superiority of IMRT. Our results were not able to confirm which treatment regimen is most optimal. So, further study is needed to confirm the optimal therapeutic regimen.

8574 POSTER

Preliminary Results of IGRT Treatment in Head Neck Squamous Cell Carcinoma − a Jaslok Hospital and Research Centre Experience

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Background: Head and neck cancer (HNC) is an ideal site for high precision radiotherapy technique like IMRT for optimal clinical outcome with reduction in normal tissue toxicity. We report our preliminary results of consecutive head and neck Squamous cell carcinoma (HNSCC) patients treated with intensity modulated radiotherapy (IMRT) with Image guidance by MV cone beam CT scan (CBCT). Analysis was done for the period of February 2009 to October 2010 after the installation of Siemens oncor expression machine in early 2009.
Materials and Methodology: Seventy patients of HNSCC were treated with 6 MV step and shoot IMRT simultaneous integrated boost technique with daily CBCT. The target volumes and organs at risk (OAR) were contoured appropriately as per consensus guidelines. The doses varied from 50 Gy to 70 Gy. Patient factor, tumour factor, treatment parameters and overall survival were analyzed.
Results: IMRT was used in 70 HNSCC patients, 53 (75.7%) males and 17 (24.3%) females. The median age was 57.5 years (range: 28−85 years). The common primary site was oral cavity 22 (31%), followed by larynx 18 (26%), hypopharynx 13 (18%), oropharynx 10 (15%) and the remaining others were para-nasal sinuses 7 (10%). The 76% of patients were in stage III and IV (16, 38) with remaining in stage I & II (2, 14).
Of 70 patients 46 patients were treated with definitive radiotherapy and the remaining 24 received adjuvant radiotherapy. The radiation dose varied from 50 Gy-70 Gy with a median of 70 Gy (70 Gy for definitive and 60 Gy for the adjuvant radiotherapy respectively. Cisplatin based induction chemotherapy (ICT) and concomitant chemotherapy (CRT) was administered in 17 and 26 patients respectively. Sixty seven (96%) patients completed the intended IMRT doses with 2 patients each required hospitalization and gap in radiation due to toxicity. The remaining 3 patients (4%) did not complete the planned treatment doses due to toxicity. Acute Grade 2&3, skin and mucosal toxicity was seen in 41 (60%), 5 (7%) and 45 (66%), 15 (22%) respectively.
After a median follow-up of 10 months, 46 (66%) had no disease, 12 (17%) patient had either persistent disease or locoregional recurrence, 3 (4%) developed distant metastases, 2 (3%) had second primary and 7 (10%) patients were lost to follow up. Grade 1&2 xerostomia was seen in 69% and 6% patients. The overall survival at 18 months is 67% in definitive group and 83% in adjuvant group.
Conclusion: Preliminary results of this cohort of patients show excellent control with acceptable toxicity, using IMRT with image guidance.

8575 POSTER

To Compare Effect of Two Different IMRT Planning Techniques on Parotid Doses in Patients With Nasopharyngeal Carcinoma

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Purpose: To compare effect of two different imrt planning techniques on parotid doses in patients with nasopharyngeal carcinoma.
Material and Methods: Ten patients with nasopharyngeal carcinoma referred to University of Istanbul Cerrahpasa Medical School were planned with arc and static 7 field imrt techniques. Simultaneus integrated boost technique was used to give 70 Gy (2.12 per fraction) to primary tumour and involved nodes 60 Gy(1.81 p/fr) to entire nasopharynx and 54 Gy(1.63 p/fr) to elective lymph nodes. While achiving this, parotid mean dose was less than to 26 Gy and maximum doses to spinal cord and brain stem were limited to 45 and 54 Gy respectively. Mean parotid doses were compared for two planning techniques with paired t test. Target coverage and dose inhomogenity were also evaluated by calculating conformity index (CI) and homogenity index.
Results: Target coverage and dose homogenity were identical and good for both planning techniques. CI; 1.05±0.08 ve 1.05±0.08 − HI; 1.08±0.02 ve 1.07±0.01 for arc and static field imrt respectively. Mean contralateral parotid doses 25.73±4.27 ve 27.73±3.5 ($p = 0.008$), where as ipsilateral parotid doses were 30.65±6.25 ve 32.55±5.93 for arc and ststic field imrt plans. Mean MU for ten patients was considerably lower for arc treatment 540.5±130.39 versus 1288.4±197.28 ($P < 0.001$).
Conclusion: Normal tissue especially parotid gland are better spared with Arc technique. MU is considerably shorter with Arc than IMRT technique for patients with nasopharyngeal carcinoma.

