Synoptic reporting in head and neck cancers— Head and Neck Cancer Imaging Reporting and Data Systems (HN-CIRADS): The journey ahead for standardization of imaging in head and neck cancer staging

ABSTRACT

Although CT and MRI are crucial imaging modalities for the preoperative staging and surgical planning of head and neck tumors, the quality of reports, as well as adequate imaging methodology, are equally critical. The content and quality of the report, and proper communication of these findings to the treating physicians are the important determinants of optimal patient care. Synoptic reporting is a method of presenting specified data pieces in a predetermined format. When compared to random reporting, synoptic reporting gives standardized information in less time. It enables more comprehensive reports and ensures that no details are overlooked. By highlighting the crucial imaging results and altering overall management, it ensures improved surgical planning.

Keywords: Head and neck cancers, imaging findings, radiologist, radiology, synoptic reporting

Head and neck cancers are a major health burden in India due to the widespread use of tobacco in various forms. For proper care, clinical evaluation is required at the time of diagnosis and local staging of the disease. Characterization of tumor imaging, on the other hand, is critical for staging of deep-seated tumors. In the current era, reporting in head and neck cancers is mainly in free-text form. Therefore, the quality and structure of the report depend on the experience.[1]

Poor documentation of lesions and lack of communication has led to inadequate staging and suboptimal management. Hence, there is a need for synoptic reporting to standardize reports, reduce hassle, and better understand the disease status. Here, we propose the use of Head and Neck Imaging-Reporting and Data System (HNI-RADS) for synoptic reporting in head and neck cancers.

WHAT IS SYNOPTIC REPORTING?

Reporting is a means of communication to physicians and patients. Therefore, it undoubtedly needs to be precise and should not miss any vital information.[2] Synoptic reporting involves reporting specific data elements in a particular

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format. This provides standardized information in lesser time than random reporting.[3]

Certain key elements that are common to all synoptic reporting formats has been described in Supplementary Figure 1.

ADVANTAGES

1. It allows for more detailed reporting and ensures nothing is missed. It ensures better surgical planning and communication by clinicians for treatment decision-making.
2. Templates are regularly updated as per recent guidelines and clinician requirements.
3. Synoptic reporting systems also generate reminders and alerts that help to carry out patient care tasks on schedule.
4. Synoptic reporting facilitates data analysis, as one can analyze all data elements separately and more easily. Hence, it helps to understand patient outcomes with different therapies. Structured reports are recommended for any research activity involving radiology reporting, and databases have been generated over which automated informatics can be run.[3]
5. Tumor response evaluation becomes efficient and effective as unnecessary data are excluded.

Table 1: Techniques for acquisition of head and neck imaging

Site	Ideal	Optional
Oral cavity	CECT PNS and NECK with CT Thorax Pros-High accuracy for bone invasion. Adequate for soft-tissue extent. Cons- Dental amalgam artifacts can be a problem.	MRI- Pros-Accurate for T staging and relations. Perineural spread more accurate than CT. Cons-Problem of motion and swallowing artifacts
Tongue	MRI HEAD and NECK with CT Thorax	DWI for nodes
Hypopharynx	CECT PNS and NECK with CT Thorax	MRI- Pros-Accurate for T staging and paraglottic and preepiglottic space involvement. Cons-Problem of motion and swallowing artifacts.
Larynx	CECT PNS and NECK with CT Thorax	CECT PNS and NECK with CT Thorax MRI- Pros-Accurate for T staging and Cartilage assessment. Cons-Problem of motion and swallowing artifacts.
Paranasal Sinuses	MRI HEAD and NECK including 3D-FSPGR and CT PNS and NECK with CT Thorax	DWI for nodes

CT: Computed tomography; PNS: Paranasal sinuses; MRI: Magnetic resonance imaging; CECT: Contrast enhanced computed tomography; DWI: Diffusion weighted imaging; 3D FSPGR: Three dimensional fast spoiled gradient echo

DISADVANTAGES

1. Increasing volume, and a variety of data variables and poor formatting can result in information overload.
2. It has been shown that increased clerical errors may occur with an increased number of required elements in synoptic reporting.[1]

IMAGING MODALITY OF CHOICE IN HEAD AND NECK CANCER

Superficial and easily accessible structures are best evaluated by clinical examination and endoscopy. However, deep structure involvement, depth of invasion, bony erosion, and perineural spread are only assessed via imaging [Table 1].

