its impact on bladder late sequelae.

Thoracic

CT scan guided percutaneous interstitial brachytherapy for malignant lung lesions

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Aim: To study the feasibility of CT scan guided percutaneous interstitial brachytherapy (IBT) in malignant lung lesions in patients with primary/ metastatic carcinoma, not suitable for surgery. **Materials and Methods:** Eight patients with primary non small cell lung cancer (NSCLC) or lung metastases, were enrolled in this study. The procedure of IBT was carried out in CT scan room under local anesthesia. A single stainless steel blind end needle for lesions up to 4 cm and two needles for lesions up to 6 cm in diameter were used. The needle was inserted percutaneously through the intercostal space. CT scan based planning was done using slice thickness of 2.5 mm on PLATO planning system. A single dose of 12-20 Gy with high dose rate (HDR) brachytherapy was prescribed at the periphery of lesion. The treatment was delivered on remote afterloading HDR brachytherapy unit in adjacent room and the needle was removed immediately after treatment. An X-ray chest after 2 hours to rule out pneumo/hemothorax and a CT scan after 1 month of the procedure was done to assess status of the treated lesion. **Results:** There were 6 males and 2 females with a median age of 55 years. The lesion size raged from 3.0-5.5 cm (median 4.0 cm). The average time taken in IBT procedure was 50 minutes. No patient had hemo/ pneumothorax or hemoptysis during perioperative period. Only 1 patient had minimal pleural effusion on the next day of procedure. CT scan at one month revealed complete regression (CR) of the lesion in 1 patient; and more than 50% regression (partial regression, PR) in 5 patients and minimal response in 2 patients. At 6 months follow up, 5 patients had complete resolution of the lung lesion. **Conclusion:** CT scan guided IBT is safe and feasible in the treatment of malignant lung lesions. It provides effective tumor control and needs to be studied further.

Evaluation of response and toxicity of treatment in patients with locally advanced non-small cell lung carcinoma receiving concommitant radiotherapy with weekly cisplatin vs three weekly cisplatin

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Aims and Objective: To compare effects on the response and toxicity of treatment in patients with locally advanced non-small cell lung carcinoma receiving concomitant chemoradiotherapy with weekly cisplatin vs three weekly cisplatin. **Materials and Methods:** 40 patients were registered in this study with biopsy proven unresectable NSCLC without distant metastasis were randomized to one of two treatment arms. Arm A - Concurrent chemotherapy was given with weekly Inj.cisplatin 30 mg per sq. meter BSA and Arm B - Concurrent chemotherapy was given with Inj.Cisplatin 70 mg per sq. meter BSA on Day 1 and Day 22 of radiotherapy. All patients were treated by external beam radiotherapy with cobalt-60 with appropriate portals. Patients in both the groups were similar in terms of age (40-65 years), sex (males 80-85%), socio-economic status, history of tobacco smoking (85%) and extent of disease (all were stage III disease). Most common histopathology and site was squamous cell carcinoma (80%) & right upper zone (63%) respectively. 55% patients had history of past tuberculosis. Cough (82.5%) and chest pain (60%) were the most common presenting complaints along with dyspnoea (57.5%), anorexia and weight loss (60%). QOL was evaluated as per the EORTC QOL Questionnaire at the start of treatment, end of treatment and after one month of completion of treatment. **Results:** All the patients were eligible and assessable. The overall response rate was 60% in arm A Vs 70% in arm B. Complete response (20%/15%), partial response (40%/55%), stable disease (25%/15%) progressive disease (15%/15%) respectively in arm A and B at one month follow up. Common grade 3/4 toxicities were dysphagia (20-26%), nausea and vomiting (10-20%), skin reactions (10-15%), pneumonitis (8-12%), anemia, neutropenia and thrombocytopenia (5-10%). QOL assessments did not reveal any significant differences between the two groups. **Conclusion:** Our preliminary result presented in this work does not show any difference between the two arms. Newer treatment approaches with prospective randomized trial need to be evaluated in pursuance to find better avenues for patients of lung cancers.

Ruthenium 106 Plaque Brachytherapy: Indications and Outcome in Ocular Tumors

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Aim: To evaluate Ruthenium 106 (Ru-106) plaque brachytherapy in the management of intraocular and adnexal tumors.

