constraints were violated we re-checked correspondence of the structures to the delineation standards of the Lungtech protocol. Association of violations and the prospectively recorded toxicity was evaluated.

Results: According to DVHs 111 SBRT plans did not violate any of the dose constraints requested in the Lungtech trial. For 7/100 patients SBRT plans exceeded the Lungtech dose constraint for the proximal bronchial tree of EqD2=74.8Gy to > 0.5cc, one of them additionally for the esophagus of EqD2=64 Gy. 6/7 patients showed an increase in dyspnea, 2 of them died 3 and 9 months after SBRT, one after hemoptysis and subsequent pneumonia, the other after being hospitalized for unclear progressive dyspnea; in both cases association of G5 toxicity to SBRT cannot be excluded.

Conclusion: Despite the lack of detailed specific constraints within the STRIPE trial OAR exposure did not largely differ from current practice in modern SBRT. However, these preliminary results underline the importance of the dose constraints for the main airways within the Lungtech trial and the necessity to continuously review and adjust treatment procedures to upcoming evidence, especially when employing new techniques.

EP-1241

Relationship of dosimetric findings and toxicity following SABR for lung cancer

K. Johnson[1], A. Morenc[2], T. Sridhar[2], L. Aznar-Garcia[2]
[1]*University Of Leicester, Cancer Studies, Leicester, United Kingdom*
[2]*University Hospitals Leicester, Oncology, Leicester, United Kingdom*

Purpose or Objective: SABR for primary NSCLC is becoming increasingly popular as evidence is mounting for its equivalent long-term clinical outcomes and good overall tolerability. We review our toxicity against dosimetry and achievement of dose constraints (SABR UK Consortium). We suggest that dosimetric constraints alone cannot be used to prevent SABR related side effects.

Material and Methods: Patients with stage I NSCLC treated with SABR between January 2014 and August 2015 were included in this single centre cohort study. They were planned using relaxed breathing 4D CT then treated using VMAT. Baseline and dosimetric data was retrospectively collected by a clinical oncologist or physicist from the radiotherapy records. Patients were followed up at 4 weeks then at 3 monthly intervals until 1 year. CT scans were performed 3 and 12 months post radiotherapy. Prospective data collection was performed at follow up visits for clinical outcomes and acute and late normal tissue toxicity (scored using CTCAE v 3.0).

Results: 28 patients were included in the study with a median follow up of 10.4 months. 19 patients have attended for post radiotherapy CT scans with 84.2% showing radiological response as per RECIST. All patients were assessed for acute toxicity data, 3.5% (1/28) noted grade 2 reaction. Data on late toxicity was available for 19 patients: 26.3% (5/19) experienced grade 2-3, no grade 4 or 5 reactions were recorded. When adjusted for baseline function (late toxicity score minus baseline score) this fell to 15% (3/19). Other than chest wall (CW) tolerances all dosimetry criteria were met. 10.7% of plans exceeded tolerance to 30cc CW (>30/32) with no recorded episodes of grade 2 CW pain in these patients. 71.4% of plans exceeded dose constraint to 0.01cc CW (>37/39) only 5% (1/20) complained of CW pain. Dosimetric analysis for this patient revealed dose to 30cc of CW was 25.8 Gy (<32), dose to 0.01 cc of CW was 59.1 Gy (<39), volume of PTV and CW overlapping was 0.03 cc and % of PTV-CW overlapping was 0.21%.

Conclusion: We are achieving low rates of moderate or severe toxicity. Despite achieving dose constraints, a small cohort of patients developed toxicity grade 2-3. We hypothesize that these patients could develop radiotherapy toxicity due to other idiosyncratic factors (genetic polymorphisms, microenvironment). Further studies are currently running to investigate other causative factors.

EP-1242

Stereotactic body radiation therapy for early stage NSCLC: clinical outcomes

A. Iurato[1], A. Carnevale[1], E. Ippolito[1], M. Fiore[1], C. Greco[1], L.E. Trodella[1], A. Di Donato[1], S. Ramella[1], R.M. D'Angelillo[1], L. Trodella[1]
[1]*Policlinico Universitario Campus Biomedico, Radioterapia Oncologica, Roma, Italy*

Purpose or Objective: The aim of this study is to evaluate efficacy and toxicity of stereotactic body radiation therapy in early stage medically inoperable non-small lung cancer.

Material and Methods: Data from patients affected by medically inoperable stage I NSCLC treated with stereotactic body radiation therapy (SBRT) were prospectively recorded. Treatments were planned employing 4D-CT . The prescribed dose was modulated according to location of the lesion and tolerance of the surrounding organs at risk: 54 Gy in 3 fractions for peripheral lesions, 60 Gy in 4 fractions for lesions adjacent to the chest wall, 60 Gy in 8 fractions for central lesions. The primary endpoints were local control and toxicity, secondary endpoint was survival. The follow-up examinations were performed with CT and/or PET-CT at 1, 3, 6, 9 and 12 months after treatment and every 6 months subsequentely. Acute and late side effects were recorded according to RTOG morbidity Scoring Scale.