Various techniques have been highlighted to delineate structures on computed tomography (CT) images, which are as follows [Table 2][4]:

1. Puffed cheek technique: The patient is instructed to blow through pursed lips consistently while moving the tongue away from the hard palate and teeth. The retromolar trigone, buccinator, pterygomandibular raphe, and cheek are all clearly defined.[4,5]
2. Modified Valsalva maneuver: Expiration is performed against pursed nose for nasopharynx, and against pursed lips for hypopharyngeal lesions (opposed to closed glottis in Valsalva maneuver).[6]

Table 2: Imaging protocol in head and neck cancers

Technique	Indication	Upper section	Lower section	Type of reformats
Puffed cheek technique	Between buccal and gingival mucosal lesions/ gingival and tongue surface	Hard palate	Inferior edge of the mandible	Sagittal: lip Coronal: cheek
Modified Valsalva maneuvre	Hypopharyngeal tumors: to see laryngeal vestibule and pyriform sinuses nasopharynx lesions	Hyoid bone	Upper part of the trachea	Sagittal: for post cricoid lesions Coronal: for pyriform sinuses
Phonation	True and false vocal cord lesions	Hyoid bone	Upper part of the trachea	Coronal±VR
Open-mouth technique	Demonstration of lesion obscured by dental amalgam artifacts	Maxillary teeth	Mandibular teeth	Sagittal/coronal

VR: Volume rendering

3. Phonation: The patient is asked to say "eee" uniformly for at least 10 seconds and a scan is acquired.
4. Open mouth technique: A device (50 cc syringe) is placed between the teeth to immobilize the open mouth position.[7]

SITE-SPECIFIC SYNOPTIC REPORTING

Head and neck squamous cell carcinomas (HNSCCs) can be categorized into the following groups based on the anatomical subsite:

(1) Oral cavity and lips: Consist of buccal mucosa-buccinator complex along with upper and lower gingivobuccal sulcus, upper and lower alveolar region, retromolar trigone, hard palate, floor of the mouth, and anterior part of the tongue, i.e., anterior to the circumvallate papillae. The oropharynx consists of the soft palate and base of the tongue including the uvula, tonsils, and pharyngeal walls.[8,9]

(2) Hypopharynx: Consists of the bilateral pyriform sinuses, post cricoid region, and posterior hypopharyngeal wall.

(3) Nasopharynx

(4) Larynx

- Supraglottic portion (suprahyoid epiglottis with both lingual and laryngeal surfaces, aryepiglottic folds, arytenoid cartilages, the false vocal cords, and the ventricles),
- Glottis (true vocal cords and the anterior and posterior commissures), and

