modality with corresponding survival are shown in Table 1. 243 (10.5%) patients received surgery and chemotherapy, 230 (10%) patients received radical radiotherapy and chemotherapy, 618 (26.8%) palliative radiotherapy or palliative chemotherapy and 802 (34.8%) received best supportive care. The proportion of patients alive was 74.4% in patients receiving surgery; 63.2% for patients receiving radical radiotherapy, 41.8% for palliative chemotherapy/radiotherapy and 23.1% for supportive care.

Conclusions The commonest curative intent treatments are bimodality treatment (chemotherapy combined with either surgery or radical radiotherapy), however only one fifth of patients received this. The majority of patient still receive palliative treatment only. Survival is higher in patients who receive surgery as part of their treatment however we are unable to exclude selection bias as the reason for this. Further risk adjustment analysis will be performed to assess this.

S99 LUNG CANCER SURGICAL OUTCOMES IN ENGLAND (2015)

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10.1136/thoraxjnl-2017-210983.105

Introduction The National Lung Cancer Audit has collected data for over 10 years demonstrating gradually rising resection rates in the UK. The Clinical Outcomes Programme (COP) uses national audit data to publish quality measures at the level of individual consultants. The lung cancer COP focusses on activity at individual surgeon level, and on survival at unit level. Previous rounds of this audit demonstrated overall 30

Abstract S99 Figure 1 Funnel plots of adjusted survival for 30 days (A) and 90 days (B) survival after surgery for lung cancer in English trusts.

and 90 day survival of 97.8% and 95.5% (2013) and 97.9% and 96.2% (2014).

Methods Data submitted to the NLCA for patients having curative-intent surgery who underwent surgery in 2015 was sent to the clinical lead at each surgical unit for validation and addition of responsible surgeon GMC number, with the option to add surgical cases if they were not included in the supplied dataset. Date of death was derived by a link to the Office of National Statistics. Units reporting unadjusted survival proportions more than three standard errors outside the national mean ("alarm" level) at 30 or 90 days were identified as statistical outliers.

Results All of the 28 surgical units in England participated in the audit, submitting a total of 5843 cases, of which 93% were NSCLC, 2% SCLC and 6% carcinoid. Median annual unit activity was 186 resections (IQR 141–264, range 49–507), an increase over the median 156 in the previous year. Median annual activity for individual surgeons was 44 (IQR 18–67, range 1–171). Median LOS 8.1 days (median 6, IQR 4–9). Overall 30 day survival was 98.2% and 90 day survival was 96.3%. There were no units with statistical outliers at the alarm level at 30 days and 90 days (see figure 1). Overall 1 year survival 87.9%.

Conclusion Volume of activity varies widely by unit and individual surgeon. Survival after lung cancer surgery is very high, is improving, and is not statistically significantly different across the surgical units in England. New measures are needed to properly reflect features that are important to patients.

S100 UTILITY OF ENDOBRONCHIAL ULTRASOUND-GUIDED TRANSBRONCHIAL NEEDLE ASPIRATION FOR PD-L1 TESTING IN PATIENTS WITH NSCLC

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10.1136/thoraxjnl-2017-210983.106

Rationale Recent data have demonstrated the superiority of Pembroluzimab over chemotherapy for patients with advanced NSCLC and high ($\geq 50\%$ expression) of PD-L1. This has resulted in NICE approving Pembroluzimab as a first line treatment option for patients with advanced NSCLC in June 2017. The original trial however excluded patients with PD-L1 testing on EBUS samples. We therefore conducted a large, multicentre study to clarify whether specimens obtained by EBUS-TBNA were suitable for testing PD-L1 in patients with NSCLC.

Methods NSCLC samples acquired by EBUS-TBNA (29.4%), percutaneous biopsy (31.2%), endobronchial biopsy (13.8%), surgical (21.4%) or other techniques (4.1%) were recorded from 435 consecutive patients with known or suspected lung cancer across 5 centres in England between January 2015 and December 2016.

Results PD-L1 assessment (using the 22 C3 assay in all cases) was possible in 92.2% of patients undergoing EBUS and there was no difference in success of PD-L1 testing according to modality of tissue acquisition ($p=0.18$). The frequency of complications from EBUS-TBNA was similar to endobronchial or percutaneous techniques but lower than surgical procedures

(5.0% vs 13.8%; $p=0.03$). PD-L1 expression in the cohort was high ($\geq 50\%$) in 28.5%, weak ($\geq 1\%$ –50%) in 28.2%, whilst 43.3% of patients were PD-L1 negative. The only statistically significant predictor for PD-L1 expression in multivariate analysis was the presence of brain metastasis at diagnosis (OR 2.02; CI 1.04–3.90). 47 patients (11.4%) were treated with immunotherapy and the response rate was 16.2%. All patients that responded to immunotherapy had high ($\geq 50\%$) expression of PD-L1.

Conclusions This large multicentre study demonstrates for the first time that samples obtained by EBUS-TBNA in routine practice are suitable for PD-L1 testing in patients with NSCLC. The presence of brain metastases at diagnosis predicts high PD-L1 expression in this cohort and this new finding should be tested in future clinical trials.

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A COMPARISON OF THE IMAGING FEATURES OF EARLY STAGE PRIMARY LUNG CANCER IN PATIENTS TREATED WITH SURGERY, SABR AND MICROWAVE ABLATION

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10.1136/thoraxjnl-2017-210983.107

Introduction Stereotactic Ablative Radiotherapy (SABR) and percutaneous microwave ablation (PMWA) are now being performed in patients deemed “medically inoperable” with non-small cell lung cancer (NSCLC). The majority of these patients are treated without ground truth histology, relying on imaging to establish the diagnosis. The purpose of this study was to

investigate whether there were differences in the visible imaging features including CT Texture Analysis (CTTA) between patients referred for surgery, SABR and PMWA, which might suggest differences in underlying diagnosis.

Methods 92 patients with one pulmonary nodule (PN) suspected as T1N0M0 to T2AN0M0 NSCLC on imaging were treated either with SABR (22 patients), PMWA (25) or Video-assisted thorascopic surgery (45) of which 23 had NSCLC (SURG M) and 22 had benign disease (SURG B). Patient characteristics, CT nodule morphology, presence of emphysema and percentage emphysema score, FDG avidity and CT textural features were compared. Twenty texture features (previously used in combination to create a nodule probability of malignancy score between 0–1) were extracted from each automatic contoured region surrounding the PN. The Kruskal-Wallis test was used to compare texture features between the 4 patient groups (SABR, PMWA, SURG M and SURG B).

Results There was no significant difference in nodule morphology, volume at presentation ($p=0.280$) or volume doubling times ($p=0.149$), and presence of emphysema ($p=0.348$) or emphysema score ($p=0.367$) between the 4 groups. There was no statistical difference in CTTA malignancy prediction score between the SABR, PMWA and SURG M groups ($p\geq 0.05$). The probability of malignancy score was significantly lower ($p\text{-value}<0.01$) for SURG B (0.58 mean ± 0.19 sd) vs. SABR (0.79 ± 0.15) treatment groups (figure 1).

Conclusion This is the first study to our knowledge to evaluate the radiological differences between patient groups referred for surgical and non-surgical treatments for NSCLC. On this small study, the Results support the hypothesis that the non-operative patient groups comprise the same proportion of benign and malignant as those in the operative group. The Results also demonstrate the potential clinical utility of CTTA in patient selection when histology is not obtainable. CTTA does not require volumetry detectable growth to detect change, and therefore may be a useful biomarker of malignancy at first diagnosis.

Abstract S101 Figure 1 Summary statistics for probability of malignancy scores.