8576 POSTER

Inter-fractional Variation of Neck Lymph Node Target Volume Delineated According to RTOG Guideline

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Background: To evaluate the reproducibility of RTOG guideline based neck lymph node delineation and quantify the relative positional changes in node negative head and neck (H&N) cancer patients and normal control group.
Materials and Methods: Three node negative H&N cancer patients and 5 control group were enrolled in this study. Control group consisted of the healthy volunteers and they did not have any benign or malignant disease in H&N region. Eligible patients had to have a pathologic diagnosis of H&N cancer without lymph node metastasis. For setup accuracy, H&N thermoplastic masks and laser alignment were used in every acquired CT images. Both group had three sequential CT images in every two weeks. RTOG guideline based delineation of all neck lymph node level was done by one physician. C2 vertebral body was used as reference point to match in every CT images. Each sequential CT images and delineated neck lymph node levels were fused with primary image, then maximal radial displacement and differences in volume at each node levels were quantified in every 1.5 cm interval from skull base to caudal margin of neck lymph node Level IV.
Results: In control group and H&N cancer patients, the mean radial displacements were 2.62 mm (1.82 to 3.51 mm) and 3.00 mm (2.07 to 4.22 mm). There was no statistical significance between the groups in terms of mean displacement ($p = 0.155$). Both group had maximal displacement at 10.5 cm inferior from skull base (SB) and neck node level V (control group: 7.5 mm, patients group 11.3 mm). In addition, mean radial displacement was increased with distance from SB level (1.53±0.10 mm at SB, 2.22±0.14 mm at 3 cm, 2.56±0.21 mm at 6 cm, 4.10±0.41 mm at 10.5 cm, $p = 0.002$). For mean volume differences at each node levels, between retropharyngeal and level V lymph node volume changes showed statistical significance ($p = 0.04$). Weight changes in H&N cancer patients does not affect mean displacement ($p = 0.533$).
Conclusion: The results of this study suggest that more generous radial margin should be applied to the lower part of the neck lymph node level.

8577 POSTER

Evaluation of Using CT Gantry Tilt Scan on Head and Neck Patients With Dental Structure − Scans Show Less Metal Artifacts