Table 3: Key imaging findings and their implications on management

SITE	SOFT TISSUE	BONE EROSION	PERINEURAL SPREAD[13]
Gingivo-buccal sulcus [14]	A) Low: upfront surgery[15] B) High infratemporal fossa involvement: i) Anterior (retroantral fat): upfront surgery or post neoadjuvant chemotherapy[16] ii) Posterior (pterygopalatine fossa and pterygomaxillary fissure): palliative	A) No or superficial cortical erosion[17]: anterior posterior extent of para-mandibular soft tissue i) < 1 cm: mandible preserving mandibulectomy[18] ii) > 1 cm: marginal mandibulectomy B) Deep or medullary cortical erosion: segmental mandibulectomy	A) Supranotch: palliative B) Infranotch: resectable depending on soft tissue extent
Tongue[14]	A) Depth of invasion >10 mm: poor prognosis and requires adjuvant radiotherapy[19] B) Tumor thickness >4 mm: high incidence of contralateral nodal metastasis (warrants contralateral nodal dissection)[20] C) Spread across midline: glossectomy is contraindicated. Treated with neck dissection and radiotherapy D) Involvement of floor of the mouth/base of the tongue: relative contraindication to surgery, treated with chemoradiotherapy. E) Extension to masticator space: treated with palliative radiotherapy	Involvement of hyoid bone: treated with chemoradiotherapy	Involvement of contralateral neurovascular bundle: glossectomy is contraindicated, treated with neck dissection and radiotherapy
Nasopharynx[21]	A) Parapharyngeal space/prevertebral space[22] B) Skull base involvement[23] C) Carotid vessel encasement/meningeal involvement All are treated with concurrent chemoradiotherapy[24]		
Lip	Depth of invasion for staging and prognostication	Neoadjuvant chemotherapy followed by upfront surgery	Resectable depending on soft tissue extent
Hard palate			Resectable, if pterygopalatine fossa involved Unresectable, once it reaches the skull base
Larynx[25]	Epicenter and craniocaudal extent: radiotherapy planning[26] Size in three dimensions: radiotherapy planning Volume if needed by the clinician: prognosis Extent of transglottic spread: planning surgery Pre-epiglottic space (minimal/extensive): laser vs chemoradiotherapy Pre-epiglottic space invasion, paraglottic space invasion, post cricoid region invasion: multimodality treatment Anterior commissure invasion: early T1B vs T3/T4A Posterior commissure invasion: contraindicated laser Subglottic cancers: anterior and posterior CC extent: cricoid conserving surgery Extra capsular spread (ECS), relation carotid artery: prognosis.[27]	A) Arytenoid/cricoarytenoid joint invasion: contraindicated laser. AC joint: radiotherapy B) Thyroid/cricoid cartilage erosion: contraindication for radiotherapy and treated with surgery.[28] Erosion of inner cortex of thyroid lamina: multimodality, but no need for radical surgery. Destruction of both cortices and/or extra laryngeal spread: total laryngectomy C) Hyoid bone invasion: influences type of surgery	
Nodes	Presence of necrosis decreases survival Extra capsular spread decreases survival Relation to carotid artery: Angle of contact <180 indicates easily resectable, > 270 indicates unresectable[29]		

ORAL CAVITY

CT/ MR legend:
CT scan/ MR scan of the neck dated:

Oral cavity (Buccal, Lip, alveolus, palate and RMT).

T stage:

Laterality:

Location/ epicentre: Buccal mucosa/ Retromolar trigone/ Alveolus/ Lip
If buccal mucosa: gingivobuccal sulcus (GBS) involvement: upper/ lower/ both
If Retromolar trigone: upper/ lower/ both
If lip: upper/ lower/ angle
Alveolus: upper/ lower

Whether Measurable/ Nonmeasurable.
If measurable
Size: ….X …. X … cm. (<2 cm, 2-4 cm,> 4 cm)
Depth of invasion: (Previous Depth of invasion :)

Primary Disease extent:

Retromolar trigone: Not involved/ Involved
Floor of mouth: Not involved/ Involved
Gingivolingual sulcus: Not involved/ Involved
Tongue: Not involved/ Involved

Masseter muscle involvement: Not involved/ Involved
Masticator space involvement: Not involved/ Involved

Infratemporal fossa: Not involved/ Involved
If yes Extension to High Infratemporal fossa: Present/ Absent

Retroantral space extension: Not involved/ Involved
Medial pterygoid muscles involvement: Not involved/ Involved
Lateral pterygoid muscles involvement: Not involved/ Involved

Pterygoid plates: Not involved/ Involved
Pterygopalatine fossa: Not involved/ Involved
Pterygomaxillary fissure: Not involved/ Involved
Temporalis Muscle: Not involved/ Involved
Condylar fossa: Not involved/ Involved

Maxillary sinus involvement: Not involved/ Involved
Hard palate involvement: Not involved/ Involved

Skin involvement: Not involved/ Involved
Specific comments, if any:

Perineural spread: Absent/ Present/ cannot be commented*
If present:
Nerve involved (V1, V2, V3 etc):

Cranial extent of perineural:
Extension up to skull base: Absent/ Present/ Suspicious or cannot be commented*
If yes: foramen ovale, foramen rotundum, vidian canal, greater palatine foramen

Intracranial extension: Present/ Absent/ Suspicious or cannot be commented*
If yes: cavernous sinus involvement: Present/ Absent

Vascular involvement: Absent/ Present (with CCA and ICA)
If present angle of contact: <90, 90 – 179, 180 – 269; >270
IJV status:

