were 626.33±113.98, 550.28±122.56 and 254.06±18.56 respectively. The treatment time for IMRT, RA and 3D-CRT were 540±45s, 130±10s, 135±10s respectively.
Conclusions: RA assisted by ABC for HCC radiotherapy was feasible, with better dose distribution, fewer monitor unit, less treatment time and sparing more OARs.

2070 POSTER

The "BUONGIORNO" Project − an Italian Survey on the Incidence of Burnout Among Young Italian Radiation Oncologists

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Background: Burnout syndrome is a psychological syndrome due to prolonged exposure to chronic work stress with insufficient recovery and it is characterized by emotional exhaustion (EE), depersonalization (DP) and low personal accomplishment. Even if it is frequent in a wide variety of health care providers, limited data exist about his prevalence among Italian radiation oncologists. We performed a national survey to assess the prevalence of the burnout syndrome among young Italian radiation oncologists.
Methods and Materials: The Maslach Burnout Inventory (MBI) was send to young members (⩽40 years) of the Italian Association of Radiation Oncology (AIRO). They filled it anonymously. The MBI evaluated burnout level and the relationship with demographic variables, practice characteristics, career satisfaction, sources of stress.
Results: From 06/2010 to 11/2010, a total of 112 young radiation oncologists (M/F ratio 39:73) participated to this study; Mean age was 32 years (range: 23−39 years). Specialists and residents were the 60% and 40% of respondents, respectively. Burnout prevalence, defined as a severely abnormal level of either EE or DP, was 35%. Looking at EE, 38% and 9% of the interviewed show a middle or an high level of EE, respectively. The prevalence of middle or high levels of DP was 41% and 26%, respectively. Following items were statistically related ($p < 0.005$) to the risk to suffer of a burnout syndrome: working position (specialist vs resident), number of years of practice, working hours per week, lack of cooperation and/or conflicts with colleagues and chiefs, lack of opportunities for professional development and uncertainties on the working perspectives. High workload and responsibilities, job-related anxiety and lack in the autonomy decision-making in treating patients were reported by 91.1%, 87.6% and 86.7% of participants, respectively. Higher burnout scores have a statistical impact in the private life of the ($p < 0.005$), and 89.6% of respondents feel not to have enough time for personal/family life because of workload. Global health status was good or very good for 85% of interviewed, with only 5% and 2% assuming hypnotic/anxiolytic or anti-depressant medications, respectively. Five respondents (4%) declared a frequent consumption of alcohol (four or more times per week). Finally, 10−12% of the respondents wanted to leave their jobs.
Conclusions: Burnout is common among young Italian radiation oncologists. The statistical relation with some working/organizational and personal factors shows the need for educational tools in order to improve the management of workload and stress.

Poster Presentations (Sat, 24 Sep, 14:00−16:30)
Imaging

2100 POSTER

Fully Automatic Segmentation of Brain Tumour in CT Images

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Purpose: A new approach is presented to automatically extract brain tumour in CT images.
Methods: The method uses a sequence of brain CT images. Firstly, use morphology operations and wavelets based filter for denoising. Secondly, find out whether CT images contain brain tumour according to the symmetry of the brain CT images, extract the unsymmetric part and its neighbor as the region of interest (ROI). Then, extract the feature (e.g. texture, contrast, homogeneity, etc.) of the ROI. Finally, use k-means clustering and support vector machines (SVM) for classification with the extracted feature of the ROI and get the contour of the brain tumour.
Results: Compared with manually contoured by the physicians, this method enables accurate and automatic extraction of brain tumour in CT images.
Conclusions: The method is shown with better performance than current methods. And it's a fully automatic, fast and accurate method in precise diagnosis and treatment of brain tumour patients.

2101 POSTER

Evaluation and Prediction of the Efficacy of Pleurodesis in Malignant Pleural Effusion by Clinical and Radiological Features

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Background: The standard treatment of recurrent malignant pleural effusion is intrapleural instillation of chemical agent, usually talc, in an attempt to produce pleurodesis. Our study purpose is to elucidate useful clinical and radiological parameters for evaluation and prediction of the efficacy of pleurodesis.
Material and Methods: A retrospective review of 83 consecutive patients treated with pleurodesis from 2002 to 2010. Clinical data were obtained from the hospital charts. All the radiological imaging, before and after the procedure, was reviewed. The patients were divided into two groups: group 1 − those with initial small to medium volume (n = 34, 41%) and group 2 − those with larger volume (fluid level above the hilus on chest x-ray) (n = 49, 59%).
Results: Clinical improvement was better and more rapid in group 1 (97% Vs 90%, and time to response 1.7 days Vs 2.6 days). Complete lung expansion was more frequent in group 1 compared to group 2 (30% vs. 12%, $p < 0.001$). Additional radiological abnormalities (atelectasis, nodules, mediastinal adenopathy, etc) revealed on CT scan were more frequent in group 2 compared to group 1 (84% vs. 58%). The above pathological changes significantly reduced expansibility rate of the lung [57% (19/33)] in group 2, but not in group 1 [80% (12/15)]. Only two patients required an additional pleurodesis within the first 3 months. CT scan done after the pleurodesis showed pleural thickening and calcfications, a desirable consequence, more common in group 1 than group 2 (58% Vs 25%, $p < 0.04$). However, there was no correlation between all the malignant thoracic findings, pleurodesis efficacy and survival. Survival was mainly dependent on the primary malignancy.
Conclusions: Treatment of pleural effusion by talc pleurodesis is highly effective, especially, if it is performed early, while there is small to medium volume of effusion, and minimal additional malignant findings in the thorax. Imaging by CT scan before pleurodesis is recommended in order to predict the outcome of the procedure and to suggest alternative treatments.

