study employs FDG-PET/CT to study the response patterns in normal lung and to potentially identify cytotoxic effects.
Materials and Methods: This project included 22 patients with advanced-stage non-small cell lung cancer, participating in a phase II trial of combined radiation and erlotinib-therapy. The patients underwent three PET-CT examinations; pre-therapy, mid-therapy, and six weeks after fractionated radiotherapy (3Gy x 10). Nine patients received fractionated RT only, while 13 patients received erlotinib (150 mg p.o. daily) and fractionated RT. For each patient, lung was delineated in the planning CT before the initiation of treatment. The RT dose matrix was co-registered with the PET/CT image series. The FDG-uptake distribution, in terms of the standardized uptake value (SUV), was obtained for lung from all PET-CT examinations. In order to identify the association between SUV and RT dose, SUV_{mean} was calculated in dose bins of 0.5 Gy. Linear regression was applied to extract trends in the dose-SUV relationship. The effect of erlotinib was investigated by separating patients into erlotinib receiving and a non-erlotinib receiving groups.
Results: A positive linear relationship was identified between SUV and RT dose in the lung at both mid- and post-therapy, considering all patients. A significant increase (15%) in FDG-uptake at all dose levels was observed from mid- to post-therapy. Separating patients based on erlotinib treatment, a positive correlation between SUV and RT dose was identified for both groups at mid-therapy. However, the FDG-uptake was significantly higher (16%) in the erlotinib-receiving group. At post-therapy, patients receiving erlotinib again had a significantly elevated FDG-uptake in lung compared to non-erlotinib receiving patients, but the association with RT dose for erlotinib-receiving patients was absent.
Conclusions: Normal lung glucose metabolism positively correlated with RT dose during the first week of treatment. This could indicate RP in the lung. Erlotinib increased the FDG uptake in the lung compared to RT only. This study indicates that more detailed follow-up of lung toxicity in patients undergoing erlotinib therapy is required. Also, deeper mechanistic studies into the biological action of RT and erlotinib in the healthy lung are warranted.

EP-1168

Tumor regression on CBCT predicts the risk of recurrence and death in locally advanced non-small cell lung cancer

J. Colliaux[1], J. Castelli[1], E. Chajon[1], J. Bellec[1], O. Henry[1], E. Le Prisé[1], H. Léna[2], R. Corre[2], R. De Crevoisier[1]
[1]*Centre Eugène Marquis, Radiotherapy, Rennes, France*
[2]*CHU Pontchaillou, Pneumology, Rennes, France*

Purpose/Objective: The aim of the study was to evaluate the interest of weekly Cone Beam CT (CBCT) to predict the risk of local recurrence and survival in case of radio-chemotherapy (RT-CT) for locally advanced NSCLC (LA-NSCLC).
Materials and Methods: Between August 2011 and March 2014, a series of 21 patients (pts) with a mean age of 67 years (49-81 years) and presenting a LA-NSCLC (stage IIIA or IIIB) were treated by RT-CT. The total dose was 66 Gy at 2.2 Gy/fraction over 6 weeks delivered by IMRT and IGRT using CBCT. Weekly CBCT were used to delineate the primary tumor (TV), excluding the mediastinal lymph nodes. The response during treatment was quantified by the ratio between the primary TV delineated in the weekly CBCT and the primary TV delineated in the planning CT. Recurrence after treatment was evaluated by 18 Fluoro-deoxy-glucose PET and CT scan, performed every 3 months during the first two years of follow up. Cox regression model was used to test the impact of TV ratio, as continuous values, in the risk of local recurrence and death. ROC analysis was used to identify TV ratio threshold values.
Results: The median follow up was 16 months (6-33 months). Ten pts (47.6%) presented local failure (LF). The risk of local failure at 18 months was 54 % (CI 95%: 30-78%). The OS rate at 18 months was 85% (CI 95%: 70-100%). The mean (range) TV ratio at week 1, 2, 3, 4, 5 and 6 were: 0.92, (0.5-1.9), 0.82 (0.3-1.45), 0.75 (0.25-1.42), 0.67 (0.18-1.4), 0.6 (0.15-1.5) and 0.53 (0.13-0.9) respectively, corresponding to a mean tumor regression during treatment of 8% per week. In univariate analysis, TV ratios, as continuous values, at the fifth and sixth week were predictive of both local failure and death ($p \leq 0.04$). TV ratio at the fourth week was predictive of local failure only ($p=0.02$). Threshold value of TV ratio between 0.7 and 0.8 appears particularly discriminant.
Conclusions: Monitoring TV in weekly CBCT during RT-CT for LA-NSCLC appears useful to predict the risk of recurrence and death, identifying pts candidates for treatment intensification. A larger series is needed to confirm these results and to perform multivariate analysis.

EP-1169

Outcomes of stereotactic body radiotherapy for intrapulmonary recurrence after lung cancer surgery

D. Nakamura[1], T. Yamazaki[2], K. Yasui[2], A. Egawa[2], N. Hayashi[3], M. Uetani[2], K. Ashizawa[1]
[1]*Nagasaki University Graduate School of Biomedical Sciences, Department of Clinical Oncology, Nagasaki, Japan*
[2]*Nagasaki University Graduate School of Biomedical Sciences, Department of Radiological Sciences, Nagasaki, Japan*
[3]*The Japanese Red cross Nagasaki Genbaku Hospital, Department of Radiation Oncology, Nagasaki, Japan*

Purpose/Objective: The management of intrapulmonary recurrence after lung cancer surgery is a challenging proposition because of poor lung function. Stereotactic body radiotherapy (SBRT) has achieved a good tumor control with preserving lung function. The purpose of this study is to evaluate the safety and efficacy of SBRT for recurrent lung cancer after surgery.
Materials and Methods: Between July 2008 and September 2013, 27 patients with intrapulmonary recurrence after lung cancer surgery received SBRT at our institution. We conducted a retrospective analysis of all these patients (4 women and 23 men). The median age was 73 years (range, 50 to 92 years). The median forced expiratory volume in 1 second before SBRT was 1820ml (range, 920 to 2520ml). The prescribed doses were 48Gy in 4 fractions, 60Gy in 10 fractions, and 50Gy in 10 fractions. Toxicity was graded via RTOG/EORTC late radiation morbidity scoring. Overall survival (OS) was calculated by the Kaplan-Meier method.
Results: The median follow up time from SBRT was 2.0 years. All patients completed the planned treatment without severe acute adverse event. One patient died due to radiation pneumonitis after 7 months from SBRT. One patient had grade 3 radiation pneumonitis, and one had grade 2. The