Bone status
Dentition: Absent/ Present
Bony Erosion: Absent/ Present: if present: maxillary/ mandibular

If absent:
Height of the mandible free from Para mandibular soft tissue: ….. mm

If present:
Bone invasion absent or limited to cortical bone: Absent/ Present
Medullary/ marrow invasion: Absent/ Present
Mandibular canal (MC) involvement: Absent/ Present
Mandibular foramen (MF) involvement: Absent/ Present
If yes, Superior extent: foramen ovale/ cavernous sinus

The height of the intact mandible at the site of erosion:

N stage
Presence of nodal disease: Metastatic/ Benign (reactive) / Indeterminate
If indeterminate/ suspicious: need for additional imaging

Laterality- Ipsilateral / contralateral / Bilateral
Right levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal
Left levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal

Necrosis: Absent/ Present
Perinodal extension/extracapsular spread: Absent/ Present

Vascular involvement:
IJV: involved/ compressed/ cannot be commented upon
CCA abutment: Absent/ Present
ICA abutment: Absent/ Present
ECA abutment: Absent/ Present
If present angle of contact for CCA and ICA: <90, 90 – 179, 180 – 269; >270
Strap muscles involvement: Absent/ Present
Prevertebral fascia invasion: Absent/ Present

Size of the largest node:
Right side: ….. mm and level
Left side: ….. mm and level

M Stage
Lung nodules: Absent / Present
If present:
solitary/ multiple
location:
Size:
suspicious/ TSTC@/ Benign
Any other metastatic lesion (hepatic, adrenal, skeletal): Absent / Present
If yes, specify location and size:

Impression:
T stage
N stage
M stage

Specific comments, if any:
* Needs additional imaging.
# Needs additional imaging/ FNAC correlation.
@ Follow-up/ image guided FNAC correlation.

TSTC: too small to characterise

Figure 1: Reporting format used in our department for staging of oral cancers

- Sub glottis (from true vocal cords to the inferior margin of the cricoid).

Lips, oral cavity, and oropharynx

American Joint Committee on Cancer (AJCC) 8th edition

changes[10,11]:

- Depth of invasion (DOI) is a critical criterion for T staging and prognostication (measured as perpendicular distance from the surface).
- Extranodal extension (ENE) is an independent prognostic sign (imaging characteristics such as perinodal fat stranding, infiltration into neighboring fat or muscle, and necrosis have a high specificity for predicting ENE).[12]
- Human papillomavirus (HPV) p16-positive tumors have a better prognosis and are staged separately. Primary tumors in p16-positive patients tend to have lower apparent diffusion coefficient (ADC) values and higher kurtosis and skewness and large, multiple, and/or bilateral cystic nodes.[13]

Implications of key imaging findings in various head and neck cancers are shown in Table 3.

Gingivobuccal, alveolus and retromolar trigone squamous cell carcinoma (SCC) [Figure 1]:

- Most prevalent in Asian patients
- Stages I and II cancers (T1-T2, N0) can be treated with single-modality treatment like surgery or radiotherapy (RT) for the primary tumor, which varies from patient to patient. Radiologists must be well-versed with the terms masticator space, infratemporal fossa (ITF), supranotch, and infranotch disease on the basis of the structures involved.[30]

According to 8th edition of the AJCC, disease involving masticator space is labelled as advanced T4b disease and deemed unresectable. However, Liao *et al.*[33] have reported that supranotch or high ITF disease has a poor outcome, whereas low ITF disease has a reasonably good outcome.

Key imaging features with implications on management and surgical planning:

- Extranodal extension[31]
- Depth of invasion[32]
- High vs low ITF involvement[33]
- Bone erosion[34]
- Perineural spread[35]

More than 1.5 cm residual mandibular vertical height is required for mandible preservation surgery, whereas para-mandibular soft tissue, inferior alveolar canal involvement, and edentulous mandible are contraindications for marginal mandibulectomy.[36,37]

For early detection of perineural dissemination, dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) is the method of choice. There is an increased enhancement

CARCINOMA TONGUE

Laterality:
Tumour size (AP x transverse x CC) MM:
Depth of invasion MM:

