Results: All patients demonstrated on-treatment reduction in MRI-defined GTV (Figure 1). Average reduction in tumor size from treatment initiation to completion of therapy was 51.0% (median 52.1%) and ranged from 30.5-70.8%. At a time point of fraction six, average reduction in GTV size was 38.2% (median 34.8%). Linear correlation across median values at each time point suggested a consistent decline over time of approximately 4% per day, with the most pronounced changes occurring between the 5th and 6th fractions.

Conclusion: Tumor volume decreased considerably during treatment for most patients undergoing lung SBRT. The dosimetric impact of this degree of MRI-defined tumor volume change during the course of therapy has yet to be assessed. However, adaptive planning during the course of SBRT may be dosimetrically advantageous for sparing of surrounding critical structures, particularly for disease involving the central thorax.

Purpose or Objective: To evaluate HRQoL, treatment-induced toxicity and issues in both clinical trials and daily care of patients receiving radiotherapy as part of their primary treatment for LA-NSCLC. Based on these considerations, a prospective cohort study has been launched in our institute, which aims to evaluate HRQoL, treatment-induced toxicity and neurocognitive functioning in patients with resectable LA-NSCLC receiving radiotherapy, all or not in combination with concurrent or sequential chemotherapy.

EP-1227
Salvage radiotherapy for regional lymph node recurrence after surgery of non-small cell lung cancer
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Purpose or Objective: To evaluate clinical outcomes of salvage radiotherapy for regional lymph node (LN) recurrence developing after radical surgery of non-small cell lung cancer (NSCLC).

Material and Methods: Between 2008 and 2013, out of patients with NSCLC who achieved complete response (CR) after definitive treatment (surgery with or without chemotherapy), 31 patients developed regional LN recurrence (mediastinum, hilum, and supraclavicular area) after definitive treatment (surgery with or without chemotherapy), 31 patients developed regional LN recurrence (median age, 66 years; stage 1, n = 17; stage II, n = 7; stage IIIA, n = 7). The median time from definitive surgery to recurrence was 12 months (range, 3-80). Fifteen patients (48.4%) had single LN recurrence and others had multiple LN recurrence. All patients were irradiated to the regional LN area with daily fractions of 2.0 Gy (n = 27), 2.5 Gy (n = 2), or 3.0 Gy (n = 2) by 3D-conformal radiotherapy. The median total dose for recurrent LN was 66 Gy (BED 79.2 Gy10; range, 65.1-79.2 Gy10). Sixteen patients received chemotherapy either.

Results: The median follow-up was 14 months (range, 3-76). After salvage radiotherapy, 16 patients (51.6%) achieved CR, 9 patients (29.0%) partial response, and 6 patients (19.4%) stable disease. After salvage radiotherapy, one- and two-year progression-free survival rate from initial salvage radiotherapy was 73.1% and 50.9%, respectively. Progression site was predominantly distant. Overall, ten of 31 patients (32.3%) were successfully salvaged as CR state. Recurred LN size (<3 vs. ≥3 cm) was a significant prognostic factor for progression-free survival (p = 0.03). Pneumonitis requiring conservative treatment (grade 2 or more) occurred in 5 patients (16.1%). There was no radiation-related mortality.

Conclusion: Salvage radiotherapy for regional LN recurrence after radical surgery was suggested to be an effective treatment option with an acceptable level of toxicity. The recurrent node size (3 cm cutoff value) was a strong predictor of progression-free survival. Aggressive salvage radiotherapy should be considered as a front-line treatment in regional LN recurrence of NSCLC.

EP-1228
Pulmonary toxicity after 3D-CRT or VMAT-based stereotactic radiotherapy for early stage lung cancer
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Purpose or Objective: To assess the pulmonary toxicity of stereotactic radiotherapy (SBRT) in comparison with the conventional 3D-CRT.

Material and Methods: A retrospective analysis was performed on 109 patients with stage I lung cancer (T1N0M0; 72 SBRT, 37 3D-CRT) treated at our institution from 2010 to 2017. The median follow-up was 24 months (range, 2-60). The prospective CT scan volume analysis was performed using the Eclipse planning system (Varian Medical Systems).

Results: The overall incidence of any acute (grade ≥2) and severe (grade ≥3) adverse events was 26% (SBRT) and 43% (3D-CRT), respectively. The median time between the two fractions and the occurrence of acute grade ≥3 toxicity was 4.8 days (SBRT) and 5.2 days (3D-CRT), respectively. The incidence of chronic toxicity was 11% (SBRT) and 45% (3D-CRT), respectively. The median time of occurrence was 17 months (SBRT) and 14 months (3D-CRT), respectively. The incidence of time of occurrence of grade ≥3 chronic toxicity was 2% (SBRT) and 40% (3D-CRT), respectively.