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Background: The materials of high density create metal artifacts in the computed tomography (CT) scans used for radiation treatment planning(RTP). The metal artifacts from dental structures cause problems in head and neck cancer patients. Metal artifacts impair visualization of tumours and normal tissue, which causes error in the dose calculation by changing the CT number.
If we use CT gantry tilt scan, we can obtain images with reduced artifacts and accurately delineate the volume of various organization. By obtaining the correct CT number, we can minimize the error of dose calculation. The purpose of this paper is to evaluate the usability of the CT gantry tilt scan.
Materials and Methods: CT gantry tilt scanning was performed to avoid metal artifacts from dental structures and transverse images reconstructed from oblique images by gantry tilt scanning using a technique of multi-planar reconstruction(MPR). The reconstructed transverse images were used for the RTP.
By using Rando phantom with and without metal artifact, we created reduce metal artifact by gantry tilt scan image, and studied how it is affected by the metal artifact. Through using the intensity volume histogram (IVH) upon both parotid glands, we compared the homogeneity of CT number and the mean dose through dose volume histogram (DVH).
CT gantry tilt scan was applied to ten head and neck patients with dental structures. Through the acquired reduced metal artifacts images using CT gantry tilt scan, we compared and the metal artifact image, CT number and mean dose.
Results: In the comparison result of IVH using the Rando phantom, we could see that the influence of metal artifacts ware reduced in the gantry tilt scan image, and the homogeneity of the CT number improved. In the comparison of DVH, mean dose of the both parotids is as follows; without artifact (RT: 44.9%, LT: 48.6%), with artifact (RT: 48.5%, LT: 50.2%), and gantry tilt scan (RT: 44.6%, LT: 48.2%), the influence of metal artifacts was reduced in the gantry tilt image.
In comparison result of IVH of 10 patients, the homogeneity of the CT number was improved in the CT gantry tilt scan. In the result of DVH comparison, the mean dose of the both parotid glands showed the difference of 0.2−6%. Such difference in the result is from the error in calculation, as dose distribution was changed by the metal artifacts.

Conclusions: The greatest advantage of CT gantry tilt scan is that through the advanced image quality, we could reduce the metal artifact and clearly distinguish tumour from the normal tissue.
Also, through obtaining the accurate CT number, the error in calculation could be minimized.
Therefore, through this experiment, we could confirm that accurate treatment plan is possible for the head and neck patients with dental structures by using CT gantry tilt scan.

8578 POSTER

The Response Evaluation Using CT/MRI for Nasal Cavity and Paranasal Sinuses Malignancies Treated With Radiotherapy or Proton Beam Therapy

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Purpose: Recently, definitive radiotherapy (RT) and proton beam therapy (PBT) are often performed for the malignancies of nasal cavity or paranasal sinuses. In other cancers which can be treated with curative intent, salvage treatment including surgery is often taken into account if we designate these as non-complete response (non-CR) after RT or PBT. However, there are some long survivors with morphologically residual tumours in malignancies of nasal cavity and paranasal sinuses, and optimal timing for evaluation has not been sufficiently investigated.
Then, we review our clinical database and investigate the relevance of the response evaluation by CT/MRI for malignancies of nasal cavity and paranasal sinuses.
Materials and Methods: Patients fulfilling the following criteria were reviewed: 1) with nasal or paranasal malignancies treated by radiotherapy or proton beam therapy between January 1998 and December 2008, 2) received CT and/or MRI at least twice after the treatment (within 6 months and around 12 months). We employed the Response Evaluation Criteria in Solid Tumours (RECIST) ver. 1.1 as reference for evaluation of target lesions. Patients who had achieved CR at 6 months after treatment were defined as CR patients, while remaining patients as non CR patients. Overall survival and Disease free survival were analyzed using the Kaplan–Meier product limits and compared with the log-rank test.
Results: Sixty five patients were reviewed. Median age was 59 (range; 21−83) years, and 39 were male and 26 were female. Tumour pathological type varied, and of all, olfactory neuroblastoma (ONB; n = 20, 30%) and squamous cell carcinoma (SCC; n = 15, 23%) were the major types. Most of the patients had T4 or Kadish C disease (n = 51, 78%). The rates of complete response at 6 months after treatment were 15% and the total 2-year local control rate was 75.4%. With a median follow up 49.6 months, 3-year overall survival was 73.4%. In CR patients, the 2-year local control and 3-year overall survival rates were 88.9% and 77.8% respectively, while 73.2% and 72.6% in nonCR patients. There is no significant difference between two groups in overall survival (p = 0.65).
Conclusions: No correlation between within 6 months imaging evaluation and outcome was seen for patients with non-surgical therapy for malignancies of nasal cavity or paranasal sinuses. Further investigations regarding response evaluation using PET-CT or other modalities are mandatory.

