm 1.6$  days. The mean tumor size was  $1.09 \pm 0.52$  cm and PTMC was in 20 cases (60.6%). Mean retrieved L/N numbers are  $6.1 \pm 4.4$  in central compartment and  $27.7 \pm 11.0$  in lateral neck compartment. There was no serious post operative complication such as Horner syndrome and major nerve injury (vagus, spinal accessory, hypoglossal, marginal mandibular branch of facial nerve and recurrent laryngeal nerve).

**Conclusion(s):** This noble procedure of robot-assisted modified radical neck dissection is technically feasible, safe and cosmetically excellent. Through this method, precise manipulation of robotic instruments makes it possible to perform complete compartment-oriented dissection without any injury of major vessels or nerves and any compromising of surgical oncologic principles. From our initial experience, the robot-assisted modified radical neck dissection can be the acceptable alternative as an operative method, currently in the low risk, well-differentiated thyroid cancer patients with lateral neck metastasis.

**Keywords:** Robotic Modified Radical Neck Dissection, Da Vinci Robot System, Papillary Thyroid Carcinoma

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[O31-09]

## New Surgical Devices - Big Help in Transcervical Approach on Retrosternal Goiter

**Miljenko Bura\***

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University Hospital Center, Croatia*

**Objective:** We report our experience in the management of retrosternal goiter with new electrical surgical technology without vessels ligation.

**Method(s):** The procedure is carried out through the “normal” cervical incision of 48-85 mm and the thyroidectomy is performed by instrument specially designed for thyroid surgery. It is powered by bipolar energy. All surgery we did without vessels ligation. We coagulated vessels with surgical bipolar instrument (BiClamp) and cut with scissors.

**Result(s):** We have treated (May 2006 to October 2009) 59 patients with retrosternal goiter. In this study 52 patients had total thyroidectomy and 7 of them lobectomy. Mean operative time for lobectomy was 76 minutes, range 54 to 98 minutes and for total thyroidectomy mean time was 116 minutes, ranged from 94 to 164 minutes. There was no postoperative bleeding and revision surgery. We had three transient recurrent nerve palsy and one permanent recurrent nerve palsy. We had two permanent hypocalcemia.

**Conclusion(s):** Transcervical approach in retrosternal goiter is a safe technique with shorter operation time (40%) in case when we used electrical bipolar device specially designed for thyroid surgery. All operations were finished transcervically and without sternotomy.

**Keywords:** Retrosternal Goiter, Transcervical Approach, Bipolar Energy

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**O32. Thyroid (III)**

**Chairs : Wojciech Golasinski (Poland)**  
**Mohssen Ansarin (Italy)**

15:30 - 17:00 SBR I

[O32-01]

## The Important Role of Preoperative Ultrasound and CT Findings of the Primary Tumor in Predicting the Cervical Lymph Node Metastases of Papillary Thyroid Carcinomas

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**Objective:** Cervical nodal metastases in papillary thyroid carcinoma (PTC), found in up to 90% of cases, are associated with an increase in recurrence rate, and may impact negatively on quality of life as well as survival. Almost of all reports about PTC with cervical nodal metastases was focused on finding usefulness of ultrasonography (US) and computed tomography (CT) for detection of lymph node metastases. It is very helpful to decide treatment strategy and strength of follow up, if we can predict cervical lymph node metastasis even in the case of clinically negative lymph node metastasis of PTC patients preoperatively. In the present study, we investigated whether the preoperative US and CT findings of the primary tumor could predict the lateral cervical lymph node metastases of PTC.

**Method(s):** A retrospective analysis was performed on 860 patients who underwent surgery for PTC between 1990 and 2008. By comparing a group with lateral cervical lymph node metastases ( $n=298$ ) with a group without lateral cervical lymph node metastases ( $n=662$ ), the findings of US and CT for the primary tumor of PTC were analyzed.

**Result(s):** Tumor size in US was significantly different between PTC with lateral cervical lymph node metastases (1.81 cm) and PTC without that (1.46 cm,  $P<0.024$ ). The number of suspicious findings for malignancy in US was also significantly different between the two groups (4.15 vs. 2.38,  $P<0.038$ ). The soft tissue invasion of primary tumor in CT was significantly different between the two groups (39 vs. 5,  $P<0.02$ ).

**Conclusion(s):** When the tumor more than 1.5 cm and suspicious findings for malignancy more than 4 were found in US and soft tissue invasion found in CT in preoperative evaluation, physician must try to find lateral lymph node metastasis intensively, and radioactive iodine ablation could be considered postoperatively. Also, patients with above findings have to be kept watch carefully.

**Keywords:** Papillary Thyroid Carcinoma, Lymph Node Metastases, Image Findings

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[O32-02]

## Clinical Behavior of Papillary Thyroid Carcinoma Smaller than 1.5 cm

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Jeong-Soo Woo<sup>1</sup>, Soon-Young Kwon<sup>1</sup>, Kwang-Yoon Jung<sup>1\*</sup>,  
Shin-Gon Kim<sup>2</sup>**

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**Objective:** With the increasing use of high resolution sonography and fine needle aspiration biopsy, the proportion of newly diagnosed thyroid papillary carcinomas have increased. However, it is not entirely clear whether microcarcinomas detectable by the above technology should be considered a threshold for risk evaluation.

**Method(s):** A retrospective chart review was conducted for 181 patients who underwent surgery for thyroid cancer and was proven to have papillary carcinoma smaller than 1.5 cm in size from 1997 to 2006. The patients were divided into 3 groups according to cancer size. The patient's gender, age, surgical method, pathology, initial neck node and neck recurrence was analyzed by chi-square test, analysis of variance (ANOVA) test and multinomial logistic regression analysis.

**Result(s):** Progressively increasing frequency of signs of tumor aggressiveness (multifocal, bilateral, extracapsular spread) was observed with increasing size. The rate of lymph node metastasis increased also, but it did not reach a significant value. Despite the increasing rate of aggressiveness and lymph node metastasis, there was no significant difference in recurrence between these groups.

**Conclusion(s):** Although the long term outcome does not seem to directly depend on tumor size in these small thyroid cancers, a progressing frequency of aggressiveness with increasing cancer size at presentation is evident.

**Keywords:** Thyroid Neoplasm, Prognosis

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[O32-03]

## A Clinical Review of Thyroid Malignant Lymphoma: Diagnosis, Treatment, and Outcome

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Japan

**Objective:** Thyroid malignant lymphoma (ML) is one of the rare malignancies in the head and neck region. Tumor may exhibit symptoms with rapid growth mass, recurrent laryngeal paralysis, and dyspnea. By reviewing thyroid ML patients, we intended to elucidate the clinical features of this rare disease.

**Method(s):** Among the 3,194 patients with head and neck malignancies treated at our institute between 1971 and 2008, thyroid ML was found in 4 patients (0.1%). The clinical feature, treatment, and outcome of these patients were summarized.

**Result(s):** Case1: A 72 y.o. female with anterior neck swelling and progressive dyspnea received emergency tracheotomy and neck exploration. She was diagnosed as diffuse large B-cell lymphoma (DLBCL) and was treated by chemoradiation therapy with complete response.

Case2: A 67 y.o. female with anterior neck swelling was initially diagnosed as thyroid tumor and subsequently received thyroidectomy. The tumor was resected with the area showing invasion to esophagus. She was diagnosed as DLBCL and was treated by chemoradiation therapy with complete response.

Case3: A 69 y.o. female with anterior neck swelling was initially diagnosed as thyroid tumor and subsequently received thyroidectomy. She was diagnosed as Hodgkin disease and was treated by chemoradiation therapy but died with systemic disease.

Case4: A 63 y.o. male with anterior neck swelling was initially diagnosed as thyroid tumor and subsequently received thyroidectomy. He was diagnosed as highly suspected ML with Hashimoto disease and was treated by chemoradiotherapy with complete response.

**Conclusion(s):** Thyroid ML is a rare head and neck malignancy with rapid growth nature therefore often requires differential diagnosis with thyroid undifferentiated carcinoma. Unlike undifferentiated carcinoma, good prognosis can be expected with thyroid ML. Meticulous evaluation is needed to properly diagnose ML in order to avoid unnecessary surgical damages to the patients.

**Keywords:** Thyroid Malignant Lymphoma, Chemoradiotherapy

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[O32-04]

## Medullary Thyroid Cancer in the Era of RET Mutation Analysis: An Australian Experience

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Bruce Robinson<sup>2</sup>, Leigh Delbridge<sup>1</sup>, Mark Sywak<sup>1\*</sup>**

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Australia

**Objective:** The management of medullary thyroid carcinoma (MTC) is improved through the introduction of RET proto-oncogene analysis which allows early surgical intervention. This study compares the outcome of patients with MTC following genetic evaluation.

**Method(s):** A retrospective study of patients undergoing surgical intervention for histologically proven MTC was performed. Patients were identified from a prospectively maintained surgical database. Patients were stratified by genetic status into sporadic (SMTC) or hereditary (HMTC) groups.

**Result(s):** Ninety four patients underwent surgical intervention for MTC between 1967-2009. Sixty-seven had sporadic disease (SMTC) and 27 had hereditary disease (HMTC). Overall 10 year disease free and overall survival for SMTC and FMTC were 47% vs. 62% ( $P=0.33$ ) and 71% vs. 100% ( $P=0.12$ ), respectively. The SMTC group was significantly older at presentation (52 vs. 34 years,  $P=0.03$ ), with higher preoperative serum calcitonin (7,968 pg/mL vs. 1,346 pg/mL). The SMTC group had larger primary tumour diameter (26 mm vs. 12 mm,  $P=0.04$ ), higher rate of vascular invasion (45% vs. 29%,  $P=0.014$ ) and greater incidence of lymph node metastasis (55% vs. 33%,  $P=0.012$ ). Since the incorporation of RET mutation analysis as part of the management workup in our unit (since 1993), patients with hereditary disease were detected at an earlier stage with smaller tumour size (10 mm vs. 18 mm), lower pre-operative calcitonin level (903 vs. 4,498 pg/mL) and less lymphovascular invasion. When the patients with HMTC were identified through RET mutation analysis screening, they tended to have more favorable histopathological characteristics (smaller tumour size, less capsular and lymphovascular invasion) compared to the index patients with HMTC.

**Conclusion(s):** In MTC, the genetic identification of familial cases allows earlier diagnosis, surgical intervention for less advanced disease and may lead to improved long term survival.

**Keywords:** Thyroid Neoplasms, Multiple Endocrine Neoplasia, Medullary Thyroid Cancer

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[O32-05]

## **Significance of Thyroglobulin Measurement in Fine-Needle Aspirate as a Preoperative Evaluation of Lymph Node**

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Hang-Seok Chang, Woong Youn Chung\*, Cheong Soo Park**

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**Objective:** The aim of the study is to evaluate the usefulness of thyroglobulin (Tg) measurement in fine-needle aspirate (FNA) in determining the necessity of lateral neck dissection for initial surgical treatment of papillary thyroid cancer.

**Method(s):** Total of 119 papillary thyroid cancer patients were prospectively studied from May, 2005 to Dec. 2007. An ultrasound-guided FNA was done in 126 lateral neck node with suspicion of metastasis at preoperative imaging study and FNA Tg was measured. All nodes were confirmed histologically.

**Result(s):** Out of 126 lateral neck nodes, 72 had been confirmed as metastasis of papillary carcinoma. FNA Tg of negative node was 1.9 ng/mL, and FNA Tg of metastatic nodes was 282.6 ng/mL. 47 metastatic nodes were diagnosed by FNAC, the sensitivity and the specificity of FNA were 61.1%/94.4%. With cutoff value as FNA Tg (10) ng/mL, the sensitivity and the specificity were 79.2%, 96.3%. With cutoff value as “FNA Tg/ the serum Tg ratio was higher than 1.0”, the sensitivity and the specificity were 78.4%, 93.5%. The diagnostic accuracy is highest when combine the result of FNA, FNA Tg (10), and FNA Tg/serum Tg ratio. Of 79 FNA negative cases, 5 inadequate FNA cases and 6 reactive hyperplasia FNA cases were diagnosed as metastatic node additionally using FNA Tg. In 11 cases with cystic neck node metastasis, the sensitivity of FNA was 45.5%, but with combination of FNA Tg, the sensitivity was improved to 91%.

**Conclusion(s):** The measurement of thyroglobulin in the fine-needle aspirate improve diagnostic accuracy than FNA alone and helpful in determining the surgical extent of lateral neck dissection at initial diagnosis, especially in controversial cases such as non-diagnostic cystic nodal metastasis or FNA negative patients with nodal metastasis.

**Keywords:** Thyroglobulin, Fine-Needle Aspirate, Lateral Neck Node Metastasis

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[O32-06]

## **Completeness of the Bilateral Axillo-Breast Approach Endoscopic Thyroidectomy Compared to Open Thyroidectomy by Means of the Postoperative Radioactive Iodine Uptake**

**Do Hoon Koo<sup>1</sup>, Hyung Jun Lim<sup>2</sup>, Kyu Eun Lee<sup>3</sup>,  
Yoo Seung Chung<sup>4</sup>, Jin Chul Paeng<sup>2</sup>, Su Jin Kim<sup>3</sup>,  
Jeonghun Lee<sup>5</sup>, June-key Chung<sup>2</sup>, Yeo-Kyu Youn<sup>3\*</sup>**

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**Objective:** The Bilateral Axillo-Breast Approach (BABA) endoscopic thyroidectomy (ET) has excellent cosmetic result as well as comparable complication rates and postoperative thyroglobulin (Tg) level. To assure the surgical completeness of BABA ET, we compared ET and open thyroidectomy (OT) by means of the radioactive iodine (RAI) uptake of remnant thyroid.

**Method(s):** From January, 2003 to June, 2007, 46 patients who had received RAI ablation after total thyroidectomy were enrolled. Twenty-five patients underwent ET and 21 OT. The two groups did not differ significantly in terms of clinicopathological factors other than sex and age. The remnant thyroid was measured by the neck-to-skull RAI uptake ratio on the first postoperative RAI ablation scan. Postoperative stimulated Tg levels were compared between ET and OT groups, as were the total number of RAI ablation sessions and the total RAI doses needed to achieve complete ablation.

**Result(s):** There were no differences between the two groups in regards of the RAI uptake ratio ( $23.7 \pm 18.8$  vs.  $20.6 \pm 21.6$ ,  $P=0.305$ ), TSH level at first ablation ( $94.40 \pm 59.1$  vs.  $83.5 \pm 39.0$ ,  $P=0.473$ ), the stimulated Tg level ( $1.6 \pm 1.6$  vs.  $1.7 \pm 2.1$ ,  $P=0.829$ ), the total number of RAI ablation sessions ( $2.28 \pm 0.61$  vs.  $2.38 \pm 0.59$ ,  $P=0.381$ ), or the total RAI doses needed to achieve a complete ablation ( $71.2 \pm 22.0$  vs.  $77.1 \pm 29.4$ ,  $P=0.384$ ).

**Conclusion(s):** The completeness of the surgical removal of thyroid tissue by BABA ET could be comparable with that of OT. The BABA ET might give a safe option for patients with low risk thyroid cancer who are concerned with the scars in the neck area.

**Keywords:** Endoscopic Thyroidectomy, Postoperative Radioactive Iodine Uptake, Surgical Completeness

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[O32-07]

## Minimally Invasive Video-Assisted Gasless Thyroidectomy (MIVAT): The University of the Philippines- Philippine General Hospital Experience

**Arsenio Claro Cabungcal\***, Alfredo Pontejos

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**Objective:** Minimally invasive video-assisted gasless thyroidectomy (MIVAT) was first described by Miccoli in 1998. MIVAT was first introduced in the Philippines in 2005. This study aims to describe the cases of MIVAT done in a tertiary government training hospital in the Philippines in terms of the patient population, preoperative evaluation and diagnosis, scope of the operation, immediate postoperative course and complications and the final histopathological results.

**Method(s):** This is a retrospective descriptive study of all patients who underwent MIVAT at the Philippine General Hospital between March 2006 and October 2009.

**Result(s):** This study shows that majority of the patients who have undergone MIVAT are females with a preoperative diagnosis of nodular nontoxic goiter. Most of them underwent lobectomy with isthmusectomy. The mean intraoperative blood loss was 34 cc, mean operative time was 120 minutes and the skin incision was limited to 2 cm. Morbidity rate was 7.7% with mortality rate 2.13%.

**Conclusion(s):** MIVAT is a relatively new approach to thyroidectomy. Within the limits of the population for which it is indicated, this approach appears to be comparable with the standard approach in terms of safety and efficacy and has the advantage of better cosmetic result due to the short incision that is used.

**Keywords:** Minimally Invasive Video-Assisted Gasles, MIVAT

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[O32-08]

## Clipless and Sutureless Endoscopic Thyroidectomy Using Only a Harmonic Scalpel

**Yoon Woo Koh<sup>1</sup>, Jae Wook Kim<sup>2</sup>, Yooseob Shin<sup>1</sup>, So-Yoon Lee<sup>1</sup>, Eun Chang Choi<sup>1,\*</sup>**

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**Objective:** The harmonic scalpel (HS) has been used in endoscopic thyroidectomy with encouraging results; however, additional instruments are frequently required to complete hemostasis. The aim of the present study was to assess the safety and efficacy of the clipless and sutureless technique using the HS in endoscopic thyroidectomy without supplementary instrumentation.

**Method(s):** A total of 114 patients underwent endoscopic hemithyroidectomy (HT) or total thyroidectomy (TT) via a unilateral axillo-breast approach. In all cases, hemostasis was achieved solely by the HS. Perioperative complications, surgery-related outcomes, and pathologic outcomes were examined.

**Result(s):** Operating time in the TT group ( $170.23 \pm 45.63$  min,  $n=22$ ) was longer than in the HT group ( $111.63 \pm 38.44$  min,  $n=92$ ;  $P=0.0000$ ). After the first 50 cases, operating time decreased significantly ( $145.60 \pm 52.72$  min vs.  $105.23 \pm 30.14$  min,  $P=0.0000$ ). Postoperative minor hematomas from the skin flap were encountered in three patients (3.3%) in the HT group. No postoperative hemorrhage or hematoma was noted in the thyroidectomy field using the HS. Four patients in the HT group (4.3%) and one patient in the TT group (4.5%) developed transient unilateral vocal cord palsy. Temporary hypocalcemia was observed in eight patients in the TT group (36.4%). No permanent recurrent laryngeal nerve palsy or hypoparathyroidism occurred in either group.

**Conclusion(s):** The HS alone in the clipless and sutureless endoscopic thyroidectomy provides a good alternative to the conventional ligation or clipping technique, as it is associated with a shorter operating time and a relatively low incidence of complications.

**Keywords:** Endoscopic Thyroidectomy, Perioperative Complications, Sutureless

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[O32-09]

## Feasibility of Sutureless Thyroidectomy Using the Harmonic Scalpel under Local Anesthesia

**Jae Wook Kim<sup>1</sup>, Yooseob Shin<sup>2</sup>, So-Yoon Lee<sup>2</sup>,  
Yoon Woo Koh<sup>2\*</sup>, Eun Chang Choi<sup>2</sup>**

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**Objective:** When general anesthesia became safer, surgeons started performing thyroidectomy exclusively under general anesthesia (GA). However, recent descriptions of thyroidectomy under local anesthesia (LA) claim similar results to thyroidectomy under general anesthesia. The thyroid gland is one of the most vascular organs and surgical resection mandates meticulous hemostasis. The aim of this study was to assess the safety and efficacy of the sutureless thyroidectomy under LA.

**Method(s):** A total of 80 patients who underwent sutureless thyroidectomy under GA or LA with monitored anesthesia care (MAC) were enrolled. LA thyroidectomy procedures were accomplished using superficial cervical plexus block (1% mepivacaine) with monitored intravenous sedation (2% propofol). Patient features, operative data, length of stay, functional outcomes (pain on operative area, sore throat, hoarseness score, and nausea/vomiting) and complications are analyzed for factors associated with outcomes. A visual analogue scale (VAS) was used for pain on operative area and sore throat assessment with time points of PACU (post-anesthesia care unit), postoperative 3 h, 6 h, and 12 h.

**Result(s):** Either GA group or LA group included 40 patients respectively. In either GA or LA group, we performed 20 vs. 14 total thyroidectomy, 17 vs. 22 less than total thyroidectomy, and 3 vs. 4 completion thyroidectomy, respectively. Permanent pathology revealed 53 thyroid cancers and 27 benign goiters. In terms of postoperative nausea/vomiting, there was no significant difference between the two groups. Pain on operative area was significantly lower in LA group than in GA group only in PACU. Sore throat and hoarseness of LA group was significantly lower than those of GA group in all time points. There was no significant difference in postoperative outcomes including operation time and hematoma between groups.

**Conclusion(s):** Sutureless thyroidectomy using HS can be performed under either GA or LA with MAC, expecting similar operative results, clinical results, and patient satisfaction.

**Keywords:** Local Anesthesia, Sutureless Thyroidectomy, Postoperative Outcomes

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## O33. Skull Base

**Chairs : Atsunobu Tsunoda (Japan)**  
**Carl H. Snyderman (USA)**

15:30 - 17:00 SBR II

[O33-01]

### Endoscopic Craniofacial Resection for Patients with Olfactory Neuroblastoma

**Chang Myeon Song, Doo Hee Han, Chae-Seo Rhee,  
Yang-Gi Min, Chul Hee Lee\***

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**Objective:** We analyzed the clinical features of olfactory neuroblastoma (ONB) and compared the treatment results according to surgical modalities, which included traditional craniofacial resection (TCFR) and endoscopic craniofacial resection with craniotomy (ECFR).

**Method(s):** Twenty-three patients who underwent craniofacial resection for ONB from 1989 through 2008 at Seoul National University Hospital, Seoul National University Bundang Hospital were included.

**Result(s):** Twelve patients underwent TCFR, while eleven ECFR. All TCFR group was Kadish stage C, whereas 1 A, 2 B, 8 C for ECFR group. The mean follow-up periods for TCFR and ECFR groups were 41.52 and 41.09 months, respectively. Five-year survival rate was higher in the ECFR patients than TCFR (100.0% vs. 47.0%,  $P=0.007$ ). Of the patients who underwent TCFR, 6 patients (50%) died of disease or complication, 3 (25%) were alive with disease, and 3 (25%) had no evidence of disease at last follow up. Nine patients (81.8%) who underwent ECFR had no evidence of disease, and 2 (18.2%) alive with disease. Of the patients who underwent TCFR, 5 patients (41.7%) had recurrence of tumor ranging from 4 to 143 months after first treatment and 5 (41.7%) patients had metastasis during follow up. For ECFR group, 2 patients (18.2%) had recurrence. While there were 2 patients with CSF leakage, 2 meningitis for the TCFR group, there was only 1 patient with hematoma for the ECFR group. Total hospitalization days (TCFR 20.6 days vs. ECFR 14.6 days,  $P=0.046$ ), bleeding amount (4,078 mL vs. 1,409 mL,  $P<0.001$ ), operation time (13.3 hours vs. 8.3 hours,  $P=0.002$ ) were significantly different between the TCFR and ECFR groups.

**Conclusion(s):** ECFR offers the advantage of avoiding facial incisions with comparable treatment results. In spite of the limitations of different staging and operation period between two groups, ECFR may be considered as an alternative in the treatment of olfactory neuroblastoma.

**Keywords:** Olfactory Neuroblastoma, Craniofacial Resection, Endoscopic

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[O33-02]

### Craniofacial Surgery for Malignant Skull Base Tumors

**Hitoshi Hirakawa<sup>1</sup>, Yasuhisa Hasegawa<sup>1\*</sup>, Akihiro Terada<sup>1</sup>, Nobuhiro Hanai<sup>1</sup>, Taijiro Ozawa<sup>1</sup>, Ikuo Hyodo<sup>2</sup>, Daisuke Kawakita<sup>1</sup>, Kiyoshi Saito<sup>3</sup>, Eiji Tachibana<sup>4</sup>, Keishi Kohyama<sup>2</sup>**

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**Objective:** Craniofacial surgery for malignant skull base tumors is a standardized procedure. We performed skull base operations depending on the extent of the cranio facial range with the basic policy that tumor resection is feasible in an en bloc fashion with negative histological margins.

**Method(s):** Seventy-six patients at Aichi Cancer Center were analyzed for outcome from January 1, 1991 to December 31, 2008. The median age was 58 years (range, 22-82 years). The majority of tumors (84%) involved the anterior cranial fossa. Paranasal sinus (64%) was the most common primary site, and squamous cell carcinoma (60%) was the most common histologic type.

**Result(s):** Postoperative complications were reported in 29 patients (39%), with CSF leakage 7%. The postoperative mortality rate was 2.6%. With a median follow-up of 40 months, the 5-year overall, disease-specific, and recurrence-free survival rates were 55.1%, 59.6%, and 50.0%, respectively. The histology of the primary tumor, its intracranial extent, and the status of surgical margins are independent determinants of outcome.

**Conclusion(s):** Craniofacial surgery is a safe and effective treatment option for patients with malignant tumors of the skull base with 5-year disease-specific survival rates 59.6%, overall mortality of 2.6% and complication rate of 39%. The histology of the primary tumor, its intracranial extent, and the status of surgical margins are independent determinants of outcome. The status of surgical margins, histologic findings of the primary tumor, and intracranial extent are independent predictors of outcome.

**Keywords:** Craniofacial Surgery, Malignant Skull Base Tumors, En Bloc Resection

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[O33-03]

## Treatment and Outcome of Advanced External Auditory Canal and Middle Ear Squamous Cell Carcinoma

**Giuseppe Spriano<sup>1\*</sup>, Giovanni Cristalli<sup>2</sup>, Barbara Pichi<sup>2</sup>, Raul Pellini<sup>2</sup>, Alentina Manciocco<sup>2</sup>**

<sup>1</sup>Otolaryngology Head and Neck Surgery,

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<sup>2</sup>Ent-head and Neck Surgery, National Cancer Institute, Italy

**Objective:** Squamous cell carcinoma (SCC) of the temporal bone is a rare disease with an overall poor prognosis. The recommended therapeutic strategy consists of surgical excision and postoperative radiotherapy. The purpose of this study was to evaluate the outcomes and complications of combined (surgery and radiotherapy) of locally advanced temporal bone carcinoma.

**Method(s):** A consecutive series of 17 patients with SCC of temporal bone treated between January 2002 and February 2007. Eleven patients had primary tumor and six were recurrences. According to the University of Pittsburgh staging system, 4 patients were Stage II (T2N0), 7 patients were Stage III (6T3N0, 1 T1N1) and 6 patients were Stage IV (5 T3N2b, 1 T4N0). All the patients underwent lateral temporal bone resection and pedicle flap reconstruction. No patients had gross tumour residual. Nine patients received intraoperative and postoperative radiotherapy, 4 postoperative radiation alone, and 4 did not receive any adjuvant treatment.

**Result(s):** With a median follow-up of 23.3 months the disease free survival was 73.3% and overall survival was 75.6 % No major complication (Osteonecrosis and osteitis, flap failure, sepsis, meningitis, lateral sinus tromboflebitis) were observed. The facial nerve was preserved in 14 cases. Five of 14 patients with facial nerve preservation experienced facial nerve paresis (3 grade IV, 1 grade V, 1 grade VI). Three patients after facial nerve resection and graft reconstruction had no recovery.

**Conclusion(s):** A radical resection (frozen section proved) is important for a good outcome. Postoperative radiotherapy is necessary to obtain a good local control. The incidence of major complications is minimal after pedicle flap reconstruction. Facial nerve paresis is the most common observed complication.

**Keywords:** Ear Cancer, Radiotherapy, Pedicled Reconstruction Flap

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[O33-04]

## Surgery for Carcinomas in the Temporal Bone

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<sup>1</sup>Otolaryngology, Tokyo Medical and Dental University, Japan

<sup>2</sup>Head and Neck Surgery, Tokyo Medical and Dental University, Japan

**Objective:** Most reliable therapeutic choice is the total removal with sufficient margin, however, safe and sufficient surgery of the temporal bone is difficult because of anatomical complexity. Purpose this study is to evaluate the surgical outcomes comparing to image studies and histopathological findings.

**Method(s):** The cases with direct invasions to the carotid artery, cerebrum and cerebellum or positive for distant metastasis on the image study were excluded from surgical treatment. Except for those cases, including cases showing invasions to the dura mata or sigmoid sinus, 21 consecutive cases of carcinomas in the temporal bone underwent surgical removal of the tumor and were enrolled for the present study. Surgical approach, area of removal were decided based on computed tomography and magnetic resonance imaging (MRI). The preoperative images and histopathology are carefully investigated.

**Result(s):** Lateral petrosectomy were applied for 14 cases and total petrosectomy was for 7 cases. Tumor was totally removed with margins in 20 cases. The case with positive margin had presented recurrence in the primary site nevertheless postoperative irradiation. Two out of 20 cases with histological negative margins developed recurrence. One case showed abnormal signals in distant parapharyngeal area on the preoperative MRI. Since this area was negative on positron emission tomography, this case underwent surgery, however, tumor recurred in the parapharyngeal space and premolar areas. The rest of case with tumor-free margins showed one lymphatic node metastasis in preauricular area. Although other metastatic nodes were not observed in the specimen obtained from neck dissection, multiple lymphatic node metastasis were observed in the upper neck and parapharyngeal spaces. These recurrences were observed from 6 to 12 month periods. The other cases live without tumor recurrence with mean follow-up periods of 3 years.

**Conclusion(s):** Based on an appropriate image assessments, surgical removals of these tumors warrant good therapeutic outcomes.

**Keywords:** Temporal Bone, Skull Base, Carcinoma

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[O33-05]

## Morbidity Profile of Facial Translocation Approaches for Skull Base Tumours

**Vikram Kekatpure<sup>1\*</sup>, Nirav Trivedi<sup>1</sup>, Daxesh Patel<sup>2</sup>, Arun Pattathayil<sup>2</sup>, Subramania Iyer<sup>2</sup>, Moni Abraham Kuriakose<sup>1</sup>**

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<sup>2</sup>*Head and Neck Institute, Amrita Institute of Medical Sciences, Kochi, India*

**Objective:** The primary objective of this study was to evaluate morbidity associated with facial translocation approaches for skull base. We also evaluated the results of various technical modifications to reduce the morbidity.

**Method(s):** Retrospective chart review was done to determine the morbidity profile of facial translocation approaches. 27 patients who underwent various facial translocation approaches to access skull base tumors from July 2005 to Aug 2009 were included in this study.

**Result(s):** A total of 27 patients underwent facial translocation approaches for access to skull base. 16 patients underwent standard facial translocation, 4 patients medial mini translocation, 7 patients underwent extended facial translocation. 12 patients had benign disease and 15 patients had malignant disease. R0 resection was achieved in 25 patients and R1 in 2 patients. The most common complication was the observed was nasal crusting and foul smell in 10 patients, nasolacrimal duct obstruction was seen in 5 patients. Necrosis of bone and exposure of mini plate was seen in 3 patients undergoing postoperative radiation. 3 patients developed palatal fistula before modification of palatal incision.

**Conclusion(s):** Facial translocation provides a satisfactory access for adequate clearance of skull base tumors. With modifications of the surgical technique, facial translocation approach has an acceptable morbidity.

**Keywords:** Facial Translocation, Skull Base, Morbidity

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[O33-06]

## A New Staging System for Angiofibromas

**Carl Snyderman<sup>1\*</sup>, Harshita Pant<sup>2</sup>, Ricardo L. Carrau<sup>1</sup>, Paul Gardner<sup>3</sup>**

<sup>1</sup>*Otolaryngology, University of Pittsburgh, USA*

<sup>2</sup>*Otolaryngology, University of Adelaide, Australia*

<sup>3</sup>*Neurosurgery, University of Pittsburgh, USA*

**Objective:** Develop a new staging system for juvenile nasopharyngeal angiofibroma that reflects changes in surgical approaches (endonasal), route of intracranial extension, and the extent of vascular supply from the internal carotid artery.

**Method(s):** Patients undergoing endoscopic endonasal surgery for juvenile nasopharyngeal angiofibroma at the University of Pittsburgh Medical Center from 1998-2008 were retrospectively reviewed. Patients were staged according to current systems and compared to a new staging system that also incorporated the route of skull base extension and tumor vascularity. Main outcome measures included estimated blood loss, number of operations, and tumor recurrence.

**Result(s):** Skull base erosion was observed in 74% of cases. Following embolization of external carotid artery tributaries, residual vascularity from the internal carotid artery was seen in 51% of patients. Residual vascularity, classified as University of Pittsburgh Medical Center stage IV and V, strongly correlated with blood loss, requirement for multiple procedures and residual or recurrent tumor.

**Conclusion(s):** Tumor size and extent of sinus disease are less important in predicting complete tumor removal with endonasal surgical techniques. The University of Pittsburgh Medical Center staging system for juvenile nasopharyngeal angiofibroma accounts for two important prognostic factors, route of cranial base extension and vascularity, and is applicable to endoscopic or open approaches. Compared with other staging systems, it provides a better prediction of immediate morbidity (including blood loss and need for multiple operations) and tumor recurrence.

**Keywords:** Angiofibroma, Staging, Endoscopic Surgery

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[O33-07]

## **Excision of Juvenile Nasopharyngeal Angiofibroma via Modified Denker Approach**

**Kathleen Fellizar\***, Alfredo Pontejos, Marion Acuin

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University of the Philippines Manila, Philippines*

**Objective:** Juvenile nasopharyngeal angiofibroma (JNA) is a rare benign tumor that is seen almost exclusively in prepubertal and adolescent males. Surgical approaches include endoscopic, transmaxillary (including, but not limited to midfacial degloving, Weber-Ferguson procedure and lateral rhinotomy), transpalatine approaches and craniofacial resection, with or without pre-operative embolization. This paper aims to present a modification in the conventional Denker approach in the excision of six cases of juvenile nasopharyngeal angiofibroma Radkowski Stage IA to IIA, in which pre-operative embolization was not done.

**Method(s):** Design: Case series

Setting: Tertiary care center

Patient: Six

**Result(s):** Six cases of juvenile nasopharyngeal angiofibroma Radkowski Stage IA to IIA that underwent excision via modified Denker approach at our institution between 2000 to 2009 were reviewed. All cases were managed by the same surgeon. No pre-operative embolization was done. Modified Denker was performed with removal of the anterior and medial maxillary walls, and cutting of the nasal spine. The posterior maxillary wall was resected endoscopically, facilitating video-assisted internal maxillary artery ligation using medium-sized ligacips. The tumors in all cases were resected en bloc. Total blood loss averaged at 0.7 liter, replaced intra-operatively or post-operatively. No intra-operative complications were encountered. The post-operative course of all patients was uneventful.

**Conclusion(s):** A successful and safe excision of a nasopharyngeal angiofibroma via a video-assisted modified Denker approach was done in these non-embolized patients. The level of intra-operative bleeding is comparable to those seen in literature. No intra-operative and post-operative complications were encountered.

**Keywords:** Juvenile Nasopharyngeal Angiofibroma, Modified Denker, Video-Assisted Excision

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[O33-08]

## **Carcinoma of the External Auditory Canal and Middle Ear: Staging and Management Dilemma**

**Sung huhn Kim, Jin Kim, Sa myung Chung, Won sang Lee\***

*Otorhinolaryngology, Head & Neck Surgery,  
Yonsei University, College of Medicine, Korea*

**Objective:** This study aims to figure out more accurate staging and proper therapeutic strategy for carcinoma of external auditory canal and middle ear.

**Method(s):** Retrospective review of medical records of 34 patients who were diagnosed as squamous cell carcinoma or adenoid cystic carcinoma of external auditory canal and middle ear and underwent curative surgery between 1989 and 2006.

**Result(s):** Patients of stage I and II showed 90% disease control rates with lateral temporal bone resection (LTBR). However, the survival rates were significantly decreased in stage III and IV. In stage III, LTBR performed for the patients where tumor confined to the external auditory canal and middle ear and subtotal temporal bone resection was performed for the patients where the tumor extended to the mastoid. The disease control rates of the two groups were not significant ( $P>0.05$ ). The disease control rates were significantly decreased in the patients of ACC where parotid gland invasion was present ( $P=0.007$ ) and in the patients of SCC where dural and intracranial invasion was present ( $P=0.001$ ). There was no significant survival difference between the patients who underwent adjuvant radiotherapy and the patients who did not undergo radiotherapy ( $P>0.05$ ).

**Conclusion(s):** For the staging system for carcinoma of external auditory canal and middle ear, stage I and II can be put together since the tumors of those stages showed excellent disease control rates. And the tumors confined to the external auditory canal and middle ear can be subdivided to earlier stage from stage III. For the treatment, LTBR is likely to be sufficient for stage I, II and limited cases of stage III where tumor confined to the external auditory canal and middle ear only. In more advanced stages, adjuvant radiotherapy hardly showed any benefit; therefore initial surgical treatment is more important.