T stage:
Crosses the midline: No/ abuts lingual raphe/ yes.
Extrinsic muscles: Not involved/ Involved
Genioglossus: Not involved/ Involved (origin/ insertion)
Hyoglossus: Not involved/ Involved (origin/ insertion)
Geniohyoid: Not involved/ Involved (origin/ insertion)

Lingual neurovascular bundle (NVB): Not involved/ Involved (grade:0/I/II/III)
If involved: Unilateral/bilateral
Sublingual space: Not involved/ Involved
Submandibular space: Not involved/ Involved

Mylohyoid: Not involved/ Involved (origin/ insertion)
Floor of mouth: Not involved/ Involved

Masticator space: Not involved/ Involved
ITF: Not involved/ Involved.
If yes Extension to High Infratemporal fossa: Present/ Absent

Posterior one-third of the tongue (BOT):Not involved/ Involved
RMT: Not involved/ Involved
Tonsillo-lingual sulcus: Not involved/ Involved
Tonsil: Not involved/ Involved

Inferior extent: up to vallecular/ epiglottis / PFS
Hyoid: Not involved/ Involved (Distance from hyoid bone)
Valleculae- Not involved/ Involved
Epiglottis: Not involved/ Involved
PFS: Not involved/ Involved

Mandibular involvement:
Cortical breach: Present/ absent
Marrow signal abnormality: Present/ absent
Need for additional imaging: yes (CT bone window)

N stage
Presence of nodal disease: Metastatic/ Benign (reactive) / Indeterminate
If indeterminate/ suspicious: need for additional imaging.

Laterality- Ipsilateral / contralateral / Bilateral.
Right levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal.
Left levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal.

Necrosis: Present/ Absent.
Perinodal extension/extracapsular spread: Present/ Absent.

Vascular involvement:
IJV: involved/ compressed/ cannot be commented upon.
CCA: Present/ Absent
ICA: Present/ Absent
ECA: Present/ Absent
If present angle of contact for CCA and ICA: <90, 90 – 179, 180 – 269; >270
Strap muscles involvement: Present/ Absent
Prevertebral fascia invasion: Present/ Absent

Size of the largest node:
Right side: ….. mm and level.
Left side: ….. mm and level.

Impression:
T stage
N stage
Specific comments, if any:
Needs additional imaging/ FNAC correlation
@ Follow-up/ image guided FNAC correlation

Involvement of lingual neurovascular bundle grading:
Type I: NVB free and away from the tumor by ≥5 mm
Type II: NVB at <5 mm distance from the tumor
Type III: Tumor abutting the NVB
Type IV: Tumor encasing the NVB

Figure 2: Reporting format used in our department for staging of tongue cancers

CARCINOMA NASOPHARYNX
CT/ MR legend:
CT scan/ MR scan of the neck dated:

Laterality: Right/ Left/ Both
Crossing midline: No/ Yes
Tumour size (AP x transverse x CC)

Primary tumor extent:
Fossa of Rosenmuller: Not involved/ Involved
Eustachian tube opening: Not involved/ Involved
Pharyngobasillar fascia: Not involved/ Involved
Levator Veli Palatini: Not involved/ Involved
Tensor Veli palatini: Not involved/ Involved
Parapharyngeal space: Not involved/ Involved
Carotid space: Not involved/ Involved
Pterygoid muscles: Not involved/ Involved
If present: medial/ lateral/ both
Infratemporal fossa: Not involved/ Involved
Pterygoid plates: Not involved/ Involved
Pterygopalatine fossa: Not involved/ Involved
Pterygomaxillary fissure: Not involved/ Involved
Masseter muscle: Not involved/ Involved
Masticator space: Not involved/ Involved

Intra-nasal extension: Not involved/ Involved
Pre-vertebral muscles: Not involved/ Involved
Clivus (altered marrow signal): Not involved/ Involved
Intra-cranial extension: absent/ Present
If present: extent
Dural enhancement: Not involved/ Involved
Parenchymal involvement: Not involved/ Involved
Oropharynx: Not involved/ Involved