Results: From 2009 to 2014, 65 patients were treated. Mean patients' age was 74 years (range 62-86). The lesions had a mean maximum diameter of 20 mm (range 10-36). All but seven patients were staged by PET-CT. 83% of cases lung cancer was histologically proven: 34 cases were adenocarcinoma, 15 squamous cell carcinomas, 5 undifferentiated carcinomas. In the last 11 patients biopsy was not performed because of high risk features for complications and/or patient's refusal. In this last group 81% had a positive PET-CT and lesion growth documented at subsequent CT and just two patients had only lesion growth. Lesion's location were as follow: RUL 25/65 (38%), RML 2/65 (3%), RIL 7/65 (11%), LUL 22/65 (34%) and LIL 9/65 (14%). Median follow-up in 61 evaluable patients was 40 months. Five local failure (8%) were recorded at a mean of 11,5 months from the end of treatment (range 5.3-22). PET-CT SUV was the only parameter predictive for local failure, with a mean value of 14,2 in the recurrence group versus 6,1 in the recurrence-free group, respectively; p=0.03. Local control at 1 and 2 years were 89.6% and 86%. Median DFS was 22.2 months and 1y-, 2y- and 3y- DFS were 66%, 47% and 40%, respectively. Lesions' location according to treatment group was related to distant progression, which was significantly higher in peripheral location (p=0.004). Overall survival at 1y-, 2y- and 3y were 97%, 77% and 66%, respectively. Treatment was well tolerated. G1 asymptomatic pulmonary toxicity was observed in 18% of cases (11/61), G2 pulmonary toxicity was recorded in 3% of patients. There were no pulmonary toxicity grade 3-4. No other toxicities were reported.

Conclusion: SBRT is an effective and safe treatment for patients with medically inoperable stage I NSCLC. Local recurrence predictive value of PET-CT SUV could be investigated in bigger series.

EP-1243

A multicentre clinical trial using 3DCRT to reduce toxicity of palliative radiation for lung cancer

R. McDermott[1]
[1]*St Luke's Radiation Oncology Center, Radiation oncology, Dublin, Ireland Republic of*

Purpose or Objective: Radiation therapy in the palliation of intra-thoracic symptoms from locally advanced non-small cell lung cancer (NSCLC) is a significant component of workload in most radiotherapy departments. While most trials have

concentrated on optimizing dose schedules, we proposed a study demonstrating that using more technically advanced techniques would result in equivalent symptomatic relief and reduce symptomatic oesophagitis.

Material and Methods: Thirty-five patients with symptomatic locally advanced or metastatic NSCLC were treated using a three-dimensional conformal technique and standardized dose regimens of 39Gy in 13 fractions, 20Gy in 5 fractions or 17Gy in 2 fractions. Treatment plans sought to minimize oesophageal dose and oesophagitis was recorded during and at one month and three months following radiation therapy where applicable. Mean dose to the irradiated oesophagus was calculated for all treatment plans.

Results: At follow-up of one month after therapy for all patients accrued, there were no grade three or higher oesophageal symptoms of oesophagitis or dysphagia reported. Four patients (11.4%) had experienced grade 2 toxicity. All patients in the study derived clinical benefit from the radiation therapy course.

Conclusion: Use of three-dimensional conformal radiation techniques is widely practiced for treating intra-thoracic symptoms in the setting of NSCLC, however no direct study exists proving its superiority in reducing toxicity. This trial is the first of its kind showing that such techniques do provide patients with lower rates of oesophageal toxicity whilst yielding acceptable rates of symptom control. (Sponsored by the All-Ireland Cooperative Oncology Research Group (ICORG). Trial registration number 06-34)

EP-1244

Radiotherapy for loco-regional recurrence of non-small-cell lung cancer after complete resection

K. Terashima[1], M. Inamori[2], A. Matsunobu[3], H. Hirata[1], K. Sakamoato[1], K. Okabayashi[4], A. Furuya[2], M. Hirakawa[1]
[1]*Kyushu University Beppu Hospital, Department of radiology, Beppu, Japan*
[2]*Fukuoka Higashi Medical Center, Department of radiology, Fukuoka, Japan*
[3]*SAGA-HIMAT Foundation, Ion Beam Therapy Center, Tosu, Japan*
[4]*Fukuoka Higashi Medical Center, Department of Thoracic Surgery, Fukuoka, Japan*

Purpose or Objective: Although there is no standard treatment for postoperative recurrence of non-small-cell lung cancer (NSCLC), radiotherapy is occasionally used in the treatment of loco-regional recurrences. The objective of this study is to analyze clinical results of curative intent radiotherapy for loco-regional recurrence of NSCLC after complete surgical resection.