**Keywords:** Carcinoma, Middle Ear, External Auditory Canal, Staging System, Treatment

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**O34. Reconstruction (V)****Chairs : Hoonshik Yang (Korea)****Alexander D. Rapidis (Greece)**

15:30 - 17:00 SBR III

[O34-01]

**Anatomical and Functional Aspects in the Reconstruction of the Oral Cavity**

Alberto Rocco<sup>1</sup>, Bruno Pesucci<sup>2</sup>, Giovanni Montemari<sup>3</sup>,  
Valerio Damiani<sup>4</sup>, Gianluca Bellocchi<sup>4\*</sup>

<sup>1</sup>ENT Department, San Camillo-Forlanini Hospital, Italy

<sup>2</sup>Maxillo-facial surgery Department,  
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<sup>3</sup>Plastic surgery Department, San Camillo-Forlanini Hospital, Italy

<sup>4</sup>ENT Department, San Camillo-Forlanini Hospital, Italy

**Objective:** The reconstructions of the oral cavity are designed to reproduce the original structures to allow a resumption of feeding and phonation functions to which this area is deputies. The choice between different methods is conditioned by the entity, the form and function of the section, considering the need of bone or soft tissue reconstruction or the filler purposes of reconstruction.

**Method(s):** The Authors present some cases of patients affected by oral cavity cancer submitted to surgical demolition and reconstruction with free microvascular flaps. Specifically, flaps used were: anterolateral tight flap, radial forearm free flap, rectus abdominis free flap and fibula free flap.

**Result(s):** Bearing in mind the division of the oral cavity in two functional areas, one set of tissues with high motility and one set of tissue with low motility, and evaluating the specific characteristic of the four flaps we used, in term of availability of donor soft tissue or bone, of reliability of vascularization and of possibility of following implants, we obtained optimal aesthetic and functional results in all patients.

**Conclusion(s):** In our experience, the use of just four free flaps allows to cover any reconstructive needs after demolitive surgery of oral cavity.

**Keywords:** Oral Cancer, Reconstruction, Flaps

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[O34-02]

**Study of the Length of Hospital Stay for Free Flap Reconstruction of Oral and Pharyngeal Cancer in the Context of the New French Casemix-Based Funding**

Angelique Girod\*, Antonio Brancati, Thomas Jouffroy,  
Veronique Mosseri, Irene Kriegel, Jose Rodriguez

Head and Neck Oncology Unit, Institut Curie, France

**Objective:** The French national health insurance reimbursement system has recently changed from a global hospital funding system to casemix-based funding. The authors studied the factors likely to influence the length of hospital stay for free flap reconstructions after surgery for cancers of the oral cavity or pharynx.

**Method(s):** Data concerning 207 oral cavity or pharynx free flap reconstructions were extracted from a prospective registration. Lengths of hospital stay were compared by an analysis of variance F test or a nonparametric Kruskal-Wallis test, and transfusion rates were compared by Chi-square test or Fisher's exact test, as appropriate.

**Result(s):** The median length of hospital stay was 24 days (range: 7 to 145 days). Length of hospital stay was significantly longer according to the type of flap ( $P<0.005$ ), in N2-N3 patients ( $P<0.02$ ), a PINI score more than 10, a 3-4 ASA score, the presence of a tracheotomy and in patients requiring transfusion ( $P<0.0001$ ).

**Conclusion(s):** As the nodal status, the ASA score of the patient, the need of tracheotomy and the type of flap cannot be corrected, the management of preoperative hemoglobin and nutritional status are the sole factors which can improve the length of hospital stay. In the context of the new casemix-based funding, this study raises the problem of harvesting of the fibula flap, management of preoperative hemoglobin and nutritional status.

**Keywords:** Length of Hospital Stay, Free Flap Reconstruction, Casemix-Based Funding

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[O34-03]

## Our Experience in Facial Middle Third Reconstruction Using Fibula Free Flap

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**Objective:** The reconstruction of maxillary defects after oncologic surgery always represents a problem of not easy resolution. The use of free flaps represents the best solution in the facial middle third reconstruction, with bone, skin and mucosa defects, in patients already treated with radiotherapy and in case of a large cranial base communication. The objectives for an adequate esthetic(=aesthetic)-functional reconstruction are: separation between oral cavity and nasal region, orbital cavity support, prosthetic-dental rehabilitation, facial soft tissue and profile projection.

**Method(s):** The Authors present some cases treated with this modality. Particularly one was a case of a large demolition of orbito-ethmoid-sphenoid-maxillary region reconstructed with two flaps: rectus abdominis and fibula flap.

**Result(s):** This reconstruction requires a good precision to obtain a valid middle third morphology, with a correct dento-skeletal relation between maxilla and mandible, so to achieve a normal and functional occlusion. The flap can be osteotomized into many segments for his double vascularization so to reconstruct in three dimensional way the orbital region, the zygomatic buttress and the alveolar ridge, so to permit a secondary application of fixture for a complete prosthetic rehabilitation.

**Conclusion(s):** In our experience, fibula free flap represents an excellent choice for a functional and aesthetically adequate reconstruction of facial middle third in oncologic surgery of the oral cavity.

**Keywords:** Maxillary Reconstruction, Fibula Free Flap, Facial Middle Third

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[O34-04]

## Reconstruction of Complex Oro-Mandibular Defects with Free Fibula Osteo Myocutaneous Flap. Is There a Need for Second Free Flap?

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<sup>1</sup>Department of Head and Neck Surgery,

Tata Memorial Hospital, India

<sup>2</sup>Department of Surgical Oncology, Tata Memorial Hospital, India

**Objective:** The free fibula flap has become the choice of mandibular reconstruction following extensive composite resections. However, there are two different schools of thought about the reliability of the vascular supply of larger skin paddles used in intra and extra oral lining thus justifying the use of double free flaps. The objective of this presentation is to prove that there is no need for a second free flap and complex oro-mandibular defects can be reconstructed with single free fibula osteomyocutaneous flap.

**Method(s):** Over a period of five years from January 2005 to December 2009 a total of 386 composite mandibular reconstructions following post tumoural ablative surgeries were included in the study. Simultaneous two team approach was adopted in all the cases. All the defects were reconstructed with a single free fibula osteomyoseptocutaneous flap.

**Result(s):** Complete flap survival was seen in 374 patients [96.8%] In these patients superficial skin necrosis was seen in 20 patients and was managed conservatively.

Complete flap loss was seen in 12 patients [3.10%]

Partial flap loss was seen in 20 patients [5.18%]

**Conclusion(s):** The vascular supply of the free fibula osteomyocutaneous flap is reliable and a flap with a large skin paddle can be used to provide outer skin cover and inner lining as first option rather than using double free flaps in the reconstruction of complex oro mandibular defects and thus avoiding the morbidity and complications associated with a second free flap.

[Closure Statement]

This abstract contains original clinical material from Plastic & Reconstructive Services of the TATA Memorial Hospital and all the authors mentioned are members of the department. The photographs of the patients shown in the presentation were consented before the procedure. There is no conflict of interest and there is no funding involved.

**Keyword:** Reconstructive Microsurgery

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[O34-05]

## Reconstruction of Anterior Skull-Base Defects for Tumor Using Free Flaps

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<sup>2</sup>Neurosurgery, Fondation Rothschild, France

**Objective:** Anterior skull-base tumor resection produces an osseous and soft tissue defect. The dura and the brain are then in contact with the nasal cavity and aerodigestive tract. The reconstruction of these defects is essential to perform adjuvant therapy and to reduce morbidity and complication of the resection. The use of free flaps produce reliable soft tissue to seal the dura, cover cranial bone and obliterate dead space.

**Method(s):** We reviewed retrospectively 17 patients who underwent anterior skull-base resection for tumor from 2004 to 2009 at our Institution. Data were recorded on patient sex and age, tumor pathology and location, prior therapy, margin status, free flap, complications, adjuvant therapy and outcome of the patient.

**Result(s):** 8 women and 9 male underwent major anterior skull-base resection with free flaps reconstruction. There were 8 adults and 9 children. The tumor pathology were various and most of the patient had previous chemotherapy and / or radiotherapy. The latissimus dorsi free flap was used everytime. There was no partial nor total loss of flap and no delay of healing. There was one cerebrospinal fluid leakage during 3 months while the chemotherapy and hyperhydratation.

**Conclusion(s):** The reconstruction of anterior skull-base defects should be safely done by soft tissue free flaps by adults and children. For children, the bony reconstruction could be delayed for the survivors when craniofacial growth and development are closed.

**Keywords:** Skull Base Tumor, Reconstruction, Free Flap

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[O34-06]

## Laryngeal Framework Reconstruction Using Titanium Mesh in Glottic Cancer after Frontolateral Vertical Partial Laryngectomy

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Quan Li, ZongYuan Zeng, ZhuMing Guo

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Sun Yat-sen University, China*

**Objective:** To investigate the feasibility and efficacy of laryngeal framework reconstruction using titanium mesh in patients with glottic cancer after frontolateral vertical partial-laryngectomy.

**Method(s):** Defect of laryngeal framework, caused by frontolateral vertical partial-laryngectomy in 9 patients with T2 or T3 squamous cell carcinoma of glottis, were reconstructed with titanium mesh from 2007 to 2009. Computer Tomography (CT) and fiberoptic examinations were performed at 2 weeks and 3 months postoperatively.

**Result(s):** No aspiration and laryngeal stenosis was observed in the 9 patients. CT scanning showed titanium mesh was fastened well without displacement and deformity, there was no laryngeal stenosis. Fiberoptic inspection showed the larynx lumen was maintained well without stricture, shrinkage and necrosis. No titanium mesh was exposed to the larynx lumen.

**Conclusion(s):** Titanium mesh was a good alternative for reconstruction of the laryngeal framework. It provided adequate structural support to maintain airway patency.

**Keywords:** Titanium Mesh, Laryngeal Framework Reconstruction, Squamous Cell Carcinoma Of Glottic

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[O34-07]

## In Situ Tissue Engineering Approach for Glottal Reconstruction: Canine Preliminary Experiment

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**Objective:** Larynx is forced to be sacrificed in some patients with malignancy. To restore the laryngeal functions, reconstruction is inevitable. Autologous grafts generally answer the purpose, however, the complicated glottal shape is difficult to be reconstructed. According to the in situ tissue engineering concept, we have succeeded in regenerating the cricoid, the trachea, and the esophagus by simply applying bioartificial scaffolds to the surgical sites. This canine trial, therefore, is designed to reconstruct the intricate glottal shape by using biomaterial.

**Method(s):** Beagle dogs were used in this study. A left glottal defect was created through a surgically made thyroid cartilage window. A polypropylene scaffold covered with collagen was preclotted, wrapped with autologous fascia, and fixed using sutures in the experimental group ( $n=5$ ), while a muscle flap was utilized in the control group ( $n=3$ ). The surgical site was evaluated three months postoperatively using endoscopic observation, CT imaging, histological assessment, and excised laryngeal study.

**Result(s):** Endoscopically, the experimental group implant was covered with mucosa in all cases, and a favorable vocal fold contour was achieved in three cases out of five. In the control group, the muscle flap was replaced by scarred tissue with a concave contour in two cases, and a granulation was observed in the third case. Histological data revealed the restoration of lined epithelium and subepithelial tissue in both groups. Computed tomography and histological data showed no cartilage formation in both groups. Excised larynx study revealed reduced vibratory amplitude in the experimental group compared with the control, however, excised phonation was not achieved in two cases in the control group.

**Conclusion(s):** This in situ tissue engineering technique appears to be a viable tool for glottal reconstruction. Since this technique is cost-effective and has less tissue damage, the therapeutic potential of this scaffold may be considered for glottal reconstruction.

**Keywords:** In Situ Tissue Engineering, Glottal Reconstruction, Tissue Regeneration

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[O34-08]

## Tracheal Transplant with a Prefabricated Microsurgical Flap

**Francisco Mello-Filho\***, Alexan Icibaci, Fabio Mello,  
**Rui Mamede, Hilton Ricz**

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**Objective:** To test the viability of a tracheal autotransplant with an original technique using a prefabricated flap from a complete tracheal neovascularized segment (CTNVS) of the sternohyoid muscle anastomosed by a microsurgical technique.

**Method(s):** An experimental study using dogs as an animal model. Ten mongrel dogs weighing 23 to 40 kg were divided into two groups: Group I (control), five animals submitted to autotransplant of the CTNVS without a microsurgical vascular anastomosis, and Group II, five dogs submitted to autotransplant of the CTNVS with a microsurgical vascular anastomosis.

**Result(s):** All Group I dogs developed respiratory insufficiency and died due to necrosis and stenosis of the autotransplanted CTNVS, whereas all Group II dogs completed the minimum period of 90 days of observation without any clinical changes. Macro and microscopic analysis revealed intact tracheal structures.

**Conclusion(s):** The present clinical and morphological findings demonstrate that the CTNVS autotransplant is viable when a microsurgical vascular anastomosis is used.

**Keywords:** Tracheal Reconstruction, Microsurgery, Transplant

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[O34-09]

## The Implications of Coronary Artery Disease as Co-Morbidity for Head and Neck Cancer Patients Receiving Microsurgical Reconstructions

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**Objective:** Reconstructive microsurgeons will have to make difficult decisions from time to time as to whether to operate on high risk patients. Coronary artery disease (CAD) will be our major concern. We would like to share our experiences regarding head and neck cancer patient with advanced coronary artery disease.

**Method(s):** Between January 2006 and November 2009, 8 patients with CAD from a total of 952 head and neck patients received free flap reconstructions in our center. Among these 8 patients were 7 male and 1 female, with age ranged from 49 to 76, averaging 63 years old. They all have CAD to various degrees, including six 3-vessel disease, one 2-vessel disease, and one 1-vessel disease. The head and neck cancer included 4 buccal cancers, 2 tongue cancers, 1 lower gum cancer, and 1 trigone cancer. Other comorbidities will be discussed.

**Result(s):** Preoperative dipyridamole T1-201 SPECT myocardial perfusion studies were performed except in one patient. All patients received cardiac catheterization, coronary angiography, and color Doppler 2D echocardiography. Six patients were recorded to have stents placed in their coronary arteries. Coronary artery bypass surgery (CABG) were performed on two patients prior to the head and neck surgery. All 8 patients received free flap reconstruction (7 anterolateral thigh fasciocutaneous flap; 1 osteocutaneous fibula flap). The average ICU stay ranged from 3 to 7 days, averaging 5.0 days. Out of these 8 patients, two patients died. Other morbidities included 2 wound infections, one hematoma, and one brain infarction.

**Conclusion(s):** Patients with advance coronary artery disease are associated with high mortality rate when faced with prolonged surgery due to head and neck cancer. They must be dealt carefully. More cases are needed in this study to make suggestion regarding patient selection in this particular group of patients in order to minimized mortality and morbidity.

**Keywords:** Coronary Artery Disease, Head and Neck Cancer

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**O35. Thyroid (IV)**

**Chairs : Euy Young Soh (Korea)**  
**Mark Singer (USA)**

15:30 - 17:00 SBR IV

[O35-01]

## Remnant Thyroid Ablation with Radioactive Iodine after Total Thyroidectomy

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**Objective:** The outcome of radioactive iodine ablation of remnant thyroid may be dependent on the extent of thyroidectomy and dose of radioactive iodine (I-131). The dose of I-131 for remnant ablation is still controversial. The aim of this study was to evaluate the outcome of remnant thyroid ablation after total thyroidectomy with different I-131 activities.

**Method(s):** Total of 188 patients who underwent total thyroidectomy for the differentiated thyroid cancer and postoperative I-131 therapy were enrolled. The numbers of I-131 therapies and the total amounts of I-131 needed to complete the ablation were reviewed retrospectively. The effectiveness of ablation was determined by following I-131 therapy scan.

**Result(s):** Among the 188 patients, 160 patients received 30 mCi of radioiodine as the first ablative dose (85.1%). In 15 patients (8.2%) of these 160 patients, the dose was changed to higher dose (than 100 mCi). Twenty eight patients (14.9%) were treated with initial high dose I-131 therapy with more than 100 mCi. Six patients (3.8%) showed no remnant at the first therapy scan. With one dose of I-131, complete ablation was achieved in 124 patients (66.0%) totally; 99 patients in the 30 mCi group (61.9%), 25 patients in the higher dose group (89.3%). The mean total number of I-131 treatment for complete ablation was 1.58 as a whole; 1.63 with initial 30 mCi of I-131, 1.25 with initial higher dose ( $P=0.043$ ).

**Conclusion(s):** With higher dose than 30 mCi of I-131, we can get complete ablation of remnant thyroid more easily. Nevertheless, complete ablation can be reached with single 30 mCi I-131 therapy in many patients after total thyroidectomy.

**Keywords:** Differentiated Thyroid Cancer, Radioiodine Ablation Therapy, Remnant Thyroid Tissue

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[O35-02]

## Prophylactic Central Lymph Node Dissection for Clinically Node-Negative Papillary Thyroid Microcarcinoma: Its Impact on Postoperative Thyroglobulin Level, Recurrences and Complications

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<sup>2</sup>*Otolaryngology-Head and Neck Surgery,  
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**Objective:** Prognostic benefit of prophylactic central lymph node dissection (CLND) for papillary thyroid microcarcinoma (PTMC) has been debated. However, there have been few studies that reported benefit and risk from prophylactic CLND in detail. We aimed to investigate the impact of prophylactic CLND on postoperative thyroglobulin level, recurrences and complications.

**Method(s):** This study included 232 patients who underwent total thyroidectomy (TT) alone or TT in conjunction with prophylactic CLND (TT+CLND) for clinically node-negative PTMC from 1999 to 2006. We compared postoperative thyroglobulin levels, recurrence rates and complications after TT and TT+CLND.

**Result(s):** Subclinical LNM was detected for 44 of 119 patients (37.0%) in the TT+CLND group. Stimulated thyroglobulin level before 1st radioactive iodine (RAI) treatment was significantly lower in the TT+CLND group than in the TT group (1.07 vs. 2.24 ng/mL,  $P=0.022$ ). However, stimulated thyroglobulin level after 1st RAI treatment (2nd stimulated Tg) in the TT+CLND group was not different from that in the TT group (0.44 vs. 0.69 ng/mL,  $P=0.341$ ). Also, the 3-year locoregional control rates of the TT+CLND group was not different from that of the TT group (98.3% vs. 96.5%,  $P=0.368$ ). Complication rates in the TT+CLND group were slightly higher than in the TT group, without statistical significance ( $P>0.05$ ).

**Conclusion(s):** Prophylactic CLND could effectively clear the subclinical LNMs in central neck and reduce postoperative thyroglobulin level without significant increase of complications. However, prophylactic CLND had little prognostic benefit, particularly for patients with RAI treatment.

**Keywords:** Papillary Carcinoma, Lymphatic Metastasis, Lymph Node Dissection

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[O35-03]

## Dangerous Early Postoperative Complications after Thyroid and Parathyroid Surgery: Clinical Implications, Prevention and Treatment

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**Objective:** Bilateral recurrent laryngeal nerve injury (BRLNI) or postoperative bleeding (PB) in thyroid bed can be cause of death.

**Method(s):** 24,942 Thyroid patients were operated on during 1973-2009. Anatomic and clinical investigation of thyroid ligaments, RLN, EBSLN structural and topographic features have undertaken at 31 corpses, 1,221 clinical cases with periodical Nerve Integrity Monitor (NIM).

**Result(s):** PB and thyroid bed hematomas were found in 131 (0.52%) patients and 7 (0.03%/5.3%) of (24,942/131) they have dead. Most often PB happened in initial and recurrent diffuse toxic goiter (DTG) (1.07%, 0.94%), Thyroid Cancer (TC) (0.82%). Signs of PB: patient restlessness, suffocation, fear of death; hoarseness voice; bulging of jugular hollow; strong outlines sternocleidomastoid muscles; discharging 150 or more mL of blood to drainage. In most (65.5%) of cases PB began during the first 6 hours. In case of PB we parted wound edges anywhere, intubated repeatedly trachea, inspected wound; performed hemostasis and drained wound. Main sources of PB: inferior (40.38%) or superior (17.30%) thyroid artery. PB prevention included: careful hemostasis; ligation of inferior thyroid artery in doubtful cases; 12 ours postop supervision. Postoperative BRLNI were revealed in 88 (0.37%) patients, most often with recurrent DTG (1.70%). Only 0.31% TC patients had BRLNI despite to regular RLN dissection. The best direction for it's dissection is bottom-up. 94.9% RLN crossed by the blood vessels before entering the larynx. Our technique allowed to find and save 15 (0.37%). Nonrecurrent LNs during 4,070 operations, decreased mortality, unilateral and BRLNI in 10 times. In case of BRLNI we use: reintubation, renarcosis, restoration of RLNs, laryngoplastics. Vocal cords function restored in 13 of 19.

**Conclusion(s):** Thyroid Surgery needs precise knowledge of skull base, neck and mediastinum anatomy, safety resection of thyroid, parathyroid under visual RLN control, thorough hemostasis and closely postoperative watching of patients.

**Keywords:** Thyroid, Surgery, Complications

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[O35-04]

## Negative and Predictive Values of Nerve Monitoring in Thyroidectomy

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**Objective:** 1. To evaluate the efficacy of a nerve monitoring (NM) system in a series of patients submitted to thyroidectomy; 2. To critically analyze the negative-predictive-value (NPV) and positive-predictive-value (PPV) of the method.

**Method(s):** NIM® System efficacy was prospectively analyzed in 447 patients submitted to thyroidectomy between 2001 and 2008 (366 female/81 male; 420 Caucasian/47 non-Caucasian; 11 to 82 year-old - median: 43 year-old). There were 421 total thyroidectomies and 21 partial thyroidectomies leading to 868 nerves at risk. The gold standard to evaluate inferior laryngeal nerve function was early postoperative videolaryngoscopy, which was repeated after 4 to 6 months in all patients with abnormal endoscopic findings.

**Result(s):** At the early evaluation, 858 nerves (98.8%) presented normal videolaryngoscopic features postoperatively. 10 paretic/paralyzed nerves (1.2%) were detected (2 unexpected unilateral paresis, 1 unexpected bilateral paresis, 1 unexpected unilateral paralysis, 2 unexpected bilateral paralysis and 1 expected unilateral paralysis). At the late videolaryngoscopy, only 2 permanent nerve paralysis were noted (0.2%), with an ultimate result of 99.8% functioning nerves. NM showed absent or markedly reduced electrical activity at the end of the operations in 25/858 nerves (2.9%), including all 10 endoscopically compromised nerves, with 15 false-negative nerves. There were no false-positive nerves. Therefore, NPV was 40.0% and PPV was 100%.

**Conclusion(s):** In the present series, NM had a very high PPV, but a low NPV for the detection of recurrent nerve injury.

**Keywords:** Nerve Monitoring, Thyroidectomy, Laryngeal Nerves

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[O35-05]

## Recurrent Laryngeal Nerve Invasion in Patients with Papillary Thyroid Carcinomas: Predictive Factors and Management

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**Objective:** The incidence of recurrent laryngeal nerve (RLN) invasion by papillary thyroid cancer (PTC) ranges from 3.7% to 25.4%. The purpose of this study was to determine the predictive factor of RLN invasion and optimal management of that in patients (pts) with PTC.

**Method(s):** A retrospective study was performed with the medical records of 50 pts with RLN invasion among 337 pts with PTC between 1995 and 2008. After resection of involved RLN (n=35), immediate reconstruction of RLN was performed on 10 cases underwent neurorrhaphy (direct anastomosis; 4, nerve graft; 4, anastomosis to ansa cervicalis; 2). 25 cases opted not to have surgical procedures. Clinical variables (preoperative vocal cord mobility, the patterns of nerve invasion, treatment, postoperative vocal cord function) were analyzed.

**Result(s):** Among the 50 pts with RLN invasion, 23 pts (46.0%) had preoperative vocal cord paralysis. RLN was involved with direct extension of PTC in 37 cases and metastatic paratracheal lymph node in 18 cases. Tumor size ( $P=0.002$ ), extra-thyroid invasion ( $P=0.025$ ) and lateral lymph node involvement ( $P=0.037$ ) were the independent factors significantly affecting RLN invasion in multivariate analysis. Of 20 RLN of shaving off procedure, 2 showed permanent paralysis, 8 showed transient paralysis, restored normal function within 6 months, and 10 showed normal vocal cord function. Of 10 RLN neurorrhaphy, 4 showed permanent paralysis, 4 showed partially recovered mobility and 2 showed fully recovered vocal cord function after 12 months.

**Conclusion(s):** Tumor size, extra-thyroid invasion and lateral lymph node involvement were the independent factors of developing RLN invasion in pts with PTC. The RLN can be preserved with shaving off, if it has not been invaded directly by the tumor. And, resection of RLN at the time of thyroid cancer extirpation require RLN reconstruction, because it offers a good postoperative vocal cord function.

**Keywords:** Papillary Thyroid Cancer, Recurrent Laryngeal Nerve

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[O35-06]

## Early Postoperative PTH Levels as a Predictor of Hypocalcemia and Facilitating Safe Early Discharge after Total Thyroidectomy

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**Objective:** Hypocalcemia is the most common complication of that procedure and a variety of strategies for diagnosing and managing post thyroidectomy hypocalcemia have been advocated. The purpose of this study is to determine whether measurement of parathyroid hormone (PTH) concentrations in the early postoperative period accurately predicts patients at risk of developing hypocalcemia and safely discharged on the first postoperative day.

**Method(s):** A prospective cohort study of patients undergoing total thyroidectomy was carried out. PTH concentrations, calcium, ionized calcium, Mg, p, H-vac were measured preoperatively and at 6 and 12 h, 24 h, 72 h, 120 h postoperatively. Serum calcium concentration was measured preoperatively and twice daily for 48 h after surgery.

**Result(s):** Sixties patients undergoing total thyroidectomy were recruited into the study in the period May 2009 to December 2009. Papillary thyroid carcinoma was the most common indication for surgery (96%). The incidence of symptomatic hypocalcemia was 54%. The mean PTH concentration at 6h after surgery was 11.04 ng/L, 0h after surgery was 13.50 ng/L and was not significantly different from the 12 h, 24 h concentration of 10.87, 10.71 ng/L. The accuracy of a single PTH concentration at 6 h was good for predicting hypocalcaemia. There was no significant difference in accuracy between the 12 h and 24 h PTH concentrations .

**Conclusion(s):** A PTH measurement at 6 hours postoperatively and ionized calcium allows for accurate prediction of patients at risk of hypocalcaemia. Patients with a normal postoperative PTH level and ionized calcium level can be safely discharged on the first postoperative day.

**Keywords:** Thyroidectomy, PTH, Hypocalcemia

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[O35-07]

## Parathyroid Hormone as A Predictor of Post -Thyroidectomy Hypocalcemia

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**Objective:** To determine the best timing for the sample and cut-off point in the decrease of parathyroid hormone (PTH) levels in order to predict the development of post-thyroidectomy hypocalcemia.

**Method(s):** Ninety patients underwent total or completion thyroidectomy at our department since February until November 2009. Patients with any condition that could interfere with calcium homeostasis were excluded from the survey. Thus, 73 patients were considered for analysis. PTH and serum calcium levels were determined preoperatively, immediately after surgery and a number of hours after surgery (delayed PTH levels: at 8 p.m. if patient underwent surgery in the morning, or at 8 a.m. if patient underwent surgery the previous afternoon or evening).

**Result(s):** Mean stay at hospital was 4.1 days, ranging from 3 to 10 days. Treatment for hypocalcemia was required in 13.7% of patients. A decrease higher than 70% in PTH levels immediately after surgery has a sensibility of 100% (95%CI: 75.7-100%) and a specificity of 72.9% (95%CI: 60.4-82.6%) for detecting the need of treatment for hypocalcemia. Mean time from surgery to delayed PTH sample was 8.75 hours, ranging from 5 to 24 hours. A 85% and higher decrease in delayed PTH levels has a sensibility of 100% (95%CI: 74.1-100%) and a specificity of 96.6% (95%CI: 88.5-99.1%) for detecting the need of treatment for hypocalcemia. Using this test, 81.4% of the patients could have been discharged home 24 hours after surgery.

**Conclusion(s):** The decrease in PTH levels is a good predictor of post-thyroidectomy hypocalcemia, specially if post-surgical PTH levels are obtained a number of hours after the end of surgery. A decrease of 85% or more in delayed PTH levels is a test with excellent sensibility and specificity. However, more patients should be included in order to reduce the 95% confidence interval.

**Keywords:** Thyroidectomy, Hypocalcemia, Parathyroid Hormone

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[O35-08]

## Reliability of Quick PTH Measurement during Primary Hyperparathyroidism Surgery

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<sup>1</sup>Head & Neck Section (Department. of General Surgery), Hospital Italiano de Buenos Aires, Argentina

<sup>2</sup>Endocrinology and Metabolism, Hospital Italiano de Buenos Aires, Argentina

**Objective:** The success of hyperparathyroidism surgery is based on multiglandular disease recognition during the first procedure. Intraoperative monitoring of plasmatic parathormone (PTH) level provides a biochemical confirmation that the whole parathyroid hyperfunctioning tissue has been removed, thus allowing mini-invasive approach when treating monoglandular disease. The objective of this paper is to assess the correlation between intraoperative PTH measurement and surgery success.

**Method(s):** Retrospective review of prospective clinical database records. 100 Patients were operated on for primary parathyroid disease at Hospital Italiano from May 2007 to June 2009. All patients were preoperatively studied with ultrasound and sestamibi scan for glandular location. PTH plasma level was measured immediately before incision as well as 5, 10 and 15 minutes after the hyperfunctioning tissue had been resected. A 50% fall of initial PTH level after parathyroid tissue removal was considered satisfactory.

**Result(s):** The mean age of our patients was 62 (80% were female). The anatomopathological analysis found 93 adenomas, 4 parathyroid hyperplasiae, 2 adenomatous hyperplasiae, 1 parathyroid carcinoma. 90% of our patients showed at least a 50% decrease in PTH values 15 minutes after hyperfunctioning parathyroid tissue was excised, including 4 patients that required 4 gland exploration. 8 patients showed a late postoperative PTH decrease higher than 50% during hospitalization. Only 2 patients did not evidence a 50% decrease even on late measurement of quick PTH during hospitalization. One of them normalized the PTH value on late follow up and the other one was considered a persistence of the disease.

**Conclusion(s):** The study has demonstrated a correlation between intraoperative plasma PTH decrease and surgery success. This certainty confirms the feasibility of miniinvasive approach when facing a parathyroid monoglandular disease.

**Keywords:** Primary Hyperparathyroidism Surgery, Minimally Invasive Procedures, Parathyroid Hormone

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[O35-09]

## Severity of Bone Disease as a Predictor of Post-Operative Hypocalcaemia after Parathyroidectomy

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**Objective:** The demographic profile of patients presenting with primary hyperparathyroidism differs significantly in developing countries like India from the western world. Routine screening of serum calcium levels in developed countries has resulted in early diagnosis and early surgery for this condition before the onset of complications. Many centers practice parathyroidectomy as day care procedures and endoscopic parathyroidectomy is popular as most tumors are small in size. In stark contrast, patients in India often present late with larger tumors and debilitating bone disease resulting in severe and protracted hypocalcaemia following surgery (hungry bone syndrome). The purpose of the study is to identify factors which may help in determining which patients were likely to develop more severe hypocalcaemia following parathyroidectomy and require close monitoring.

**Method(s):** A retrospective review was done of 36 patients who underwent parathyroidectomy at our institute for primary hyperparathyroidism from 2000-2009. Patients were divided into 2 groups; those with clinical and radiological evidence of bone disease (Group A; n=17) and those without bone disease (Group B; n=19). The 2 groups were compared with respect to their pre-operative calcium, parathormone and alkaline phosphatase levels and the degree of post-operative hypocalcaemia.

**Result(s):** Group A patients had higher pre-operative mean serum calcium, parathyroid hormone, alkaline phosphatase values and larger tumors (12.5 mg/dL, 1740 pg/mL, 1,075 IU/mL and 3.2 cm respectively) compared to Group B patients (11.4 mg/dL, 661 pg/mL, 399 IU/mL and 2.8 cm respectively). Post-operatively, Group A patients had a sharper and more persistent fall in their serum calcium requiring close monitoring, intravenous calcium infusion (average 3.6 days) and longer hospitalization.

**Conclusion(s):** More than the pre-operative calcium and parathormone levels it was the alkaline phosphatase values which were found to be a more reliable predictor of the severity of post-operative hypocalcaemia and warrants further prospective studies on its role in identifying patients requiring close monitoring following parathyroidectomy.

**Keywords:** Parathyroidectomy, Hypocalcaemia, Alkaline Phosphatase

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## Indian Society Symposium Symposia on Oral cancer

12:00 - 13:30 SBR IV

## Adjuvant Treatment for Head & Neck Cancer

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Several retrospective studies have shown that adjuvant radiotherapy reduces local and locoregional failures, thereby improving survival. Studies reveal that a dose of 60–65 Gy over 6–7 weeks is necessary for patients with negative margins. A definite dose response relationship exists when considering the doses of adjuvant radiotherapy. In a trial by Peters L.J. et al, patients who received a dose of <54 Gy had a significantly higher local failure than those receiving >57.6 Gy ( $P=0.02$ ). No significant dose response could be demonstrated above 57.6 Gy except for patients with extracapsular nodal disease. Analysis of prognostic factors for local-regional recurrence show that extracapsular nodal disease was the only variable of independent significance. However, clusters of two or more of the following risk factors were associated with a progressively increased risk of recurrence: oral cavity primary, mucosal margins close or positive, nerve invasion, >2 positive lymph nodes, largest node >3 cm and treatment delay greater than 6 weeks. Hence, for patients with close (less than 5 mm) or involved margins or any of the above-mentioned high-risk features, dose >60 Gy is recommended.

The optimal time to start adjuvant radiation post surgery is within 6–8 weeks post surgery, preferably as soon as the operative wound heals. Inspite of adjuvant radiotherapy, local failures of 30–60 %, distal failures of 25% and 5-year survival rates of 30% were noted in high risk cases. One of the major advances in this regard is the exploitation of combining chemotherapy and radiotherapy. The trial by Bachaud et al, showed marked benefit with post operative, adjuvant chemoradiotherapy over post-op radiotherapy alone. These results were confirmed by 2 major, landmark trials (RTOG 9501 and EORTC 2293), with an absolute advantage of 4% in the presence of high risk features (Inter group 0034 study).

Various other trials are also ongoing to evaluate further intensification in high risk cases with the addition of targeted therapies like Lapatinib and Cetuximab. Altered fractionation has also been evaluated.

Concurrent adjuvant chemoradiotherapy is a way to intensify treatment for resectable, high-risk head and neck tumors to improve upon existing control rates. However, in patients with no known high risk features, there is no benefit in terms of local control or survival over post op radiotherapy. It should not be applied to all patients who require postoperative irradiation. High incidence of treatment related toxicity interfering with compliance and quality of life issues need to be addressed.

## LS02. Luncheon Symposium (J&J)

Chair : Young-Ik Son (Korea)

12:00 - 13:30 CBR I + II

[LS02-01]

### Minimally Invasive Videoassisted Thyroidectomy (MIVAT)

Paolo Miccoli

*Department of Surgery, University of Pisa, Italy*

Minimally invasive video assisted thyroidectomy (MIVAT) was set up and introduced at the Department of Surgery, University of Pisa, in 1998. Its results after an acceptable relapse can now be evaluated, also speculating on new possible indications.

Selection criteria were: nodule size < 35 mm, thyroid volume < 25 ml; no thyroiditis nor previous neck surgery or irradiation. Preoperative diagnosis was: 665 follicular nodule, 621 papillary carcinoma, 35 toxic adenoma, 116 Hurtle cell nodule, 429 multinodular goiter, 103 Graves' disease, 15 toxic goiter, 21 completion thyroidectomy, 35 RET gene positive, 2 thyreoglossal duct carcinoma.

The procedure is based on a unique incision in the central neck, 2 cm above the sternal notch, using small conventional retractors and needlescopic (2mm) reusable instruments. Haemostasis is achieved by a harmonic scalpel. 2042 patients underwent MIVAT since June 1998. There were 1738 females and 304 males (ratio 4:1). Lobectomy was carried out in 532 patients, total thyroidectomy in 1510 patients. Mean operative time was 31,1 (range 20-120) minutes for lobectomy and 41,1 (30-130) minutes for total thyroidectomy. Conversion to standard cervicotomy was required in 42 cases (2%). Operative complications were represented by transient monolateral recurrent nerve palsy in 53 cases (2,5%), definitive monolateral recurrent nerve palsy in 23 cases (1,1%). 75 patients exhibited a hypoparathyroidism, which corresponds to 4,9% of total thyroidectomies performed, but only 6 showed a permanent hypoparathyroidism (0,3%).

MIVAT can be considered a safe operation offering significant cosmetic advantages with possible new promising indications such as prophylactic thyroidectomy in RET gene mutation carriers. It is though still limited to a minority of patients in particular in endemic goitre countries.

**Keywords:** Thyroidectomy, Minimally Invasive, Videoassisted

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[LS02-02]

### Harmonic Scalpel® in Harvesting the Vascular Pedicle of Radial Forearm Free Flap

Chung-Hwan Baek

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Radial forearm free flap (RFFF) is one of the most commonly used free flaps in head and neck reconstruction. It provides a thin, pliable flap with a reliable and long pedicle, which characteristics make RFFF to be suitable for three-dimensional defects in head and neck regions. However, there are some disadvantages concerning donor site, the forearm, which is located in an esthetically exposed region. Skin and soft tissue defect is well recognized morbidity in RFFF. And a long incision to trace and harvest the proximal segment of the vascular pedicle might cause a severe scar problem for patients even though wavy incision is usually made to prevent scar contracture. Depending on the patient's skin texture, hypertrophic scar or keloid formation in forearm area.