Conclusion: SBRT was associated with a lower incidence of acute toxicity and a similar incidence of chronic toxicity compared to 3D-CRT. The incidence of grade ≥3 acute toxicity was significantly lower in SBRT (p = 0.03). The incidence of grade ≥3 chronic toxicity was also lower in SBRT (p = 0.04).
Purpose or Objective: To compare patterns of acute and late clinical/radiological lung toxicity following either 3D or image-guided VMAT stereotactic radiotherapy for stage I non-small cell lung cancer (NSCLC).

Material and Methods: In this observational study, we included 148 patients from a prospective mono-institutional SBRT series (time interval 2004-2014). All subjects had peripheral tumors and a prescription BED10Gy (at 80%) in the range 100-120 Gy. The first 95 patients (2004-2010) were planned with 3D-CRT, using multiple non-coplanar fields; a stereotactic body frame was used with CTV-PTV margins of 5 mm (antero-posterior and latero-lateral) and 10 mm (cranio-caudal). The second cohort (2010-2014) included 53 patients, planned with volumetric IMRT, using a single/multi arcs VMAT technique, on a PTV generated with 3 mm margins from a patient’s specific ITV (obtained from 4D-CT), with a frameless approach through cone-beam CT guidance. Clinical acute and late toxicities were scored according to RTOG scales; radiological acute (<6 months from SBRT) and late (>6 months post SBRT) toxicity on the basis of modified Kimura and Koenig’s classifications, respectively. Student’s T test was used to compare clinical characteristics, and Pearson’s chi square test to compare the incidence of any grade lung toxicity.

Results: Patients and tumors’ characteristics were similar and well matched between the groups. PTV volumes were also comparable (35.1 cc for 3D-CRT vs. 40.3 cc for VMAT, p=0.16). Moreover, no significant difference was detected in Mean Lung Dose, converted in 2 Gy equivalent (11.7 vs. 10.4 Gy for 3D-CRT and VMAT, respectively, p=0.13). Frequencies of acute and late clinical toxicity (all grades) were superimposable between 3D-CRT and VMAT (acute: 10.5% vs. 22.6%, p=0.28; late: 4.2% vs. 13%, p=0.09, respectively). The crude rate of RTOG acute ≥ grade 3 radiation pneumonitis was 2.1% after 3D-CRT and 3.8% after VMAT. Acute and late radiological toxicity patterns were also similar between the two cohorts. Figures 1 and 2 depict the incidence and grade of both, according to different treatments. As expected, late radiological toxicity occurred in approximately 60% of patients, with modified conventional (25% after 3D-CRT vs. 32.6% after VMAT) and mass-like (19.6% after 3D-CRT vs. 17.4% after VMAT) patterns as the most commonly observed findings.

Conclusion: Results of the present study indicate that the pattern of clinical and radiological toxicities following SBRT in peripheral early stage NSCLC treated with comparable BED10Gy is not influenced by the different techniques used for planning and delivery.

EP-1229 Non-small cell lung cancer: marked difference in first failure site depending on histology

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Purpose or Objective: Inoperable non-small cell lung cancer (NSCLC) comprises several histological subtypes, with squamous cell carcinoma (SCC) and adenocarcinoma (AC) being most frequent. The prognosis is poor with current chemo-radiation strategies and treatment intensification is limited by patient tolerance. It is therefore relevant to target experimental therapeutic approaches to a patient’s risk of local versus distant failure. The purpose of the current study was to compare the pattern of first relapse after chemo-radiation for locally advanced pulmonary SCC and AC.

Material and Methods: We retrospectively included 193 patients with locally advanced NSCLC treated with chemoradiotherapy from 2009 to 2012. Patients with initial stage IV (n=17) disease and/or patients with histology other than AC or SCC (n=22) were excluded leaving 155 patient for the analysis. Patients were identified and grouped according to first event as either: loco-regional (LR) failure; intra-cranial distant metastases (ICDM), extra-cranial distant metastases (ECDM); dead without evidence of disease (Dead, NED), with the remaining patients being Alive, NED at latest follow-up in August 2015. The cumulative incidence of events was compared across the histology subtypes, using the competing risk method of Fine and Gray.