2102 POSTER

Bilateral Analysis of the Vascular Surface of the Internal Mammary Arteries and Veins in Patients With Breast Cancer on Magnetic Resonance Mammography (MRM)

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Background: Within the staging of breast cancer MR mammography (MRM) plays an important role. The aim of this study is to analyze the bilateral differences in the vascular surface of the internal mammary artery (IMA) and vein (IMV) in patients with established breast cancer versus healthy control patients.
Material and Methods: MRM of 135 patients was analyzed. Patients with postoperative changes of the breast, bilateral malignancy or patients treated with neo-adjuvant therapy were excluded. Measurements were made on a transverse T2w sequence (scanning parameters: slice thickness 1 mm, field-of-view 280×338×190 mm, matrix 352). Surface of both the AMI and VMI has been determined on both sides particularly on the second and third intercostal space by two independent readers. Differences in vessel surface between patients with and without breast cancer were analyzed using a linear mixed model.
Results: The vascular surface of the AMI was significantly higher on the side with breast cancer in comparison to the contra lateral side (mean difference in size 0.86 mm2, $p = 0.001$). Similar differences were observed for the VMI (mean difference in size 0.83 mm2, $p = 0.005$). There has been no significant difference in vascular area of the AMI and VMI in the group of patients without breast cancer.

Conclusions: The vascular surfaces of AMI and VMI were significant different on the side with breast cancer compared to the contra lateral side. This difference was not observed in healthy controls. Future research should proof whether the vascular surface could be a supplementary parameter in the assessment of MRM.

2103 POSTER

Role of [18F]FDG-PET/CT Imaging in the Management of Muscle Invasive Transitional Cell Carcinoma: a Single-institutional Experience Report

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Background: The management of muscle-invasive bladder cancer has evolved over the years with the introduction of perioperative chemotherapy; however, the appropriate selection of patients is still a limiting issue. Computed tomography (CT) or magnetic resonance imaging (MRI) have limited accuracy, particularly, in lymph node staging. In this setting, [18F]fluoro-2-deoxy-D-glucose ([18F] FDG) positron emission tomography (PET) has emerged as an useful alternative for adequate staging and decision making.
Materials and Methods: This study investigated the value of FDG-PET/CT imaging in the management of patients with advanced bladder cancer. Between January 2004 and May 2010, 26 patients with muscle-invasive bladder cancer underwent FDG-PET/CT after CT or MRI for staging purposes. The accuracy of FDG-PET/CT was assessed using both organ-based and patient-based analyses. FDG-PET/CT findings were validated by either biopsy or serial CT/MRI.
Results: Of the 26 patients available for analysis, PET/CT demonstrated different findings from CT or MRI in 38% of the cases, including evidence of lymph node involvement in 3 patients with originally uninvolved lymph nodes and distant metastases in one of these patients. Also, FDG-PET/CT findings were normal in two out of 15 patients with evidence of nodal involvement by CT or MRI. In both patients, there were no pathological evidences of metastatic involvement. However, FDG-PET/CT was associated with three false positive cases including renal tuberculosis, nodal chronic inflammatory process and chronic pancreatitis. Initial management modifications and changes in the treatment modality occurred in 34% and 23% of the patients, respectively, as a result of FDG-PET/CT re-staging.
Conclusion: FDG-PET/CT provides additional diagnostic information that enhances clinical management, when compared to CT or MRI alone. FDG-PET/CT scans may provide better accuracy in clinical information for directing treatment. However, the number of false positive findings are still a concern, particularly in areas such as South America, where the incidence and prevalence of some types of infectious and granulomatous diseases differ from the American and European populations.