The advantages of Harmonic Scalpel® in harvesting the vascular pedicle are as follows; 1) the heat diffusion into the surrounding tissue is less than conventional diathermy, therefore, the pedicle can be harvested with lower risk of thermal damage, 2) simultaneous tissue cutting and coagulations might reduce flap elevation time, and 3) it enables the surgeon to access narrow operating fields to make the skin incision as small as possible ever.

Harmonic Scalpel® in harvesting the vascular pedicle of radial forearm free flap will be presented with aesthetic outcome in donor site as well as safe and feasible pedicle harvest. the detailed surgical technique and illustrative figures.

**Contact Information** Chung-Hwan Baek(chbaek@skku.edu)

[T3-01]

## Combination of Bendamustine and Cetuximab as an Alternative Therapeutic Option for Recurrent Head and Neck Squamous Cell Carcinoma

**Wolf-Oliver Jordan<sup>1\*</sup>, Ingeborg Wildfang<sup>2</sup>, Heiko Niebuhr<sup>1</sup>, Jurgen Borghardt<sup>3</sup>, Hayssam Zakaria<sup>1</sup>, Sepideh Fanaei<sup>1</sup>, Barbara Tschechne<sup>1</sup>**

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**Objective:** After failure of a standard therapy for inoperable head and neck tumors with squamous histology, further failure of 2nd line therapies even with radiation therapy included, other therapy options are extremely limited. In this highly palliative situation we treated a small group of 15 patients with the combination of bendamustine and cetuximab. 7 Patients had a local progression, 8 patients had already distant metastases.

**Method(s):** Cetuximab in a starting dose (day 0) of 400 mg/m<sup>2</sup>, from day 8 subsequently weekly 250 mg/m<sup>2</sup> till a progressive disease had to be observed. Bendamustine (Day 9, 10) 100 mg/m<sup>2</sup> in a three week cycle also till progression.

**Result(s):** So far, this therapy seems to be highly effective, so after 28 weeks 9 patients showed a partial response, 5 patients a stable disease and 1 patient was progressive. The therapy has been well tolerated (grade 1/2 rash symptoms by cetuximab), hematological Grade 3/4 toxicities were not observed.

**Conclusion(s):** Similar therapeutic results have not been observed under cetuximab +/- docetaxel in this form by us before. We conclude that bendamustine in combination with cetuximab is a valid treatment option. In particular to its low toxicity profile future trials should evaluate this regime in more detail.

**Keywords:** Bendamustine, Cetuximab, Failure of 2nd Line Therapies

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[T3-03]

## Preliminary Analysis of Induction Chemotherapy Efficiency

**Larissa Botolina<sup>1</sup>, Sergey Kravtsov<sup>2</sup>, Anna Kornietskaya<sup>1\*</sup>**

<sup>1</sup>Chemotherapy, Moscow Research Institute of Oncology name of P.A. Herzen, Russian Federation

<sup>2</sup>Surgery department of Head and neck, Moscow Research Institute of Oncology name of P.A. Herzen, Russian Federation

**Objective:** To evaluate the efficiency of induction chemotherapy for treatment of laryngopharynx cancer.

**Method(s):** The study included 6 pts., age 50-68 years. In all the patients squamous cell laryngopharynx carcinoma T3-4N1-2M0 was diagnosed. Treatment regimens were: cisplatin 80 mg/m<sup>2</sup>-1 day; gemcitabine 1250 mg/m<sup>2</sup>-1st and 8th days. Altogether 23 maintenance chemotherapy courses were carried out (3 courses-1 patient, 6 courses-3 patients, 2 patients are still being treated). The interval between the courses is 21 days. The treatment efficiency was evaluated based on the computer-aided (CT) and magnetic-resonance imaging tomography data (MRI), endoscopic and ultrasound examinations following 3 courses of maintenance chemotherapy.

**Result(s):** Tumor regression by more than 50% (WHO) was identified in 3 patients who were randomized into 2 groups: radiation therapy-2 patients and surgical treatment in 1 patient. In 1 patient after 3 courses of induction chemotherapy the tumor regression was below 50% and because of this the patient underwent an operation. At present all the patients are alive, the maximum term of follow-up is 11 months. The best response to the treatment was observed on the part of the primary site, and the maximum regression rate was identified during the first 4 courses of chemotherapy. The response of the metastatic lymph nodes to the therapy was by far less effective, the maximum rate of regression was achieved in the process of the last 3 courses of chemotherapy.

**Conclusion(s):** Application of induction therapy in patients with locally advanced cancer of laryngopharynx allows reaching more than 50% tumor regression. It makes possible an attempt of conservative surgery in regard to a number of patients.

**Keywords:** Induction Chemotherapy, Laryngopharynx Cancer

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[T3-02]

## The Docetaxel/cisplatin as First-Line Chemotherapy in Patients with Recurrent, Metastatic Head and Neck Carcinoma; The Possible Impact of Rassfla and ERCC Expression on Treatment Outcomes

**Yong Park<sup>1</sup>, Kyong Hwa Park<sup>2</sup>, Seung Kuk Baek<sup>3</sup>, Soon Young Kwon<sup>3</sup>, Chul Yong Kim<sup>4</sup>, Sang Won Shin<sup>1\*</sup>, Kwang Yoon Jung<sup>3</sup>, Nam Joon Lee<sup>5</sup>, Jun Suk Kim<sup>2</sup>, In Sun Kim<sup>6</sup>**

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**Objective:** The objective of this retrospective phase II study was to access to the clinical activity and toxicity of docetaxel and cisplatin and to evaluate the implication of the expression of Rassfla and ERCC in Korean patients with locally advanced unresectable, metastatic or recurrent squamous cell carcinoma of the head and neck.

**Method(s):** 54 patients were treated with docetaxel 65 mg/m<sup>2</sup> and cisplatin 60 mg/m<sup>2</sup> on day 1. Therapy was repeated every 3 weeks. 36 patients were evaluated for Rassfla and ERCC expression. These patients were categorized as two subgroups; the group in which the tumor expressed high Rassfla ( $\geq 50\%$  of tumor) and low ERCC ( $\leq 50\%$  of tumor) and the others.

**Result(s):** Overall, the rate of objective responses based on an intention-to-treat analysis was 31.5%. 6 patients showed complete remission, 11 patients showed partial remission, 14 patients showed stable disease, and 22 patients showed the disease progression. The median progression free survival (PFS) was 8.68 months (95% confidence interval was not calculated yet) and the median overall survival (OS) was 24.29 months (95% confidence interval, 3.47-45.153 months). Patients with high Rassfla and low ERCC expression showed the trend of improved PFS and OS (the median was not reached yet, respectively) compared with the others (median PFS, 8.39 months, 95% confidence interval 4.299-12.561 months, and median OS, 13.0 months, 95% confidence interval 1.912-24.088 months). However statistical significance could not be observed ( $P=0.192$  for PFS, and  $P=0.173$  for OS, respectively). 27 patients had grade 3-4 neutropenia 11 patients had febrile neutropenia. 1 patient had died due to septicemia.

**Conclusion(s):** Overall the combination of docetaxel and cisplatin represents an activity and safety in Korean patients with locally advanced unresectable, metastatic or recurrent squamous cell carcinoma of the head and neck.

**Keywords:** Docetaxel, Cisplatin, Head and Neck Cancer

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[T3-04]

## Induction Methotrexate, Cisplatin, and 5-Fluorouracil (MPF), Followed by Concurrent Radiation Therapy for Organ Preservation in Locoregionally Advanced Head and Neck Squamous Cell Carcinoma

**Tung-Lung Tsai<sup>1\*</sup>, Pen-Yuan Chu<sup>1</sup>, Shyh-Kuan Tai<sup>1</sup>, Yi-Fen Wang<sup>1</sup>, Muh-Hwa Yang<sup>2</sup>, Ling-Wei Wang<sup>3</sup>, Jing-Feng Lirng<sup>4</sup>, Shyu-Eyh Chang<sup>1</sup>**

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**Objective:** In an effort to decrease acute and late toxicity without attenuating organ preservation survival in patients with locoregionally advanced head and neck squamous cell carcinoma (HNSCC), we conducted sequential chemoradiation therapy combining induction methotrexate-cisplatin-fluorouracil (MPF) with weekly cisplatin/fluorouracil (PF) concurrent chemoradiation (CCRT).

**Method(s):** Two induction courses using methotrexate (40 mg/m<sup>2</sup> on day 1,8,15), cisplatin and 5-fluorouracil (25 mg/m<sup>2</sup>/day and 750 mg/m<sup>2</sup>/day continuous intravenous infusion days 1-4) were given, with an interval of 28 days. Patients who were responded to the chemotherapy received definitive radiation with concurrent weekly cisplatin (20 mg/m<sup>2</sup>/day) and 5-fluorouracil (400 mg/m<sup>2</sup>/day).

**Result(s):** There were 57 eligible patients enrolled between December 2000 and July, 2004; 33 (58%) had stage IV disease. At least 1 grade 3-4 toxicity was experienced by 17 patients (30%) during induction. A total of 49 patients completed induction and began CCRT; 47 (96%) completed all planned treatment. At least 1 grade 3-4 toxicity was noted in 36 of the 49 patients (74%) evaluated for toxicity from CCRT. One patient died during induction, and one during chemoradiation. With a median follow-up of 25 months (range, 3-83), the 2-year and 3-year overall survival estimates were 56% and 50%, with 2-year and 3-year disease specific survival estimates of 62% and 58%, 2-year and 3-year organ preservation survival estimates of 78% and 74% in CCRT completed remission patients, respectively. 96% current survivors were tracheotomy and feeding tube-free. No patient without local/ regional failure or secondary primary malignancy suffered from distant metastasis.

**Conclusion(s):** MPF induction chemotherapy followed by weekly PF CCRT is toxic-acceptable without attenuating organ preservation survival in patients with locoregionally advanced head and neck squamous cell carcinoma (HNSCC). In this patient cohort with advanced head and neck squamous cell cancer, overall and organ preservation survivals were encouraging, justifying further study of this approach.

**Keywords:** Induction Chemotherapy, Concurrent Chemoradiation, Organ Preservation

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[T3-05]

## TS-1 and Cisplatin as First-Line Chemotherapy in Patients with Advanced Head and Neck Carcinoma

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**Objective:** The objective of this Phase II study was to assess the clinical activity and toxicity of TS-1 and cisplatin in patients with unresectable, metastatic, or recurrent squamous cell carcinoma of the head and neck.

**Method(s):** Between July 2008 and December 2009, a total of 29 patients were treated with TS-1 60 mg/m<sup>2</sup> on Day 1-14 and cisplatin 70 mg/m<sup>2</sup> on Day 1 every 3 weeks as a first line palliative therapy.

**Result(s):** Total 79 cycles of treatment were administrated (median 2.5 cycles; range 1-10). Treatment was stopped due to progressive disease (n=11), treatment-related toxicity (n=6), a lack of further tumor reduction (n=2), and other causes (n=6). Of 24 evaluable patients, 1 had complete response, 6 had partial responses, and 8 had stable responses, with 51.8% of disease control rate. With a median 17.4 months (range 6.2-68.9) of follow up, the median time to progression and overall survival were 4.6 (95 CI 2.1-6.9 months) and 7.9 month (95% CI 4.2-11.7), respectively. There was one treatment related death, died of neutropenic fever, and treatment delays in 6 patients (20.1%); grade 2-3 neutropenia (n=5), grade 2 diarrhea (n=1). The mean relative dose intensity of TS-1 and cisplatin were 0.9 (95% CI 0.86-0.96) and 0.96 (95% CI 0.86-0.99), respectively.

**Conclusion(s):** The combination of TS-1/cisplatin demonstrated favorable efficacy with tolerable toxicity for advanced SCCHN patients.

**Keywords:** Head and Neck Cancer, TS-1, Cisplatin

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[T3-07]

## A Retrospective Review of Radical Neck Dissection Followed by Interstitial Brachytherapy for Nodal Recurrence of Nasopharyngeal Cancer

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<sup>2</sup>Department of Otolaryngology, Singapore General Hospital, Singapore

**Objective:** Radical neck dissection (RND) offers the best form of salvage for patients who develop nodal recurrence following radical radiotherapy for nasopharyngeal cancer (NPC). Patients with extracapsular nodal disease or disease adherent to carotids have a high risk of recurrence following RND alone. We report our experience with the additional use of interstitial brachytherapy following RND for patients with nodal recurrence of NPC.

**Method(s):** We retrospectively reviewed records of patients who underwent interstitial brachytherapy following radical neck dissection for non metastatic nodal recurrence of NPC at our Centre. Patients underwent 30 Gy in twice daily fractions (at least 6 hours apart) over 5 days using high dose rate Iridium-192 after-loader. Survivals were analyzed using the Kaplan Meier method.

**Result(s):** Between June 1996 and December 2003, 24 patients (16 males, 7 females) were identified. At median follow up of 25 months from RND, the 2 years DFS is estimated to be 40%. Two patients failed locally, one patient developed contralateral neck recurrence and nine patients developed distal metastasis. The estimated 5 years actuarial survival was 30%. Toxicities include symptomatic neck stiffness and fibrosis in 9 patients, chronic neck pain in 1 patient, osteoradionecrosis in 1 patient and carotid stenosis leading to cerebro-vascular accident in 1 patient. Updated results will be presented.

**Conclusion(s):** In patients with relapsed nodal disease with high risk features such as extracapsular spread or tumour adherent to carotids, addition of interstitial brachytherapy to the neck offers excellent local control. In our series, most patients eventually succumb to metastatic disease.

**Keywords:** Brachytherapy, Neck, Nasopharyngeal

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[T3-06]

## Induction Chemotherapy with S-1 and Cisplatin in Patients with Squamous Cell Carcinoma of the Head and Neck: A Single Center Experience

**Dok Hyun Yoon<sup>1</sup>, Yoojin Cho<sup>1</sup>, Sang Yoon Kim<sup>2</sup>, Soon Yuhl Nam<sup>2</sup>, Seung-Ho Choi<sup>2</sup>, Sang-wook Lee<sup>3</sup>, Jeong Hyun Lee<sup>4</sup>, Jae Seung Kim<sup>5</sup>, Kyung-Ja Cho<sup>6</sup>, Sung-Bae Kim<sup>1\*</sup>**

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**Objective:** A combination of 5-FU and cisplatin has been the primary induction chemotherapy regimen for patients with locally advanced squamous cell carcinoma of the head and neck (SCCHN). Because of drawbacks of this regimen, we have investigated the efficacy and safety of the combination of S-1, an oral fluoropyrimidine, and cisplatin, as induction chemotherapy in such patients.

**Method(s):** We retrospectively analyzed outcomes in 55 consecutive patients with stage III or IV squamous cell carcinoma of the oropharynx, hypopharynx, larynx, or oral cavity, treated with S-1/cisplatin induction chemotherapy at a single center between July 2006 and December 2008. The planned induction chemotherapy regimen consisted of two 21-day cycles of cisplatin (60 or 75 mg/m<sup>2</sup>) on day 1 and S-1 at 40 mg/m<sup>2</sup> twice daily on days 1 to 14. This was followed by concurrent chemoradiotherapy or surgery, when possible.

**Result(s):** Partial response to induction chemotherapy was observed in 38 of the 55 patients (69.1%). No complete response was observed. At a median follow-up time of 21.4 months (range, 9.4 to 39.2 months) in surviving patients, the median progression-free survival was 25.1 months, and the median overall survival was 31.0 months, with a 2-year survival rate of 70.8%. Most Grade 3 or 4 adverse events during induction chemotherapy were hematological, including anemia (n=2), thrombocytopenia (n=2), neutropenia (n=10), and febrile neutropenia (n=2).

**Conclusion(s):** The combination of S-1 and cisplatin is feasible as induction chemotherapy in patients with locally advanced SCCHN.

**Keywords:** Head and Neck Cancer, Induction Chemotherapy, S-1

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[T3-08]

## Evaluation of Set-Up Accuracy for Intensity Modulated Radiation Therapy (IMRT) to the Head & Neck Region

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**Objective:** Intensity Modulated Radiotherapy (IMRT) allows radiotherapy to be delivered with a steep dose gradient. Knowledge of departmental radiotherapy set-up error is crucial to ensure accurate delivery of radiation to tumour and avoidance of organs at risk. The systematic and random set-up error for IMRT to the head and neck region and a proposed Clinical Target Volume (CTV) to Planning Target Volume (PTV) margin based on these results is presented here. Updated results will be presented.

**Method(s):** Between November 2009 and January 2010, orthogonal pre-treatment verification images were acquired using on board kilovoltage X-ray or megavoltage imaging for 48 consecutive patients who underwent IMRT to the head and neck region. These images were obtained for the first three radiotherapy fractions and compared with the reference images (simulator image or digitally reconstructed radiograph). Isocenter displacements in Right-Left (R-L), Anterior-Posterior (A-P) and Superior-Inferior (S-I) directions were recorded. Using previously described methods (van Herk et al., 2004), systematic and random set-up error was calculated.

**Result(s):** A total of 288 pre-treatment verification images were studied. The population systematic errors (SSE,  $\Sigma$ ) were 0.10 cm (R-L), 0.14 cm (A-P) and 0.10 cm (S-I) and the population random errors (RSE,  $\sigma$ ) were 0.08 cm (R-L), 0.09 cm (A-P) and 0.07 cm (S-I). Using margin recipe of  $2.5\Sigma+0.7\sigma$  (van Herk et al., 2000), CTV to PTV margin was calculated to be 0.3 cm in R-L & S-I direction and 0.4 cm in A-P direction.

**Conclusion(s):** Set-up accuracy for this cohort of patients is comparable to published data. Recommendation was made to for CTV-PTV margin to be 4mm for patients undergoing head and neck IMRT using current immobilisation at our centre.

**Keywords:** Set-up, Accuracy, Error

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[T3-09]

## The Increase in Incidence of Squamous Cell Carcinoma of the Tongue in Young Adults Continues into the 21st Century

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**Objective:** We previously showed an increased incidence in SCC of the tongue in Scandinavia during a 35-year period, 1960-1994, in all ages, most pronounced in patients aged 20-39 (young adults) where the increase was 5-fold in men and 6-fold in women. Aim of the study was to investigate if the incidence increase in SCC of the tongue, continues during 1994-2004 in the Scandinavian population.

**Method(s):** Data of all reported SCCs of the tongue in patients aged 20-79 years during the period 1994-2004 was extracted from the NORDCAN registry. This registry is based on the National Cancer registries in all the Nordic countries, Sweden, Norway, Finland, Denmark, The Faroe Islands and Iceland. The age groups 20-39, 40-64 and 65-79 were studied separately as well as male and female figures.

**Result(s):** During the study period 10 355 SCCs of the tongue were reported of which 566 were diagnosed in patients aged 20-39. The incidence increased for every 5-year period at all ages and was most pronounced in female young adults where it increased more than 4-fold.

**Conclusion(s):** Thus the incidence increase continues into the 21st century. The reason for this is still unknown.

**Keywords:** Tongue Carcinoma, Incidence, Young Adults

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[T3-10]

## Narrow-Band Imaging for Detecting Early Recurrent Nasopharyngeal Carcinoma

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**Objective:** Detection of early recurrent nasopharyngeal carcinoma (NPC) is of clinical challenging. Narrowband imaging (NBI) is powerful in detecting early superficial lesions in the head and neck, although the utility of NBI in detecting nasopharyngeal cancer is still unknown.

**Method(s):** Case presentation.

**Result(s):** We describe a case of a 51-year-old man with early recurrent NPC detected in subclinical stage by NBI coupled with conventional endoscopy. Magnetic resonance imaging (MRI) revealed no obvious bulging or inward invasion over nasopharynx. Because of superficial, localized recurrence, we performed laser nasopharyngectomy and his postoperation course was uneventful.

**Conclusion(s):** We demonstrated that postirradiated NPC in a patient with early recurrence was successfully detected by NBI coupled with conventional endoscopy. NBI endoscopy is a simple, convenient, and reliable tool, and adds additional value to detect local recurrence in the early phase. It may serve as an ideal tool in post-treatment surveillance in a patient with NPC.

**Keywords:** Nasopharyngeal Tumor, Narrow Band Imaging, Recurrence

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[T3-11]

## Transnasal Endoscopy with Flexible Spectral Imaging Color Enhancement (FICE) for Diagnosing Superficial Oro-Hypopharyngeal Cancer

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**Objective:** We describe the clinical usefulness of transnasal endoscopy using white-light imaging or Flexible Spectral Imaging Color Enhancement (FICE) for diagnosis of superficial oro-hypopharyngeal cancers.

**Method(s):** Between August 1996 and August 2009, 74 superficial oro-hypopharyngeal cancers were found in 56 patients.

**Result(s):** Among them, 8 lesions were detected by transnasal endoscopy. 21 patients with a combined 24 lesions underwent transnasal endoscopic study before the medical treatment. The mean age of the patients examined was 69.8 years (range, 56-80 years), and all patients were male. The pyriform sinus was the most frequent primary site (46%; 11 of 24 lesions). The median tumor diameter was 20 mm (range, 2-40 mm). Among 21 lesions which size was over 5 mm, 20 lesions (96%) were able to detect by transnasal endoscopy. Most of them revealed well demarcated brownish area and scattered brown dots on FICE image. The lesions which size were less than 5 mm, it was difficult to detect by transnasal endoscopy. Endoscopic resection was performed in 17 lesions. Of the remaining 7 patients, four were followed without treatment because they had advanced esophageal carcinoma, three was treated with radiotherapy because the lesion was too large to be removed surgically. 8 lesions were histologically confirmed to be carcinoma in situ, and 9 lesions showed invasion into the subepithelial tissue. 13 lesions of them (76%) were able to predict the range of tumor similarly compared with iodine unstained area. Although further improvements in its resolving power and manipulation performance are desirable, if the size exceed 5 mm, it is possible to find it.

**Conclusion(s):** Observation of the oro-hypopharynx by transnasal endoscopy is easy and feasible because of its attenuation of the gag reflex. Transnasal endoscopy may in the future become the standard examination for the screening of the upper GI tract.

**Keywords:** Transnasal Endoscopy, FICE

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[T3-12]

## A New PET System with Semiconductor Detectors: Evaluation of Usefulness in Head and Neck Cancer

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**Objective:** Positron emission tomography (PET) is a widely used nuclear imaging technique. However, its spatial resolution is not so high due to the scattered noise. A new PET system with semiconductor detectors which is dedicated to human brain imaging and is suppose to have low scattered noise was applied to the imaging of head and neck cancer. The aim of this study was to evaluate the usefulness of this new system in our clinical practices.

**Method(s):** Thirteen patients with head and neck cancer received examination using a prototype 3-dimentional PET with semiconductor detectors immediately after the conventional PET/CT without additional administration of 18F-FDG. We compared edge sharpness and details in 18F-FDG focal uptake between the images obtained from two different detectors in each patient. This study was approved by the Ethics Committee of the Hokkaido University School of Medicine and all of the patients gave written informed consent.

**Result(s):** In 12 of 13 patients (92.3%), edge sharpness of the images obtained with semiconductor detectors was higher than those with conventional PET/CT. More details in 18F-FDG focal uptakes were also exhibited in at least 3 patients.

**Conclusion(s):** This study suggests that this new PET system with semiconductor detectors provided higher spatial resolution than the conventional PET/CT in depicting head and neck cancer.

**Keywords:** PET, Semiconductor, Head and Neck Cancer

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[T3-13]

## Quantitative Analysis of Tongue Cancer Permeability by Using Magnetic Resonance Dynamic Contrast Enhancement (DCE) Technique

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**Objective:** Magnetic resonance dynamic contrast enhancement (DCE) technique is gradually accepted and applied in every aspect of disease. Permeability values of tumors, which reflect angiogenesis or immature neovascularization, can be calculated and shown by voxel-based post-processing maps. We use DCE technique for surveying different-staged tongue cancers and try to correlate the permeability values with tumor stages. **Method(s):** Totally 28 patient with new diagnosed tongue cancer were included in this study, including 10 patient with T2 stage and 18 patients with T4a stage. DCE technique was used via 3T GE signa machine. Permeability could be characterized by the initial area under the Gd-DTPA uptake versus time curve (IAUC). IAUC60 were defined as the area under the curve from initial enhancement time point to the 60th second. All patients' IAUC60 maps were generated by in-house Matlab software. Every map was drawn by the radiologist. Mean^ROI values were got by choosing region of interest (ROI) in tumors. Afterward we outlined along the tumor borders in all slices. The average and maximal IAUC60 values of the whole tumor (WT) were regarded as Mean^WT and Max^WT respectively. Then three values of tumors were achieved: mean value in ROI (Mean^ROI), mean value of whole tumor (Mean^WT) and maximum value of whole tumor (Max^WT).

**Result(s):** If we divide these three values (Mean^ROI, Mean^WT and Max^WT) into two groups according to their tumor stages, i.e. T2 stage tumors as Group 1 and T4a stage tumors as Group 2. All of these values between Group 1 and Group 2 have statistical significance by t-test ( $P<0.05$ ).

**Conclusion(s):** By using IAUC60 map for getting permeability-related values of tumors, we found statistical significance between T2 and T4a stages. This result implies correlations between permeability characters and tumor stages. In other words, advanced-staged tumors may have higher angiogenesis activity inside.

**Keywords:** Tongue Cancer, MRI, Dynamic Contrast Enhancement (DCE)

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[T3-15]

## Quality of Life for Head and Neck Cancer Patients Treated by Combined Modality Therapy-the Therapeutic Benefit of Technological Advance in Radiotherapy

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**Objective:** This study is to evaluate the quality of life (QoL) for patients with head and neck squamous cell carcinoma (HNSCC) treated by combined modality therapy, focusing on the therapeutic benefits of QoL by the technological advances in radiotherapy (RT) in different time periods.

**Method(s):** A cross-sectional survey of the QoL by the EORTC QLQ-C30 and QLQ-H&N35 questionnaires was performed for 307 HNSCC survivors. There were 135 patients treated by two-dimensional RT (2DRT), 90 by three-dimensional conformal RT (3DCRT), and 82 by intensity-modulated RT (IMRT). The effect size between groups was calculated using Cohen's D coefficient.

**Result(s):** Those who had a higher annual family income or treated by more advanced RT technique had better QoL outcomes. Compared with 2DRT, the impact of 3DCRT was small (Cohen's D: 0.02–0.40) on all QoL scales. For IMRT, the impact was small on most scales and moderate (Cohen's D: 0.55–0.60) on opening mouth, dry mouth, and sticky saliva. Compared with 3DCRT, the impact of IMRT was small (Cohen's D: 0.03–0.29) on all scales.

**Conclusion(s):** The advances in RT provided a positive effect in QoL outcome, especially on swallowing-related QoL scales, for HNSCC patients treated by combined modality therapy.

**Keywords:** Head and Neck Squamous Cell Carcinoma, Quality of Life, EORTC QLQ-C30

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[T3-14]

## Rehabilitation Protocol for Postoperative Dysphagia in Head and Neck Cancer Patients

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**Objective:** Patients with cancer in head and neck who treated with surgical removal may result in some degree of dysphagia. The swallowing disorders depend on the site, the extent of surgical resection, and the nature of the surgical reconstruction. As a result, rehabilitation needs to be managed by head and neck surgeons with specific anatomical knowledge. But, it is only occupational therapist who can get an approval for dysphagia rehabilitation from national health insurance cooperation in Korea. Therefore, we designed the comparative study of rehabilitation protocol.

**Method(s):** The data were collected by medical record review of 40 patients who ever got operation on oral cavity, larynx and hypopharynx from November 2007 to January 2009. 20 patients selected from the patients who ever got the Advanced Rehabilitation Protocol (ARP) with head and neck surgeon's management. Another 20 patients were selected from non-ARP application group.

**Result(s):** Although, the result has no statistical significance, the period to be able to oral diet and discharge was contracted among patients with advanced rehabilitation protocol, and so that they could start adjuvant therapy earlier.

**Conclusion(s):** Rehabilitation needs to be managed cooperatively by multidisciplinary team including otolaryngologist who has specific anatomical knowledge of resected area and reconstruction according to specific swallowing problems.

**Keywords:** Dysphagia, Rehabilitation, Head and Neck Cancer

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[T3-16]

## Association of Tracheostomal Size with Clinical and Demographic Characteristics after Total Laryngectomy with Primary Voice Reconstruction in a Philippine Tertiary Hospital

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**Objective:** To determine the association of tracheostomal size with clinical and demographic characteristics after total laryngectomy with primary voice reconstruction using VMCU technique.

**Method(s):** Cross-sectional, retrospective study was done. 24 in-patients post total laryngectomy with primary voice reconstruction using VMCU technique for laryngeal cancer from 1995 to 2008 in a tertiary hospital answered a questionnaire with Demographic, Anthropometric and Clinical Data to complete. Pearson Correlation Analysis was used to associate stomal size with these factors as well as independent t-test, one-way analysis of variance and Spearman Rank Correlation was utilized to correlate stomal size with functional ability, quality of life and tumor stage. A  $P<0.05$  was considered significant.

**Result(s):** No significance among the demographic characteristics like age and gender, anthropometric measurements, co-morbidities like COPD, diabetes and goiter and clinical findings like pre-operative tumor site and stage, history of airway obstruction and tracheostomy, neck dissection, and pathologic resection. Duration of follow-up after radiotherapy and hypertension were significantly correlated with stomal size. Functional ability and perception of the quality of life were not significantly correlated to stomal size.

**Conclusion(s):** Demographic characteristics cannot be associated with stomal size. Certain clinical characteristics like history of hypertension, length of follow-up and radiotherapy can be correlated with tracheostomal stenosis.

**Keywords:** Tracheostomal Stenosis, Total Laryngectomy, Voice Reconstruction

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Friday, June 18

[T3-17]

## Speech and Swallowing (Functional) Outcome Following Free Ileocolic Flap in Total Pharyngolaryngectomy

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**Objective:** To evaluate the functional outcome of reconstruction by a free vascularized ileocolic flap after concurrent chemoradiotherapy (CCRT) and surgery for advanced laryngeal and hypopharyngeal cancer.

**Method(s):** Fifteen patients (all male, mean age 49.8 years) with squamous cell carcinoma of larynx (n=1) and hypopharynx (n=14) received a circumferential pharyngolaryngectomy and resection of the proximal esophagus followed by postoperative concurrent chemoradiotherapy (60-65 Gy, cisplatin and 5-FU). A single-stage reconstruction was performed with a free vascularized ileocolic flap using a microsurgical technique.

**Result(s):** The course of all operations was uneventful. 8 patients were alive after a follow-up time of 24 months after operation, while 7 patients died from local recurrence, distant metastasis and suicide. Relief of dysphagia was achieved in fourteen cases. Speech of intelligibility was recorded in 5 patients.

**Conclusion(s):** Reconstruction after radical resection for advanced laryngeal and hypopharyngeal cancer can be carried out with low mortality, acceptable morbidity and a promising functional outcome.

**Keywords:** Ileocolic, Oncology, Hypopharynx

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[T3-18]

## A Case of Major Tracheal Reconstruction with Costal Cartilage

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**Objective:** We experienced a case of a large tracheal wall defect after an operation for carcinoma showing thymus-like differentiation (CASTLE) tumor. The defect was closed by performing three subsequent operations.

**Method(s):** A 58-year-old male underwent operation for malignant tumor of the thyroid gland. Half the circumference of the trachea, just under the cricoid cartilage to inlet of mediastinum, was removed because of cancer invasion. The defect was restored using a pectoralis major myocutaneous flap. There was a major tracheo-cutaneous fistula.

**Result(s):** The pathological diagnosis after total resection of tumor was CASTLE tumor. Radiation therapy was performed after the operation. The patient sometimes had difficulty breathing with the soft lateral wall of the trachea, especially when coughing. 13 months after the first operation, costal cartilage transplantation was carried out in the lateral tracheal wall defect. 18 months from the first operation, the lateral wall recovered its rigidity by ingrowth of the cartilage. Approximately two thirds of the defect was closed with a small tracheostomy. Then two months later, the tracheostomy was closed.

**Conclusion(s):** When dealing with a major defect of the tracheal wall, rigidity of reconstruction material is necessary, for negative pressure of breathing. We successfully reconstructed a major tracheal wall defect using costal cartilage. As of the 27th month after the total resection, tumor recurrence has not been observed and the tracheae have been functioning without trouble.

**Keywords:** Major Tracheal Reconstruction, Costal Cartilage

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[T3-19]

## Prognostic Factors in Optimising the Treatment of Differentiated Thyroid Carcinoma

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**Objective:** To determine significant prognostic factors of differentiated thyroid carcinoma that influence long-term results.

**Method(s):** Treatment results of 386 patients with papillary and follicular thyroid carcinoma who underwent different extents of surgical treatment depending on tumor type (multicentric, intrathyroidal and extrathyroidal), presence or absence of neck metastases were analyzed.

**Result(s):** Organ saving procedures were performed in 142 patients. In patients with intrathyroidal tumor, 10-year survival was 94.3% (117/124), 20 year survival—85.5% (106/124). In patients with extrathyroidal tumor extension same parameters were 72.2% (13/18) and 55.6% (10/18) respectively. Total thyroidectomy was performed in 72 patients. 10 year survival with extrathyroidal tumor extension was 70.6% (12/17), intrathyroidal tumor—92.7% (51/55). 20 year survival was 64.7% (11/17) and 80% (44/55). Difference in survival is significant ( $P<0.05$ ). Patients with tracheal involvement are of particular interest. In case of minor tracheal involvement, tracheal resection was performed and defect closure was performed using a strap muscle (20). In seven patients circular resection of 5 to 7 tracheal rings was performed, in six patients with formation of tracheal anastomosis, in one patient laryngostoma was performed due to involvement of cricoid cartilage. In all patients with tracheal anastomoses intraoperatively temporary tracheostoma was performed to facilitate wound healing. These patients are alive from one to 13 years. Survival of patients was analyzed based on multicentric growth of tumor. In group of multicentric tumor 10 year survival was 88.9% (24/27), in group with single primary 99.2% (106/115), 20 year survival was 85.2% (23/27) and 81% (93/115) respectively. Difference between survival in these groups are not significant.

**Conclusion(s):** Extrathyroid growth of tumor is an unfavorable prognostic factor of differentiated thyroid carcinoma. Presence of multicentric growth of primary does not affect long-term results. Presence of metastases in lymphnodes may have a negative impact on 20-year survival.

**Keywords:** Thyroid Carcinoma, Prognostic Factors, Survival

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[T3-20]

## Treatment Papillary Thyroid Carcinoma at Children

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**Objective:** To develop adequate strategy of diagnostics and treatment papillary thyroid carcinoma (PTC).

**Method(s):** 258 children for the period with 1971-2009 have been included in research. At 166 children (from 1971 to 1999): metastases to lymph nodes or lateral trigonum of the neck are found out 104 (62.7 %), in an average line at 74 (44.6 %). Metastases in lungs have been found initially at 14 (8.4 %) and during dynamic supervision already at 40 (24.1 %) patients.

At 92 children (from 1999 to 2009): metastases to lymph nodes or lateral trigonum of the neck are found out 109 (84 %), in an average line at 109 (84 %). Metastases in lungs have been revealed initially at 7 (8 %) and during dynamic supervision already at 32 (35%) patients.

**Result(s):** Among primary patients till 1999, relapses PTC was 29 %, and after 3 %. Decrease level of relapses was affected with use more aggressive surgical tactics of treatment thyroidectomia at monofocal tumours in the size more than 1 see with obligatory removal central lymph dissection, and under indication removal of other groups of lymph nodes of neck.

**Conclusion(s):** treatment PTC should have aggressive character (Thyroidectomia at tumor more than 1 cm. in diameter, radical operation on a lymphatic collector of a neck, radioiodotherapy, suppressive hormonal therapy).

**Keywords:** Papillary Thyroid Carcinoma, Papillary Thyroid Carcinoma, Children

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[T3-21]

## Hormone Therapy Locally Advanced and Generalized Medullary Thyroid Cancer in Term Combined Treatment

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**Objective:** The aim of the study was to improve near results in combined treatment of the patients with local spread and metastatic medullary thyroid cancer.

**Method(s):** The microsurgery department of Herzen Moscow R&D oncological institute provides diagnostics and treatment for patients with local and distant metastatic medullary thyroid cancer spread. All patients passed the calcitonin test before the operation. The surgical treatment was provided to patients in accordance with tumor location and extent. After the operation, the Immunohisto-chemistry analyses with grade assessment and functional activity of medullary cancer cells evaluation was performed. The calcitonin testing was repeated in all patients after surgical treatment. The octreotide hormone therapy was used in the case of worth functional cancer cells activity (up to 30%, according to the Immunohisto-chemistry analyses data), as well as high calcitonine blood concentration. The usage of octreotide-depo maintains constant drug concentration for four weeks. The drug was administrated intramuscularly, once in a month with dosage 20 mg. The treatment was managed in accordance with calcitonin test monitoring.

**Result(s):** The surgery treatment combined with postoperative octreotide hormone prescribing was performed in 6 patients. The stabilization of calcitonin in 12 months period was obtained in 4 patients. The tumor progression was detected in 2 patients.

**Conclusion(s):** The hormone therapy of medullary thyroid cancer improves the near results of combined treatment.

**Keywords:** Thyroid, Cancer, Hormone Therapy

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[T3-23]

## Determination of Volume of Surgical Intervention in Thyroid Cancer C Lymphadenopathy front of Upper Mediastinum

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**Objective:** To determine indications for surgical access to the lymph nodes anterior upper mediastinal lymphadenopathy with about thyroid cancer: minimal invasive through the upper thoracic aperture, or sternotomy. To analyze the complications, immediate and remote results.