8579 POSTER

Low Dose Weekly Paclitaxel Versus Cisplatin Concurrent With Radiation in Advanced Head and Neck Cancer

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Purpose: To compare the tolerability and efficacy of low dose weekly Paclitaxel versus cisplatin concurrent with radiation in locally advanced head and neck cancer.
Material and Methods: One hundred patients of locally advanced head and neck cancer were enrolled in the study from November 2009 to June 2010. All patients were randomised into two groups, study group A and control group B. Study group patients received injection Paclitaxel 30 mg/m^2 iv 1 hour infusion weekly for 6 weeks whereas control group patients received injection cisplatin 30 mg/m^2 iv 2 hour infusion weekly for 6 weeks. All patients were treated with concurrent radiation to a dose of 64- 70 Gy, 2 Gy/fraction, 5 fractions a week by cobalt teletherapy machine. Total treatment time was 6−7 weeks.
Results: Follow up data for 6 months was analysed and observed complete response rates of study and control group was 86% and 44% respectively. There was a highly significant difference in treatment response between the study and control groups [χ^2 = 19.76, df = 2, p value <0.001]. Local toxicities including mucositis, dysphagia and skin reactions were comparable between the two groups. At 6 months of follow up, 98% of patients in the study group and 44% in the control group were alive and disease free.
Conclusion: Low dose weekly infusion of Paclitaxel concurrent with radiation in locally advanced head and neck cancer is a promising and well tolerated regimen. Further studies of long term follow up are required to evaluate if this benefit will translate into prolonged survival.

8580 POSTER

The Routine Use of Harmonic Scalpel in Total Thyroidectomy is Associated With a Low Re-Bleed and Low Hypocalcaemic Rate

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Aim: Despite the published evidence of shorter operating time, less bleeding and good cosmesis, the use of harmonic scalpel remains controversial in thyroid surgery. Hypocalcaemia (transient or permanent) following total thyroidectomy has been reported to be as high as 24%. In our practise, the harmonic scalpel is used to seal both the STA and the branches of the ITA without additional ligation. The purpose of this study was to evaluate the feasibility, safety and outcome of this surgical tool in total thyroidectomy.
Methods: Data of all patients who underwent primary total or completion thyroidectomy between January 2009 and May 2010 were reviewed. Age, sex including co-morbidities, previous operations and laboratory investigations were recorded in a proforma and analysed.
Results: Study comprised of 89 consecutive patients without exclusions. 73 (82%) total and 16 (18%) completion thyroidectomies were performed using the harmonic scalpel. There were 80 (90%) female and 09 (10%) male with a median (*) age of 46* (range 28−81). Operative time was 105* (50–220) minutes. *Final histology showed 44(49%) had multinodular goitre, 25 (28%) thyroid cancer, 16 (18%) autoimmune disorders (grave's, hashimoto's)* and 4 (5%) had other benign conditions. None of the patients developed a post-operative neck haematoma requiring return to theatre and nor developed wound infections. Post operative hypocalcaemia was found in 3(3.5%) patients which was corrected with IV & oral replacement or oral replacement only. Inpatient stay was 2* (range 1−6) days and 49 (55%) only had an overnight stay. Follow up was 12* (range 6- 22) months. The transient hypocalcaemia in the three patients resolved within 8 weeks.
Conclusion: This study presents evidence that there is a very low incidence of return to theatre for bleeding with the routine use of the harmonic scalpel. It is also associated with a low level of both post-operative and permanent hypocalcaemia.

8581 POSTER

Diagnostic and Treatment With Endoscopy in Secondary Oncopathology of Orbit

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Material and Methods: 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.
Results and Discussion: A clinical characteristic of cranial orbital facial tumours 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 tumours of cranial orbital facial localization. The analysis of diplopia symptom demonstrated a presence of various types of diplopia in patients with tumours 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.
Conclusions: In all groups of localization an ophthalmic symptomatology is significantly pronounced, an otorhinolaryngologic and a neurologic symptomatology is more pronounced in larger lesions. Endoscopic