

PO-0690

Patient weight loss predicts worse overall survival for stage I lung cancer treated with SABR

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Purpose or Objective: As per published guidelines, SABR is the recommended curative treatment option for those stage I non-small cell lung cancer patients (NSCLC) who either cannot or will not have surgery. This study investigates whether patient reported weight loss at presentation is a prognostic factor in a retrospective cohort of biopsy-proven stage I NSCLC patients who received SABR at one institution.

Material and Methods: Between January 2009 and December 2013, 314 consecutive patients with histologically proven T1 or T2a N0 NSCLC treated with SABR were entered in a research ethics board approved database. All patients were reviewed for potential surgical resection by a thoracic surgeon and all had FDG-PET/CT staging. Overall survival (OS) by weight loss was evaluated by Kaplan-Meier and log-rank test. Univariate and multivariate of weight loss was performed using a Cox proportional hazard model; adjustment of potential confounders included age, gender, performance status, histology, T-stage, tumor location, SUV max, smoking status and Charlson Comorbidity Index (CCI).. Weight loss was self-reported by patients on a standard intake form prior to oncology consultations under 5%, 5-10% or greater than 10%.

Results: 292 patients (92.9%) in the database had self-reported weight loss. 26 (8.9%) and 27 (9.2%) patients self-reported weight loss of 5-10% or greater than 10%, respectively. Survival differences were significant between weight loss groups especially in those patients with greater than 10% cohort. On univariate analyses, hazard ratio (HR) were 0.86 (95%CI 0.41-1.80) and 2.77 (95%CI 1.61-4.79) for patients with 5-10% and greater than 10% weight loss, respectively. The increased risk of death in patients with greater than 10% weight loss remained significant after adjustment for all confounders HR= 2.52 (95% CI 1.43-4.45). Weight loss overall was a significant risk factor for overall survival (P=0.0059).

Conclusion: Patient reported weight loss is a symptom that predicts shorter survival even in early stage NSCLC treated with SABR.

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SABR for central lung tumors: plan quality and long-term clinical outcomes

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Purpose or Objective: The role of stereotactic ablative radiotherapy (SABR) for central tumors is less well established due to toxicity concerns. Volumetric modulated arc therapy (VMAT) has been used at our center since 2008 to deliver risk-adapted SABR for central tumors. We evaluated plan quality and clinical outcomes for patients with a central tumor.

Material and Methods: We identified 80 consecutive patients with primary NSCLC located within 2 cm from the proximal bronchial tree (PBT) and treated using RapidArc™ between 2008-2013. Patients with prior radiotherapy or lung surgery were excluded. RTOG definitions were used to contour organs at risk (OARs). Compliance to departmental, RTOG 0813 and LungTech criteria was assessed for PTV coverage, high/low dose spillage and doses delivered to OARs. Long-term toxicity results were analysed and overall survival (OS) was compared

with 252 peripheral tumors (same exclusion criteria) treated with 3 or 5 fractions during the same period.

Results: PTV V95 was 60Gy in 96% of patients. Median PTV was 66 cm³ (range 9-286). Dmax was ≥60Gy in 40% of patients for PBT, 26.3% for aorta, 55% for heart, and 1.3% for trachea. Esophageal maximum Dmax was 58Gy. Mean total lung V5Gy was 21% and mean total lung V20Gy was 8%. Mean contralateral V5Gy was 6.3%. 54 patients (68%) exceeded RTOG0813 Dmax for organ-at-risk (OAR), with 27 exceeding PBT Dmax. LungTech OARs dose limits were exceeded in 48 patients (60%). 5 of 78 patients (6.4%) with adequate follow-up information had grade 3 toxicity. Grade 4 toxicity was not observed. Treatment-related death was considered possible (n=3) or likely (n=3) in 6 patients (7.5%). With a median follow-up of 47 months, 3-year survival was 53%, compared with 57% for 252 peripheral tumors treated with 3 or 5 fractions SABR in the same period (p=0.369).

Conclusion: Although a substantial proportion of moderately central SABR patients received ≥60Gy to OARs, the 3-year survival was similar to patients with peripheral tumors. OARs tolerance doses continue to be refined and patients should be informed of the potential risks and benefits of central lung SABR. In the meantime, it appears reasonable to limit Dmax in OARs (including inside PTV) and lung doses (e.g. V5), using IMRT/VMAT. It is finally important to note that the outcomes in the present analysis should not be extrapolated to very central tumors, where the toxicity risks may be higher.

PO-0692

A novel endoscopically injected liquid-gel marker for image guided radiotherapy of thoracic tumours

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Purpose or Objective: A novel liquid gel fiducial marker (BioXmark®) was developed for use in image guided radiotherapy (IGRT).

The injectable marker is based on three components; sucrose acetate isobutyrate (SAIB), x-SAIB (electron dense SAIB analogue) and ethanol. After injection, the liquid gel matrix rapidly increases viscosity forming a rigid hydrophobic gel with minimal degradation over months (animal studies). The marker was developed as an alternative to solid metal fiducial markers, providing a simpler injection procedure and potentially lowering the risk of complications/displacement/marker loss while remaining visible on ultrasound, 2D kV X-ray/CT and MRI images.

In this study, we investigated the safety and feasibility of endoscopic (bronchial) ultrasound (EUS/EBUS) guided injection of the liquid marker into patients with stage III non-small cell lung cancer (NSCLC), and the visibility of the marker throughout the radiotherapy (RT) course.

Material and Methods: Patients with stage III NSCLC referred for concomitant chemo-RT (66 Gy in 33 fractions) were eligible.

Marker injection was done by experienced pulmonologists as an outpatient procedure. Standard EUS and EBUS equipment with a 22G aspiration needle was used for injection.

Marker deposits were injected in the primary tumour (if possible) and affected mediastinal lymph nodes. The