Material and Methods: A retrospective review of the medical records of 84 eyes of 84 patients at the LV Prasad Eye Institute from January 2001 to August 2009 identified a spectrum of ocular tumors managed with Ru-106 plaque brachytherapy. We analyzed the patient demographics, tumor characteristics, radiation parameters, and final outcome. Tumor recurrence and eye salvage were the main outcome measures. **Results:** The tumors included uveal melanoma (28), ocular surface squamous neoplasia (19), choroidal hemangioma (19), retinoblastoma (16) and choroidal metastasis (2). **Uveal melanoma:** The mean patient age was 45.9 (range, 17-76) years. There were 14 male patients. Plaque brachytherapy was the primary treatment in 96% patients. The mean tumor diameter was 12.1 (7-21) mm and mean height was 5.3 (3-8) mm. A notch plaque was used in 71%. The mean tumor apex dose was 9528 (range, 6726- 15194) cGy and mean duration for treatment was 119.6 (45.7 – 261.9) hrs. Tumor regression rate was 67.8%, eye salvage was achieved in 82%, and 71.4% had useful residual vision (>20/200). Complications included scleral necrosis (7.1%), vitreous hemorrhage (7.1%), radiation retinopathy (3.5%), cataract (3.5%), and retinal detachment (3.5%). **Ocular surface squamous neoplasia:** The mean patient age was 49.3 (range, 33– 71) years. There were 10 male patients. Plaque brachytherapy was used to manage residual (excision base involvement on histopathology) or recurrent OSSN. The mean tumor diameter was 8.7 (5-15) mm, and the mean height was 2.3 (1.5-3) mm. A round plaque was used in all. The mean tumor apex dose was 5626 (range, 4896-6736) cGy and mean duration for treatment was 22 hrs. Tumor regression rate was 84.2%, eye salvage was achieved in 78%, and 63.2% had useful residual vision (>20/200). One patient each had scleral necrosis and corneal epithelial defect. **Choroidal hemangioma:** The mean patient age was 28.7 (range, 9– 70) years. There were 8 male patients. Plaque brachytherapy was used as primary treatment in patients with choroidal hemangioma with diffuse subretinal fluid. The mean tumor diameter was 12.7(8-18) mm, and the mean height was 5 (3.6-9) mm. A notch plaque was used in 89%. The mean tumor apex dose was 3246 (range, 2496 - 6018) cGy and mean duration for treatment was 48.7(16 - 97.4) hrs. Tumor regression rate was 89.6%, eye salvage was achieved in all and 57.9% had improvement in visual acuity (>2 Snellen lines). **Retinoblastoma:** The mean patient age was 3.5 (range, 1.4– 6.7) years. There were 10 male patients. Plaque brachytherapy was used to treat residual or recurrent retinoblastoma. The mean tumor diameter was 9.8 (5 – 18) mm and mean height was 4.6 (2.5 – 6) mm. A notch plaque was used in 50%. The mean tumor apex dose was 4699 (range, 1955 - 7568) cGy and mean duration for treatment was 72 (16.8 – 124.8) hrs. Tumor regression rate was 68.8%, eye salvage was achieved in 60%, and 33.3% had useful residual vision (>20/200). Complications included radiation retinopathy in 6.6% and vitreous hemorrhage in 6.6%. **Choroidal Metastasis:** The patient age was 52 and 72 years, both

were male patients. Plaque brachytherapy was used to treat solitary choroidal metastasis. The tumor diameter was 4 mm and 13.6 mm and mean height was 5.2 (3.6 – 6.8) mm. A notch plaque was used in 100%. The mean tumor apex dose was 4995 (range, 4992 - 4998) cGy and mean duration for treatment was 48.5 (48.2 – 48.9) hrs. Tumor regression was seen in both, eye salvage was achieved in 100%, and 100% had useful residual vision (>20/200). No complications were encountered. **Conclusion:** 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.

Computer generated image guidance in Prostate Brachytherapy provides consistent post-implant dosimetry

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Aim: To demonstrate that an image guided intra-operative planning system using ultrasound guided needle placement with sagittal views results in consistent post-operative dosimetry. **Material and Methods:** In our institute 320 patients have had prostate brachytherapy performed using an intra-operative planning and delivery system (FIRST®). Of these, 172 patients have more than 24 months of follow up (range 24-56 months). The prescribed reference dose was 144Gy to the prostate plus 3-5 mm margin. Average seed activity was 0.434 mCi. Planning parameters were V100 > 99%, V150 (75 to 80%), V200 (35 to 40%) and intra-op D90 >190Gy. **Results:** The mean D90 planned intra-operatively was 194.4Gy (171.3-213.8Gy). Pre image guidance and inverse planning post implant D90 ranged from 133–199Gy (mean 162.7Gy), V100 85.8-99.4% (mean 93.9%). After image guidance the range of post op D90 decreased to 152–182.7Gy (mean 158.5Gy) and V100 90.1-98.3% (mean 93.8%). **Conclusion:** Computer guided intra-operative prostate brachytherapy with needle guidance and inverse planning allows for consistent intra-operative planning parameters that results in improved post-op dosimetry by reducing the range of post-op D90 to 30.7Gy vs. 66Gy and V100 to 8.2% vs. 13.6%.