Methods and Materials: Operable patients with biopsy-proven Stage I NSCLC were treated with SBRT followed by surgical resection. The protocol mandated an interval of 10 weeks between SBRT and surgery. The tumor response post-SBRT was assessed using RECIST 1.1 methodology. LC were categorized as complete response (CR), partial response (PR), stable disease (SD), and progressive disease (PD).

Results: A total of 188 patients were included in the study, with 111 patients completing both treatments. Median age was 70 (range 54-76), 60% had T1 disease, and 60% had adenocarcinoma. The median time to surgery after SBRT was 10.1 weeks (range 9.3-15.6 weeks). Surgical resection was performed with lobectomy (n = 8) or wedge resection (n = 2). Median follow up after surgery was 6.3 months. After combined treatment, the rate of Grade 3-4 toxicity was 10% (one patient with pneumonia, atrial fibrillation, and respiratory failure due to mucus plugging, all resolved). Seven patients developed Grade 2 toxicities. Thirty- and 90-day mortality post-surgery were both 0%.

Conclusions: Toxicity rates after SBRT + surgical resection compare very favourably with reported rates in prospective studies of surgical resection alone (~48% Grade 3-5 toxicity after lobectomy [1] and ~30% after wedge resection [2]). Mature data on pCR rates and oncologic outcomes from this combined modality strategy are awaited.

158 TUMOUR RESPONSE TO STEREOTACTIC BODY RADIATION THERAPY (SBRT) AS PREDICTOR OF DISTANT FAILURE AND SURVIVAL OUTCOMES IN PATIENTS WITH STAGE I NON-SMALL CELL LUNG CANCER (NSCLC).

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Purpose: SBRT is an alternative treatment to surgery for Stage I NSCLC. Intriguingly, NSCLC lesions post-SBRT rarely exhibit a complete response locally and yet yield excellent local control of around 95%. The degree of treatment response seems to have little effect on in current practice. This study investigated tumour response post-SBRT as a clinical outcomes predictor in Stage I NSCLC patients.

Methods: Overall survival of 233 patients were reviewed retrospectively from Sunnybrook Electronic Patient Record. Tumour sizes were collected from radiologist’s measurements based on CT-Scan pre and post-SBRT within 6, 12, and 18 months intervals. Each patient’s maximum response within 18 months was calculated and grouped using RECIST 1.1 methodology: complete response (CR), partial response (PR), stable disease (SD), and progressive disease (PD).

Results: The median age of study population was 77.5 years. Median follow up duration was 25 months. Local control (LC), overall survival (OS), and non-local control (NLC) for all patients at two years were: 92.5, 74.6, and 68.0% respectively. Of patients with available pre and post-SBRT tumour sizes (n = 188), 11 (5.9%), 92 (48.9%), and 79 (42.0%), and six (3.2%) patients were categorized CR, PR, SD, and PD respectively using RECIST 1.1 methodology. LC were: CR (100%), PR (94.6%), SD (89.7%), and PD (66.7%) respectively after two years. OS were: CR (80.8%), PR (72.0%), and PD (44.4%) respectively. NLC were: CR (100%), PR (66.4%), SD (62.5%) and PD (16.7%) respectively. There is a statistically significant difference in NLC between groups (p = 0.0009).

Conclusions: Stage I NSCLC patients with a lesser response post-SBRT are at higher risk of developing non-local recurrences. These patients may benefit from closer follow up and adjuvant treatment post-SBRT.

159 PHASE I STUDY OF NEO-ADJUVANT STEREOTACTIC BODY RADIOTHERAPY (SBRT) IN OPERABLE PATIENTS WITH BORDERLINE RESECTABLE LOCALLY ADVANCED NON-SMALL CELL LUNG CANCER (LA-NSCLC) (LINEARRIE: A STUDY: NCT02433574)

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Purpose: In patients undergoing surgery for Stage I NSCLC, the delivery of neoadjuvant SBRT has been proposed as a method of improving oncologic outcomes. A Phase II trial was launched to evaluate oncologic outcomes, pCR rates, and toxicity after SBRT followed by surgical resection. The protocol mandated an interim safety analysis after completion of combined treatment in the first 10 patients.

Methods and Materials: Operable patients with biopsy-proven Stage I NSCLC were considered eligible. SBRT was delivered using a risk-adapted fractionation (54 Gy/3 fractions, 55/5 fractions or 60/8 fractions, all with biologically effective dose > 100 Gy10), prescribed to the ~80% isodose line covering the planning target volume. Surgical resection was planned 10 weeks later, either lobectomy or sublobar resection, at a high-volume tertiary centre completing more than 200 lung cancer resections annually. Patients were imaged with dynamic FDG-PET CT and dynamic contrast enhanced CT before SBRT and again before surgery. Toxicity was recorded using CTCAE version 4.0.

Results: Twelve patients were enrolled between September 2014 and September 2015. Two did not undergo surgery after SBRT due to patient or surgeon preference; neither patient has developed toxicity or recurrence. For the 10 patients completing both treatments, median age was 70 (range 54-76), 60% had T1 disease, and 60% had adenocarcinoma. Median FEV1 was 73% predicted (range 54-87%). Median time to surgery post-SABR was 10.1 weeks (range 9.3-15.6 weeks). Surgical resection consisted of lobectomy (n = 8) or wedge resection (n = 2). Median follow up after surgery was 6.3 months. After combined treatment, the rate of Grade 3-4 toxicity was 10% (one patient with pneumonia, atrial fibrillation, and respiratory failure due to mucus plugging, all resolved). Seven patients developed Grade 2 toxicities. Thirty- and 90-day mortality post-surgery were both 0%.

Conclusions: Toxicity rates after SBRT + surgical resection compare very favourably with reported rates in prospective studies of surgical resection alone (~48% Grade 3-5 toxicity after lobectomy [1] and ~30% after wedge resection [2]). Mature data on pCR rates and oncologic outcomes from this combined modality strategy are awaited.