**Method(s):** since 2002 in the department of microsurgery Herzen Moscow R&D oncological institute performed 66 video-assisted surgery. The operation is performed with confirmed thyroid cancer and metastases to the lymph nodes of the upper anterior mediastinum, as well as lymphadenopathy detected in the survey. After surgery on the thyroid gland - thyroidectomy, from the same access, through the jugular clipping, retrosternal entered the telescope, using endoscopic instruments are block removal of the pre-and paratracheal tissue around the neck on both sides, and in the anterior upper mediastinum by video-recurrent laryngeal nerves, the mediastinal structures, thus minimizing the possible intraoperative complications. However, in connection with the preoperative underestimation of tumor process in the mediastinum, double-conversion was carried out in the sternotomy and removal of metastases in the mediastinum with resection of surrounding structures.

**Result(s):** the number of lymph nodes removed on average 8, 9, maximum 26. Size of nodes to a maximum of 3.5 cm Operation time, compared to sternotomy decreased twice. According to 5 years of observations of the 66 patients in 4 cases, showed progression of the tumor process, in 1 case arose recurrence of metastases of thyroid cancer in 42 cases, a comprehensive study of recurrence of metastasis in the mediastinum were found. Complications associated with the implementation of this operation were observed.

**Conclusion(s):** The use of techniques video-assisted lymphadenectomy in the upper anterior mediastinum metastases of thyroid cancer, can be considered adequate and radical. This type of surgery reduces surgical trauma compared with sternotomy, and has better cosmetic effect. For guidance on the preoperative examination of the presence of metastases in the mediastinum more than 3.5 cm, as well as signs of germination of metastases in the surrounding structures must immediately comply sternotomy.

**Keywords:** Thyroid Cancer, Metastasis, Mediastinum

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[T3-22]

## A Case of Collision Tumor of Head and Neck: A Patient with Papillary Thyroid Carcinoma Colliding with Laryngeal Squamous Cell Carcinoma

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**Objective:** In clinical, the double cancer in upper aerodigestive tract mucosa is not uncommon. However, the collision tumor of papillary thyroid carcinoma and laryngeal squamous cell carcinoma is rare. Only a few cases have been reported.

**Method(s):** The patient was a 55-year-old male who presented with a 2-year history of a rapidly expanding right neck mass for 2-month with progressive hoarseness and dyspnea. Physical examination revealed a firm, removable 3.0×3.0×2.0 cm mass of the right neck near the sternocleidomastoid muscle, and a firm,

**Result(s):** Electric laryngoscope examination revealed fixed right true vocal cord and exophytic lesion in the right hemilarynx. A computed tomography (CT) scan showed a mass of right parapharyngeal space, considered the possibility of laryngeal cancer infiltration, at the same time the lesion infiltrated to the right lobe of the thyroid gland; swollen of right neck lymph nodes. The diagnosis is tumor of larynx, tumor of thyroid gland. Considered the tumor is malignant. At surgery, we do total thyroidectomy combined with a total laryngectomy with paratracheal and bilateral selective neck dissections.

**Conclusion(s):** Final pathology revealed laryngeal squamous cell carcinoma, the full-thickness wall of larynx with the thyroid gland invasion. The right lobe of thyroid gland was papillary thyroid carcinoma, thyroid cartilage was invaded and penetrated, invaded to deep tissue of larynx, had infiltration in neural tissue. Multiple cervical lymph nodes were sectioned and showed metastatic carcinoma from thyroid papillary carcinoma. Patient had discharged at 14 HOD without any complication. The term "collision tumor" refers to the coexistence of two histologically distinct malignant tumors within the same mass. Collision carcinoma is a special type of multiple primary carcinoma. In conclusion, collision tumors of the neck and thyroid region are rare but must be considered in any patient with a thyroid mass in continuity with a mass in the larynx.

**Keywords:** Collision Tumor, Tumor, Histologically

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[T3-24]

## Clinical Significance of Frozen Section Analysis of Central Lymph Node in Thyroid Cancer

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**Objective:** The central lymph node metastases in thyroid cancer are very common condition, but, preoperatively or intraoperatively, it is difficult to determine the presence of central lymph node metastasis. The aim of this study is to determine presence of lymph node metastasis and clinical significance by frozen section analysis during thyroid surgery.

**Method(s):** Between April 2009 to July 2009, 117 patients were performed in thyroidectomy in papillary thyroid cancer. All patients were preoperatively diagnosed with thyroid cancer or suspicious thyroid cancer. There is no evidence of central lymph node metastasis preoperatively. Frozen section analysis of dominant thyroid nodule and ipsilateral central lymph nodes were performed during the operation. We investigated the accuracy and clinical significance of frozen section analysis of central lymph node.

**Result(s):** The mean age was 47.4 years old and the mean cancer size was 1.04 cm. Central lymph node metastases were found in 46 patients. The mean number of retrieved lymph node was 14 and metastatic lymph node was 2.6. Twenty three patients have bilateral thyroid cancers. Thirteen patients have ipsilateral multifocal thyroid cancers. In frozen section analysis, the sensitivity and specificity were 90 and 100 percent. The positive predictive value was 100 percent and the diagnostic accuracy was 93.1 percent. Twenty five patients were performed in contralateral central lymph node dissection. Among them, 8 patients had contralateral central lymph node metastasis. Extrathyroidal extensions is statistically significant factor associated with contralateral central lymph node metastasis ( $P<0.006$ ).

**Conclusion(s):** Preoperative diagnosis of central lymph node metastasis in thyroid cancer is very difficult. The frozen section analysis would be determined whether central lymph node is positive or negative in thyroid cancer patients. If central lymph node metastasis is proven in frozen section analysis, contralateral central lymph node dissection could be performed.

**Keywords:** Thyroid Cancer, Central Lymph Node, Frozen Section Analysis

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[T3-25]

## Endoscopic Thyroidectomy via Axillo-Bilateral-Breast Approach (ABBA): Analysis of 200 Cases

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**Objective:** Endoscopic thyroidectomy has been applied to solve the cosmetic problems that resulted from conventional thyroidectomy. The aim of this study was to assess the safety and feasibility of endoscopic thyroidectomy via axillo-bilateral-breast approach (ABBA).

**Method(s):** We analyzed 200 patients who underwent endoscopic thyroidectomy for thyroid nodule between May 2006 and November 2009. We used two 12 mm ports through bilateral circumareolar incisions and one 5 mm port through axilla. Working space was created with CO<sub>2</sub> insufflation at 5 mmHg of pressure. The indications for thyroid carcinoma were papillary thyroid microcarcinoma, absence of extrathyroidal invasion, and absence of cervical lymph node metastasis on preoperative radiologic examination.

**Result(s):** One hundred eighty-two females and 18 males, with a mean age 38.2 (16-56) years were operated. The mean diameter of 138 thyroid carcinomas, 60 benign nodules, and 2 well differentiated tumor-uncertain malignant potential was 0.72 (0.1-3.8) cm, 2.27 (0.5-4.8) cm, and 2.35 cm, respectively. One hundred fifty-two lobectomy, 41 total thyroidectomy, 4 subtotal thyroidectomy, 2 nodulectomy, and 1 near-total thyroidectomy were performed. The mean operation time of lobectomy and total thyroidectomy was 144 (8-509) minutes and 161 (110-250) minutes. The mean length of hospital stay was 6.35 (5-15) days. The mean amount of closed drainage was 100.6 (0-364) ml. There were postoperative complications of 35 (17.5%) cases: transient recurrent laryngeal nerve palsy in 16 cases, transient hypocalcemia in 17 cases, and ecchymosis in 2 cases. One case required conversion to open surgery due to recurrent laryngeal nerve injury. Most of the patients were satisfied, especially concerning the cosmetic results.

**Conclusion(s):** These results suggest that endoscopic thyroidectomy using ABBA is a safe, feasible procedure with excellent cosmetic benefits in thyroid benign and selected malignant tumors.

**Keywords:** Thyroid Neoplasm, Endoscopic Thyroidectomy

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[T3-26]

## Choice of Volume Video-Assisted Operations at the Andnocrinoma of the Thyroid Gland Based Morphogenetic Portrait Tumor

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**Objective:** Based on the analysis of the major oncogenic mutations of B-Raf and K-Ras genes in biological samples of patients with differentiated thyroid cancer have used the technique of execution video-assisted of minimally invasive surgical access to the sentinel lymph node biopsy.

**Method(s):** In the department of microsurgery Herzen Moscow R&D oncological institute video-assisted performed operations on the thyroid gland of minimally invasive lateral access through, with highly differentiated adenocarcinoma of the thyroid gland T1-T2NxM0 - 27 patients with sentinel lymph node biopsy after prior lymphography. The presence of mutations of B-Raf and K-Ras genes allowed to determine the degree of malignancy of the tumor and its potency to metastasize. Studied the "hot points" of genes B-Raf (15th exon) and K-Ras (2nd exon).

**Result(s):** In 2 (7.4%) patients identified the genetic mutation. Length video-assisted operations on the thyroid gland with sentinel lymph node biopsy was 60 minutes. There were no intraoperative complications. Results of morphological studies of planned sentinel lymph node - micrometastasis papillary thyroid cancer in the sentinel lymph nodes were found in 2 (7.4%) patients with identified mutations in the genes B-Raf (15th exon) and K-Ras (2nd exon). In these cases, was performed thyroidectomy with paratracheal lymphadenectomy.

**Conclusion(s):** The identification of gene mutations in B-Raf and K-Ras can talk about a high probability of detection of metastases and cervical lymph nodes. Determination of sentinel lymph node allows you to identify the initial phase of lymphogenous metastasis. A minimally invasive access enables you to perform any amount of radical surgery on the thyroid gland. Video-assisted operations with highly differentiated thyroid cancer stage I (T1-T2NxM0) do not affect cancer outcome.

**Keywords:** Thyroid, Metastasis, Mutations

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[T3-27]

## Thyroid Surgery Mission in West Sumba Island, Indonesia

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**Objective:** The Thyroid surgery mission is one of the Indonesian Otorhinolaryngology Head and Neck Surgery Society programme for public support services in the peripheral area, accommodate the needs of increasing knowledge and skills of the ENT specialists from other centres of doing thyroid surgery with the Instructor supervising the surgery. The programme held 2 times a year in Karitas Hospital in small area Weetabula West Sumba Island. There are several reasons can be suspected as the caused of high incidence of these disorder in the beach area like: decreasing iodine capacity in the drinking water (0.89-1.47 ppm), consumption of some kind of cassava contained goitrogen, fish management and use of salt without iodine/ inappropriate iodine that will give worst condition.

**Method(s):** The team will be around 15 persons each trip including 2 anesthetist specialist.

**Result(s):** In 2008 for 5 days we did 38 thyroid surgery with 33 female and 5 male patients, the age range between 13-53 years old. From the macroscopic appearance most of the cases are cysts 22 (57.89%), multicystic 8 (21.05%), 8 cases (21.05%) with hard nodule with average size around 6×5×4 cm. The pathology result of the thyroid specimens are Adenomatous Goiter 18 cases (47.37%), Adenoma follicular 10 (26.32%) which three cases of these result also found as a differential diagnosis of follicular variant of papillary carcinoma.

**Conclusion(s):** This programme is a very useful and give advantages for the hospital, patients and the society. In the future there will be a lot of activity will conduct to increase the health status in the community with involvement of other multidisciplines and public health.

**Keywords:** Thyroid Surgery Mission, Struma Goiter, Thyroidectomy

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[T3-28]

## Comparison of the Efficacy of OK-432 and Ethanol Sclerotherapy for Benign Thyroid Cysts

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**Objective:** Thyroid nodules are common and are present clinically in 4-7% of the population, only 5% of these nodules are malignant. Cystic thyroid nodules are usually benign, and benign thyroid cysts have been treated with nonoperative sclerotherapy by many different agents like ethanol, tetracycline, or OK-432, however, the results are variable. The purpose of this study is to evaluate of the efficacy of OK-432 and ethanol sclerotherapy for benign thyroid cysts.

**Method(s):** We reviewed 37 cases with benign thyroid cysts treated at our institute from December 2002 to April 2009. All cases were cytologically negative for malignancy. 20 cases received OK-432 injections at a concentration of 0.05 mg/ml with sonography, and 17 cases received ethanol (99%) injections with sonography. When treatment results were unsatisfactory, the procedure was repeated up to three times at approximately 4 week intervals (mean number of OK-432 was 2.05 and ethanol was 1.75). Statistical analysis was performed using SPSS (Version 10.0) with Mann-Whitney test.

**Result(s):** Ten of the 37 cases were excluded for various reasons. Among the remaining 27 cases, 15 cases have been treated with OK-432 sclerotherapy, and 12 cases with ethanol sclerotherapy. Eleven of the 15 cases (73.3%) showed good responses (<10 mm in diameter), whereas the other 4 patients showed poor responses in OK-432 sclerotherapy. Nine of the 12 cases (75.0%) showed good responses (<10 mm in diameter), whereas the other 3 patients showed poor responses in ethanol sclerotherapy. There was no statistically significant difference in sclerotherapy effect between OK-432 and ethanol group ( $P=0.082$ ). All patients tolerated the therapy well, and no significant morbidity or complication occurred among patients treated by sclerotherapy.

**Conclusion(s):** Sonography-guided OK-432 and ethanol sclerotherapy are effective and safe, and offers a useful alternative treatment for benign thyroid cysts in selected patients.

**Keywords:** Thyroid Cyst, OK 432, Ethanol, Sclerotherapy

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[T3-29]

## Radiofrequency Ablation of Locally Recurrent Tumors in Postoperative Patients for Papillary Thyroid Carcinoma: Short-Term Results and Perspectives<sup>1</sup>

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**Objective:** To report the short-term results of radiofrequency ablation (RFA) for locally recurrent tumor in postoperative patients for papillary thyroid carcinoma (PTC).

**Method(s):** From 2008 to 2009, postoperative patients with locally recurrent tumors of PTC were considered for RFA. Inclusion criteria were refusal or ineligibility of surgery and locally recurrent tumors less than 5 in number. Among them, we recruited 12 consecutive patients with 16 recurrent tumors followed at least 6 months. There were 7 female and 5 male patients with a mean age of 62 years (range, 92–28 years). Nodule volume, vascularity, and serum thyroglobulin level were evaluated before and after 1-, 3-, and 6-month follow-up.

**Result(s):** The means of the longest diameter and the volume of the pretreatment tumors were 0.84cm (0.02–3.03 cm) and 0.89ml (range, 0.008–9.26 mL), respectively. Twelve of 16 nodules in 9 patients were completely disappeared at the last follow-up US (mean, 10months; range, 6–18 months). During the follow-up, the volume of the treated nodules was significantly decreased to 34.1% at 1-month (n=15, P<0.001), 12.7% at 3-month (n=14, P<0.001), 3.6% at 6-month (n=13, P<0.001), and 6.8% at the last follow-up (n=16, P<0.001). Transient voice change after RFA occurred in three of 12 patients. Multivariate analysis revealed the longer pretreatment diameter and higher vascularity of the tumor were significantly correlated with the presence of residual tumor at the last follow-up (P=0.002, 0.007).

**Conclusion(s):** RFA is an effective alternative to surgery in postoperative patients with papillary thyroid carcinoma, who are ineligible for surgery

**Keywords:** Head and Neck, Thyroid Neoplasm, Radiofrequency Ablation

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[T3-31]

## The Role of HIF1-Alpha and HSP-90 in Tumorigenesis of Thyroid Cell Carcinoma

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**Objective:** The aim of this study is to find out the molecular mechanism of tumorigenesis of PTC by comparison experiment of BHP10-3 cell line and BHP10-3SCmice cell lines and to demonstrate the role of hypoxia inducible factor-1alpha in tumorigenesis of thyroid cancer with in vitro and in vivo experiment.

**Method(s):** Microarray of BHP10-3 cell line and BHP10-3SCmice cell line was performed to find out promising genes resulting in difference in tumorigenesis between BHP10-3 and BHP10-3SCmice. Those genes from microarray data are verified with real time- PCR genes and western blot. Knockdown experiment of promising gene was performed to reveal the role of the promising gene(s) with invasion assay and in vivo inhibitor study was also undertaken.

**Result(s):** Microarray showed that 513 genes were upregulated and 175 genes were downregulated in BHP10-3SCmice cell line compared to BHP10-3 cell line. Among 175 upregulated genes, 7 highly upregulated genes (HIF-1 $\alpha$ , HSP105, HSP90, TPR, Integrin 1- $\beta$ , TTC-9) that was considered to be related with tumorigenesis were selected and upregulation was verified with RT-PCR to confirm that HIF-1 $\alpha$ , HSP105, HSP90, TPR, Integrin 1- $\beta$ , and TTC-9 were found to be increased in tumorigenic cell line, BHP10-3SCmice. Among them, HIF-1 $\alpha$  and HSP90 protein expression was found to be increased in tumorigenic cell line, BHP10-3SCmice, suggesting its important role in tumorigenesis of thyroid cancer. Knockdown of HIF-1 $\alpha$  in BHP10-3SCmice cell line resulted in decreased invasiveness in invasion assay, suggesting its important role in tumorigenesis in thyroid cancer. In addition, treatment of 17-AAG, HSP90 and HIF-1 $\alpha$  inhibitor, decreased tumor size to 82% compared with control group in orthotopic thyroid cancer mouse model.

**Conclusion(s):** These data showed that HIF-1 $\alpha$  played an important role in tumorigenesis of thyroid carcinoma.

**Keywords:** Papillary Thyroid Carcinoma, Hypoxia Inducible Factor-Lalpha, Heat Shock Protein 90

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[T3-30]

## Stereotactic Body Radiotherapy for Refractory Cervical Lymph Node Recurrence of Nonanaplastic Thyroid Cancer

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**Objective:** To investigate the feasibility and efficacy of stereotactic body radiotherapy (SBRT) as salvage treatment for cervical node recurrence from nonanaplastic thyroid cancer refractory to other modalities.

**Method(s):** Between August 2002 and November 2007, 9 patients with recurrent nonanaplastic thyroid cancer were treated with stereotactic body radiotherapy for nodal metastases. Radiotherapy was delivered in 1-3 fractions, and the median dose was 36 Gy (range, 30 to 39 Gy).

**Result(s):** Twenty-nine nodes in 9 patients were treated. Seven patients had papillary carcinoma and two had medullary carcinoma. These patients developed nodal recurrence after they had received salvage surgery and/or radioisotope (RI) treatment for recurrent thyroid cancer. All nodes were in the cervical or supraclavicular areas, excepting one hilar node. Retropharyngeal node metastases were present in five patients. The median follow-up period was 23 months (range, 4 to 63 months). No local progression was observed in nodes treated by SBRT. No serious adverse events were observed in any patient.

**Conclusion(s):** For select patients, stereotactic body radiotherapy may be a feasible option in treating refractory nodal recurrence from nonanaplastic thyroid cancer. Further studies are necessary to define the role of stereotactic body radiotherapy in the management of thyroid cancer.

**Keywords:** Thyroid Cancer, Lymph Node Metastasis, Salvage Treatment, Stereotactic Body Radiotherapy

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[T3-32]

## Hyperparathyroidism with Bone Tumor Like Presentation: Approach for Diagnosis and Surgical Intervention

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**Objective:** This work is to find out a clinical approach for diagnosis of cases with hyperparathyroidism presented with bone tumor like condition as first and main presentation and to clear out the indications and type of surgery in such cases.

**Method(s):** It is prospective case series study done at the National Cancer Institute, Egypt from April 2000 to May 2009. During this period we followed 45 cases of hyperparathyroidism presented with main complain of bone tumor. We started by clinical evaluation, laboratory investigations. Radiological investigations for preoperative localization included neck ultrasound, Tc99m Sestamibi scan, C-T neck and superior mediastinum and Intraoperative ultrasound.

**Result(s):** We had 39 females and 6 male patients with age ranged 18-70 years. Preoperative diagnosis of primary hyperparathyroidism was achieved in 80% of cases, secondary in 15.5%, while, tertiary hyperparathyroidism in 4.5%. Single benign adenoma was found in 73.3%, diffuse hyperplasia in 8.8% and one case parathyroid carcinoma (2.2%). Neck ultrasound could localize 29 adenoma (29/38) in a sensitivity of 73.3%, sestamibi could localize 23/38 including another 2 cases of diffuse hyperplasia not detected by ultrasound in a sensitivity of 63.8% of cases. Total preoperative localization was successful in 84.2%. We used unilateral exploration 27 cases, bilateral in 11 cases. Intraoperative ultrasound was useful in detection of adenoma in 2 cases. Intraoperative parathyroid hormone assessment after 15 minutes dropped in all cases. Recurrence of the disease occurred in 2 cases during follow up. Postoperative hypocalcemia in severe form occurred in 4 cases that needed longer hospitalization and longer period of oral calcium. Healing in cortical bone was faster than cancellous bone.

**Conclusion(s):** Diagnosis of hyperparathyroidism should be suspected in all cases with bone tumor like presentation. Laboratory investigations as well as imaging localization can establish the diagnosis to differentiate from other clinical entities.

**Keywords:** Hyperparathyroidism, Bone Like Tumor Presentation, Surgical Approach

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[T3-33]

### Anticancer Effect of Combination Treatment with Photodynamic Therapy and Sulforaphane in AMC-HN3 Human Head and Neck Cancer Cell Line

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**Objective:** We evaluated the anticancer effects of photodynamic therapy (PDT) combined with sulforaphane on human head and neck cancer cells (AMC-HN3).

**Method(s):** We compared the cytotoxic effects of single modality group (PDT, sulforaphane) and combination therapy group by MTT assay. Using confocal microscope, we also measured the formation of reactive oxygen species (ROS) and extent of apoptosis or necrosis in each groups.

**Result(s):** In MTT assay, combination group showed more cytotoxic effect than sum of single modality of photodynamic therapy or sulforaphane. ROS formation was higher in combination group than single modality group. Cells showed apoptosis or necrosis much more in combination group. When block the ROS formation by sodium azide, the enhanced anticancer effect of the combination group was blocked.

**Conclusion(s):** The anticancer effect was enhanced in combination therapy of PDT and sulforaphane. The enhanced effect was related with the promotion of the ROS formation in cancer cells.

**Keywords:** Photodynamic Therapy, Sulforaphane, Reactive Oxygen Species

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[T3-34]

### Nucleophosmin, p53 and Ki-67 Expression Patterns on An Oral Squamous Cell Carcinoma Tissue Microarray

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**Objective:** To characterize the expression of nucleophosmin, p53 and Ki67 and determine possible correlations between the expression of these proteins and clinicopathologic features of oral squamous cell carcinoma (OSCC).

**Method(s):** One hundred and fifty four cases of OSCC, arranged in a tissue microarray, were immunohistochemically analyzed.

**Result(s):** Less than 10% of nuclear staining was observed in 90.3%, 50.6% and 65.3% of the cases for nucleophosmin, p53 and Ki67, respectively. Expression of p53 was not significantly associated with any of the clinicopathologic parameters analyzed. Increased expression of Ki-67 was associated with the presence of lymph node metastasis ( $P<0.0001$ ), advanced stages of disease ( $P=0.0030$ ), tumors occurring in the floor of mouth ( $P=0.0018$ ) and moderately/well differentiated tumors ( $P=0.0287$ ). Local recurrence was associated with higher expression of nucleophosmin ( $P=0.0233$ ) and disease-free survival rate was significantly better in patients with low expression of nucleophosmin ( $P=0.0360$ ). Multivariate analysis suggested that expression of nucleophosmin could be an independent prognostic factor for OSCC patients.

**Conclusion(s):** Nucleophosmin expression is associated with local recurrence and might be used as a prognostic indicator in oral squamous cell carcinoma.

**Keywords:** Nucleophosmin, Oral Squamous Cell Carcinoma, Immunohistochemistry

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[T3-35]

### Molecular Markers of Capsular Rupture in Squamous Cell Carcinoma

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**Objective:** The goal of this study was evaluate the prognostic significance of molecular markers involved in capsular rupture in oral squamous cell carcinoma (OSCC).

**Method(s):** The protein expression of 12 potential molecular markers related with epithelial-mesenchymal transition (EMT) and WNT pathway was evaluated by immunohistochemistry reaction in a tissue microarray containing forty-five OSCC samples. All these patients were submitted to the neck dissection presenting clinically negative lymph nodes (N0) but the histological analyses confirmed pN+ with eight cases (17.8%) with capsular rupture. These patients from the A.C. Camargo Hospital, São Paulo, Brazil were followed-up by 150 months. Clinical and treatment data were obtained from the medical records and histological features were reviewed.

**Result(s):** Patients in advanced clinical stage and poorly differentiated tumors (grade III) presented more capsular rupture ( $P=0.007$  and  $P=0.050$ , respectively). The OSCC with capsular rupture was strongly associated with distant metastasis ( $P=0.003$ ). Tumors with reduced catenin alpha and beta-1 expression ( $P=0.040$  and  $P=0.033$ , respectively) and increased vimentin and VEGF-A expression ( $P=0.050$  and  $P=0.042$ , respectively) were associated with positive capsular rupture. The overall survival was lower in patients when there was capsular rupture (5 year rates OS of 82.0% if pN+RC-, 37.5% if pN+RC+,  $P=0.0035$ ).

**Conclusion(s):** These results suggest that loss of catenin alpha and beta-1 plus increased vimentin and VEGF-A expression are associated with a high risk of lymph node metastasis with capsular rupture.

**Keywords:** Squamous Cell Carcinoma, Capsular Rupture, Molecular Markers

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[T3-36]

### S100A8 Expression in Squamous Cell Carcinoma of Oral Cavity

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**Objective:** There have been continued efforts to identify novel biomarkers to aid in early detection and accurate prediction of tumor behavior to reduce the mortality and morbidity of cancers. S100A8, a calcium-binding protein, is associated with keratinocyte differentiation, inflammation and wound healing. The potential use of the S100 family proteins as prognostic markers in tumor lesions is related to their role in cell cycle regulation, differentiation, growth and metabolic control. In the current study, we investigated the clinico-pathological relationship of S100A8 expression in squamous cell carcinoma of oral cavity (OSCC).

**Method(s):** Immunohistochemical analysis was performed to study S100A8 and CK10 (a keratinocyte differentiation marker) expressions on the paraffin-embedded tissue of 256 OSCCs. In addition, S100A8 expression was further confirmed by Western blotting and reverse-transcription polymerase chain reaction.

**Result(s):** S100A8 expression significantly correlated with CK 10 expression. Lower expression of S100A8 immunostaining significantly correlated with advanced T stage ( $P<0.001$ ), positive N status ( $P<0.001$ ), advanced TNM stage ( $P<0.001$ ) and male gender ( $P=0.035$ ). Unfavorable cumulative 5-year overall survival rates significantly correlated with lower expression of S100A8 immunostaining ( $P<0.001$ ), advanced T stage ( $P<0.001$ ), positive N status ( $P<0.001$ ) and advanced TNM stage ( $P<0.001$ ). However, Cox regression analysis revealed that T stage and N status were independent prognostic factors for survival (both  $P<0.001$ ).

**Conclusion(s):** These results suggested that S100A8 expression status may be a useful prognostic factor for patients with OSCC.

**Keywords:** S100A8, Squamous Cell Carcinoma, Oral Cavity

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[T3-37]

## Prognostic Value of CCND1 Amplification and Protein Overexpression in Oral Squamous Cell Carcinoma of Young Patients

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**Objective:** The aim of this retrospective study was to evaluate correlation with CCND1 amplification and protein overexpression with clinicopathological features and clinical outcomes in patients younger than 41 years with oral squamous cell carcinoma (OSCC).

**Method(s):** Paraffin-embedded tumors block from 87 oral SCC from young patients were evaluated using the Tissue Microarray (TMA) technique, immunohistochemistry and fluorescence in situ hybridization (FISH). These cases were compared with 112 patients older than 50 years (controls). Demographic and clinical data were collected to analyze patient outcomes.

**Result(s):** Cyclin D1 overexpression was observed in 45.2% of tumors in young group and in 38.8% of controls, the difference was statistically significant ( $P=0.03$ ). Only 69 specimens were suitable for evaluating gene amplification, being 26 and 43 of young and control groups, respectively. In the young group, CCND1 amplification was positive in 12 (46.2%), one (3.8%) specimen showed polysomy and 13 (50.0%) were not amplified. In the control, 8 (18.6%) cases had CCND1 amplification, in 3 (7.0%) had polysomy and in 32 (74.4%) were not amplified. The difference was statistically significant ( $P=0.03$ ). In the control, the tumors with cyclin D1 overexpression had worse prognosis. In young group, protein overexpression decreased the disease free survival (DFS) ( $P=0.04$ ). In both groups, the amplification and polysomy had no influence on overall survival and DFS.

**Conclusion(s):** In the young, the CCND1 amplification/polysomy and overexpression were higher than control patients. The protein overexpression is an indicator of worse DFS in both groups. Larger studies are required to confirm the prognostic value of CCND1 amplification in oral SCC of the young.

**Keywords:** Oral Cancer, Young, Cell Cycle

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[T3-39]

## Valproic Acid Exhibits Synergistic Cytotoxicity with Cisplatin and Resensitizes Cisplatin-Resistant Head and Neck Cancer Cells

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**Objective:** Although cisplatin is among the most effective cytotoxic agents used in head and neck cancer treatments, the success has been limited. At present, certain inhibitors of histone deacetylases have been shown to induce cytotoxicity in combination with cisplatin in cancer cells. The aim of the present paper is to model the biological effects of its combined treatment on cisplatin resistant head and neck cancer. In addition the present study was to determine whether the antiseizure drug valproic acid (2-propylpentanoic acid; VPA), which is also able to inhibit histone deacetylase, exhibits synergistic cytotoxicity with cisplatin.

**Method(s):** In this study, we used human head and neck squamous cell cancer cell lines including SNU-1066, SNU-1076, and SNU-1041 obtained from Korean Cell Line Bank. To examine the effects of VPA on cisplatin-resistant cells 5 cycles, survival cells against cisplatin treatment eventually revealed cisplatin-resistant phenotype.

**Result(s):** The cytotoxic effects of cisplatin on three different cell lines revealed different. Cancer cells having wild type p53 was the most sensitive. SNU-1076 was the most sensitive to cisplatin treatment. However, cytotoxic effects of VPA were no different among HNSCC cell lines. Consistent with the increased cytotoxicity, cotreatment with VPA was shown to upregulate the cisplatin-mediated apoptosis revealed by induction of BAX, cytochrome C, and cleaved PARP. In treatments of VPA, cisplatin-resistant cells were more sensitive than their parental cells. Expression of genes related to histone deacetylase inhibitor was effectively increased in cisplatin resistant cells.

**Conclusion(s):** Our results clearly show that VPA not only exhibits synergistic cytotoxicity with cisplatin in head and neck cancer cell lines tested, but also can resensitize the cells that have acquired resistance to cisplatin. These results with resensitization of cisplatin-resistant cells particularly may provide benefits in the treatment of head and neck cancer patients.

**Keywords:** Cisplatin-Resistance, Valproic Acid, Resensitization

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[T3-38]

## The Anti-Tumor Effects of Cytotoxic Triterpenes from *Antrodia camphorata* in Oral Carcinoma Cells

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**Objective:** *Antrodia camphorata* is a parasitic fungus grown on the hardwood of *Cinnamomum kanehirai* Hay (Lauraceae), has been widely used as a Chinese remedy for food and drug intoxication, diarrhea, abdominal pain, hypertension and cancer. Crude extracts from the fruiting bodies and mycelium of *Antrodia camphorata* show potent anticancer activities in various human cancer cells.

**Method(s):** Eleven lanostane and ergostane-type triterpenes isolated from the fruiting bodies of *Antrodia camphorata* were evaluated for their in vitro cytotoxic data against various cancer cell types, including pancreatic cancer, breast cancer, osteosarcoma and oral cancer. Among these compounds, an ergostane type triterpenoid, methylancinate A (Cpd 11), showed the most noteworthy cytotoxic potential on various cancer cells, especially oral cancer cells. Hence, the anti-cancer effects of Cpd 11 on oral cancer cells were selectively deciphered in the following study. The in vitro effects of Cpd 11 were evaluated in two oral cancer cell lines: OEC-M1 and OC-2. Cell viability, apoptosis, and signaling targets were determined by MTT assay, flow cytometry, and immunoblotting.

**Result(s):** By MTT assay, methylancinate A was shown to display significant inhibition on cell growth with an IC50 value less than 50  $\mu$ M, while only minor or none cytotoxicity on normal oral fibroblast was observed. Moreover, three parameters, i.e. caspase-3 activity, annexin V binding, and DNA fragmentation were used to detect apoptosis. Increased apoptotic deaths of two oral cancer cell lines, OEC-M1 and OC-2, treated with methylancinate A were revealed by flow cytometric analysis after Annexin V-FITC and PI staining. The results of caspase 3 activation and DNA fragmentation also suggested that methylancinate A induce apoptosis in a time- and dose-dependent manner.

**Conclusion(s):** Taken together, methylancinate A isolated from *Antrodia camphorata*, which has been widely used as a Chinese remedy, shows the potential to be a new anti-oral cancer drug.

**Keywords:** *Antrodia camphorata*, Oral Cancer, Cytotoxicity

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[T3-40]

## Diagnosis and Treatment of Multiple Primary Cancers in Head and Neck

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**Objective:** Multiple primary cancers in head and neck region have been recently increasing in number. Because ENT surgeons have become aware of it disease entity and diagnostic procedures were extensively advanced for the last ten years. The incidence of double cancers of hypopharynx seemed to be more common in comparison with the other sites of cancer in head and neck region.

**Method(s):** At our university hospital, for the last twenty years, 97 (16.6%) cases out of 581 patients with head and neck cancer were categorized as metachronous, or synchronous double cancers. Average age of those patients is 63.9 years old, which means almost of the double primary cancers occur in elder population.

**Result(s):** The incidence of double primary cancers in patients with hypopharyngeal cancer is 35%. We have experienced 49 cases of hypopharyngeal cancers in our clinic and all of them were squamous cell carcinomas in histopathology. Of those, 4 patients recently underwent a simultaneous surgical resection of two different tumors with various types of reconstruction in collaboration with surgery department and each patient has a good prognosis.

**Conclusion(s):** To improve the survival rate of hypopharyngeal cancer, the early detection of secondary tumors should be carried out and the operation of double cancers in collaboration with general surgeons is strongly recommended, because of relatively high incidence of double cancers in elderly patients with hypopharyngeal cancer.

**Keywords:** Multiple Cancers in Head and Neck, Hypopharyngeal Cancer, Prognosis

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[T3-41]

## Cutaneous Squamous Cell Carcinoma Metastatic to Parotid Lymphnodes

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**Objective:** Australia has the highest per capita incidence of cutaneous Squamous Cell Carcinomas (cSCC) in the world, with a rate in excess of 300 per 100,000 per annum. Lymph node metastasis from cSCC is relatively uncommon, occurring in 2-4%, depending on site (being commoner in head and neck sites). Whilst cSCC's are considered a relatively benign disease with excellent outcomes, once lymph node metastasis are present the prognosis is significantly impaired. We report on a prospective series of 32 consecutive patients with metastatic cSCC.

**Method(s):** Our database identified 32 consecutive patients with metastatic cSCC to the parotid lymph nodes treated at Sir Charles Gairdner Hospital, a tertiary teaching hospital in Western Australia over a 5 year period from January 2000 to December 2004. All data was collected prospectively and all patients were treated with curative intent, with surgery followed by postoperative high dose external beam radiotherapy.

**Result(s):** With a median follow up of 75months (range 48-112 months), the locoregional control rate was 91%, cancer specific survival was 74% and overall survival 54% at 5 years.

**Conclusion(s):** We conclude that surgery plus radiotherapy achieves excellent locoregional control, but deaths from metastatic disease remain a problem. Better systemic therapies are required to address this problem.

**Keywords:** Squamous Cell Carcinoma, Parotid, Cutaneous

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[T3-43]

## The Analyses of the Laryngocarcinoma Patient's Information Offered by Qilu Hospital of Shandong University and the First Hospital of Jilin University

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**Objective:** Laryngocarcinoma patient's information offered by Qilu Hospital of Shandong University and the First Hospital of Jilin University, compare the laryngocarcinoma patient's sex, age and clinical classification of laryngeal carcinoma.

**Method(s):** The information of the patients with laryngeal carcinoma cured in two hospital were collected. Between them, the patient's data offered by Qilu Hospital of Shandong University came from the cases which were continuously drawn from 1988 to 1999 and the cases which were randomly drawn from 1979 to 1987, and that offered by the First Hospital of Jilin University came from the cases which were continuously drawn from 1992 to 2000.

**Result(s):** 625 patients aged from 26-78 with laryngeal carcinoma cured in Qilu Hospital of Shandong University that include 554 men and 71 women were collected. There are 182 supraglottic carcinoma including 142 men and 40 women, 429 glottic carcinoma and 14 infraglottic carcinoma. 387 patients aged from 24-90 with laryngeal carcinoma cured in the First Hospital of Jilin University that include 253 men and 134 women were collected. There are 156 supraglottic carcinoma including 86 men and 70 women, 189 glottic carcinoma and 42 infraglottic carcinoma.