Perineural spread:
Absent/ Present/ cannot be commented*
If present:
Nerve involved (V1, V2, V3 etc):
Cranial extent of perineural:
Extension up to skull base: Present/ Absent/ Suspicious or cannot be commented*
If yes: foramen ovale, foramen rotundum, vidian canal, greater palatine foramen
Intracranial extension: Present/ Absent/ Suspicious or cannot be commented*
If yes: cavernous sinus involvement: Present/ Absent

N stage:
Presence of nodal disease: Metastatic/ Benign (reactive) / Indeterminate
If indeterminate/ suspicious: need for additional imaging

Laterality- Ipsilateral / contralateral / Bilateral
Right levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal
Left levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal
Necrosis: Absent / Present
Perinodal extension/extracapsular spread: Absent / Present

Vascular involvement:
IJV: involved/ compressed/ cannot be commented upon
CCA abutment: Absent / Present
ICA abutment: Absent / Present
ECA abutment: Absent / Present
If present angle of contact for CCA and ICA: <90, 90 – 179, 180 – 269; >270
Strap muscles involvement: Absent / Present
Prevertebral fascia invasion: Absent / Present

Suspicious nodes: above cricoid only / above and below cricoid
Size of the largest node:
Right side: ….. mm and level
Left side: ….. mm and level

Impression:
T stage
N stage
Specific comments, if any:
* Needs additional imaging.
# Needs additional imaging/ FNAC correlation.
@ Follow-up/ image guided FNAC correlation.

Figure 3: Reporting format used in our department for staging of nasopharyngeal cancers

Table 4: Neck Imaging-Reporting and Data System (NI-RADS) surveillance imaging

	Key Findings	Interpretation	Recommendation
NI-RADS 1	Postoperative changes		
NIRADS 1F	First post-treatment baseline study: Near complete response in primary tumor with or without residual perineural enhancement.	No recurrence	Routine follow up (6 months)
NI-RADS 2	Ill-defined lesion/low FDG uptake		
NIRADS 2F	First post-treatment baseline study: Partial response in the primary tumor with no change in soft tissue in skull base foramina and perineural regions or new thin smooth enhancement in radiation field.	Low suspicion of recurrence	Short follow up (3 months)/PET/direct inspection
NI-RADS 3	Discrete or new lesion/ intense FDG uptake	High suspicion of recurrence	Biopsy
NI-RADS 4	Pathology proven/ clinical or radiological progression	Definitive recurrence	Therapy

NI-RADS: Neck imaging-reporting and data system; PET: Positron emission tomography, FDG: Fluorodeoxyglucose

along the relevant nerve due to a disruption of the blood-nerve barrier.[38,39]

Lip SCC

These are better evaluated clinically. Advanced cancers are imaged to look for bony erosion and nodal disease.

SCC of the tongue and floor of the mouth

- SCCs of the tongue usually occur along the ventral/lateral surface.
- Depth of invasion is crucial in disease staging.[40]
- The pattern of lymphatic spread of SCCs of the oral tongue, lip, and floor of the mouth is predominantly to levels I and II nodes.[41]
- Imaging protocol includes coronal short tau inversion recovery (STIR) and T1-weighted images, axial T1-weighted and T2-weighted images, sagittal T2-weighted images, diffusion-weighted images in the axial plane for nodal assessment, and post-contrast images in all three planes [Figure 2].

Nasopharyngeal SCC (NSCC)

- It is prevalent in northeast Asia.[42]
- The primary treatment is external beam radiation to

LARYNX AND HYPOPHARYNX
CT/ MR legend:
CT scan/ MR scan of the neck dated:

Primary:

Laterality:
Larynx/ Hypopharynx:
If Larynx: epicentre of disease: Glottic/ Supraglottic/ Sub glottic
If hypopharynx: epicentre of disease: Pyriform sinus/ post-cricoid
Whether Measurable/ Nonmeasurable. If measurable
Tumor Volume/Transverse dimensions: ……. (AP x transverse x CC)
Volume:….cc

T stage:
Epiglottis: Not involved/ Involved: If Involved: Free edge (ipsilateral / both sides)/ Base
Pre-epiglottic space: Not involved/ Involved: If Involved: Less than 25 % / Less than 50%/ More than 50%
Vallecula: Not involved/ Involved: If Involved: ipsilateral/ both sides
Hyoid bone: Not Involved/ Involved: If Involved: (erosion/ sclerosis)/ cannot be commented