Material and Methods: A total of 38 patients, who had developed loco-regional recurrence after complete resection and received curative intent radiotherapy between 1999 and 2014, were retrospectively analyzed. There were 29 male patients and 9 female patients. The age range was 47-89 years (median 70 years). 25 patients had adenocarcinoma, thirteen patients squamous cell carcinoma. There were 29 patients with regional lymph nodes recurrence, and 10 patients with local recurrence at primary or anastomotic sites with or without lymph nodes recurrence. No patient had distant metastasis at presentation. The clinical endpoints included overall survival, progression-free survival, loco-regional recurrence within the irradiated field, and any other recurrence. The overall survival and local control rate were calculated from the day of radiotherapy completion and estimated by Kaplan-Meier method.

Results: The median total dose of radiotherapy was 60 Gy (range, 50–70 Gy). Thirteen of the 38 patients were treated with concurrent chemotherapy. The median follow-up time after radiotherapy was 30.4 (2.9–151) months. 1-5-year survival rates were 81.2, 69.6, 55.7, 48.5 and 39.6%, respectively. The 5-year progression-free survival, and local control rate were 32.6%, and 67.6%, respectively. Eight patients have survived more than 5 years. There was no significant difference between patients with lymph nodes recurrence and those with local recurrence in overall survival.

Conclusion: Radiation therapy for loco-regional recurrence after complete resection provides acceptable disease control. Curative intent radiation therapy can be the treatment of choice if no evidence of metastasis is observed.

EP-1245

BED <100Gy and ITV≥20cc predict local relapse after stereotactic radiation therapy for lung cancer

A. Suissa[1], A. Levy[1], F. Belkhir[1], N. Grellier-Adedjouma[1], P. Xu[1], F. Martinetti[1], C. Le Péchoux[1]
[1]*Gustave Roussy, Radiation Oncology, Villejuif, France*

Purpose or Objective: To determine predictive factors of local recurrence (LR) after Stereotactic Body Radiotherapy (SBRT).

Material and Methods: Data were retrospectively analyzed from 136 consecutive patients and 156 lung tumors treated with curative intent SBRT between April 2012 and December 2014 at our institution. Most patients had early lung cancer (76%). SBRT was also included in the treatment strategy for locally advanced (3%) or oligometastatic (21%) patients with an intent to complete response.

Results: The median follow-up was 21.8 months (2.4-70.8 months). The median age at diagnosis was 66,5 years (33-89 years) and median performance status was 0,5 (range 1-3). 54% patients had a smoking history with a median VEMS of 62,2%. Histological confirmation was obtained in 67%: 35% adenocarcinoma, 21% squamous cell carcinoma, 5% undifferenciated NSCLC and 5% other. Molecular markers were known in 27 tumors (17%): negative markers in 10%, KRAS mutation in 6%, other in 2%. Tumor location was central in 28%, peripheral in 48%, and intermediate in 24%. Median SUVmax at diagnosis was 7,1. Median ITV was 31,7 cc (0,56-104,8 cc) and median Biological effective dose (BED) was 123,8 Gy (72-151,2 Gy, α/β=10). 11 LR occurred resulting in a 2 year LR rate of 8% [CI 95%: 3-14%]; median: not reached; mean time to LR: 38.4 month [CI 95%: 36-39.6]. BED ≤100Gy (HR=5 [CI 95%: 1.1-22]; p=0.03), and Internal Target Volume (ITV) ≥20cc (HR=4.9 [CI 95%: 1.3 -18.5); p=0.02) were associated with a decreased LR in the multivariate analysis (MVA). Histology (squamous cell carcinoma), central location, and SUVmax of the treated lesion > 8 were not associated with local control in the MVA. Delay from diagnosis to SABR and molecular markers were not correlated with LR results in the univariate analysis. Two years overall survival and progression free survival rates were respectively 74% (IC 95%: 65-83%) and 62% (IC 95%: 52-72%).

Conclusion: BED should carefully be taken into account, particularly in case of tumors that exceed 20 cc

EP-1246

Is there a different dose-effect relation between the tumour and involved lymph nodes in NSCLC?

L. Van den Bosch[1], G. Defraene[2], S. Peeters[1], C. Dooms[3], W. De Wever[4], C. Deroose[5], D. De Ruysscher[1]
[1]*University Hospitals Leuven, Radiation Oncology, Leuven, Belgium*
[2]*University Hospitals Leuven, Experimental Radiation Oncology, Leuven, Belgium*
[3]*University Hospitals Leuven, Respiratory Oncology, Leuven, Belgium*
[4]*University Hospitals Leuven, Radiology, Leuven, Belgium*
[5]*University Hospitals Leuven, Nuclear Medicine, Leuven, Belgium*

Purpose or Objective: It is unknown whether dose-response for the primary tumor is different from that of the involved lymph nodes (LN). As the recurrence rate is much lower in LN, we hypothesized that involved LN need a lower radiation dose than the primary tumor.