**Conclusion(s):** The proportion of female laryngocarcinoma patients in the First Hospital of Jilin University was higher than that in Qilu Hospital of Shandong University, and this was partially caused by phenomenon that women also used cigarette in north-east area. The ratio of the supraglottic carcinoma in the First Hospital of Jilin University was higher than that in Qilu Hospital of Shandong University too. at same time, we found that in both hospital ,there were more supraglottic carcinoma in female patients and more glottic carcinoma in male patients. In north-east area, the proportion of female laryngocarcinoma patients and the ratio of the supraglottic carcinoma were relatively higher, and there is a mutual causation relationship between them.

**Keywords:** Laryngeal Neoplasms, Epidemiology, Supraglottic Carcinoma

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[T3-42]

## The Treatment of Patients with Advanced Pharynx Cancer

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**Objective:** Oropharynx, nasopharynx, and hypopharynx cancer is associated with aggressive behavior, and frequent lymphogenic metastases. In most cases combine radiotherapy and chemotherapy enable to achieve complete response in primary tumor and perform surgery only in regional lymph nodes.

**Method(s):** A total of 130 patients with T1-4 and N1-3 pharynx cancer were analyzed (nasopharynx cancer n=28; oropharynx cancer n=49; hypopharynx cancer n=53). The patients with complete regression in primary tumor were included in analysis. T3-T4 and T2 stage was obtained in 88 patients (67,7%) and 42 patients (32,3%), respectively. N2-N3 and N1 stage was obtained in 103 patients (79,2%) and in 27 patients (20,8%), respectively. Initial chemoradiotherapy was consisted in two cycles of chemotherapy with 5-FU and cisplatin with concomitant radiation therapy to primary tumor and neck-supravacuicular lymph nodes on both sides with dose 40 Gy (2 Gy per fraction). Once clinical response assessed as shrinking of primary tumor more than 50%, and was acquired than radiotherapy was consecutive escalated to 70 Gy.

**Result(s):** In all patients complete response in primary tumor was achieved due to radical course of radiotherapy (70 Gy). Complete response in N1 and N2-3 stage was obtained in 23 patients (85,2%) and in 28 patients (27,2%), respectively. Partial response rate in N1 and N2-3 stage was 14,8% (n=4) and 72,8% (n=75), respectively.

**Conclusion(s):** Chemoradiotherapy improved primary pharynx cancer greater than regional metastases (partial response in 79 cases). Low therapy effect of chemoradiotherapy was associated with greater N. 2-year disease-free survival rate was 90,2% due to 46 alive patients with complete response for regional metastases. 2-year disease-free survival rate for patients after lymphodissection for regional lymph nodes 64,5% (n=51). Surgery for neck lymph nodes significantly improved disease-free survival rate and should be mandatory in patient with advanced metastases into the neck lymph nodes (N2-3).

**Keywords:** Cancer, Oropharynx, Nasopharynx

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[T3-44]

## Clinical Application and Investigation of Echo-guided Small-Gauge Core Biopsy in Head and Neck Surgery

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**Objective:** To explore the feasibility of echo-guided small-gauge core biopsy in the diagnosis of head and neck masses.

**Method(s):** Patients from June 2009 to September 2009, 121 patients with head and neck mass received complete ENT field evaluation and ultrasound examination. By exclusion of those with lesions smaller than 1cm or with only cystic contents, 74 patients underwent echo-guided small-gauge core biopsy. Technique Sonographic features, number, and location of the lesions were recorded. Color-duplex model was used for looking for a safer needle tract and excluding hyper-vascular tumor. Under echo-guidance, we used biopsy needles with different sizes for specimen harvest. Only one biopsy pass was done in each patient. Most patients tolerated the whole procedure well without local anesthesia. Bleeding was controlled with pressure and the bleeding time was recorded for analysis. All samples were sent to department of pathology for staining and microscopic examination.

**Result(s):** There are 38 male and 36 female patients. In these patients, 10 were malignant and 58 were benign lesions. The other 6 had inadequate specimen for diagnosis. The adequacy rate of core biopsy was 92%. Under ultrasound examination, 13 patients had neck mass with unknown origin, 9 had thyroid tumor, 44 had enlarged lymph node, and 2 had salivary gland tumor. Eleven procedures used 16-gauge core needles, 20 used 18-gauge needles, and another 43 used 20-gauge needles. Adequacy rate and percentage of local anesthesia increased with enlarged core needle calibers: 100% and 54.5% for 16-gauge, 100% and 15% for 18-gauge, and 86% and 14% for 20-gauge. The bleeding time decreased as the caliber of needle decreased: 4.09+0.83s for 16-gauge, 3.1+1.4s for 18-gauge, 2.6+0.7s for 20-gauge.

**Conclusion(s):** Based on its advantages of minimal invasiveness and cost effectiveness, echo-guided small-gauge core biopsy is suggested to be included in the diagnostic procedures of head and neck lesions.

**Keywords:** Echo-Guided Core Biopsy, Minimally Invasive Procedure, Head and Neck

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[T3-45]

## Evaluation of Secondary Cervical Lymph Node Metastasis of Squamous Cell Carcinoma on Oral Region

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**Objective:** The control of neck lymph node metastasis in oral cancer is an important determinant of the prognosis. The purpose of this study was to evaluate with secondary cervical lymph node metastases (secondary metastases) of the squamous cell carcinoma of oral region.

**Method(s):** A clinical study was performed on 27 cases of squamous cell carcinoma of oral region with secondary cervical lymph node metastases (secondary metastases) who were treated in our department from 1998 to 2008. The results were as follows;

**Result(s):** 1) Secondary metastases were found in 18% of N0 cases. 2) The control rate of secondary metastases was 85%, satisfactorily.

**Conclusion(s):** We retrospectively evaluated the clinico-pathological factors (primary site, T classification, degree of differentiation, mode of invasion, therapy and modality of metastasis) in cases with secondary metastases. According to the follow-up after primary treatment of N0 cases, it is important to detect cervical lymph nodes carefully with use of diagnostic imaging and to perform therapeutic neck dissection as soon as possible if secondary metastases are detected.

**Keywords:** Diagnostic, Cervical Lymph Node Metastases , Carcinoma of Oral Region

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[T3-46]

## Results of Cervical Lymph Dissections of Local Spread Cancer of Mucous Membrane of Oral Cavity Floor and Alveolar Part of Lower Jaw

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**Objective:** To study results of cervical lymph dissections of local spread cancer of mucous membrane of oral cavity floor and alveolar lower jaw.

**Method(s):** We analyzed surgery results of regional metastases in 47 patients with cancer of mucous oral cavity floor and alveolar lower jaw treated in NROC MH RUz over 2002-2007. Surgery was performed as complex treatment in 47 patients. Patients' distribution received regional metastases surgery depended on localization of initial focus. Mucous membrane of oral cavity floor anterior parts -21 (44.68%),and side parts-8 (17.02%). Alveolar lower jaw, anterior part-12 (25.53%) and side parts-6 (12.76%). At present when performed surgery the levels of regional nodal involvement have been considered under those the patients were divided as follows:

**Result(s):** Two-year survival rate being 42.4±4.6% in patients' group who were performed functional cervical resection relapse free and recurrent metastases. When analyzed two-year relapse-free survival rate it was established that in 32 patients from 47 metastases were prognostically more favorable localized at 1 level-9 patients (28.1%), in 10 (31.2%) patients metastases were at I-II levels, in 13 (40.6%) patients metastases were at II-III levels. After functional cervical dissection within 1-year after the treatment regional metastases localized in adverse part in 9 patients from 42, that being 21.4%.

**Conclusion(s):** We approved performance of simultaneous surgery on initial focus and on zones of regional metastases in local spread cancer of local spread cancer of mucous membrane of oral cavity floor and alveolar part of lower jaw. Bilateral cervical lymph dissection administrated in affection of anterior part mucous membrane of oral cavity floor and alveolar part of lower jaw of T3-4.

**Keywords:** Alveolar, Cervical, Lymph Dissections

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[T3-47]

## Thyroid Metastasis in a Patient with Lung Adenocarcinoma: Case Report and Review of Literature

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**Objective:** Although up to 24% of metastatic cancers have been reported to spread to the thyroid gland in autopsy studies, metastases to the thyroid are not detected in clinical practice in most cases, and the occurrence of lung adenocarcinoma metastasis to thyroid is extremely rare.

**Method(s):** In this report we describe a rare case of lung adenocarcinoma metastasized to thyroid synchronously in 82-year-old woman. She noticed a swelling in the anterior neck area and mass in left lung. Needle biopsy cytology from lung mass indicated adenocarcinoma and Fine needle aspiration cytology from thyroid mass indicated malignancy.

**Result(s):** So the patient received total thyroidectomy and left lung lobectomy. Histopathology from thyroid mass showed metastasis of the lung adenocarcinoma.

**Conclusion(s):** So we report rare case of metastatic adenocarcinoma of thyroid.

**Keywords:** Lung Adenocarcinoma, Thyroid Adenocarcinoma, Thyroid Metastasis

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[T3-48]

## Malignant Lymphoma Occurring in the Jawbone

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**Objective:** Most malignant lymphomas that occur in the head and neck areas are non-Hodgkin lymphomas, many of which first occur in the Waldeyer's ring and the cervical lymph nodes but rarely in the mouth. In this study, we examined the clinical characteristics of malignant lymphoma observed in the jawbone.

**Method(s):** [Case 1] Case 1 was an 81-year-old male patient who had a neoplastic lesion that was covered with necrotic tissues over the surface from the left soft palate to the faecal pharyngeal region, and partial bone exposure was observed. We palpated the cervical lymph nodes on both sides several times. In CT images, extensive bone destruction was observed around the upper jawbone and the neoplastic lesion, and the cervical lymph nodes on both sides exhibited multiple enlargements. The case was histopathologically diagnosed to have malignant lymphoma (Diffuse large B cell lymphoma stage IVB).

[Case 2] Case 2 was a 63-year-old male patient presenting with thumb-sized bloating and tenderness in the left cervical lymph node as well as gingival bloating and a deep ulcer with necrosis on the surface. CT and MRI images revealed a ruptured cortical bone in the left lower jawbone and a plurality of enlarged lymph nodes around the submandibular gland on both sides. The case was histopathologically diagnosed to have malignant lymphoma (Angioimmunoblastic T-cell type IVB).

**Conclusion(s):** The X-ray findings of malignant lymphomas revealed diffuse bone destruction, which is generally believed to indicate either a malignant tumor or osteomyelitis, which is characterized by a greater degree of bone destruction than in cases of osteomyelitis. Furthermore, the lesioned areas were covered with necrotic tissue and included deep ulcers.

**Keywords:** Lymphomas Revealed, Tumor, Osteomyelitis

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[T3-49]

## Photodynamic Therapy of Residual Solitary Plasmacytoma

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**Objective:** To propose a new method: photodynamic therapy (PDT), to treat plasmacytoma refractory to conventional treatment.

**Method(s):** A case report of a patient with residual plasmacytoma of the nasopharynx after radiation therapy is presented. Considering the possible morbidities of the surgical excision the patient was treated with PDT. Foscan (mTHPC) was injected intravenously. Four days later 652nm wavelength light is applied via a specialized nasopharynx applicator to deliver 20 joules per cm diffuser length.

**Result(s):** The plasmacytoma has disappeared 2 weeks after light administration. The patient is free of disease since four years.

**Conclusion(s):** PDT can be a treatment method for solitary plasmacytomas refractory to conventional treatment and located at an area where surgical resection is associated with morbidities.

**Keywords:** Solitary Plasmacytoma, Nasopharynx, Photodynamic Therapy

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[T3-50]

## Cutaneous Metastases from Nasopharyngeal Carcinoma: A Rare Manifestation

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**Objective:** Nasopharyngeal carcinoma (NPC) has a higher risk of distant metastases when compared with other malignant head and neck tumors. However, skin metastases in NPC patients are extremely rare. To our knowledge, there are only a few reported cases worldwide.

**Method(s):** In this report, we present two such cases of advanced NPC with multiple nodular skin metastases. The first patient was a 53-year-old man with stage IVB NPC (T3, N3a Mo) who had completed radical radiotherapy to the nasopharynx and neck bilaterally. The second patient involved a 43-year-old woman with stage IVB NPC (T3, N3a, Mo) who was treated with full course of radiotherapy and concurrent chemotherapy. In both of cases, they later developed multiple small subcutaneous nodules all over their body. Biopsy of these lesions confirmed metastatic NPC.

**Result(s):** The first patient was given a course of palliative chemotherapy, but unfortunately, he succumbed to the disease a few weeks later. The second patient was treated with palliative radiotherapy with partial response. Later she developed multiple bone metastases and pathological fracture of her left femur. She succumbed to the disease approximately 20 months after her initial presentation.

**Conclusion(s):** The duration of survival of patients with skin metastases is generally poor due to visceral metastases and advanced disease.

**Keywords:** Nasopharyngeal Carcinoma, Cutaneous Metastases, Distant Metastases

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[T3-51]

## Cryosurgery in Treatment of Nose Skin Tumors

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**Objective:** To define effectiveness of cryosurgery for primary and recurrence nose skin cancer; to clarify the possibility of cryosurgery for elderly patients; to assess cosmetic effect and long-term results.

**Method(s):** A total of 131 patients with nose skin neoplasm were analyzed. Cryosurgery was performed in 84 patient with basal cell carcinoma and in 47 patients with squamous cell carcinoma of nose skin between 1973 and 2001 years. Histopathologic examination of tumor was performed for all patients. Of all patients 82,7% were older than 50 years old. Of all patients 66% were suffered from concomitant diseases of different severity. Allocation of patients according to TNM classification was: T1N0M0 (n=38), T1N1M0 (n=2), T2N0M0 (n=8), T2N1M0 (n=1), T3N0M0 (n=5), T4N0M0 (n=11), T4N1M0 (n=4), T4N0M1 (n=1). Local and advanced recurrences were appeared in 22 and 40 patients, respectively.

**Result(s):** Recurrences of skin carcinoma was obtained in 2 (3%) of 71 followed up patients with stage T1/2N0M0 and local recurrences after different initial therapy. Deformation external nose was avoided due to cryosurgery in patient with restricted primary and recurrence tumors. Recurrence rate was 46% in patients with advanced recurrences and T3/4N0/1M0/1. Death rate was 32 %. Unfavorable prognostic factors was associated with distant metastases, 8 of 11 patients died for metastases at 1 year. Different external nose defects were formed after cryosurgery for vast tumors. Plastic reconstruction and prosthetics were needed in 11 patients. Patients with concomitant diseases tolerate cryosurgery very good.

**Conclusion(s):** Cryosurgery for skin carcinoma was effective in patients with early stages and restricted recurrences of basal cell carcinoma and squamous cell carcinoma of nose skin. It allows to keep integrity of skin and achieved excellent cosmetic effect and long-term results in most cases. Cryosurgery doesn't deteriorate general condition in elderly patients with concomitant diseases.

**Keywords:** Cryosurgery, Nose, Cancer

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[T3-52]

## A Case Report of Nasopharyngeal Adenocarcinoma

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**Objective:** Nasopharyngeal carcinoma is a common head and neck cancer. and the majority of the cancers are squamous cell carcinomas. But the malignant neoplasm with glandular differentiation in the nasopharynx is extremely rare.

**Method(s):** In this report we describe a rare case of nasopharyngeal adenocarcinoma in 68-year-old man. He was presented throat discomfort, blood-tinged sputum. The endoscopic findings revealed a round polypoid mass located on the nasopharynx and posterior pharynx.

**Result(s):** Intraoperative biopsy of the neoplasm pathologically characterized as adenocarcinoma. Complete tumor resection via trans oral approach was undergone. Positive surgical margins were identified after resection of the tumor. There is no evidence of recurrence at 6 months after the chemotherapy and radiation therapy.

**Conclusion(s):** We report rare case of nasopharyngeal adenocarcinoma.

**Keyword:** Nasopharynx Adenocarcinoma

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[T3-53]

## A Case Report of Low Grade Myofibroblastic Carcoma of Posterior Auricle

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**Objective:** Myofibroblastic sarcomas are extremely rare malignant neoplasms of myofibroblasts. In 1978 Vasudev and Harris first described the myofibroblastic sarcoma that is malignant tumor composed of myofibroblast. They are characterized by the pattern of cells and special immunohistochemical markers such as vimentin, desmin and alpha-smooth-muscle actin. Low grade myofibroblastic sarcoma mostly develops in the soft tissues of the head and neck. There is still no case report in Korea.

**Method(s):** The authors present a case of a 37-year-old man with posterior auricular mass.

**Result(s):** After surgical resection of the mass, pathologic report is low grade myofibroblastic sarcoma.

**Conclusion(s):** We report this case with a review of literature.

**Keyword:** Myofibroblastic

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[T3-54]

## Risk Adapted Treatment of Retinoblastoma

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**Objective:** The purpose of this study was to evaluate the efficacy of therapy local-extended and metastatic retinoblastoma (Rb).

**Method(s):** From 2001 to 2008 53 pts with Rb (unilateral n=52 and bilateral n=1) were treated. The median age was 32 mos. Standard risk (SR) was defined as insufficiency or minimum tumor invasion choroid and prelaminar invasion of the optic nerve (ON) (n=17), intermediate risk (IR) as invasion into the anterior chamber, massive tumor invasion choroid, intra- and extralaminar invasion ON (n=18), high risk (HR) as involvement ON's cut end after enucleation or orbital relapses and metastatic disease (unilateral n=11 and bilateral n=1). The treatment included only enucleation in SR group, 4 courses CT including cyclophosphamide VP-16 and carboplatin after OP in IR group with RT(extralaminar invasion ON). HR group received 4 CT, surgery, RT and HDCT by busulfan and melphalan followed by autologous PBSC. 6 pts (Group B n=2 and Group D n=4) were without initial enucleation and received conservative therapy (4 CT and RT or plaque radiotherapy).

**Result(s):** All 17 pts are alive with free disease in SR group with a median period of follow-up of 45 mos. DFS in IR (n=18) and HR (n=12) groups were accordingly 89% with a median period of follow-up of 78 mos and 64% with a median period of follow-up of 56 mos. All 6 pts are alive with free disease and saving eye in conservative treatment group with a median period of follow-up of 32 mos.

**Conclusion(s):** Risk adapted therapy improves results of treatment Rb. Exclusion external beam irradiation in SR and IR groups except as extralaminar tumour invasion of the optic nerve is not getting worse DFS . It is necessary search for new approaches in treatment metastatic disease Rb.

**Keywords:** Retinoblastoma, Risk Adapted Therapy, Eye-Saving Therapy

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[T3-55]

## Laryngeal Carcinosarcoma that Showed Early Lymphatic Metastasis: A Case Report and Review of Literature

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**Objective:** Carcinosarcoma, also referred to as spindle cell carcinoma, is a rare carcinoma that account for approximately 1% of all malignant laryngeal tumors. The tumor is a poorly differentiated squamous cell carcinoma with a prominent mesenchymal components. A widely accepted explanation for the histological features of this lesion is that it arises from a neoplastic epithelial cell manifesting both squamous and spindle cell features.

**Method(s):** A 51-year-old Chinese man was admitted to hospital because of complaint of a painless mass enlarging rapidly in his left neck for only one week. So We did acupuncture biopsy and found malignant cells through cytological examination. Then, an enlarged polypoid mass lesion (about 30×20 mm) with a slightly non-smooth surface and normal mucosal color was recognized from the left aryepiglottic fold to arytenoid, without both vocal fold involved , through laryngoscope. Excisional biopsy was performed, revealing poorly differentiated squamous cell carcinoma with massive spindle cell. The clinical stage was T2N2M0. So we did extended vertical partial laryngectomy and bilateral selective neck dissection. Final pathological findings revealed that the laryngeal tumor contained both squamous cell carcinoma and spindle cell sarcomatous components, which was arranged in a storiform pattern. Immunohistochemical studies showed that CK was present in epithelial cell and negative in sarcoma, whereas VIM was present in sarcoma ,but negative in carcinoma. The jugular mass was eventually proved to be lymph node metastatic foci pathologically.

**Result(s):** In the present case, the onset of the tumor was insidiously , with enlarged lymph node as the first symptom, which showed early progressive lymphatic metastasis.

**Conclusion(s):** Laryngeal carcinosarcoma are uncommon tumors, frequently misdiagnosed as mesenchymal malignancies or true sarcoma. There are still different viewpoints in its histogenesis, recent studies favor a sarcoma-like transformation of the carcinoma. Complete surgical eradication, tumor stage, and tumor location were significant prognostic factors.

**Keywords:** Prognostic, Dysphagia, Smoking

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[T3-56]

## Refeeding Syndrome and Sepsis - The Effects of Potassium, Magnesium and Phosphate in Head and Neck Cancer Patients

**Pouya Youssefi, Raghav Dwivedi\*, Peter Rhys-Evans**

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The Royal Marsden Hospital NHS Foundation Trust, London, UK

**Objective:** Malnutrition in head and neck cancer patients can be caused by both the disease process and its treatment. These patients are at risk of developing refeeding syndrome (RFS), a metabolic disorder affecting multiple organs including the body's response to sepsis. Potassium, magnesium and phosphate have been shown to be central to these metabolic derangements. We aimed to investigate the effects of both pre-feeding and post-feeding potassium, magnesium and phosphate concentrations on post-feeding leucocytosis and tube-related septic complications in patients at risk of developing RFS.

**Method(s):** All head and neck cancer patients who fulfilled risk factors for RFS during a 2 year period were included in the study. They were divided into groups based on pre-feeding and post-feeding serum concentrations of potassium, magnesium and phosphate. The measured end-points were post-feeding leucocyte count, leucocyte trend, and feeding-tube related septic complications.

**Result(s):** Out of 110 subjects, a total of 71 patients were identified (mean age 60.5 years, 75% male). Twelve out of 36 (33%) patients with post-feeding hypokalaemia developed a leucocytosis, compared to one out of 33 (3%) patients with post-feeding normokalaemia ( $P=0.003^*$ ). Further analysis of sub-groups showed ten out of 26 (38%) patients with pre-feeding normokalaemia followed by post-feeding hypokalaemia demonstrated leucocytosis ( $P=0.02^*$ ). Six out of 15 (40%) patients with post-feeding hypophosphataemia showed leucocytosis, with only one patient out of 18 (6%) with post-feeding normophosphataemia showing leucocytosis ( $P=0.02^*$ ). Feeding-tube related septic complications were found in seventeen out of 52 (33%) subjects with pre-feeding normokalaemia, compared to one out of 18 (6%) pre-feeding hypokalaemic ( $P=0.02$ ) (\*data values with estimated frequency <5 was more than 20%).

**Conclusion(s):** In head and neck cancer patients at risk of RFS, an increased risk of leucocytosis was associated with a post-feeding drop in potassium, as well as post-feeding hypophosphataemia. More feeding-tube related septic complications developed in those with pre-feeding normokalaemia.

**Keywords:** Refeeding Syndrome, Sepsis, Phosphate

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[T3-57]

## Silent Severe Stone-Related Hydronephrosis in a Patient of Nasopharyngeal Cancer

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<sup>2</sup>Hematology, Chi Mei Medical Center, Liouying, Taiwan

**Objective:** A case report for impaired renal function was not due to chemotherapy, but due to left severe hydronephrosis by an impacted ureteral stone in a patient of nasopharyngeal cancer.

**Method(s):** This 61 year-old male has nasopharyngeal carcinoma, with stage IVb (cT4N3M0, AJCC 6th edition). Pathology showed non-keratinizing differentiated squamous cell carcinoma. He received induction therapy with cisplatin and 5-FU followed by concurrent chemo-radiation therapy. Meanwhile, impaired renal function was noted and mild intermittent left flank pain developed. Computed tomography showed severe left hydronephrosis and an impacted ureteral stone was noted.

**Result(s):** After percutaneous renal drainage, and scheduled ureterolithotomy, the patient's renal function got improved gradually. Serum creatinine was from 1.6 down to 1.2 mg/dL after 6 months. He kept regular follow-up in the oncology department with complete remission.

**Conclusion(s):** Impaired renal function may be encountered in the cancer patients receiving chemotherapy. However, oncological professionals are encouraged to be aware of urinary problem not related to chemotherapy.

**Keywords:** Nasopharyngeal Cancer, Renal Function, Stone

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[T3-58]

## Malignant Melanoma of Soft Parts Involving Larynx and Thyroid

**Takayuki Kawabata<sup>\*</sup>, Toru Sasaki, Akira Seto, Takeshi Beppu, Kazuyoshi Kawabata**

*Head & Neck, The Cancer Institute Hospital of Japan Foundation for Cancer Research, Japan*

**Objective:** Malignant melanoma of soft parts (MMSP) was originally described as a distinct entity by Enzinger in 1965 and was termed.

**Method(s):** Present history and clinical course: A 26-years-old mongolian previously healthy woman presented to her local physician complaining of anterior neck mass in June 2009. On examination, there was a hard and not mobile mass on anterior neck region without inflammatory site. Radiographic studies(X-ray and computed tomography imaging) were completed and showed a anteriorly placed soft tissue mass involving thyroid, hypopharynx and larynx. Metastatic cervical lymph nodes and distant metastasis were not detected. She was referred to our hospital. Incisional biopsy was performed under general anesthesia, diagnosed as s malignant melanoma of soft parts, suspected. In October 15, Surgical operation(Total pharyngolaryngectomy, bilateral neck dissection, total thyroidectomy, pharyngeal reconstruction using the free jejunum) was performed. Histopathologic examination revealed a multinodular pigmented tumor infiltrating mainly the left lobe of thyroid gland and surrounding paraglottic space and hypopharyngeal mucosal membrane. Macroscopically thyroid lymph nodes metastasis were also proven. Immunocytochemical studies were diffusely immunoreactive for S-100 protein, HMB-45 in the tumor cells. We have consulting a professional for searching the chimeric gene, EWS/ATF-1.

**Result(s):** The patient's postoperative course was uneventful, and has shown no sign of recurrence for 5 months.

**Conclusion(s):** We experienced a rare case of malignant melanoma involving larynx and thyroid. The origin derived from neural crest was not ascertained. Surgeons should be aware of the potential for encountering unexpected malignant melanoma involving soft tissue of neck.

**Keywords:** Malignant Melanoma of Soft Parts, Clear Cell Sarcoma, Neck

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## P19. Sinonasal Malignancy

**Chair : Seiji Kishimoto (Japan)**

**Moderator : William I. Wei (Hong Kong)**

08:20 - 09:50 CBR I + II

[P19-01]

### How Can Interdisciplinary Cooperation Result in Visual Acuity Preservation in the Treatment of Locally Advanced Sinonasal Cancer?

**György Kovacs<sup>1\*</sup>, Jens Meyer<sup>2</sup>**

<sup>1</sup>Interdisciplinary Brachytherapy Unit, University of Lubeck and UK S-H, Germany; <sup>2</sup>ORL, Head and Neck Surgery, University of Lubeck and UK S-H, Germany

Advanced or recurrent malignancies such as carcinomas or sarcomas of the paranasal sinuses are associated with infiltration of the orbit and/or frontobasis, furthermore with an extremely poor prognosis. Current therapy concepts reflect the conflict between aggressive surgical approaches including mutilating exenteration of the eye and quality of life oriented organ preservation strategies. Intensive efforts have been made in the past years to use the potential of interdisciplinary cooperation. In the University Hospital Schleswig-Holstein, Germany, an interdisciplinary team of H&N Surgeons, Neurosurgeons, Dentomaxillo-Facial Surgeons, Ophthalmologists and Radiotherapy experts developed an interdisciplinary approach: After function preserving surgical excision of the tumor, intraoperative implantation of inactive plastic tubes for postoperative image adapted fractionated brachytherapy (IABT) to the surgical margins, which were in the majority of the cases R1/R2 in interest of visual acuity and/or frontobasis preservation. Due to IABT it is possible to enlarge the surgical margins with about 1 cm. Due to the steep dose fall off of the high-dose-rate brachytherapy sources organs at risk like optic nerve or other adjacent structures could be saved. This dose of radiation can be combined with other percutaneous radiotherapy modalities in terms of local dose escalation. Between 1992-2003 we treated in the frame of a feasibility observation nine advanced paranasal sinus and 13 orbital rhabdomyosarcoma patients. The majority of them were recurrent cases, 86% did have orbital involvement and 28% transdural-intracerebral infiltration. In all cases surgery was performed as visual acuity preservative approach. IABT was performed postoperatively with a usual dose of 20 Gy (10-25 Gy) in 4 days (2-5 days). In all cases visual acuity could be preserved. Acute toxicity was observed in 7 out of 22 cases (diarrhea, infection, disturbances of wound healing), mostly in the group of patients with frontobasis infiltration. Keratopathy (1/22), lagophthalmus (3/22), retinopathy (1/22) were also observed. No treatment related late toxicity was recorded. Three years overall survival was 60% for rhabdomyosarcoma and 33% for paranasal cancer cases. Based on this observation we introduced the presented interdisciplinary approach into our routine treatment of paranasal sinus cancer patients.

**Keywords:** Visual Acuity Preservation, Image Adapted Brachytherapy (Iabt), Advanced Paranasal Sinus Tumors

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[P19-02]

### Trimodality Therapy for Sinonasal Cancer

**K Thomas Robbins**

*Otolaryngology Head and Neck Surgery, Director, Simmons Cancer Institute, Southern Illinois University, USA*

The majority of patients who present with sinonasal cancer have locally advanced disease (T3-4) and require combined modality therapy. Although there have been modest improvements in survival and morbidity with standard therapy (surgery with adjuvant radiation therapy for resectable disease), there remains an important need to improve treatment outcomes. The incorporation of chemotherapy into the treatment approach for this disease shows promise for achieving this goal. Outcomes data from personal experience with induction IA high dose targeted cisplatin chemotherapy (120 mg/m<sup>2</sup> given weekly X 4 with systemic sodium thiosulfate neutralization) and reduced dose radiation therapy (50 Gy), followed by conservation surgery (preservation of orbit and palate), is outlined. The 5 year overall survival for 19 patients (14 squamous cell carcinomas; 2 adenocarcinomas; 2 adenoid cystic carcinomas; 1 undifferentiated carcinoma; 16 (84%) had T4 disease; median follow-up of 53 months) was 53%. 5 patients had local failure and 3 had distant metastasis. Except for cataract formation in 2 patients, no visual loss was observed. Combined with the positive experience of other centers applying the concept of trimodality therapy, it is recommended that this approach be compared prospectively to the currently used standard treatment.

**Keywords:** Sinonasal Cancer, Chemotherapy, Organ Preservation

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[P19-03]

## Reconstructive Options Following Surgery for Sinonasal Malignancy

Eric Genden

*Head and Neck Surgery AND Neurosurgery,  
Mount Sinai Medical Center, USA*

The Skull base and upper jaw play an essential role in support of the brain, mastication, articulation and cosmetic form. Reconstruction of the skull base has evolved significantly over the past 25 years. Prior to the introduction of free tissue transfer, reconstruction was allocated to local flaps many of which were unreliable. As a result CSF leak was common. Similarly, cosmetic and functional results were poor. Over the past two decades, there has been an evolution in reconstructive techniques that have resulted in improved functional and cosmetic results. The aim of this discussion is to review the contemporary techniques used for skull base reconstruction.

**Keywords:** Skull Base, Reconstruction, Free Tissue Transfer

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[P19-04]

## Sinonasal Cancers: Progress, Challenges, and Future Directions

Ehab Hanna

*Head and Neck Surgery, MD Anderson Cancer Center, USA*

The outcomes of patients with cancers of the sinonasal and skull base regions have improved significantly over the last 40 years. This improvement may be attributed to better diagnostic capability including endoscopy and high-resolution imaging as well as progress made in craniofacial surgery, conformal radiation, and neoadjuvant and adjuvant systemic therapy. This presentation will describe recent advances, limitations, and future direction in the multidisciplinary management of these patients.

**Keywords:** Sinonasal Cancers, Skull Base Surgery, Prognostic Factors

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## P20. Approaches to Residual / Recurrent Neck

**Chair : Giuseppe Spriano (Italy)**

**Moderator : Jesus E. Medina (USA)**

08:20 - 09:50 CBR III

[P20-01]

### New Approaches in the Treatment of Recurrent Squamous Cell Carcinoma of the Head and Neck (SCCHN) : the Point of View of a Medical Oncologist

**Joel Guigay**

*medical oncology, Institut Gustave Roussy, France*

Treatment options for patients with recurrent SCCHN include chemotherapy, re-irradiation, salvage surgery, or best supportive care according to previous treatment, sequelae and performs status. Until 2008 standard platinum based chemotherapy as a first-line treatment was typically associated with a median survival of 6–9 months. Over the last 30 years no conventional treatment combination has improved median overall survival. Promising results with anti-EGFR therapies were confirmed in the European phase III study (EXTREME). A total of 442 patients were randomized to a regimen of cisplatin or carboplatin and 5-FU with or without Erbitux. The addition of cetuximab to platinum-based chemotherapy significantly prolonged median overall survival by 2.7 months versus chemotherapy alone (10.1 vs. 7.4 months; hazard ratio: 0.797;  $P=0.036$ ). Progression-free survival was significantly improved in the Erbitux plus chemotherapy arm (5.6 months) compared with chemotherapy alone (3.3 months;  $P<0.0001$ ), representing a 46% reduction in the risk of progression. Furthermore, there was an 83% increase in response rate in the Erbitux plus chemotherapy arm compared with chemotherapy alone (objective response rate 35.6% vs. 19.5%, respectively;  $P=0.0001$ ). The addition of Erbitux did not modify the characteristic adverse-event profile of platinum-based chemotherapy and did not have a negative impact on quality of life. According to these results, Cetuximab in combination with platinum-based chemotherapy is now the standard combination in first line. Next approaches and ongoing trials explore other anti-EGFR, and new combinations with cetuximab including taxanes, antiangiogenic therapies, integrin inhibitor, or TLR9 agonist in order to reduce resistances.

**Keywords:** Cetuximab, Recurrent, Targeted Therapies

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[P20-02]

### Planned Neck Dissection in Oropharyngeal Cancer

**Giuseppe Spriano**

*Otolaryngology Head and Neck Surgery,  
National Cancer Institute, Italy*

**Objective:** Concurrent chemoradiotherapy is the current standard of care in the non surgical management of locally advanced (N2-N3) oropharyngeal squamous cell carcinoma providing excellent locoregional control and overall survival. The necessity for postchemoradiation planned neck dissection (PND) after a complete locoregional response, especially with advanced pretreatment nodal disease ( $N>3$  cm), remains controversial. Some Authors perform PND, others have adopted a watchful waiting approach in an effort to avoid neck dissection and its complications in a newly irradiated surgical field.

The purpose of our observational study was to determine the ability of neck US, MRI and FDG-PET in detecting residual cervical metastases after concomitant chemoradiotherapy in patients with advanced neck disease.

**Methods:** 31 previously untreated patients with locoregional advanced ( $N>3$  cm) oropharyngeal SCC were enrolled. All patients were treated with chemoradiation therapy with curative intent. Twelve weeks after completion of chemoradiotherapy all patients were re-evaluated by neck US, MRI and FDG-PET to assess clinical and radiological response. If the primary site was clear of disease regardless radiological response to the treatment on the neck, the patients underwent PND.

**Result:** The sensitivity, specificity and diagnostic accuracy of neck US were 90%, 72.7% and 81% respectively. The sensitivity, specificity and diagnostic accuracy of MRI were 80%, 54.5%, and 66.7% respectively. The sensitivity, specificity and diagnostic accuracy of PET were 40%, 90.9%, and 66.7% respectively. Complications rate was high in patients who underwent PND (40.6%) especially when a RND or MRND was performed.

**Conclusions:** Based on this preliminary analysis we suggest that patients with no clinical residual disease in the neck and negative MRI, US and PET 12 weeks after definitive chemoradiation therapy are highly reliable for the absence of residual cervical nodal disease and can be safely observed avoiding neck dissection and its complications. In patients with clinical residual nodal disease in the neck and metabolically inactive radiological pattern (negative PET, no contrast enhancement and low signal in T2 and fat suppressed sequences at MRI and no vascularization at US) 12 weeks after chemoradiation therapy selective neck dissection is safe and feasible

**Keywords:** Oropharyngeal Cancer, Planned Neck Dissection, Complication

**Contact Information** Giuseppe Spriano (orl@ifo.it)

[P20-03]

## The Role of Proton Therapy Combined with Intra-arterial Chemotherapy for Recurrent Head and Neck Cancer

**Nobukazu Fuwa**

*Radiation Oncology, Southern Tohoku Proton Therapy Center,  
Japan*

### Propose

The standard therapy for locally advanced recurrent head and neck cancer after surgery has not been established. Even if surgery can be done, it loses patients' quality of life. Though the treatment results of radiation combined with intra-arterial chemotherapy have been satisfactory, late adverse effects caused by radiation therapy have become a subject of discussion. Proton therapy has an advantage of good dose distribution to reduce normal tissue damage. We report the initial experience of proton therapy combined with intra-arterial infusion chemotherapy for locally advanced recurrent head and neck cancer after surgery.