Medial wall of pyriform & AE fold: Not Involved/ Involved: If Involved: (Ipsilateral/Contralateral)
Lateral wall of pyriform sinus: Not Involved/ Involved
Apex of pyriform sinus: Not Involved/ Involved

Para Glottic Space: Not Involved/ Involved (a) at false cord level b) true cord level) both
False vocal cord: Not Involved/ Involved
True vocal cord: Not Involved/ Involved
Anterior commissure: Not Involved/ Involved
Posterior commissure: Not Involved/ Involved

Sub-Glottis: Not Involved/ Involved (if involved inferior extent in mm)
Post cricoid: Not Involved/ Involved
Trachea: Not Involved/ Involved
Thyroid gland: Not Involved/ Involved

Pre-vertebral fascia: Not Involved/ Involved/ Indeterminate

Cartilage erosion:
Thyroid cartilage: Not Involved/ Involved: If Involved: (sclerosis/ erosion-lysis/ encased & displaced)
If Eroded: Unilateral/Bilateral laminae, Outer/ Inner cortex/both
Arytenoid cartilage: Not Involved/ Involved: If Involved: (sclerosis/ erosion-lysis/ encased & displaced).

Cricoid cartilage: Not Involved/ Involved: If Involved: (sclerosis/ erosion/ lysis/ marrow invasion)
Crico-arytenoid joint: Not Involved/ Involved
Exolaryngeal Spread: absent/ Present,
If present mode of spread-through eroded thyroid cartilage/ through thyrohyoid membrane/ along the posterior aspect of the thyroid cartilage.

N stage:
Presence of nodal disease: Metastatic/ Benign (reactive) / Indeterminate
If indeterminate/ suspicious: need for additional imaging

Laterality- Ipsilateral / contralateral / Bilateral
Right levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal
Left levels: Levels IA & IB/II, III, IV, V, VI & retropharyngeal

Necrosis: Absent / Present
Perinodal extension/extracapsular spread: Absent / Present

Vascular involvement:
IJV: involved/ compressed/ cannot be commented upon
CCA abutment: Absent / Present
ICA abutment: Absent / Present
ECA abutment: Absent / Present
If present angle of contact for CCA and ICA: <90, 90 – 179, 180 – 269; >270
Strap muscles involvement: Absent / Present
Prevertebral fascia invasion: Absent / Present

Size of the largest node:
Right side: ….. mm and level
Left side: ….. mm and level

M Stage
Lung nodules: Absent / Present
If present:
solitary/ multiple
location:
Size:
suspicious/ TSTC@/ Benign

Any other metastatic lesion (hepatic, adrenal, skeletal): Absent / Present
If yes, specify location and size:
Impression:
T stage
N stage
M stage

Specific comments, if any:

Needs additional imaging/ FNAC correlation
@ Follow-up/ image guided FNAC correlation

TSTC: too small to characterise

Figure 4: Reporting format used in our department for staging of laryngeal cancers

the nasopharyngeal bed and primary draining lymph node, although in advanced illness, concomitant cisplatin-based chemotherapy is administered.[43]

- Direct visualization with flexible endoscopy is the most sensitive modality for demonstrating mucosal nasopharyngeal SCCs; however, deep-seated lesions require magnetic resonance imaging (MRI) [Figure 3].
- Imaging protocol:

(1) T1 axial and sagittal for skull base involvement
(2) T2 axial for peripheral nervous system involvement
(3) T1 post-contrast axial for perineural spread
(4) Diffusion-weighted imaging

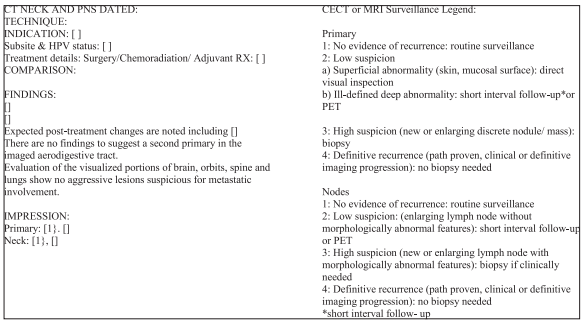
Laryngeal SCCs

SCCs accounts for 90% of laryngeal cancer cases with lymphoma being the second-most common diagnosis. Hoarseness is the most common symptom of laryngeal cancer, but other symptoms include a neck lump, dysphagia, stridor, and hemoptysis. Speaking, breathing, and swallowing are all affected by impaired laryngeal function caused by cancer and its treatment [Figure 4].