2104 POSTER

Role of FDG-PET/CT in the Evaluation of Bone Marrow Involvement of Solid Tumours

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Background: Bone scintigraphy, magnetic resonance imaging, and FDG-PET/CT are used in the evaluation of bone metastasis in solid tumours. There is paucity of imaging modalities that predict bone marrow metastasis in adult solid tumours. We aimed to investigate the predictive value of FDG-PET/CT in solid tumours in which bone marrow metastasis was proven by biopsy.
Materials and Methods: We retrospectively analysed patients with proven bone marrow metastasis histopathologically. FDG-PET/CT was ordered in 10 patients. We quantitatively evaluated FDG uptake in iliac wing, corpus sterni, and lomber vertebra with respect to liver and spleen involvement. We used standard uptake value (SUVmax) and involement rate to depict bone marrow metastasis.
Results: We found bone and bone marrow involvement in all 10 patients with FDG-PET/CT imaging. Five patients showed only bone metastasis whereas 5 patients both bone and bone marrow metastasis. In 5 patients, bone marrow involvement was suspected by FDG-PET/CT although complete blood count was within normal limits.
Conclusion: FDG-PET/CT was highly accurate in predicting bone marrow metastasis in solid tumours in adults.

2105 POSTER

Positive Predictive Value of PET- CT in Evaluating Post Therapy Residues of Hodgkin Lymphoma and Diffuse Large B Cell Lymphoma

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Background: Patients with diffuse large B cell NHL (DLBCL) and Hodgkin lymphoma (HL) often exhibit a residual mass of which only 20% and still lesser numbers of NHL and HL respectively, have persistent disease at restaging laparotomy. Computerized tomography scan (CT scan) low specificity in response assessment following therapy [2,3]. So the necessity to identify cases with no viable disease in residues is increasing, but with lesser invasive techniques. Various studies have shown varying sensitivity and positive predictive value of Fluorine^{18} fluoro deoxy glucose positron emission tomography (FDG PET) which leads to either unnecessary biopsy of PET positive residues. Indian data addressing this issue is scarce, where PET positive post treatment residues have a high chance of being non malignant, chronic inflammatory conditions or reactive, with paucity of studies using fusion of FDG and CT scan that can improve diagnostic accuracy. This study has been specifically designed to address this issue and find the positive predictive value (PPV) of fusion of PET CT, in evaluating post treatment residues in HL and DLBCL. Further a trend of the Standard Uptake value (SUV) in predicting viable disease has also been analyzed as a secondary outcome of the study.
Materials and Methods: Between June 2008 and October 2009, patients diagnosed to have HL and DLBCL at Cancer Institute (WIA) Chennai, treated with standard chemotherapy protocols with or without radiotherapy & who underwent end of therapy ^{18}FDG PET CT scan to assess post treatment residues, were included in the study. All cases with PET positive residues were biopsied wherever feasible. Correlation of the biopsy with PET positivity and its SUV was done. The PET negative residues were not biopsied and were kept under follow up. All the cases had a mean follow up of 11.69$\pm$4.45 months.
Results: Seventy eight patients were included in the study with a median age of 36 years (4−76 years), of which there were 55 males and 23 females with a male: female ratio of 2.3:1. Of 78 patients, there were 52 cases of HL and 26 cases of DLBCL. In DLBCL patients, PPV of PET CT was 75% (SUV max 2.03). The 4 PET CT positive cases (SUV max of 1.1) which could not be biopsied were disease free at a median follow up of 15.5 months (10−19 months). In the HL PPV of PET CT was 36.3%. The mean SUV of PET positive residue in DLBCL was 5.7$\pm$3.49 (SUV max 12.8), whereas the mean SUV of PET positive residue in HL was 10.8$\pm$3.63 (SUV max 15.06) (p value − 0.018).
Conclusions: The PPV of PET findings is somewhat limited,dictating necessity to biopsy any PET-positive node, before salvage treatment is contemplated. Even lower SUV values in DLBCL residues may reveal viable disease. On the other hand, larger the node, more were the chances of finding viable disease PET positive HL residues. Size of the node appeared to be predictive in HL. Radiotherapy did not seem to affect the false positive rates in either HL or DLBCL.

2106 POSTER

18F-FDG PET for Assessment of Therapy Response After Neoadjuvant Chemotherapy in Stage IIIa Non-small Cell Lung Cancer

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Background: The aim of this study was to evaluate FDG-PET for assessment of therapy response and prediction of patient outcome after neo-adjuvant chemotherapy (NACT) of IIIA non-small cell lung cancer (NSCLC).
Material and Methods: Twelve patients (11 men and 1 women, mean age: 64.33 years old (range:19−81)) with newly diagnosed and histologically proven IIIA NSCLC (5 adenocarcinoma and 7 squamous cell carcinoma) were included in a prospective study between September 2008 and January 2010. All patients underwent CT and 18F-FDG-PET-CT (Siemens Biograph. 16 ®) before and after NACT (cisplatin-based chemotherapy). The images data were collected, analyzed and correlated with outcome data. Maximum SUV (SUVmax) value and the NACT response (EORTC criteria) were correlated with clinical outcome. We also compared the assessment of treatment response between CT scan (RECIST criteria) and PET-CT scan (EORTC criteria).
Results: The mean average FDG uptake of the primary tumours was 13.26 compared with 7.72 after NACT. According to RECIST criteria, one patient developed a complete response (CR), 7 had partial response (PR), 3 stable disease (SD) and one had progressive disease (PD). On PET-CT scan