### Methods

From March 2009 to March 2010, 9 patients were entered into this study. Their characteristics were as follows : median age 58 years old, 3 females and 6 males, performance status 0 to 2. The primary site of 4, 3, and 2 patients were tongue, maxillary sinus and hard palate, respectively. The pathology of 6, 1 ,1, and 1 patients were squamous cell ca, sarcoma, malignant amelobalastoma and mucoepidermoid ca, respectively. The conventional X ray therapy was performed in 2 patients 5 times a week for 4 weeks at a radiation dose of 1.8 Gy (total dose: 30.6-36 Gy) before proton therapy. Proton therapy using 150 MeV was performed 5 times a week for 3-7 weeks at a radiation dose of 2.2 GyE (total dose: 39.6-74.8 GyE). The irradiation field of proton therapy included gross tumorous lesion. Intra-arterial infusion from superficial temporal artery using CDDP with STS for neutralizer of CDDP was performed. Systemic chemotherapy was performed in 2 patients before proton therapy.

### Results

Though local tumor has been controlled, distant metastasis was detected in 2 patients. As the early toxic event, grade 3 of mucositis were seen in 6 patients, but it was tolerable.

### Conclusion

Though the period of observation is short, proton beam therapy combined with intra-arterial chemotherapy is thought to be effective. We believe that this therapy will be a new effective therapy for locally advanced recurrent head and neck cancer. The control of distant metastasis will be a prognostic factor.

**Keywords:** Recurrent Head and Neck Cancer, Proton Therapy, Intra-Arterial Chemotherapy

**Contact Information** Nobukazu Fuwa (nobufuwa@nifty.com)

[P20-04]

## The Reconstruction of Head and Neck Tissues after the Excision of Recurrent Tumors

**Igor Reshetov**

*Department of Head and Neck Surgery,  
P.A. Hertzen Cancer Research Institute, Russia*

In P.A. Hertzen Moscow Cancer Research Institute, in the Department of Microsurgery we have experience in the treatment of recurrent tumors of head and neck. 70% of patients under treatment have the recurrent tumors, and the majority of them have third or forth recurrence.

We compare remote results of the treatment of primary and recurrent head and neck tumors.

### Special methods

We attach significance to the carrying out of IORT ? intraoperation radiotherapy. After radical ablation of the recurrent tumors, wide defects of head and neck organs appear. They need immediate elimination using microsurgical tissue autotransplantation or flap transposition.

### Proposed tactics

We hold the following tactics of head and neck recurrent tumors treatment: in our opinion, the treatment of recurrent tumors should be the same as the therapy of primary tumors in cases without distant metastases. This means radical excision of the tumor, conducting of the chemotherapy, radiotherapy, intraoperation PDT.

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## O36. Radiotherapy (II) : New Technology

**Chairs : Yong-Chan Ahn (Korea)**

**Paolo Miccoli (Italy)**

08:20 - 09:50 SBR I

[O36-01]

### Increased Expression of DNA Ligase4 (LIG4) is a Good Prognostic Marker of Nasopharyngeal Cancer Patients Treated with Radiotherapy

**Sung yong Oh<sup>1</sup>, Young Jin Choi<sup>2</sup>, Hyuk-Chan Kwon<sup>1</sup>,  
Young Mi Seol<sup>2</sup>, Dong Hoon Shin<sup>3</sup>, Heon-soo Park<sup>4</sup>,  
Jin Sook Jeong<sup>5</sup>, Won Joo Hur<sup>6\*</sup>**

<sup>1</sup>Department of Internal Medicine, Dong-A University College of Medicine, Korea; <sup>2</sup>Department of Internal Medicine, Pusan National University Hospital, Korea; <sup>3</sup>Department of Pathology, Pusan National University Hospital, Korea; <sup>4</sup>Department of Otolaryngology-Head and Neck Surgery, Dong-A University College of Medicine, Korea; <sup>5</sup>Department of Pathology, Dong-A University College of Medicine, Korea; <sup>6</sup>Department of Radiation Oncology, Dong-A University College of Medicine, Korea

**Objective:** DNA double-strand breaks (DSB) are the major lethal lesions induced by ionizing radiation. The capability for DNA DSB repair is crucial for inherent radiosensitivity of tumor and normal cells. Repair of DSBs presumably involves two main mechanisms, nonhomologous end joining (NHEJ) and homologous recombination (HR). NHEJ is likely to be the major mechanism of repair of radiation-induced DSBs in humans. Ku 70, DNA-PKcs, MRN, RAD50, XRCC4, and LIG4 play a critical role in DNA DSB repair through NHEJ. In this work, we have investigated the clinicopathologic significance of DNA repair genes expression in nasopharyngeal carcinoma.

**Method(s):** We immunohistochemically investigated the expression of Ku 70, DNA-PKcs, MRN, RAD50, XRCC4, and DNA ligase4 (LIG4) in nasopharyngeal cancer patients who treated with radiotherapy.

**Result(s):** A total of 65 nasopharyngeal cancer patients who received radiotherapy were included in the current analyses. They comprised 42 males and 23 females, with a median age of 56 years (range, 18-84 years). The stages of patients were I, II (a+b), III, and IV (a+b) in 1, 13, 21, and 30 patients, respectively. Immunopositivity to Ku 70, DNA-PKcs, MRN, RAD50, XRCC4, and LIG4 was found in all tumor tissues examined. There were no apparent differences in the expression of these four proteins between cancerous tissues except RAD50 and LIG4. The positive proportions of RAD50 (0, +1, +2, +3) were 27.7%, 32.3%, 21.5%, and 18.5%. LIG4 (0, +1, +2) were 12.3%, 44.6%, and 43.1%, respectively. The median follow-up duration after diagnosis was 55 months. Increased expression of LIG4 was a good prognostic marker of disease recurrence or progression ( $P<0.001$ ).

**Conclusion(s):** Our results suggest the possibility of predicting the intrinsic radiosensitivity of nasopharyngeal cancer able to perform immunohistochemical analysis of LIG4.

**Keywords:** DNA Ligase4, Nasopharyngeal Carcinoma, Radiotherapy  
**Corresponding Author:** Won Joo Hur (wjhur@dau.ac.kr)

[O36-02]

### The Outcome of Postoperative Simultaneous Modulated Radiotherapy (Smart) for Head and Neck Squamous Carcioroma

**Sung Ho Moon<sup>1</sup>, Yuh-Seog Jung<sup>2</sup>, Jun Sun Ryu<sup>2</sup>,  
Sung Weon Choi<sup>2</sup>, Joo Yong Park<sup>2</sup>, Tak Yun<sup>2</sup>,  
Sang Hyun Lee<sup>2</sup>, Kwan Ho Cho<sup>1\*</sup>**

<sup>1</sup>Proton Therapy Center, Research Institute and Hospital,  
National Cancer Center, Korea

<sup>2</sup>Center for Specific Organs Center, Research Institute and Hospital,  
National Cancer Center, Korea

**Objective:** To evaluate the outcome of postoperative simultaneous modulated accelerated radiotherapy (SMART) for patients with head and neck squamous cell carcinoma (HNSCC).

**Method(s):** Between February 2003 and September 2008, 51 patients with histologically confirmed HNSCC received postoperative IMRT (n=33) or helical tomotherapy (n=18) using SMART after curative surgical resection. Sites included were oral cavity in 23, oropharynx in 20, larynx in 5, and hypopharynx in 3 patients.

**Result(s):** Median follow-up duration of all patients and surviving patients were 32 months (range, 5-78) and 39 months (range, 9-77), respectively. Two-year and 3-year overall survival, cause specific survival, disease free survival, loco-regional recurrence free survival (LRRFS) and distant metastasis free survival (DMFS) of all patients were 79% and 71%, 83% and 77%, 78% and 75%, 88% and 85%, and 85% and 82% respectively. Although no significant difference in 3-year LRRFS was found between oral cavity (82%) and oropharyngeal cancer (82%), 3-year DMFS was worse in oral cavity cancer (66%), compared with oropharyngeal cancer (95%) ( $P=0.0414$ ). Acute grade 3 dermatitis, mucositis, and esophagitis occurred in 10%, 10%, and 2%, respectively. At last follow up, grade 3 xerostomia were documented in 10%, respectively. Young age ( $\leq 40$  y) ( $P<0.001$ ) and oral cavity cancer primary ( $P=0.0142$ ) were poor risk factors on univariate analysis for DMFS.

**Conclusion(s):** Postoperative SMART was effective and safe in patients with HNSCC.

**Keywords:** Intensity-Modulated Radiotherapy, Helical Tomotherapy, Head and Neck Cancer

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[O36-03]

## Preliminary Results of Simultaneous Integrated Boost Intensity-Modulated Radiation Therapy (SIB IMRT) and Chemotherapy in Oropharyngeal Cancer: A Retrospective Single-Institution Analysis

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**Objective:** To review the Seoul National University's experience of intensity-modulated radiation therapy (IMRT) in oropharyngeal squamous cell carcinoma.

**Method(s):** Between October 2006 and July 2009, 41 patients with histologically confirmed oropharyngeal cancer were treated with IMRT using simultaneous integrated boost (SIB) for curative intent at the Seoul National University Hospital. Twenty-nine patients were treated with definitive IMRT and 12 received postoperative IMRT. Of the 29 patients who had definitive IMRT, concurrent chemotherapy was given to 26 patients (90%), 20 of whom also received chemotherapy prior to concurrent chemoradiotherapy. For definitive IMRT, the prescribed doses were as follows: 67.5 Gy at 2.25 Gy/fraction to postchemotherapy gross tumor, 54 to 60 Gy at 1.8 to 2 Gy/fraction to subclinical disease, and 48 Gy at 1.6 Gy/fraction to elective neck. For postoperative IMRT, the prescribed doses were as follows: 63 Gy at 2.25 Gy/fraction to tumor bed, 56 Gy at 2 Gy/fraction to subclinical disease, and 50.4 Gy at 1.8 Gy/fraction to elective neck.

**Result(s):** With a median follow-up of 14 months (range, 5-40), only one base of tongue cancer patient who received induction chemotherapy followed by commando resection and postoperative IMRT relapsed within tumor bed, subclinical area, and elective neck area. The 2-year local progression-free, regional progression-free, distant metastasis-free, and overall survival rates were 97%, 97%, 100%, and 97%, respectively. Acute grade 3 toxicity developed in 20 patients. Xerostomia decreased with increasing time interval from the end of radiotherapy, and among the patients with at least 9 months of follow-up there was 88% Grade 0-1 and 12% Grade 2 xerostomia.

**Conclusion(s):** IMRT with SIB technique for oropharyngeal cancer was feasible and effective regarding locoregional control and reduction of incidence and severity of xerostomia. Long-term follow-up is needed to confirm this preliminary finding.

**Keywords:** Oropharyngeal Cancer, Intensity-Modulated Radiation Therapy, Induction Chemotherapy

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[O36-04]

## Helical TomoTherapy for Head and Neck Squamous Cell Carcinoma: Dosimetric Comparison with Linear Accelerator Based Step and Shoot IMRT

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**Objective:** Helical TomoTherapy (HT) is a new platform to deliver Intensity Modulated Radiation Therapy. This study compares step-and-shoot Intensity Modulated Radiation Therapy (SS IMRT) with dynamic Helical TomoTherapy (HT) dosimetrically in patients with head and neck squamous cell carcinoma (HNSCC).

**Method(s):** Twelve patients with HNSCC previously treated with SS IMRT were re-planned on HT using the same CT dataset. Plans were compared for target coverage and organ-at-risk (OAR) sparing. Sparing of parotids was assessed after stratifying for side (contralateral vs. ipsilateral) and site of disease (laryngopharynx vs oropharynx). Normal tissue complication probabilities (NTCP) were compared.

**Result(s):** All HT plans showed improvement in target coverage and homogeneity, and reduction in OAR doses as compared to SS IMRT plans. For PTV 66, the mean V99 improved by 14.65% ( $P=0.02$ ). Dose Homogeneity (D10-90) was significantly better in the HT plans (mean 2.07 Gy vs. 4.5 Gy,  $P=0.02$ ). HT resulted in an average reduction of mean parotid dose of 12.66 Gy and 18.28 Gy for the contralateral and ipsilateral glands ( $P=0.003$ ) respectively. This translated into a 24.09% and 35.22% reduction in NTCP for the contralateral and ipsilateral parotids respectively ( $P<0.01$ ). Site of disease did not have any significant impact on parotid sparing between SS IMRT and HT. The maximum dose to the spinal cord showed a mean reduction of 12.07 Gy in HT plans ( $P=0.02$ ).

**Conclusion(s):** Helical Tomotherapy achieved significantly better target coverage with improved OAR sparing as compared to SS IMRT which translated into meaningful reduction in NTCP. Potential clinical implications are currently being tested.

**Keywords:** Tomotherapy, Dosimetric Comparison, IMRT

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[O36-05]

## CyberKnife Stereotactic Radiotherapy for Initial Treatment of Head and Neck Malignancy: A Clinical Review of 12 Patients

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**Objective:** By combining robotics and linear X-ray accelerator, CyberKnife is one of the stereotactic radiotherapy devices invented in 1994 and introduced to Japan in 1997. By evaluating the preliminary experience of CyberKnife radiotherapy as an initial intervention, we intended to elucidate the clinical significance of this cutting edge treatment.

**Method(s):** Between 2007 and 2009, 12 patients (13 sites) with head and neck malignancies received CyberKnife radiotherapy. Primary sites were as follows: pharynx (4), oral cavity (3), nasal cavity (2), parapharynx (2), and parotid gland (1). Pathological diagnoses were as follows: squamous cell ca. (7), adenoid cystic ca. (2), mucoepidermoid ca. (1), neuroendocrine ca. (1), malignant tumor (1). The prescribed dose was 36.50 Gy (30–40 Gy) in 3 or 5 fractions and average isodose line was 74%. The target volume varied from 7 to 111 mL (mean 35.5 mL). Median follow-up time was 5 months.

**Result(s):** Among the 13 sites, CR, PR, and SD were observed in 4, 6, and 1 site, respectively. One patient died of other cause before evaluation. Observation period was between 4 to 5 months for the three patients who showed complete response. Two patients received chemotherapy consisted of oral antitumor agent of fluorinated pyrimidines (S-1). No patient required admission at the initial treatment course of CyberKnife radiotherapy.

**Conclusion(s):** Based on our preliminary experience, CyberKnife radiotherapy is an effective treatment for selected head and neck malignancies. By virtue of the excellent conformity and high dose delivery with Cyberknife radiotherapy, overall response and local control rates were particularly encouraging. Indication including patients with 1) advanced tumor not suitable for conventional radiotherapy, 2) advanced age and poor general condition not suitable for conventional treatments, 3) refusal of conventional treatments. Further evaluation is needed to elucidate the long term impact of this treatment option.

**Keywords:** Cyberknife, Radiotherapy, Head and Neck Malignancy

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[O36-06]

## CyberKnife Stereotactic Radiotherapy for Salvage Treatment of Head and Neck Malignancy: A Clinical Review

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<sup>2</sup>Neurosurgery, Tokyo CyberKnife Center, Oka Neurosurgical Clinic, Japan

**Objective:** By combining robotics and linear X-ray accelerator, CyberKnife (Accuray Co.) is one of the stereotactic radiotherapy (SRT) devices invented in 1994 and introduced to Japan in 1997. By analyzing the preliminary experience of CyberKnife radiotherapy as a salvage treatment, we intended to elucidate the clinical impact of this cutting edge treatment.

**Method(s):** Between 2007 and 2009, 7 patients with head and neck malignancies received CyberKnife radiotherapy. Primary sites were as follows: nasopharynx (3), oral cavity (2), hypopharynx (1), and larynx (1). Target sites radiated were as follows: primary sites with residual tumor (3), cervical lymph node (2), and metastatic disease (2). The prescribed dose was average 34 Gy (20–43 Gy) in 3 or 5 fractions and average isodose line was 67%. Gross tumor volume ranged from 10 to 127 mL (average 45 mL). The median survival rate of this therapy group was compared with the terminal patient group who received conventional palliative treatment between 2002 and 2006 but this therapy.

**Result(s):** All patients showed mild to moderate response. Median follow-up time was 7.7 months. Median survival rates were 232 and 151 days with and without this therapy, respectively. Most of the patients with this therapy attained improvement in their quality of lives.

**Conclusion(s):** Based on our limited experience, CyberKnife radiotherapy is an effective treatment for recurred head and neck cancers. Although without significant differences, patients who received this therapy as a salvage treatment attained longer survival rates. By carefully balancing the side effect and the clinical effectiveness, this therapy can be a valuable treatment option for the terminal stage patients who may otherwise belong to the hospice care. Further analysis is needed to elucidate the long term impact of this treatment option.

**Keywords:** CyberKnife, Radiotherapy, Salvage Treatment

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[O36-07]

## Proton Beam Therapy for Malignancy of the Nasal Cavity, Para-Nasal Sinuses, and/or Involving the Skull Base

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**Objective:** This retrospective analysis evaluated the clinical profile of proton beam therapy (PBT) for malignancy of the nasal cavity, para-nasal sinuses, and/or involving the skull base.

**Method(s):** Efficacy was investigated in patients from our database fulfilling the following criteria, namely 1. malignant tumors of the nasal cavity, para-nasal sinuses, and/or involving the skull base; and 2. definitive or postoperative PBT (>50 GyE). Late toxicities were investigated in a limited number of patients who satisfied the above criteria and were followed for more than 1 year or until late toxicity occurred. Toxicities were graded according to the Common Terminology Criteria for Adverse Events v3.0 (CTCAE ver. 3.0).

**Result(s):** From January 1999 through December 2006, 90 patients satisfied both criteria. Patient characteristics were as follows: median age 58 years (range, 17-87); males/females 50/40; T1/2/3/4/rec 4/17/11/47/11; and post-operative PBT/definitive PBT 24/66. With a median active follow-up of 39.2 months, 3-year progression-free and overall survival was 49.6% and 72.7%, respectively. Of these, 70 patients were investigated for late toxicity. Median time to onset >Gr. 2 late toxicity was 35.1 months (range 2.7-78.6). Grade 3-4 late toxicities occurred in 10 patients (14.2%) with 12 events (Gr.4: 3 events, namely CSF leakage 1, cataract 3, hearing loss 2, decreased visual acuity 2, soft tissue necrosis 2, and bone necrosis 2. One treatment-related death occurred, caused by CSF leakage Gr.4 (1.5%).

**Conclusion(s):** The present analysis suggests that the clinical profile of PBT for malignancy of the nasal cavity, para-nasal sinuses, and/or involving the skull base justifies its use not only as an alternative to radiotherapy but also as a promising treatment option for patients who are not candidates for surgery.

**Keywords:** Proton Beam Therapy, Craniofacial Surgery, Head and Neck

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[O36-08]

## Boron Neutron Capture Therapy (BNCT) in the Treatment of Non-Operable Locally Recurred Head and Neck Cancer (LRHNC) - Application of Single Therapy and Combination with Cetuximab

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**Timo Atula**, **Antti Makitie**, **Hanna Koivunoro**, **Tiina Seppala**,  
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**Objective:** Many LRHNC patients are not candidates for re-resection or subsequent courses of radiation therapy. Despite best current practice the risk of recurrence or development metastatic disease remains high. More effective therapies are urgently warranted. BNCT is based on the reaction of thermal neutrons and boron atoms leading to high energy radiation. Boronphenylalanine fructose (BPA-f), given as an i.v. infusion, is used as boron carrier. Epithermal neutron beam is generated in a nuclear reactor. Results of 14 patients, including those enrolled in the BNCT LRHNC trial (n=12), and the newly opened trial combining BNCT with cetuximab therapy will be presented. All BNCT trials are registered at www.clinicaltrials.gov.

**Method(s):** Patients were referred to HUCH for therapeutic evaluation of LRHNC. Eligibility was evaluated according to the inclusion criteria defined in the trial protocols. BNCT was given in collaboration with VTT (Technical University, Otaniemi, Finland) and Boneca Ltd (Helsinki, Finland). Epithermal neutron beam source was Triga 250 kW research reactor. BPA-f (Katchem) 400 mg/kg infusion was given in 2 hours for all patients.

**Result(s):** Two patients with LRHNC rT4N0M0-1 (oral cavity, sinonasal carcinoma) were treated as compassionate cases with BNCT (one fraction). The first patient achieved complete response for 60+ months. The second patient received post-BNCT cetuximab for 6 months. This patient achieved partial response for 11 months. Clinical response rate (CR or PR) with the subsequent 12 patients in the LRHNC BNCT trial was 80%. The adverse events were transient and modest. The newly opened BNCT phase I trial for LRHNC patients consists of BNCT×1 followed by cetuximab at standard dose.

**Conclusion(s):** BNCT is effective and safe in the treatment of LRHNC. BNCT appears to become an accepted treatment option for LRHNC with promising efficacy. Clinical trials evaluating BNCT combined with cetuximab are ongoing.

**Keywords:** BNCT, LRHNC, Neutron Beam Source

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[O36-09]

## Current Trials Evaluating Boron Neutron Capture Therapy (BNCT) in the Treatment of Inoperable, Locally Recurred Head and Neck Cancer (LRHNC) at the Helsinki University Central Hospital (HUCH) and FiR1

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**Objective:** Many patients with LRHNC are not candidates for surgery or radiotherapy, and generally have unfavorable prognosis. Therefore, novel effective therapies are urgently needed. We treated 2 patients with LRHNC, one with sinonasal undifferentiated carcinoma (Radiother Oncol 2004;72:83-5) and another one with inoperable oral cavity carcinoma on a compassionate use basis with BNCT. Both patients responded (for 6 months and 60+ months) suggesting efficacy for BNCT. These findings led to initiation of 2 prospective clinical trials (NCT00114790 and NCT00927147, www.clinicaltrials.gov).

**Method(s):** Patients with inoperable, fully irradiated LRHNC without detectable distant metastases were eligible to these trials. Patients entered to NCT00114790 (BNCT-HN) received 2 BNCT treatments a few weeks apart, and those enrolled to NCT00927147 (BNCT-cetuximab) will receive one BNCT treatment followed by an escalating number of infusions of anti-EGFR monoclonal antibody cetuximab. L-boronophenylalanine-fructose (BPA-F), administered as a 2-hour intravenous infusion, is used as the boron carrier in both studies, and neutron irradiation is delivered at the FiR 1 nuclear reactor facility in collaboration with VTT (Helsinki University of Technology, Espoo, Finland) and Boneca Ltd (Helsinki, Finland).

**Result(s):** In the interim analysis of BNCT-HN, 10 (83%) out of 12 patients responded to BNCT and the remaining 2 (17%) had tumor growth stabilization for 5.5 and 7.6 months. The median duration of response was 12.1 months (IJROBP 2007;69:475-82). The accrual is now completed with 30 patients included, and the results will be updated at the meeting. BNCT-cetuximab trial is open for recruitment. The early results suggest that administration of cetuximab immediately after BNCT is feasible and does not add markedly to toxicity of BNCT.

**Conclusion(s):** We conclude that BNCT is effective and safe in the treatment of LRHNC. Most patients respond to this treatment. The first results suggest that cetuximab therapy may be added to BNCT, which might further improve efficacy.

**Keywords:** BNCT, Cancer, BPA-f

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**O37. Basic Science (V)****Chairs : Sung-Bae Kim (Korea)****Chih-Yen Chien (Taiwan)**

08:20 - 09:50 SBR II

[O37-01]

## **Identification of Radioresistant Genes in the Head and Neck Squamous Cell Carcinoma Cell Line**

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**Objective:** Resistance for radiotherapy is one of the most important prognostic factors in the treatment of head and neck squamous cell carcinoma. In this study, we aimed to detect changes of gene expression pattern after inducing radioresistance in head and neck squamous cell carcinoma cell lines and identify genes related radioresistance.

**Method(s):** Head and neck squamous cell carcinoma cell lines (SCC15, SCC25 and QLL1) were irradiated with a dosage of each 2G, cumulative 60G for acquisition of radioresistance. Results of cDNA array and proteomics in radioresistant head and neck squamous cell carcinoma cell lines were compared with results of corresponding control group, non-irradiated cell lines for detecting changes in gene expression and candidates for radioresistance related gene.

**Result(s):** On cDNA array, common 265 up regulated genes and 268 down regulated genes were detected after irradiation in all 3 cell lines. We detected common 45 up regulated proteins and 6 down regulated proteins in proteomics. On combined cDNA array and proteomics results, NM23A and EBP1 were significantly overexpressed in all 3 radioresistant cell lines than non-irradiated control cell lines. Among them, NM23A organized network and protein-protein binding with AURKA, known as a radioresistant gene, through ingenuity pathway analysis (IPA), and NM23A was overexpressed in the Western blot for validation of cDNA and proteomics results.

**Conclusion(s):** There was a significant change in gene expressions after irradiation in the head and neck squamous cell carcinoma cell lines and NM23A may be one of the genes to be related to radioresistance.

**Keywords:** Squamous Cell Carcinoma, Radioresistance, Gene

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[O37-02]

## **Overexpression of Activin A is Associated with Poor Prognosis in Patients with Oral Squamous Cell Carcinoma and Promotes the Proliferation, Motility and Invasion of Oral Cancer Cells**

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**Objective:** Both activin A, a member of transforming growth factor  $\beta$  superfamily, and its inhibitor follistatin have been shown to be overexpressed in various cancers. We examined the expression of activin A and follistatin in tissue and blood samples from patients with oral squamous cell carcinoma.

**Method(s):** The study population comprises 92 patients with oral squamous cell carcinoma. activin A and follistatin levels in tissues and sera were examined by qRT-PCR, immunohistochemistry and ELISA, respectively. Effects of activin A on oral cancer cells were investigated by trans-well migration/invasion assays and RNA interference.

**Result(s):** Overexpression of immunohistochemically detected activin A was correlated with positive N stage, poor histological differentiation, and perineural invasion ( $P=0.029$ ,  $0.002$ , and  $0.014$ , respectively). Statistical significant correlations between activin A and FST were observed in both mRNA and immunohistochemical expression (Pearson's correlation  $r=0.507$ ,  $P=0.008$  and  $r=0.354$  and  $P=0.0005$ , respectively). In survival analyses, patients with oral squamous cell carcinoma whose tumors overexpressed activin A had a worse prognosis for overall survival and disease-free survival ( $P=0.009$  and  $0.007$ ). However, expression of follistatin in tumor was not correlated with overall survival or disease-free survival. Serum activin A and follistatin levels in 111 untreated patients were neither significantly different from those of 91 control samples nor associated with any clinicopathological manifestations. In vitro suppression of activin A expression in OC3 cells using specific interfering RNA attenuated cell proliferation, migration, and invasiveness.

**Conclusion(s):** These findings suggest that activin A overexpression in oral squamous cell carcinomas is associated with patients survival and may contribute to tumor progression and metastasis.

**Keywords:** Activin A, Follistatin, Oral Cancer

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[O37-03]

## Macrophage Inflammatory Protein-3 $\alpha$ is a Novel Serum Marker for Nasopharyngeal Carcinoma Detection and Prediction of Treatment Outcomes

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**Objective:** We herein examine whether macrophage inflammatory protein (MIP)-3 $\alpha$  is a biomarker for nasopharyngeal carcinoma (NPC), and whether it is involved in modulating NPC cell functions.

**Method(s):** The study population comprises 275 NPC patients and 250 controls. MIP-3 $\alpha$  levels in tissues and sera were examined by immunohistochemistry and ELISA, respectively. EBV DNA load and EBV VCA IgA were measured by qRT-PCR and immunofluorescent assay, respectively. Effects of MIP-3 $\alpha$  on NPC cell motility were investigated by trans-well migration/invasion assays and RNA interference.

**Result(s):** MIP-3 $\alpha$  was overexpressed in NPC tumor cells. Serum MIP-3 $\alpha$  levels were significantly higher in untreated patients, recurrent patients and patients with distant metastases versus non-NPC controls, patients with complete remission, and long-term disease-free patients. In the prospective cohort, serum MIP-3 $\alpha$  levels were significantly higher in untreated NPC patients with advanced TNM stage versus early stage, and also correlated with EBV DNA load. Measurement of MIP-3 $\alpha$ , EBV DNA and VCA IgA levels in serial serum/plasma samples from treated patients at 6-month intervals revealed a high association between MIP-3 $\alpha$  level, EBV DNA load and disease status. Among 155 consecutive NPC patients, subjects with pre-treated MIP-3 $\alpha$  serum levels over 65 pg/ml had worse prognoses for overall survival and distant metastasis-free survival in univariate and multivariate analysis. Additionally, cell functional assays showed that MIP-3 $\alpha$  contributed to migration and invasion of NPC cells, which could be effectively inhibited by MIP-3 $\alpha$  knock-down.

**Conclusion(s):** MIP-3 $\alpha$  may be a novel biomarker and prognosticator for NPC and is involved in migration and invasion of NPC cells.

**Keywords:** Nasopharyngeal Carcinoma, EBV, MIP-3 $\alpha$

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[O37-04]

## Antimicrobial Peptides are Highly Effective against Head and Neck Squamous Cell Carcinoma Cells

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**Objective:** Antimicrobial peptides (AMP) are natural occurring, multifunctional effector peptides of the immune system and are mainly expressed at the barriers of the body to the environment such as mucosa and skin, but also in cells of the immune system. The main functions of AMP are antimicrobial, immunomodulatory, chemotactic and anticancer activities. The participation of AMP in combating head and neck squamous cell carcinomas (HNSCC) is described.

**Method(s):** Using the cyclic in silico/in vitro processing for evolutive peptide sequence optimization different fragments of the AMP LL-37 were synthesized. Cytotoxic assays were done to test cytotoxicity. Immunofluorescence microscopy was performed to show the location of action of the LL-37 derivatives and finally FACS analysis was done to distinguish apoptosis from necrosis.

**Result(s):** Cytotoxic assays showed that more than 90 % of the tested tumor cell lines UTSCC-60A, -B, HTB-43 were lysed by concentrations between 0.5 and 50  $\mu$ g/mL of the synthetic AMP LL-10 and LL-32. These concentrations showed no cytotoxic effects on erythrocytes or primary respiratory epithelial cells. The synthetic AMP RK-20 and LL-20 did neither show any effect on carcinoma cells nor on the control cells. Immunofluorescence reveals that LL-32 adheres to the cell membrane with stronger affinity towards carcinoma cells than towards normal cells. FACS studies demonstrate that the cells die due to necrosis.

**Conclusion(s):** Synthetic derivatives of LL-37 effectively and selectively kill HNSCC cells by necrosis. The reason of the selective adherence to cancer cells is due to the more negatively charged tumor cells compared to normal cells by phosphatidylserines. Therefore, synthetic derivatives of the AMP LL-37 are potential agent for the treatment of HNSCC.

**Keywords:** Host Defense Peptides, Head and Neck Cancer, Immunotherapy

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[O37-05]

## Immunologic Consequences of STAT3 Activation in Head and Neck Carcinoma

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**Objective:** Signal Transducer and Activator of Transcription 3 (STAT3), which is constitutively activated in diverse cancer types, has been shown to be a key regulator of cytokine and chemokine expression in murine tumors, resulting in suppression of both innate and adaptive anti-tumor immunity. However, the immunologic effects of STAT3 activation in human cancers have not yet been studied in detail. We sought to investigate how STAT3 activity in human head and neck squamous cell carcinoma (SCCHN) might alter the tumor microenvironment to enable immune escape.

**Method(s):** Human STAT3 expression was silenced or blocked with STAT3 siRNA or with Stattic, a STAT3-specific inhibitor, in human HNSCC cell lines or in primary tumor cell lines. Conditioned media from these cells were used to examine paracrine immunological consequences of STAT3 signaling from the tumor cells *in vitro*.

**Result(s):** STAT3 inhibition in multiple primary and established human squamous carcinoma lines resulted in enhanced expression and secretion of both proinflammatory cytokines and chemokines. Conditioned medium containing culture supernatants from STAT3-silenced human SCCHN tumor cells enhanced dendritic cell activation *in vitro*. Moreover, supernatants from STAT3-silenced tumor cells were able to stimulate the migratory behavior of lymphocytes from human peripheral blood *in vitro*.

**Conclusion(s):** These results demonstrate the importance of STAT3 activation in suppressing the release of immune and inflammatory mediators by human tumors and further validate STAT3 as a promising target for therapeutic intervention.

**Keywords:** STAT3, Tumor Immunology, Immune Evasion

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[O37-06]

## STAT3 as Antiangiogenic Target in Head and Neck Cancer

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**Objective:** Signal transducer and activator of transcription 3 (STAT3) is a transcription factor downstream of EGFR mediating proliferation, invasion, migration, and survival in cancer cells. STAT3 has been shown to be a promising therapeutic target in cancer cells. In this study, we aimed to learn the role that STAT3 plays in endothelial cell signaling and to characterize STAT3 as an antiangiogenic target for the treatment of HNSCC.

**Method(s):** The STAT3 decoy, an antisense oligonucleotide mimicking the DNA binding region of STAT3, was our primary tool to study the effects of STAT3 inhibition on human umbilical vein endothelial cells (HUVEC) and human dermal microvascular endothelial cells (HDMEC). As a control, we also used a mutant decoy that varies from the STAT3 decoy by one base-pair but does not bind activated STAT3. We used STAT3 siRNA in order to confirm the effects of STAT3 decoy on endothelial cells. We used biochemical assays to elucidate the signaling pathway with which STAT3 is involved. Additionally we used flow cytometric analysis for an apoptosis marker and a tubule formation assay to study the phenotypic effects of STAT3 inhibition.

**Result(s):** We demonstrate that inhibition of STAT3 in endothelial cells inhibits tubule formation, decreases proliferation, and promotes apoptosis. Our data further demonstrates that STAT3 is downstream of interleukin-6 (IL-6) and that STAT3 inhibition inhibits IL-6 induced proliferation of endothelial cells.

**Conclusion(s):** STAT3 plays an important role in the regulation of endothelial cell physiology and appears to be a valid antiangiogenic target. Therefore, a single agent approach that inhibits STAT3 may have the potential to affect both the tumor cell and endothelial cell compartments in HNSCC.

**Keywords:** STAT3, Angiogenesis, Head and Neck Cancer

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[O37-07]

## ADH1B and ALDH2 Polymorphisms and Risk of Squamous Cell Carcinoma of Head and Neck in Koreans

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Hanyang University, Korea

**Objective:** Alcohol drinking is a major risk factor for squamous cell carcinoma of head and neck (SCCHN). ADH and ALDH is a major player in metabolizing ethanol. The objective of this study was to investigate the association of ADH and ALDH single nucleotide polymorphisms (SNPs) with the risk of HNSCC in Koreans.

**Method(s):** We have performed a hospital based case-control study in 225 Korean SCCHN patients and 301 healthy control group. Genomic DNA was extracted from peripheral blood lymphocyte, and genotyping of ADH1B +3170A>G and ALDH2 +1951G>A SNPs was done by single base extension and TaqMan assay.

**Result(s):** The frequencies of ADH1B +3170A>G (AA/AG/GG) genotypes were 48.0%/38.7%/13.3% in patients, and 57.8%/37.2%/5.0% in controls. The odds ratio (OR) of the ADH1B +3170 AG and GG genotype were 1.44 (0.88-2.36) and 1.89 (1.23-2.92) in reference to the AA genotype. The frequencies of ALDH2 +1951G>A (GG/GA/AA) genotypes were 66.2%/32.3%/1.5% in patients, and 68.4%/28.6%/3.0% in controls. The OR of ALDH2 +1951 GA and AA genotype were 1.61 (0.95-2.73) and 0.61 (0.23-1.59) in reference to the GG genotype. In subgroup analyses of smoking and drinking status, SNPs of ADH1B +3170A>G showed more increased relative risk in heavy drinker and heavy smoker group. The OR of GG genotype in ADH1B +3170A>G was 11.9 (2.65-52.63) in heavy drinker group and 4.7 (1.54-14.29) in heavy smoking group but the SNPs of ALDH2 +1951G>A showed no statistically significant association with the risk of SCCHN.

**Conclusion(s):** Based on this study, ADH1B +3170 GG genotype is associated with increased risk of SCCHN, especially in heavy drinker and heavy smoker and it can be used as biomarker in the selection of high risk group of SCCHN in Koreans. ALDH2 +1951G>A was not associated with risk of SCCHN in Koreans.

**Keywords:** Polymorphism, ADH, ALDH

**Corresponding Author** Kyung Tae (kytae@hanyang.ac.kr)

[O37-08]

## Is It Possobile to Selectively Target and Treat the Head and Neck Squamous Cell Carcinoma by the Stem Cell Transfected with Therapeutic Gene?

**Seong keun Kwon<sup>1</sup>\*, Seung u. Kim<sup>2</sup>**

<sup>1</sup>Otorhinolaryngology - Head and Neck Surgery,  
Dongguk University Ilsan Hospital, Koyang, Korea

<sup>2</sup>Neurology, UBC Hospital, University of British Columbia, Vancouver, Canada

**Objective:** 5-fluorouracil (5-FU), is the effective chemotherapeutic agent in advanced head and neck cancer patients. However, it has serious side effect and high dose levels required for the response. Recently neural stem cells (NSCs) have been explored as a potential vehicle for delivery of anti-cancer agents due to tropism for tumor locations. Cytosine deaminase (CD) can convert non-toxic substrate 5-fluorocytosine (5-FC) to 5-FU. In this study, we investigated anti-cancer therapeutic effect of human neural stem cells encoded with CD in head and neck cancer animal model.