Neck node imaging

Nodal stations:

(1) Gingivobuccal and retromolar trigone malignancies drain to levels IB, II, and III.
(2) Oral and tongue malignancies drain to levels I, II, and III (contralateral adenopathy is also seen in tongue



CT NECK AND PNS DATED:
TECHNIQUE:
INDICATION: [ ]
Subsite & HPV status: [ ]
Treatment details: Surgery/Chemoradiation/ Adjuvant RX: [ ]
COMPARISON:

FINDINGS:
[]
[]
Expected post-treatment changes are noted including []
There are no findings to suggest a second primary in the imaged aerodigestive tract.
Evaluation of the visualized portions of brain, orbits, spine and lungs show no aggressive lesions suspicious for metastatic involvement.

IMPRESSION:
Primary: [1]. []
Neck: [1], []

CECT or MRI Surveillance Legend:

Primary
1: No evidence of recurrence: routine surveillance
2: Low suspicion
a) Superficial abnormality (skin, mucosal surface): direct visual inspection
b) Ill-defined deep abnormality: short interval follow-up*or PET

3: High suspicion (new or enlarging discrete nodule/ mass): biopsy
4: Definitive recurrence (path proven, clinical or definitive imaging progression): no biopsy needed

Nodes
1: No evidence of recurrence: routine surveillance
2: Low suspicion: (enlarging lymph node without morphologically abnormal features): short interval follow-up or PET
3: High suspicion (new or enlarging lymph node with morphologically abnormal features): biopsy if clinically needed
4: Definitive recurrence (path proven, clinical or definitive imaging progression): no biopsy needed
*short interval follow- up

Figure 5: Reporting format used in our department for post-treatment evaluation of head and neck cancers

malignancies as a result of the disease crossing the midline).

(3) Nasopharyngeal malignancies drain to levels II and V.
- The survival rates are reduced by 50% with a solitary lymph node metastasis from HNSCC, which is further reduced to 33% with contralateral node metastasis.
- Morphological indicators of nodal metastasis include loss of fatty hilum, rounded appearance, necrosis, and cystic changes.

POST-TREATMENT EVALUATION

1. For surveillance imaging (adopted from NI-RADS): It is performed in a manner similar to Breast Imaging-Reporting and Data System (BI-RADS) [Table 4 and Figure 5][44]
2. Post-neoadjuvant chemotherapy evaluation: It is performed for response assessment. Reporting template is similar to primary staging with documentation of change in the size and appearance of any new lesions.
3. Post-palliative chemotherapy/Metronomic therapy

CONCLUSION

The quality of the report and clear communication of findings to treating physicians play an essential role in patient management. Synoptic reporting provides standardized information in shorter time and ensures detailed reports without missing significant findings, thereby affecting overall patient management.

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Nil.

Conflicts of interest
There are no conflicts of interest.

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Demographics
(Information provided by RIS and DICOM headers)

Name of facility where examination was provided

a. Name of the patient

b. Patient's gender

c. Patient's date of birth and age

d. Name(s) of referring physician(s) or other health care provider(s)

e. Name of type of examination

f. Date and time of the examination

g. Date and time of dictation and final transcription

Relevant clinical information

a. Clinical symptoms

b. Addictions – Smoking/Alcohol/ Chewing tobacco

c. Co-existing health morbidities – COPD/ Diabetes Mellitus/ Immunocompromised status

d. Occupational history for any relevant occupational exposures

e. Previous cancer

f. Previous surgery

g. Previous chemotherapy or radiation

h. Current working diagnoses (if any)

i. Recent most relevant lab tests and/or imaging tests

Body of the report:

a. Type of study and the technical protocol

b. Contrast information

c. Quality of examination

d. Comparison to the previous study and date

Supplementary Figure 1: Key elements of Synoptic Reporting common to all reports in Head and Neck cancer using HN- CIRADS