**Method(s):** (1) Cell proliferation assays:F3.CD (human neural stem cells encoding CD gene), F3.CD NSCs were co-cultured with SNU-1041 (head and neck cancer cell line) cells in the presence of 0 to 1500 ng/mL 5-FC. Five days later, plates were subjected to the MTT assays. (2) In vivo migration assay: In nude mouse, SNU-1041 cells were subcutaneously injected, and one week later, F3.CD cells tagged with Feridex were injected via tail vein. One week after F3.CD cell injection, mice were sacrificed and processed for histological examination. (3) In vivo anti-cancer effect of F3.CD cells: In nude mouse, SNU-1041 cells were subcutaneously injected, and one week later F3.CD cells were injected via tail vein. Animals were treated with 5-FC at 500 mg/kg/day i.p. in two rounds of 5 consecutive days with 2-day break. Tumor volume was measured every day.

**Result(s):** (1) In co-culture of F3.CD and SNU-1041 cells, 5-FC markedly reduced growth of both cell types in dose-dependent manner, while 5-FC did not affect growth of SNU-1041 or F3.CD cells. (2) F3.CD NSCs were identified only in or around the tumor mass. (3) Significant inhibition of tumor growth was observed in all animals injected with F3. CD human NSCs by day 14 without toxic side effects.

**Conclusion(s):** Human neural stem cells transfected with suicide gene showed a significant anti-cancer effect without any side effect.

**Keywords:** Head and Neck Cancer, Stem Cell, Tropism

**Corresponding Author** Seong keun Kwon (otolarynx@duih.org)

[O37-09]

## Expression and Clinical Significance of CCR6, CCR7 and CD4+CD25+Foxp3+ Regulatory T Cells in Laryngeal Squamous Cell Carcinoma and Metastatic Lymph Nodes

**Lei Tao\***

Otolaryngology-HNS, Eye & ENT Hospital of Fudan University,  
China

**Objective:** To evaluate the expression and clinical significance of chemokine receptor 6 (CCR6), chemokine receptor 7 (CCR7) and CD4+CD25+Foxp3+ regulatory T cells (Treg) in laryngeal squamous cell carcinoma and metastatic lymph nodes.

**Method(s):** Blood samples, fresh specimens of LSCC were obtained from 50 LSCC patients treated in our hospital and blood samples from normal subjects were donated by 20 volunteers in our hospital. The expression of CCR6, CCR7 and their ligands CCL20, CCL19/CCL21 mRNA as well as the protein CCR6, CCR7 were detected by real-time quantitative RT-PCR (real-time qRT-PCR) and immunohistochemistry (IHC) respectively. Flow cytometry (FCM) was used to investigate Treg in peripheral blood mononuclear cell (PBMC).

**Result(s):** The relative expression level of CCR6, CCR7, CCL19 mRNA of tumor tissue from cases with lymphatic metastasis was significantly lower than that of those without lymph node metastasis ( $P<0.05$ ), while the relative expression level of CCL20 mRNA in tumor situ was significantly higher than that of those without metastatic lymph nodes ( $P<0.05$ ). IHC showed the expression of protein CCR6 and CCR7 in all the cases in both tumor situ and metastatic lymph nodes. And the expression level of CCR6 and CCR7 in tumor situ were significantly higher in patients with lymph nodes metastasis than that of cases with no lymph nodes metastasis. Flow cytometry showed the percentage of Treg in LSCC was significantly higher than that of normal subjects ( $P<0.05$ ) and those with lymph nodes metastasis had much higher percentage of Treg ( $P<0.05$ ).

**Conclusion(s):** It was speculated that the expression profile of CCR6, CCR7 and the proliferation of Treg would have taken part in the process of lymph nodes metastasis in LSCC patients.

**Keywords:** Laryngeal Squamous Cell Carcinoma, CD4+CD25+Foxp3+Treg, Chemokine Receptor

**Corresponding Author** Lei Tao (taolei@fdeent.org)

## O38. QOL & Supportive Care (III)

**Chairs : Byoung Chul Cho (Korea)**

**Jan Olofsson (Norway)**

08:20 - 09:50 SBR III

[O38-01]

### Head and Neck Cancer Awareness Survey among Lay Public in India

**Purvish Parikh<sup>1\*</sup>, Kumar Prabhash<sup>2</sup>, G.S. BHATTACHARYA<sup>3</sup>, Hemant Malhotra<sup>4</sup>, T.P. SAHOO<sup>2</sup>, S. Dattatraya<sup>5</sup>, Shailesh Bondarode<sup>6</sup>, Sachin Hingmire<sup>7</sup>, Durgatosh Pande<sup>8</sup>, Pankaj Chaturvedi<sup>9</sup>**

<sup>1</sup>Medical Oncology, Tata Memorial Hospitals, India;

<sup>2</sup>Medical Oncology, Mumbai, India; <sup>3</sup>Medical Oncology, India., India;

<sup>4</sup>Medical Oncology, Tata Memorial Hospitals, India;

<sup>5</sup>Medical Oncology, Calcutta, India; <sup>6</sup>Medical Oncology, Sms, India;

<sup>7</sup>Medical Oncology, Jaipur, India; <sup>8</sup>Medical Oncology, Bhopal, India;

<sup>9</sup>Medical Oncology, Hyderabad, India

**Objective:** Primary objective was to gauge current awareness and understanding of H&N cancer and associated risk factors. And to use output of this survey to increase awareness with the media, general public and healthcare professionals across India.

**Method(s):** This was a community based survey by ICON. Patients, Relatives and even health care provider were questioned about amount of alcohol consumption, amount and form of tobacco consumed. The site, incidence, etiology , body parts involved, symptomatology, common belief about modes of occurrence of head neck cancers were questioned.

**Result(s):** 57% patients were unaware of head and neck cancers. Media contributed to awareness included TV (30%), Internet (45%), newspaper (46%), friends and relatives (50%), hospitals and clinics (37%). 50 % believed less than 25 % of those with H&N cancer would be alive after 5 years 95% assumed some kind of lifestyle habits as an etiology whereas 22% heredity , 29% not due to any particular etiology and 12% to promiscuous sexual behavior as a cause. More than 90 % people attributed tobacco chewing and smoking as a major cause. Most distressing complaints included dysphagia (34%), voice changes (27%), Ulceration (25%), bleeding from mouth (27%). Though 98% people agreed to seek medical attention on detection of cancers and tobacco is harmful to human health, 86% of them supported ban over it , they gave many reasons to hide cancers due to fear of society (52%), painful treatment of cancer (56%) and it being always fatal (46%).

**Conclusion(s):** There is a lack of knowledge amongst the general public in India about head and neck cancer and patients may delay consulting a physician and their diagnosis, making treatment difficult.

**Keywords:** Head and Neck Cancers, Awareness, Tobacco

**Corresponding Author** Purvish Parikh (purvish1@gmail.com)

[O38-02]

### An Explorative Study of Clinico-Demographic Factors Affecting Post-Treatment Quality of Life (QOL) in Oral and Oropharyngeal Cancers

**Raghav Dwivedi\*, Suzanne St. Rose, Pouya Youssefi, Afroze Khan, Peter Clarke, Cyrus Kerawala, Christopher Nutting, Peter Rhys-Evans, Kevin Harrington**

*Head-Neck Unit, Royal Marsden Hospital, UK*

**Objective:** To evaluate the impact of different clinico-demographic variables on post-treatment QOL of surgically treated oral cavity (OC) and oropharyngeal (OP) cancer patients.

**Method(s):** Sixty-three consecutive follow-up OC and OP cancers were recruited for the study. We have utilized the UWQOL-v4 as a comparative gold standard QOL scale.

**Result(s):** The mean composite QOL score (SD) for the whole group, OC and OP cancer patients were 74.4 (14.3), 76.6 (15.2) and 73.4 (13.9) respectively. Chewing difficulties, anxiety and swallowing problems were the worst performing domains in OC cancer patients; mean scores (SD) of 55.9 (34.8), 71.8 (24.0) and 74.1 (31.4) respectively. For OP cancer patients, decreased saliva production, taste impairment and limitation of shoulder functions were the commonest problems faced in their day-to-day lives with the mean scores (SD) of 49.5 (27.4), 67.4 (28.0) and 69.5 (28.6) respectively. Younger patients had significantly lower QOL than their older counterparts; mean scores (SD) 69.7 (14.0) vs. 79.6 (SD), respectively. Patients with higher T stage (T3 and T4) and higher overall stage (III and IV) had significantly lower mean QOL scores as compared to early T (T1 and T2) and overall early stage (I and II); mean scores (SD) 64.3 (13.6) & 72.3 (13.8) and 76.6 (13.6) & 81.7 (14.1) respectively. Patients who underwent reconstruction following tumor resection also had a significantly lower mean QOL scores as compared to those without reconstruction; mean scores (SD) 67.6 (16.0) and 77.4 (12.5) respectively. Most important issues over the last 7 days as identified by patients were saliva (n=20, 36.4%), swallowing (n=15, 27.3%, speech (n=14, 25.5%), shoulder (n=13, 23.6%) and activity (n=12, 21.8%).

**Conclusion(s):** In general good post-treatment QOL scores were found. T stage, overall stage, age at presentation and reconstruction had a significant direct effect on the post-treatment QOL of OC and OP cancer patients.

**Keywords:** Quality of Life (QOL), Oral and Oropharyngeal Cancer, Clinico-Demographic Factors

**Corresponding Author** Raghav Dwivedi (raghav\_dwivedi@rediffmail.com)

[O38-03]

## **Heat and Moisture Exchange Capacity of the Upper Respiratory Tract and the Effect of Tracheotomy Breathing on Endotracheal Climate**

**Renske Scheenstra<sup>1\*</sup>, Sarah Muller<sup>2</sup>, Andrew Vincent<sup>3</sup>,  
Frans Hilgers<sup>4</sup>**

<sup>1</sup>Department of Otorhinolaryngology, Head and Neck Surgery,  
Academic Medical Centre, Netherlands

<sup>2</sup>Department of Nuclear Medicine-Radiology,  
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<sup>3</sup>Department of Biostatistics, Netherlands Cancer Institute,  
Netherlands

<sup>4</sup>Department of Otorhinolaryngology, Head and Neck Surgery,  
Netherlands Cancer Institute, Netherlands

**Objective:** Investigating endotracheal temperature and humidity at subglottic level in head and neck cancer (HNC) patients in order to determine target values for the further development of heat and moisture exchangers (HMEs) for laryngectomized, and tracheotomy patients.

**Method(s):** Temperature and humidity measurements were obtained in 10 HNC patients with a temporary precautionary tracheotomy. Temperature and humidity were measured during 10 minutes of nose, mouth, and tracheotomy breathing in a randomized sequence. A mixed effects model was used for analysis.

**Result(s):** End-inspiratory temperature of nose, mouth, and tracheotomy breathing was 31.2, 31.3 and 28.3 °C, respectively. End-inspiratory humidity of nose, mouth, and tracheotomy breathing was 29.3, 28.6 and 21.1 mg H<sub>2</sub>O/L, respectively. There was a trend towards lower end-inspiratory humidity in patients with radiotherapy or with large surgery-induced oropharyngeal mucosa defects, whereas temperatures were similar.

**Conclusion(s):** This study provides information about the HME capacity of the upper respiratory tract in patients with HNC with precautionary tracheotomy, and thus provide target values for further development of HMEs for laryngectomized and tracheotomised. Since compromised mucosa (either surgically or radiotherapy-induced) mainly lowered minimum humidity, even slightly higher end-inspiratory humidity may be aimed at.

**Keywords:** Total laryngectomy, Heat and Moisture Exchanger, Endotracheal Climate

**Corresponding Author** Renske Scheenstra (r.j.scheenstra@amc.uva.nl)

[O38-04]

## **Objective Measures of Neck Fibrosis: Variability Amongst Different Treatment Modalities with Quality of Life Correlates**

**John Yoo\*, Jason Franklin, Chris Chin, Kevin Fung, Phil Doyle**

*Otolaryngology-Head and Neck Surgery,  
University of Western Ontario, Canada*

**Objective:** Neck fibrosis is a major side effect following head and neck cancer treatment. Until recently, there was no objective measure of neck fibrosis. The cutometer is a validated device which assesses skin elasticity and stiffness. The authors evaluated this tool for application in head and neck cancer patients. The objective of the study was to assess different modalities of treatment on neck fibrosis and evaluate the effects on various patient-specific parameters. This is the first large study utilizing this recently validated instrument.

**Method(s):** Retrospective analysis of consecutive head and neck cancer patients. Patients underwent neck fibrosis measurements using the cutometer and completed a quality-of-life questionnaire. Bilateral neck measurements were taken and where patients received unilateral cancer treatment, the non-treated side served as internal controls.

**Result(s):** 200 patients (400 necks) were recruited and measured. The extent of fibrosis was greater in patients who underwent combined modality treatment and correlated with quality of life assessments. There were differences in extent of fibrosis based on gender, race and body habitus independent of treatment factors.

**Conclusion(s):** This study provided evidence that multimodality therapy is associated with measurable differences in neck fibrosis. Furthermore, the degree of fibrosis may vary depending on patient-specific factors.

**Keywords:** Fibrosis, Head and Neck Cancer, Cutometer

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[O38-05]

## Change of Ghrelin Expression in Submandibular Gland after Irradiation in Rat

Yun-Sung Lim<sup>1</sup>, Yoon Se Lee<sup>1</sup>, Jin-Choon Lee<sup>1</sup>,  
Soo-Geun Wang<sup>1</sup>, Won Taek Kim<sup>2</sup>, Byung-Joo Lee<sup>1\*</sup>

<sup>1</sup>Otorhinolaryngology, Pusan National University Hospital, Korea

<sup>2</sup>Radiation oncology, Pusan National University Hospital, Korea

**Objective:** Patients with head and neck cancer are most susceptible to malnutrition due especially to anorexia, which is aggravated by radiation therapy. However, it is unclear why anorexia develops in patients with radiation therapy. Ghrelin plays a key role in the stimulation of the hypothalamic appetite centers and in the coordination of energy homeostasis. Ghrelin also acts for orexigenic properties in rodents and humans, of which synthesis occurs mainly in the stomach with smaller amounts in the salivary gland. The purpose of this study was to investigate the ghrelin expression in submandibular gland and the change of ghrelin expression after irradiation in the rat.

**Method(s):** A total of 20 rats were divided into four groups as non-irradiated control and irradiated group which was sacrificed at 3, 6, and 30 day after irradiation of head and neck area. Expression of ghrelin in submandibular gland was measured in each ten, different field by immunohistochemical staining. The percentage of positive ghrelin expression in total secretory gland was calculated in each group.

**Result(s):** Ghrelin was mainly expressed in intercalated and striated secretory ductal cell, not in the acinous, mucous, or serous cell. The ghrelin expression was significantly reduced by irradiation, which was decreased as time passed, by 11%, 29% and 64% respectively at post-irradiated 3, 6 and 30 day, compared with that in non-irradiated group in the immunohistochemical study.

**Conclusion(s):** In the submandibular gland, ghrelin was expressed in the ductal cell. Irradiation in head and neck area reduced the ghrelin expression in SMG. Moreover the decrease of expression was aggravated in each group without compensatory period. This study suggest that the decrease of ghrelin expression after irradiation may be one of the cause of anorexia in head and neck cancer patient with radiation therapy.

**Keywords:** Ghrelin, Radiation, Submandibular Gland

**Corresponding Author** Byung-Joo Lee (voicelee@pusan.ac.kr)

[O38-06]

## Effect of Epicatechin against Radiation-Induced Oral Mucositis in Rats

Chul-ho Kim<sup>1\*</sup>, Hyang Ae Shin<sup>1</sup>, Jang Hee Kim<sup>2</sup>,  
Young-Taek Oh<sup>3</sup>, Jin Seok Lee<sup>1</sup>

<sup>1</sup>Department of Otolaryngology, Ajou Medical Center,  
Ajou University, Korea

<sup>2</sup>Department of Pathology, Ajou Medical Center,  
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<sup>3</sup>Department of Radiation Oncology, Ajou Medical Center,  
Ajou University, Korea

**Objective:** Radiation-induced oral mucositis limits the delivery of high-dose radiation to head and neck cancer. This study aimed to investigate the effectiveness of epicatechin (EC), minor component of the green tea extracts on radiation-induced oral mucositis in rat.

**Method(s):** The Female Sprague-Dawley rats were randomly divided into three groups such as control group, radiation group (RT group), and radiation+epicatechin (RT+EC group) and were immobilized using anesthesia and acryl plate for localized irradiation. A single dose of the radiation, 30 Gy, was delivered by opposed photon beams at a rate of 2 Gy per min bilaterally at a distance of 100 cm from the source to the axis using the LINAC, 6MV. Rats in RT+EC group received oral treatments with EC using a feeding device each day at 9 am, 1 pm, and 6 pm, with the volume of each dose being 2 mM/L for 23 days after irradiation.

**Result(s):** Rats were monitored for survival rate, appearance of oral mucosa, oral intake and weight change. We found that survival rate, oral intake, and weight loss were significantly increased and histologic changes were significantly decreased in the EC-treated rats. Immunohistochemical studies of rat mucosa revealed EC treatment significantly decreased TUNEL-positive cells and expression of caspase-3 induced by radiation.

**Conclusion(s):** This result suggests that EC significantly inhibits radiation-induced oral mucositis and orally administered EC is an efficient and safe therapeutic strategy in radiation-induced oral mucositis, and is easily transferable into the clinic.

**Keywords:** Radiation, Oral Mucositis, Epicatechin

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SATURDAY, JUNE 19

[O38-07]

## Epicatechin Inhibits Radiation-induced Auditory Cell Death in Zebrafish and Rats

**Chul-ho Kim<sup>1\*</sup>, JungHee Pyun<sup>1</sup>, Young-Taek Oh<sup>2</sup>,**  
**Mi Hye Lee<sup>1</sup>, Hye Sook Hwang<sup>1</sup>, Sung Un Kang<sup>1</sup>**

<sup>1</sup>*Department of Otolaryngology, Ajou Medical Center,  
Ajou University, Korea*

<sup>2</sup>*Department of Radiation Oncology, Ajou Medical Center,  
Ajou University, Korea*

**Objective:** Radiotherapy is commonly used to treat patients with head and neck cancers. However, radiation-induced toxicity limits the delivery of high-dose radiation to head and neck lesions. The aim of this study was to investigate the effectiveness of epicatechin (EC), a minor component of green tea extract, on radiation-induced cell death *in vitro* and *in vivo*.

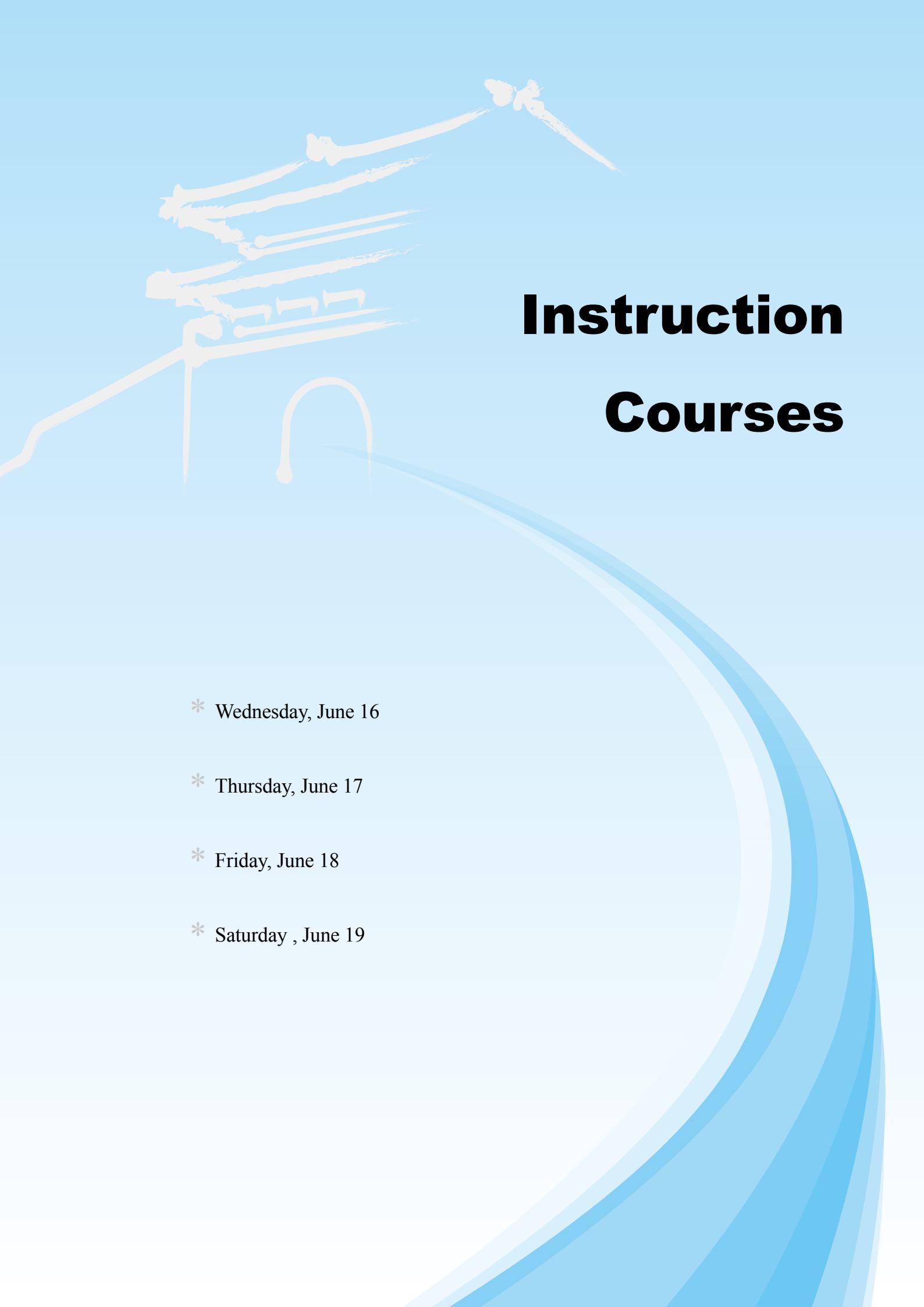
**Method(s):** The effect of EC on radiation-induced cytotoxicity was analyzed in the organ of Corti-derived cell lines HEI-OC1 and UB-OC1. The cell viability, apoptosis, ROS generation, and mitochondrial membrane potential (MMP) as well as changes in the signal pathway related to apoptosis were investigated. Then, the therapeutic effects of protecting hearing and drug toxicity of EC were explored in a zebrafish and rat model.

**Result(s):** Radiation induced apoptosis and altered mitochondrial membrane potential in the organ of Corti-derived cells was observed. EC inhibited radiation-induced apoptosis and intracellular ROS generation. EC markedly attenuated the radiation-induced embryotoxicity and loss of lateral line hair cells in a dose-dependent manner. Scanning electron micrographs showed that treatment with EC protected against radiation-induced loss and changes in the kinocilium and stereocilia of the zebrafish neuromasts. In addition, intratympanic administration of EC was protective against radiation-induced ototoxicity in the rat model, as determined by ABRs. EC significantly reduced the expression of p-JNK, p-ERK cleaved caspase-3, and PARP compared to their significant increase after radiation treatment.

**Conclusion(s):** The results of this study suggest that EC significantly inhibited radiation-induced apoptosis in auditory hair cells and may be a safe and effective candidate treatment for the prevention of radiation-induced ototoxicity.

**Keywords:** Radiation, Ototoxicity, Epicatechin

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# **Instruction Courses**

- \* Wednesday, June 16
- \* Thursday, June 17
- \* Friday, June 18
- \* Saturday , June 19



[IC01]

## Surgery for Malignant Parotid Tumors

Vincent Vander Poorten

*University Hospitals Leuven, Belgium*

Primary tumor surgery for malignant parotid tumors depends on location, size and local extension. A superficial parotidectomy adequately removes most T1, T2 and selected T3 tumors in the superficial lobe. More extended surgery is needed in tumors with deep lobe or surrounding structure involvement or facial palsy. An intact facial nerve can usually be kept intact, remaining microscopical disease being controlled by radiotherapy. When nerve resection is unavoidable, the margins should be checked peroperatively. Immediate nerve repair provides the best functional results, but static reconstruction is the best option in older patients. Surgical neck treatment is indicated in obvious regional metastasis (in about 16% of patients, mainly involving levels II, III and IV). For the cN0 neck a subgroup at high risk of occult metastasis (large primary, high grade histology, advanced age, perilymphatic/extraparotid extension) is candidate for elective neck dissection or radiotherapy to the neck, but to date no data exist comparing the efficacy these modalities.

The course will go over the enumerated statements, at every point highlighting relevant literature, coming to a literature-supported global treatment pathway for every patient with this disease.

[IC02]

## Shifting Paradigms - Can Sentinel Lymph Node Mapping be standard of Care in Head and Neck?

Chair: Sandeep Samant

*American Head and Neck Society, USA*

### Sentinel Lymph Node Mapping - The Concept and Technique in Head and Neck

Jose Steck

*Brazilian Head and Neck Society,American Head and Neck Society, Brazil*

### What is the Evidence?

Andre Carvalho

*Brazilian Head and Neck Society,American Head and Neck Society, Brazil*

This course will discuss the most relevant aspects of Sentinel Lymph Node Mapping for Oral and Oropharyngeal Cancer. Emphasis will be placed on the technical aspects such as indications and patient selection, choose of radiolabelled markers, lymphoscintigraphy interpretation, the validity of the blue dye, surgical tips and pitfalls, learning curve and histopathological analysis of lymph nodes. We will address also the evidence on these topics as well the capability of the method to become the State of the art in the treatment of oral and oropharyngeal squamous cell carcinoma.

At the conclusion of the course, the participants will have increased their knowledge in all of these areas, and in particular will have a thorough understanding of and be able to describe:

1. The potential advantages of the Method, like the reduction in morbidity.
2. How to adequately select the patients who will benefit from this method.
3. The potential for false negatives, and how to minimize it.
4. How to improve the learning curve of the Team, not only the Surgeons, but also the Nuclear doctors and Pathologists.

[IC03]

## Maxillary Swing Approach to Central Skull Base

**William I. Wei**

*The University of Hong Kong, Hong Kong, China*

**Jonathan Lau**

*The University of Hong Kong, Hong Kong, China*

Pathologies at the central skull base is difficult to eradicate surgically, as it is difficult to expose the region adequately for an oncological resection. We have developed the maxillary swing approach, the anterolateral approach, to the central skull base. Over the past twenty years we have employed this approach for resection of recurrent nasopharyngeal carcinoma and other central skull base tumours such as schwannoma, chordoma, sarcoma, and recurrent deep lobe parotid tumour etc for 267 patients. We have modified the palatal incision and the palatal fistula which previously occurred in 20% of patients has been eliminated in recent 4 years despite previous radiation.

The course will illustrate through slides and videos, step by step the surgical procedure to expose the central skull base, the nasopharynx, and the paranasopharyngeal space with the maxillary swing approach. Practical hints aiming to avoid complications will be stressed.

For recurrent nasopharyngeal carcinoma, a total of 246 patients have been treated this way and a 5-year actuarial local tumor control rate of 63% with a 5-year disease free survival rate of 54%. The operation allows control of the internal carotid artery, there was no hospital mortality and the associated morbidity was acceptable.

Endoscopic resection of the recurrent nasopharyngeal cancer has also performed recently and the pathological basis of adequate resection to salvage these patients will also be presented.

[IC04]

## The Integration of Chemotherapy in the Treatment of Locally Advanced Head and Neck Cancer

**Marshall Posner**

*Dana Farber Cancer Institute, USA*

Decision making regarding chemotherapy in the combined modality treatment of locally advanced head and neck cancer is complex. Decisions can be informed by data from clinical trials; clinical assessment of the patient; the biology, stage and site of the tumor. This course will discuss the clinical trials data supporting the application of chemoradiotherapy and sequential therapy to treatment in locally advanced head and neck cancer; the pharmacologic rationale for different drug choices and the timing of therapy; and the emerging biology and molecular understanding of the different diseases that now make up head and neck cancer. At the end of the session there will be a case based presentation to review the complex decision making process. When the session is complete the participants will be better prepared to make decisions regarding therapy for their patients and better able to inform their patients and their colleagues regarding the value of different treatment options for the individual patient.

[IC05]

## Deep Lobe Parotidectomy -Indications and Technique

**Kerry Olsen**

*Mayo Clinic, USA*

The management of the deep lobe of the parotid gland is an area of marked controversy regarding indications and surgical approach for benign and malignant tumors. This course will review the pertinent anatomy and describe the lymphatic parotid system and how this relates to the effective treatment of primary and metastatic parotid cancers. The deep lobe of the parotid is also an area of surgical challenge regarding tumor extension to the parapharyngeal space for recurrent and extensive benign and malignant tumors. The evaluation and surgical technique will be outlined to allow for a safe and en bloc removal of the deep portion of the gland with facial nerve preservation when indicated. The cervical parotid approach to prestyloid parapharyngeal tumors will also be reviewed. The attendees should have a good understanding of the rational and individualized approach to managing tumors and potential metastatic cancers in this region.

[IC06]

## Transoral Laser Microsurgery for Laryngeal Carcinoma

**Phil-Sang Chung**

*Dankook University Hospital, Korea*

**Kang Dae Lee**

*Kosin University Hospital, Korea*

Transoral laser microsurgery is newly developed treatment methods combining a minimally invasive approach with CO<sub>2</sub> laser for laryngeal carcinoma. This course will introduce the management strategy, including laser safety, surgical principles based on our experience and statistically analyzed data. The role of laser microsurgery for early glottic and supraglottic carcinoma is well established and the oncologic efficacy and advantage over conventional surgery or radiation therapy is widely accepted nowadays. The aim of laser microsurgery is complete resection of tumor with minimal morbidity and maximal preservation of function. For the successful laser surgery, adequate exposure of lesion, well trained surgeon, and cooperation with anesthesiologist and pathologist is mandatory. For the surgical principle, the type of laser cordecomy, technique of laser resection, safety margin according to the tissue interaction, instrumentation, functional outcome, and the management of neck for supraglottic tumor will be discussed.

[IC07]

## Quality of Life in Head and Neck Cancer

### Quality of Life in Head and Neck Cancer:

#### Perceptions and Misconceptions

**Randall Morton**

*University of Auckland, New Zealand*

### Functional Outcomes following major resection and reconstructive surgery for head and neck cancer

**Rajan Patel**

*University of Auckland, New Zealand*

This Course describes how perceptions in the management of head and neck cancer have been affected by quality of Life (QOL) issues. Attendees will learn a practical and meaningful approach to QOL will be presented, which will assist practitioners to understand QOL and help them in the decision-making process.

There is considerable variation in the way that QOL is measured and reported, which leads to confusion among many practitioners. This in turn produces misconceptions and faulty reasoning that, paradoxically, can affect patient care adversely.

The principle role of the clinician is to ensure that patients are given the best chance of cure. Some clinicians modify their therapeutic approach based on their perceptions of the QOL outcomes that follow specific treatments.

Clear guidelines as to what QOL information is meaningful will be given in this presentation. Advice as to how to interpret QOL outcomes studies and how to apply such information to one's own Head and Neck Oncologic practice will also be given.

In particular, the clinician's role in managing QOL of head and neck cancer patients will be explained.

The question of Quality-adjusted survival will also be addressed, with an explanation of its importance in future planning.

[IC08]

## Radiation Induced Oral Mucositis

**Vinay Sharma**

*Charlotte Maxeke Johannesburg Academic Hospital,  
University of Witwatersrand, South Africa*

Oral Mucositis is a significant problem for cancer patients and is seen in 85-100% patients receiving radical chemo-radiation for Head and Neck cancers. It is associated with pain, increased risk of infections leading to impaired nutritional status, poor quality of life as well as the treatment interruptions. The treatment interruptions are associated with poorer outcome of the cancer treatments. Mucosal reactions are associated with a change in the normal bacterial flora and denuding of the epithelial lining. Mucositis is in part mediated by endo-toxins mainly produced by gram negative oral bacteria that are able to penetrate the radiation injured mucous membrane. Traditional management of oral mucositis has involved patient education and compliance, use of non-medicated saline rinses,-topical and systemic pain control, hydration, nutritional support, and infection surveillance. Various agents as amifostine, prostaglandins, Sucralfate, antibiotics have been used to reduce mucositis with questionable results. Mouth rinses containing either antimicrobial or anti-inflammatory compounds are used to minimize oral mucositis and infections. An experimental mouth rinse developed in our hospital is being compared with a proprietary mouth rinse in a double blind randomized clinical trial to prevent oral mucositis in patients receiving radical radiation therapy. The experimental rinse has been shown to have antimicrobial properties as well as minimal toxicity in the laboratory testing before initiation of the trial. The patients have an intra oral examination of the disease status, intra oral photographs, saliva samples for microbial counts and swabs for presence or absence of bacteria/fungal infection prior to start of treatment as well as every week during the treatment and for 6 weeks post treatment. A quality of life questionnaire is also completed at each visit.

[IC09]

## Functional Palato-Maxillary Reconstruction

Alexander Rapidis

*Greek Anticancer Institute, Saint Savvas Hospital, Greece*

Maxillary defects resulting from tumor resection or trauma can cause severe functional and cosmetic deformities to the patient. The complexities of function and anatomy in the skeleton of the middle third of the face and a paucity of local soft tissue have made midfacial reconstruction a particularly difficult problem. The resection of large segments of the middle third of the face in order to achieve disease free surgical margins, usually leaves to the patient a three-dimensional surgical defect.

Immediate repair of a maxillary defect after resection of a tumor has traditionally been rejected, as it was thought that it would not allow close observation of the tumor site for possible recurrence. However, there is no convincing evidence that patients who have reconstructions have worse survival from those that have been obturated, as local recurrences very seldom can be re-operated.

Every reconstructive technique must satisfy the following key objectives: 1) obliteration of the defect; 2) restoration of function, particularly speech and mastication; 3) structural support for reconstruction of external facial features; and 4) aesthetic reconstruction of these external facial features.

The introduction of free tissue transfer techniques has made reconstruction of the midfacial defects possible. Several strategies for the reconstruction of midfacial defects with free tissue transfer have emerged in the reconstructive literature. These approaches are typically based on the extent of the maxillectomy defect and attempt to simultaneously address the aesthetic and functional requirements.

Several types of free flaps have so far been used and these include composite flaps- the radial forearm, the fibula, the scapula, the iliac crest- and muscle flaps- the rectus abdominis, the latissimus dorsi, and the lateral arm and thigh. The two free flaps most commonly used when bone is not required are the radial forearm and the rectus abdominis.

[IC10]

## Positron Emission Tomography (PET) in Head and Neck Cancer Patients: What are the Indications?

### Positron Emission Tomography (PET) in Head and Neck Cancer

Remco de Bree  
*VU University Medical Center, The Netherlands*

C. René Leemans  
*VU University Medical Center, The Netherlands*

Accurate staging at presentation of patients with head and neck squamous cell carcinoma (HNSCC) is critical for treatment selection: delineation of the primary tumour, assessment of the presence and extent of lymph node metastases and screening for distant metastases. Discrimination between postradiation effects and recurrent or residual disease after radiotherapy with or without chemotherapy may be difficult and results in futile invasive diagnostic examinations and treatments.

Positron emission tomography (PET) is theoretically a potential method of improving staging and detection of recurrent or residual disease. However, PET has its clinical limitations, is limited available, harbours radiation exposure and is an expensive diagnostic technique. Therefore, indications for the use of PET in head and neck cancer patients are warranted.

In this course the role of PET in all the above mentioned clinical problems will be discussed. Aspects concerning clinical use, decision models, applicability (interobserver agreement) and cost-effectiveness will be presented.

At the end of the course the participants will know in which patient and for which clinical problem PET is indicated.

[IC11]

## The Role of Partial Laryngectomy for Function Preservation

Javier Gavilán

*Spain*

[IC12]

## Comprehensive Management of Tongue Cancer

Chung-Hwan Baek

*Korea*

Snehal Patel

*USA*

In this course, two most important prognostic issues will be discussed for the treatment of tongue cancer

1. What is the safe deep margin and how to get the safe deep margin during tongue cancer surgery
2. Management of N0 neck of tongue cancer: Selective neck dissection vs Sentinel node biopsy

[IC13]

## Recent Advances in Postlaryngectomy Comprehensive Rehabilitation

**Frans Hilgers**

*Head and Neck Oncology and Surgery,  
Netherlands Cancer Institute, Netherlands*

Although the goal of every clinician is to preserve organ anatomy and organ function with laryngeal and hypopharyngeal cancer patients, total laryngectomy is often times unavoidable in patients with advanced and recurrent disease. Fortunately, the quality of life following a total laryngectomy is quite good provided surgical and rehabilitation efforts are optimal. Over the last several decades' considerable progress in voice, pulmonary and olfaction rehabilitation of the total laryngectomy patient has been made. This course will share current trends and practices in postlaryngectomy rehabilitation and discuss recent advances in this pre-eminently multidisciplinary function restoration field.

Topics covered during this course:

- The latest in surgical techniques and thinking: including techniques for stoma optimization to accommodate airtight peri- or intrastomal fixation.
- Primary and secondary voice prosthesis placement: pros and cons
- Voice prosthesis selection: making the right choice.
- Troubleshooting: any surgical technique potentially is suffering from adverse events and complications. In prosthetic vocal rehabilitation almost one-third of the patients occasionally might be confronted with this, although this concerns only some 10% of all prosthesis replacements. Mostly these issues are minor and relatively easy to be taken care of, but an early and adequate response to some of these challenging side effects is key to any successful rehabilitation program. The impact of co-morbidities, such as reflux and pharyngeal stenosis, will be discussed and tips, and tricks for the solution of various complications will be given.
- Update about recent research on postlaryngectomy respiratory patho-physiology and the rationale and benefits of pulmonary rehabilitation by the prescription of heat moisture exchangers (HMEs).
- Smell/olfaction function, presently easily being rehabilitated by means of the “Nasal Airflow Inducing Maneuver” or “Polite Yawning” technique, as long as clinicians and patients are aware of this simple, straight-forward technique.

[IC14]

## Comprehensive Management of Parotid Neoplasms

**Randal Weber**

*UT MD Anderson Cancer Center, USA*

This course will review the demographics and histologic spectrum of parotid neoplasms and how histology impacts biologic behavior. Comprehensive surgical management with review of pertinent anatomy will be presented. Key landmarks for facial nerve identification and preservation will be addressed. A video presentation will demonstrate Harmonic assisted parotidectomy. Difficult surgical management problems will be addressed in a stepwise fashion that will highlight the scenarios of facial nerve involvement, management of deep lobe and parapharyngeal salivary gland tumors and the role of neck dissection for malignant tumors. The benefit of multimodality therapy in management of malignant tumors will be reviewed as demonstrated by available literature.

[IC15]

## Risk Adapted Surgical Strategy for Cancer of the Thyroid Gland

**Jatin Shah**

*Memorial Sloan Kettering Cancer Center, USA*

This course will emphasize Risk group stratification for patients with cancer of the thyroid gland, and recommend Selective surgical treatment of the primary tumor and regional lymph nodes, for differentiated cancer of the thyroid gland. It will also discuss the role of radical surgery for advanced thyroid cancers, and show video clips for techniques of such operations.

[IC16]

## Radiation Oncology of Head and Neck Cancer: The State and Reality of the Science

**Brian O'Sullivan**

*Princess Margaret Hospital, University of Toronto, Canada*

The purpose of this course is to overview the evidence relating to the role of radiotherapy in the management of head and neck cancer including its interactions with other treatments. The course will outline the principles in understanding the basis of radiation effects and the evidence for these strategies. Many radiotherapy options exist that include technical delivery platforms, biological optimisation, and combinations with other agents and other treatments including surgery. Precision radiotherapy, such as intensity modulated radiotherapy (IMRT) will be described briefly including its potential value in protecting normal tissues and achieving dose escalation in tumors, and the importance of radiotherapy quality assurance to avoid 'geographic miss' in radiotherapy planning and delivery. In contemporary head and neck oncology practice there is an appropriate wish to improve efficacy through intensification of treatment based on the results of clinical trials. While this has been successful, unfortunately concern also exists that many of our treatment approaches have become overly toxic and patients are suffering permanent sequelae especially those related to the local impact of intensive schedules of radiotherapy. Refinement of treatments are needed, including employing combined modalities more conservatively with potential equal or greater efficacy while also considering functional and cosmetic outcomes in addition to cure. Different etiologies are also emerging that appear to be relevant in the overall spectrum of this group of diseases and may influence the choice of treatment or the way it should be administered and seems especially important in the treatment of diseases related to the human papilloma virus (HPV); protocols for de-intensification should be considered because of the more favorable outcomes of these tumors with conventional treatments. Finally there will be a discussion of the critical need to focus on management approaches that meet the needs of our aging population.

[IC17]

## Optimal Treatment of Medullary Thyroid Carcinoma

### Current Diagnosis & evaluation of MTC including RET proto-oncogene

Jong Ju Jeong

*Yonsei University of Hospital, Korea*

### Surgical management of MTC

Jandee Lee

*Ajou University of Hospital, Korea*

### Systemic therapeutic options of MTC

Ki-Wook Chung

*National Cancer center, Korea*

Medullary thyroid cancer (MTC) occurs in the sporadic form in about 70?80% of cases, whereas the remaining 20?30% is represented by three hereditary forms: multiple endocrine neoplasia type 2A (MEN 2A), multiple endocrine neoplasia type 2B (MEN 2B), and familial MTC not associated with MEN (FMTC). These hereditary forms are inherited as an autosomal dominant trait. Distinct germ-line mutations in the RET protooncogene on chromosome 10 have been identified in patients who are affected by familial MTC. Because surgery is only effective treatment modality currently, early diagnosis and surgical management improve the prognosis of patients with MTC.

First, Introduction course discuss the current methods available for the diagnosis and evaluation of a patient with suspected medullary thyroid cancer, including RET proto-oncogene mutation. Second, we discuss the management of medullary thyroid cancer is predominantly surgical excision, consisting of a total thyroidectomy and lymph node dissection. Also, the extent and timing of surgical excision are discussed. Finally, we discuss Systemic therapeutic options including chemotherapy, radiation therapy, and biological target therapy, so far limited for medullary thyroid cancer.

[IC18]

## Organ/Function Preservation by Interdisciplinary (Surgery+Brachytherapy) Approach in HNSCC

Chair: Jochen Werner

*University of Marburg, Department of head and Neck Surgery, Germany*

### Interdisciplinary Organ/Function Preserving Brachytherapy - Surgical point of view

Jens Meyer

*University of Luebeck, Department of Head and Neck Surgery, German*

### Interdisciplinary Organ/Function Preserving Brachytherapy - Radiotherapy point of view

György Kovacs

*University of Luebeck, Interdisciplinary Brachytherapy Unit, German*

Image adapted perioperative brachytherapy (IABT) is a modern interdisciplinary development of classic radiation therapy, which allows the geographically exact application of high radiation dose in a relatively small tissue volume. Due to minimizing high dose radiation volumina, radiation related normal tissue acute/late toxicity could be avoided. Classical indications are head and neck squamous cell cancers (HNSCC) of the oropharynx, nasopharynx and mesopharynx. A special advantage of IABT combined with organ/function preservation surgery could be achieved in advanced nasal/paranasal sinus cancers, where visual acuity preservation became possible due to the interdisciplinary approach (enlarging surgical margins by IABT) in treatments with curative intentions. The application type could be solely IABT with curative intention in the adjuvant setting (implantation of brachytherapy applicators after close margin surgery to avoid local recurrences) or as a boost in combination with external beam radio(chemo)therapy. In the palliative setting less aggressive surgery (debulking) combined with intraoperative implantation of plastic tubes (inactive brachytherapy applicators) and postoperatively performed fractionated, intensity-modulated radiation offers a highly effective treatment method. The main advantage of this interdisciplinary cooperation is the intraoperative, optimal radiation target definition for geographic distribution of needed high radiation dose areas. Compared to different methods of a single shot (one intraoperative fraction of radiation) IABT has more flexibility in covering target areas as well radiobiological advantages due to the fractionation. Different publications encourage the integration of interdisciplinary IABT as part of the therapy of HNSCC and thereby improving the prognosis and quality of life of patients. The presenting group reports on their more than 15 years interdisciplinary experience and clinical results as well gives an overview on methodology and "tips and tricks".

[IC19]

## **Thyroid Nodule Guidelines : Ultrasound and FNA**

### **Thyroid Nodule Guidelines : Ultrasound and FNA**

**Jung hee Shin**

*Samsung Medical Center, Korea*

### **Preoperative evaluation of thyroid cancer**

**Jun-sun Ryu**

*Head & Neck Oncology, National Cancer Center, Korea*

This course will explain ultrasonographic (US) descriptors of thyroid nodules and demonstrate US findings to differentiate benign from malignant thyroid nodules, which have been widely acceptable until now. With regard to fine-needle aspiration (FNA) indications for thyroid nodules, recently updated American Thyroid Association guidelines and European Thyroid Association guidelines will be introduced. Guidelines for FNA and follow-up of thyroid nodules in Korean Society of Thyroid Imaging have suggested since 2007 and acquired currency in Korea. Korean guidelines of thyroid nodules will be introduced.

[IC20]

## **Endoscopic Thyroidectomy via an Axillo-Breast Approach without Gas Insufflations**

**Yoon woo Koh**

*Department of Otorhinolaryngology, Yonsei University College of Medicine, Korea*

Endoscopic thyroid surgery is no longer a new method. During the last decade, several endoscopic thyroidectomy techniques have been described, with the primary aim of obtaining better cosmetic results. The new methods have been developed largely because the incidence of thyroid nodules is markedly higher among women, especially young women, which means that cosmetic results are of great importance. Although the indications for endoscopic thyroidectomy have been expanded extensively, there has been limited acceptance of their application for large benign thyroid lesions ( $>3-4$  cm in diameter or  $>20$  mL in volume) and for thyroid cancer. As the size of a benign thyroid lesion increases, so does the potential necessity for surgical treatment. Furthermore, the prevalence of micropapillary carcinoma has increased, and a significant number of patients are young women. Therefore, to gain a wider acceptance for endoscopic thyroidectomy, the surgical technique and feasibility for the management of large size goiters ( $>4$  cm in diameter) and endoscopic thyroidectomy including central neck dissection (CND) should be very clearly established.

Our group has previously described an unilateral axillo-breast approach for endoscopic thyroid surgery without gas insufflation. With the accumulation of our experience, the practice of endoscopic thyroidectomy within our institute has stabilized, and we have expanded the inclusion criteria to include micropapillary carcinomas and larger benign tumors. This course will review our experience with endoscopic thyroidectomy via an axillo-breast approach without gas insufflation and its applications to large benign tumors ( $>4$  cm in tumor diameter) and micropapillary carcinomas. Also, we will discuss the safety and efficacy of the clipless and sutureless technique using the HS in endoscopic thyroidectomy without supplementary instrumentation.

## **Endoscopic & Robotic Thyroidectomy**

**Kyung Tae**

*Hanyang University Hospital, Korea*

Conventional open thyroidectomy can be done with minimal morbidity and almost no mortality. However, the procedure leaves a scar on the anterior neck. As a result, a variety of minimally invasive techniques to minimize neck scars and surgical morbidity have been developed. The minimally invasive thyroidectomy technique includes mini open incision thyroidectomy, video assisted thyroidectomy, and pure endoscopic thyroidectomies. Endoscopic thyroidectomy can be classified by the position of the incision and includes cervical, anterior chest, breast, and axillary approaches, and modifications or combinations of these approaches. The advantages of endoscopic thyroidectomy over conventional open thyroidectomy include better aesthetic results and better surgical views with magnification. However, there are some limitations to endoscopic thyroidectomy in obtaining adequate surgical viewing angles, precisely manipulating endoscopic instruments. Recently, robotic technology using the da Vinci Surgical Robot system has been applied to minimally invasive thyroid surgery to overcome the limitations of endoscopic thyroidectomies. The application of the da Vinci S Surgical Robot system for endoscopic thyroidectomy offers many advantages over traditional endoscopic thyroidectomies. In this course, we will discuss the history and evolution of endoscopic thyroidectomy and robotic thyroidectomy. We will also present the surgical techniques of endoscopic thyroidectomy and robotic thyroidectomy using da Vinci Surgical Robot system by unilateral axillo-breast approach.

[IC21]

## **Management of the Neck in Thyroid Cancer**

**Ashok Shah**

*Memorial Sloan-Kettering Cancer Center, USA*

This course discusses the controversial issues related to the management of the neck in thyroid cancer. Even though the presence of metastatic disease in well differentiated thyroid cancer does not have a major impact on long term survival, it has generated considerable discussion about recurrent disease and subsequent morbidity. The ATA Guidelines have proposed central compartment dissection in selected high risk patients. The current controversy revolves mainly around routine or selective central compartment dissection. The postoperative follow-up with routine thyroglobulin and ultrasound reveals a high incidence of recurrent nodal disease. Whether this has a major impact or not remains to be seen. Decisions about lateral neck dissection are generally standardized-only therapeutic lateral neck dissection is recommended. Elective nodal dissection, whether central or lateral, has to be weighed against the risk of complications and long term benefit. Preoperative ultrasound is helpful in making certain critical decisions. Postoperative follow-up involves serial thyroglobulin evaluations along with TSH stimulation. Suspected recurrent disease can be easily confirmed with FNA. The current controversy involves the role of neck dissection versus close observation in subcentimeter neck nodes.

This course will discuss central compartment dissection, postoperative follow-up, and major issues related to persistent hyperthyroglobulinemia. It will be beneficial for active thyroid surgeons.

[IC22]

## **Changing Views in the Application of Neck Dissection**

**K Thomas Robbins**

*Southern Illinois University, USA*

New treatment strategies and enhanced knowledge of nodal metastases have led to significant alterations in the application of neck dissection for head and neck cancer. When the procedure is indicated as part of the initial treatment, its extent is depended on the presence and location of clinically positive nodes. In patients with advanced disease undergoing chemoradiation, neck dissection is primarily used for early salvage of persistent nodes. This course will outline the principles of when and how to apply surgical dissections based on contemporary treatment approaches. The use of imaging including PET/CT will be highlighted. Emphasis will be placed on the importance of conserving function through tissue preservation and how neck dissection is best incorporated into multimodality treatment.

[IC23]

## Management of Advanced Thyroid Cancer- the Multidisciplinary Approach

Hang-Seok Chang

Department of Surgery,  
Yonsei University College of Medicine, Korea

### The management of locally invasive differentiated thyroid cancer

Il-Seok Park, Young Soo Rho

Department of Otorhinolaryngology-Head and Neck Surgery,  
Ilsong Memorial Head and Neck Cancer Center,  
Hallym University Medical Center

Although most patients with differentiated thyroid cancer (DTC) have a relatively good prognosis, some patients unfortunately present with or develop locally invasive DTC which leads to significant local morbidity and mortality. Careful preoperative examination and risk stratification can help identify high-risk patients. Symptoms may include stridor, hoarseness, dysphagia, and hemoptysis. Appropriate surgical planning is crucial in the care of these patients. Radiologic imaging can help define the extent of disease. The reported incidence of extrathyroidal extension in differentiated thyroid carcinoma varies but ranges from 6% to 13%. Structures commonly invaded by DTC include strap muscles, recurrent laryngeal nerve, trachea, larynx, esophagus, and pharynx. Surgical resection is the primary treatment for locally invasive DTC.

Although the optimal surgical approach (ranging from conservative shave excision to aggressive en bloc resection of tumor and vital structures) in patients with locally invasive DTC is controversial. The goal of treatment is complete gross tumor removal with maximal preservation of function. In these cases, appropriate initial surgery can have a major impact on the long-term outcome of survival. Appropriate treatment depends upon an understanding of the biology, histopathology, and tailored surgical approach along with adjuvant therapy (postoperative radioactive iodine (RAI) with or without external beam radiotherapy). Adjuvant therapy is often necessary and should be used to help improve locoregional control and survival.

June-Key Chung

Department of Nuclear Medicine,  
Seoul National University Hospital, Korea

[IC24]

## Thyroid Surgery with the Application of Neuromonitoring

### Thyroid Surgery with the Application of Neuromonitoring

Feng-yu Chiang

Kaohsiung Medical University Chung-Ho Memorial Hospital , Taiwa

### IONM in Animal Research Model

Che-wei Wu

Department of Otolaryngology - Head and Neck Surgery,  
Kaohsiung Medical University, USA

This instruction course is intended to be an update of thyroid surgery with an emphasis on the identification of recurrent laryngeal nerve (RLN) and the application of intraoperative neuromonitoring (IONM).

The topics will include:

1. Standardization of IONM procedures
2. Avoidance of RLN injury with the application of IONM
3. Elucidating the mechanism of RLN injury with the application of IONM
4. Anatomic variations of RLN
5. IONM in animal research model
6. Optimal intensity and safety of electrical nerve stimulation in IONM

At the conclusion of this course, participants will be familiar with the technique of RLN identification and the application of IONM in thyroid operation.

[IC25]

## Management of Papillary Thyroid Cancer

**Robert Witt**

*Christiana Care Health Systems, Jefferson Medical College, USA*

The highlights and limitations of the 2009 American Thyroid Association (ATA) Guidelines are reviewed. The relevant molecular biology and genetics that provide a present foundation and a clear vision of where practice will progress in the near future are presented. Pearls in office thyroid ultrasonography are outlined. Safe surgical practice is detailed with a careful look at the role of nerve integrity monitors. A clear trend toward more aggressive initial surgery is described along with management of neck metastasis, extra-thyroidal spread and spread to the aero-digestive tract. Survival from papillary thyroid carcinoma is generally good, but post-operative management plays an important role in minimizing the likelihood of disease recurrence. Risk variables that increase the threat of recurrence after surgery that might be mitigated by the use of radiation therapy are also reviewed. New ATA post-op surveillance guidelines are covered. Available genetic analysis for papillary thyroid cancer diagnosis and prognostication along with the role of molecular targeted therapy are interwoven in the presentation.

[IC26]

## Robotic Thyroid Surgery

### Robotic Surgery in Thyroid Cancer

**Kee-Hyun Nam**

*Yonsei University Hospital, Korea*

### Robotic Modified Radical Neck Dissection, Gasless, Transaxillary Approach

**Sang-wook Kang**

*Ajou University of Hospital, Korea*

### Robotic BABA Thyroid Surgery

**Kyu Eun Lee**

*Seoul National Medical center, Korea*

In the late twentieth century, surgeons became concerned about patient satisfaction factors, such as, incision scars, pain, and the required time to return to work after surgery. Consequently, minimally invasive techniques, such as, endoscopy and laparoscopic surgery, were rapidly developed. These trends also influenced thyroid surgery, and the developments of new techniques, such as, minimally invasive open thyroidectomy and endoscopic thyroidectomy. Since endoscopic subtotal parathyroidectomy was first introduced by Ganger in 1996 and endoscopic thyroidectomy by Hüscher in 1997, various types of endoscopic thyroid surgeries have been devised using axillary, breast, axillo-breast, anterior chest, and cervical approaches. Furthermore, the developments of robotic surgical systems have encouraged many surgeons to incorporate more dexterous surgical instruments into thyroid operations. However, the spatial (deep and narrow working space) and anatomic limitations (abundant blood supply, critical nerves and great vessels around the gland) of endoscopic thyroid surgery make it more difficult for beginner surgeons to start robotic thyroidectomy. There are two outstanding methods which are used with wide acceptance for the robotic thyroid surgery. One is the method using gasless, transaxillary approach, and the other is bilateral axillo-breast approach (BABA). In this session, we will introduce the detailed methods of robotic thyroid surgery with two approaching routes and technical keynotes of each procedure for the beginner robotic thyroid surgeons.

[IC27]

## Larynx Preservation

Jean Louis Lefebvre

*France*

[IC28]

## Ablative and Reconstructive Surgery for Difficult Parotid Salivary Gland Carcinoma

Michael Lee

*St. Geroge's Hospital, UK*

Martin Vesely

*St. Geroge's Hospital, UK*

Salivary gland carcinoma is the 6th commonest malignant neoplasm of the head and neck, constituting 0.3% of all cancers. About 20% of parotid neoplasms are malignant. Adenoid cystic, mucoepidermoid and acinic cell carcinoma make up about 70% of all parotid malignancies and they usually present at an early stage (T1 and T2). Other cancer types, such as ductal cell carcinoma, carcinoma ex-pleomorphic adenoma and squamous cell carcinoma, are rare. However, they demonstrate aggressive behaviour and usually present late with facial nerve palsy, local invasion and regional cervical lymph node metastasis. The mainstay of treatment is surgery with or without adjuvant radiotherapy. The ablative and reconstructive surgery for advanced disease poses a great challenge to surgeons and requires a multi-disciplinary team approach. The objectives of this instructional course are to review the biologic behaviour, investigations and surgical treatment of different types of salivary gland carcinoma, including the indications for neck dissection and sacrifice of the facial nerve. The operative techniques covered will include parotidectomy with methods of finding the facial nerve trunk and its branches using antegrade and retrograde techniques, the use of the intra-operative facial nerve monitor and stimulator, neck dissection, lateral temporal bone resection, excision of temporomandibular joint, nerve grafting and restoration of facial function following sacrifice of the facial nerve and reconstruction of the surgical defect using pedicle and free flaps. Practical and useful tips for surgery in difficult cases of parotid gland carcinoma will be highlighted.

[IC29]

## Posterior Tibial Flap for Head and Neck Reconstruction

**Yu-wai Chan**

*Queen Mary Hospital, University of Hong Kong, Hong Kong*

Over the years, the radial forearm flap has been the flap of choice for the repair of shallow cutaneous or mucosal defects. However, it is notorious for the potential donor site morbidities. It would be advantageous for any flap which can provide similar tissue properties, while at the same time carry less donor site morbidity.

The posterior tibial flap shares many of the characteristics with the radial forearm flap. Our anatomical study showed that the flap is supplied by constant septocutaneous perforators arising from the posterior tibial artery in the medial distal third of the leg. The skin paddle taken from the region is both thin and supple. Since the first posterior tibial flap was performed at Queen Mary Hospital in October 2006, we have accumulated 48 cases and it has become one of the most commonly used flaps in our center. The success rate is 100%, demonstrating that the flap is safe and reliable.

The posterior tibial flap has various types of clinical applications. In the head and neck region, it is mostly commonly used for resurfacing shallow defects after tumour extirpation.

Mild donor wound infection occurred in 6.1% of our patients. The aesthetic outcome of the donor site has been satisfactory. None of our patients have problems on walking after surgery. There was no statistically significant change in pre- and post-operative range of ankle movement as well as the vascular perfusion of the lower limb. On the whole, the donor site morbidity after posterior tibial flap harvesting was low, with acceptable aesthetic outcome and minimal functional deterioration.

In conclusion, the posterior tibial flap is a safe and versatile flap to be used clinically. Because the donor site morbidity is low, it has the potential to replace the radial forearm flap to resurface shallow cutaneous and mucosal defects.

[IC30]

## Biostatistics in Designing Clinical Trials for Head and Neck Cancer

### Clinical Trial Designs with Novel Targeted Agents

**Jae won Lee**

*Department of Statistics, Korea University, Republic of Korea*

### Classical & Adaptive Designs of Phase II and III Cancer Clinical Trials

**Byung-ho Nam**

*National Cancer Center, Republic of Korea*

The aim of the course is to share the latest methods for the design, conduct and analysis of cancer clinical trials and translational research.

Emphases will be on the designs of phase I, phase II and phase III trials including both classical and adaptive designs, new design concepts for cytostatic agents and targeted therapies, and methodologies of meta analysis for clinical trials.

This course will consist of three presentations:

1. Classical & Adaptive designs of Phase II and III cancer clinical trials
2. Meta analysis of clinical trials
3. Clinical trial designs with novel targeted agents

[IC31]

## Nasopharyngectomy: Open vs Endoscopic

### Nasopharyngectomy: Open Approach

**Sheng-po Hao**

*Chang Gung University, Taiwan*

### Nasopharyngectomy: Endoscopic

**Mu-kuan Chen**

*Department of Otorhinolaryngology,*

*Head and Neck Surgery, Changhua Christian Hospital, Taiwan*

Nasopharyngeal carcinoma (NPC) is a malignant epithelial tumor arising in the nasopharyngeal space. The majority of NPCs are undifferentiated or poorly differentiated carcinomas and are very radioresponsive, so the mainstay of the treatment is radiation therapy or concurrent chemoradiation therapy. Local relapse, however, still represents a major failure pattern in advanced T-stage.

Primary recurrences of NPC after radiation therapy failure can be treated with re-irradiation, which offers only a poor to moderate survival rate but carries important complications. In recent years, nasopharyngectomy has been suggested for primary recurrences of NPC. Due to the anatomic complexity, surgical approach to the nasopharynx has been a challenge to head and neck surgeons. There are many open surgical approaches to the nasopharynx, including transpalatal, transmandibular, transpterygoid, mid-face degloving, facial traslocation, maxillary swing, and combined neurosurgical approach. Each approach has its advantages and disadvantages.

Minimally invasive endoscopic surgery has emerged as the standard, and frequently preferred, technique in a number of surgical disciplines including urological, general, and orthopedic surgery due to its minimal invasiveness with short recovery time. However, such operations are not yet a standard procedure in the head and neck region because of anatomic complexity in this region, especially in nasopharynx. Recently, with the advancement of the endoscopic surgery, minimally invasive endoscopic nasopharyngectomy was reported to be a feasible treatment of early recurrence.

We will present the advantages, disadvantages, and results of salvage nasopharyngectomy via different open approaches and the endoscopic approach.

[IC32]

## Practical Technique of TORS in Head and Neck Cancer

**Se-heon Kim**

*Yonsei University College of Medicine, Korea*

The current trend in managing head and neck cancer is to perform organ preservation therapy, which improves quality of life and decreases treatment related morbidity. Transoral robotic surgery (TORS) can overcome the limit of “line of sight” often met in classic transoral procedure. We utilized robotic surgical system for the treatment of oropharyngeal, hypopharyngeal and laryngeal cancer. TORS was performed using the da Vinci surgical robot (Intuitive Surgical, Inc., Sunnyvale, CA). It is consisted of a surgeon’s console and a manipulator cart, equipped with 3 robotic arms. The surgeon is provided with 3-dimensional magnified images from the endoscopic arm and can control 2 instrument arms for delicate operations from the console. Based on our experiences on TORS, we will lecture the following contents.

### Contents

1. TORS settings in operation room
2. Techniques for exposing primary lesions, including application of various retractors
3. TORS for lateral oropharyngectomy in oropharyngeal cancer
4. TORS for total en-bloc pyriform sinus resection in hypopharyngeal cancer
5. TORS for parapharyngeal tumor
6. TORS for laryngeal cancer
7. Bleeding control technique in TORS

[IC33]

## Selective Neck Dissection

**Eugene Myers**

*University of Pittsburgh School of Medicine, USA*

The most important single indicator of survival in cancer of the head and neck is the extent of metastases to the neck; therefore management of the neck remains an important part of cancer control. Treatment by surgery, radiotherapy or both depends upon the site and state of the primary as well as the clinical and pathological staging of the neck. The selective neck dissection (SND) which removes lymph nodes vulnerable to metastases from various primary sites spares adjacent structures and has low morbidity. The SND originally applied for diagnostic purposes in the N0 neck may also be used successfully in the treatment of the N+ neck. Indications for surgery, surgical technique, postoperative management complications and outcomes will be discussed.

[IC34]

## Harmonic Scalpel Technology for Head Neck Surgery

**Chair: Claudio Cernea**

*University of Sao Paulo - Hosp Das Clinicas, Brazil*

### Technical Aspects of Harmonic Technology

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### Video Session - Harmonic for Head Neck Surgery

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As well as drug and radiation technology improvements result in better care, surgery can be easier for the surgeon and better for the patient. the most known but still to be really discovered harmonic technology is a handy and safe tool. The main goal of this instructional course is to show how the harmonic technology can be employed in order to reduce risks and to improve the overall outcome of the head and neck patient. a multiple operations setting as thyroidectomy, parotidectomy, neck dissections,etc. will be presented to the audience. Questions and experience sharing are welcome.

[IC35]

## Overview of Apoptosis Detection Methods in Head and Neck Tumors

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This course lecture will provide the participants information about apoptosis signaling and their detection methods in Head and Neck tumors.

Head and Neck carcinogenesis is correlated with a progressive accumulation of genetic alterations in molecules that play crucial roles during apoptosis. Apoptosis is studied by direct visualization of apoptotic cells by means of light or electron microscopy. Detection of apoptosis is achieved also by various assays, including immunohistochemistry, *in situ* hybridization, and DNA repair assays and assays that measure nuclear condensation and DNA fragmentation for eg. TUNEL assay. Alterations in the plasma membrane and DNA content by flow cytometry, caspase activation and mitochondrial changes including release of cytochrome c and transmembrane potential can also be assessed. The detection of aberrations in the expression and function of molecules that regulate apoptosis by immunohistochemical or molecular techniques may serve as an additional diagnostic tool. Determination of the presence and extent of abnormal apoptotic activity in oral epithelium, as opposed to the regular process of terminal differentiation, may provide an indication of the dysplastic or neoplastic nature of a lesion, possibly when histologic signs of transformation are not yet visible.

Given that alterations in the rate and mediators of apoptosis are related to the progression of cancer, techniques for assessment of apoptosis may be useful for determination of prognosis. For example, it has been suggested that assessment of apoptotic markers (e.g., p53 and members of the bcl-2 family) may identify high-risk dysplastic lesions or predict the aggressive behavior of squamous cell carcinomas of the head and neck. Moreover, the response of oral cancer to different therapies is possibly linked to the occurrence of mutations that affect the expression levels and the function of specific apoptotic molecules. In the future, the optimal therapeutic regimen for each tumor will be selectively determined according to the presence or absence of specific molecular features, including apoptotic aberrations.

[IC36]

## Advanced Endoscopy: Narrowband World

### Detection of Superficial Cancer in Head and Neck Region, State of Art.

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### NBI Histological Back Ground and Basis for its Development

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Narrow band imaging (NBI) is a novel optical technique that enhances diagnostic capability of endoscopes in characterizing tissues by using narrow-bandwidth filters in a video endoscope system. The electro-endoscope equipped with this technology is very useful for detecting early superficial cancer in the oropharynx and hypopharynx. The patient whose superficial cancer is early detected could undergo minimally invasive treatment, such as endoscopic mucosal resection. We introduced NBI electro-scope for as routine practice four years ago, and we have had more than 200 superficial cancers detected in the oropharynx or hypopharynx. No patients with superficial cancer died from the primary cancer but some patients have suffered from neck lymph node involvement. This course will focus on how to detect superficial cancer in the oropharynx and hypopharynx. Furthermore, we would like to mention what types of lesion have a potential to develop neck lymph node involvement. We will share plenty of photos and videos of superficial pharyngeal cancer with the attendees. The participants will understand how useful this video-scope is in detecting superficial lesions, and what clinical features have a risk of developing lymph node metastasis at the end of this course.

[IC37]

## Management of Nasopharyngeal Cancer

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Nasopharyngeal cancer is different from other head and neck cancers for its unique epidemiology, natural behavior and therapeutic considerations. The geographical and ethnic distribution pattern is peculiarly skewed: the annual incidence rate ranged from less than 1 per 100,000 among Caucasians to more than 21 per 100,000 among Southern Chinese male populations. Sharing of experience between the East and the West is hence especially important.

Radiotherapy is the primary treatment modality, with addition of concurrent chemotherapy recommended for patients with advanced locoregional disease. This cancer is one of the greatest challenges for radiation oncologists because high dose is needed for cure, and the complex cancer targets are surrounded by critical structures. Late toxicity is a serious concern. State of the art radiotherapy technique and meticulous attention in every step of the radiation process is demanded.

### Learning Objectives:

To present updated knowledge on

1. The special characteristics of nasopharyngeal carcinoma: natural history, prognostic factors and staging
2. Decision on treatment strategies;
3. Recommendations on radiotherapy technique: intensity-modulated radiotherapy, image guidance and adaptive radiotherapy;
4. Recommendations on selection of chemotherapy regimens for advanced stages;
5. Post-treatment monitoring: early detection of relapse, management of late toxicities.

[IC38]

## Targeted Therapeutics and Immunotherapy of Head and Neck Cancer

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Targeted therapeutics and cancer immunotherapy, including tumor antigen specific vaccines and monoclonal antibodies (mAb) have recently enjoyed a renaissance due to enhanced clinical efficacy in the head and neck cancer (HNC) patients. These novel therapeutic agents are based on a recently enhanced understanding of tumor cell biology, EGFR signaling pathways, and mechanisms of tumor antigen escape, leading to the US FDA approval of cetuximab for HNC in 2006. Therapy with the tumor antigen-specific mAb, cetuximab, is clinically effective for advanced HNC but only in a subset (20-30%) of patients. Indeed the magnitude of the benefit is similar to that observed with standard chemotherapeutic agents, but with substantially lower toxicity. Unfortunately, the mechanism of antitumor activity in those patients who demonstrate clinical responsiveness is poorly understood. These clinical findings have stimulated interest in determining the mechanisms underlying the anti-tumor effects of therapeutic mAbs and small molecule inhibitors, in order to explain the differential clinical responses that have been observed, and to optimize the selection of patients to be treated. This instructional course presentation will review the recent advances in cancer immunotherapy, focusing on antigens targeted, and agents in clinical trials in HNC, with a focus on novel combination approaches.

[IC39]

## Stapler Use in Total Laryngectomy and Voice Rehabilitation

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**Yoav P. Talmi**

*Yoav p. Talmi (Dept OTO-HNS, Sheba Medical Center and the Tel Aviv University, Israel*

Stapler application for pharyngeal closure following total laryngectomy has been widely used in Russia and recently in the West as well. The technique is indicated for endolaryngeal (T3) and the majority of T4 tumors, excluding those with hypopharyngeal extension. Total laryngectomy is performed traditionally but with comprehensive skeletonization of the laryngeal framework. The trachea is then transected and the pyriform sinuses are completely released. The epiglottis is retracted and a TA 60 stapler is placed with the open jaws facing caudally and activated. The specimen is now removed and margins verified. A single stapling application of 60 mm and up is all that is required for complete pharyngeal closure. Second layer closure is not mandatory. At this stage an easy to perform novel TEP technique without pharyngotomy is done and will be described in detail. The advantages of mechanical sutures with the closed stapling technique are: simple and rapid application, watertight closure, prevention of field contamination, allows good speech and deglutition, does not increase fistula incidence and is consistent with very low local recurrence rates.

[IC40]

## Management of the N0 Neck in Head and Neck Cancer

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**Eun Chang Choi**

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In head and neck cancer, regional recurrence through the lymphatics to regional lymph nodes are the most important causes of poor prognosis. Management of the neck when metastasis is not clinically evident is where the greatest ambiguity lies. The discussion on the elective treatment of subclinical lymph node affection in carcinomas of head and neck is focused on eventual clinically occult lymph node metastases, which are supposed to occur in a range of 12–50%. The lymphatic metastatic spread depends on primary tumor origin. Many controversies still exist to manage the N0 neck according to the primary sites. In laryngeal cancer, a number of prospective multi-institutional studies of the distribution of cervical lymph node metastases in the neck indicate that lymph nodes in sublevel IIB and level IV are rarely involved in cases of laryngeal cancer with N0 neck. About the carcinomas of the hypopharynx, some authors treat the neck by SND II-IV as recommended in literature, whereas others by SND II-V. Both procedures seem to be justified with regard to the high density of lymph vessels. With regard to carcinoma of oral cavity, reports show rates of occult metastasis ranging from 10% to 45%. Elective treatment of the N0 neck may prevent these recurrences and the need for more radical surgery, but may also subject a patient to an unnecessary major surgery and its associated risks, particularly the shoulder syndrome. And some authors suggest the sentinel lymph node biopsy to reduce unnecessary surgery. Clinical studies have lacked sufficient power and follow-up time to show a survival benefit for any particular option. The management of patients staged N0 is controversial, and treatment plans are still based on treatment of the primary tumor and surgeon preference. We will discuss the proper management of N0 neck based on our experiences and literature review.



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### 원료약품 및 분량

1. 티에스원 캡슐 20  
이 약 1캡슐(139.4mg) 중 테가푸르(K.P): 20mg · 기메라실(별규): 5.8mg · 오테라실칼륨(별규): 19.6mg

2. 티에스원 캡슐 25  
이 약 1캡슐(139.4mg) 중 테가푸르(K.P): 20mg · 기메라실(별규): 5.8mg · 오테라실칼륨(별규): 19.6mg

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### 용법 · 용량

보통, 성인에게 초회 투여량(1회량)을 체표면적 기준으로, 조식 후 및 석식후에 1일 2회, 28일간 연일 경구투여하고 그 이후 14일간 휴약합니다. 이것을 1사이클로 하여 투여를 반복합니다. 다만, 이 약의 투여에 의한 것으로 판단되는 임상 검사치 이상(혈액검사, 간·신기능 검사) 및 소화기 증상이 발현하지 않아 안전성에 문제가 없는 경우에는 휴약을 단축할 수 있으나 그 경우에도 적어도 7일간은 휴약합니다. 다만, 환자의 상태에 따라 적절히 증감합니다. 증강량의 단계는 40mg, 50mg, 60mg, 75mg/회로 합니다. 증량은 위와 마찬가지로 안전성의 문제가 없어 증량이 가능한 것으로 판단되는 경우에 초회 기준량으로부터 한 단계까지 75mg/회를 한도로 합니다. 다만, 김량은 보통, 한 단계씩 행하고, 최저투여량은 40mg/회로 합니다.

체표면적	초회 기준량(테라푸르 상당량)
1.25m <sup>2</sup> 미만	40mg/회
1.25m <sup>2</sup> 이상 ~ 1.5m <sup>2</sup> 미만	50mg/회
1.5m <sup>2</sup> 이상	60mg/회

Drug	Case	Response rate (%)	Author (year)
UFT <sup>1)</sup>	104	27.7%	Ota (1988)
5'-DFUR <sup>2)</sup>	140	14.3%	Nitani (1985)
CDDP <sup>3)</sup>	68	19.1%	Ishibiki (1989)
CPT-11 <sup>4)</sup>	60	23.3%	Futatsuki (1994)
TS-1 <sup>5-1) 2)</sup>	101	44.6%	Sakata Koizumi (1998) (2000)
Docetaxel <sup>6-1) 2)</sup>	59	23.7%	Taguchi Mai (1998) (1999)
Paclitaxel <sup>7)</sup>	60	23.3%	Ohtsu (2001)

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2) Gan To Kagaku Ryoho. 1985 Oct;12(10):2044-51

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