

histological and surgical details were extracted from clinical records. Analysis was conducted on MedCalc software v13.3.1 and reviewed by an independent statistician.

**Results** 42 patients who underwent EBUS+/-EUS for mediastinal staging were found to have no evidence of N2/3 disease. In 3 cases subsequent mediastinoscopy was performed as a high degree of suspicion for mediastinal disease persisted. However, in all cases surgical staging correlated with endosonographic staging. At thoracotomy, 3 (other) patients were upstaged to N2 disease. In two cases, micrometastatic disease was present in a station 7 node and one case had positive station 5/6 not accessible at EBUS/EUS. Overall the NPV of EBUS+/-EUS was 93% (95% CI, 80%–98%). In 22 of 42 patients, the same nodal stations sampled on EBUS/EUS were removed at surgery. In this subset, EBUS/EUS had a NPV of 91% (95% CI, 71% to 99%).

**Conclusion** We have shown that in an experienced centre, mediastinal staging by EBUS+/-EUS can have a high NPV. In these circumstances, surgical staging following negative endosonography is probably not warranted unless a high degree of clinical suspicion remains following MDT discussion. Regular audit of NPV is recommended to ensure performance standards are maintained.

#### REFERENCES

- 1 Annema *et al.* *JAMA* 2010;304:2245
- 2 NICE guidelines, 2011, *Lung Cancer*, CG121

#### P218 NODAL STAGING IN LUNG CANCER: A RISK STRATIFICATION MODEL FOR LYMPH NODES CLASSIFIED AS NEGATIVE BY EBUS-TBNA

M Evison, P Crosbie, J Morris, J Martin, R Shah, P Barber, R Booton. *University Hospital South Manchester, Manchester, UK*

10.1136/thoraxjnl-2014-206260.347

**Background** Over the last 10 years, EBUS-TBNA has become established as the first line nodal staging procedure of choice for lung cancer patients. However, the pathway for patients following a negative EBUS-TBNA has not been clearly defined.

**Aims and objectives** The primary aim of this study was to develop and validate a risk stratification model to categorise lymph nodes deemed negative by EBUS-TBNA into 'low risk' and 'high risk' groups, where 'risk' refers to the risk of false negative sampling.

**Materials and methods** A retrospective analysis of a prospectively maintained database at a UK tertiary EBUS-TBNA centre. Only patients with primary lung cancer and only negative lymph nodes by EBUS-TBNA were included in the analysis. A risk stratification model was built from a derivation set using independent predictors of malignancy and the validation set used to evaluate the constructed model. The study period was March 2010 to August 2013.

**Results** 329 lymph nodes were included in the analysis (derivation set  $n = 196$ , validation set  $n = 133$ ). Lymph node SUV, the SUV ratio between the lymph node and primary tumour and heterogeneous echogenicity during sonographic assessment were the only independent predictors of malignancy. Using a simplified scoring system based on the natural logs of the odds ratios from the multivariable analysis on the derivation sample, lymph nodes can be stratified into 'low risk' (score  $\leq 1$ ) and 'high risk' (score  $\geq 2$ ). 141/142 and 94/96 lymph nodes classified as 'low

risk' in the derivation and validation set respectively were ultimately proven to be benign and 35/54 and 24/37 lymph nodes classified as 'high risk' were proven malignant. The negative predictive value of the risk stratification model for the derivation set and validation set was 99.3% (95% CI 96.1–99.6) and 97.9% (95% CI 92–99.6%) respectively.

**Discussion** This risk stratification model may assist lung cancer MDTs in deciding which patients need further staging procedures and which may proceed directly to treatment after a negative EBUS.

#### P219 A RETROSPECTIVE ANALYSIS OF THE RELATIONSHIP BETWEEN EBUS-TBNA DIAGNOSTIC UTILITY AND LUNG CANCER STAGE

CL Marchand, ARL Medford. *North Bristol Lung Centre, Southmead Hospital, Bristol, UK*

10.1136/thoraxjnl-2014-206260.348

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is an important minimally invasive technique in lung cancer staging and diagnosis.

**Aim** A retrospective analysis of EBUS-TBNA performance in patients with suspected malignancy referred between November 2009 and December 2013 to a UK tertiary EBUS centre.

**Methods** We reviewed consecutive EBUS-TBNA cases with CT/PET positive mediastinal/hilar nodes detected in suspected malignancy. EBUS-TBNA was performed as previously documented [Medford A. *et al.* *QJM* 2009; 102:859–864]. No rapid on-site cytology was available.

**Results** 186 patients with suspected malignancy (intra/extrathoracic and lymphoproliferative) were referred for EBUS-TBNA. Mean age was 66(31–87) with a 3:2 male:female ratio. In this group the sensitivity of EBUS-TBNA was 95.5%, accuracy 96.2% and negative predictive value (NPV) 80.6%. The prevalence of malignancy was 84.4%.

159 patients (85%) were referred with suspected lung cancer. In this group the sensitivity of EBUS-TBNA was 94.7%, accuracy 95.6% and NPV 78.8%. The prevalence of lung cancer was 83.6%.

The performance of EBUS-TBNA by lung cancer stage was also analysed, (See Table).

**Conclusions** This study shows high EBUS-TBNA diagnostic accuracy for all lung cancer stages. The NPV may have been reduced by the high prevalence of lung cancer in our cohort.

The majority of EBUS-TBNA procedures were performed for radiological stage III-IV disease where confirmation of disease would select those suitable for palliative rather than radical treatment.

**Abstract P219 Table 1** Showing the performance of EBUS-TBNA by lung cancer stage

Stage	Number	Sensitivity (%)	Accuracy (%)	NPV (%)	Prevalence (%)
I and II	20	100	100	100	60
IIIa	49	92.5	93.9	75	81.6
IIIb	28	100	100	n/a	100
IV	62	92.4	93.5	69.2	85.5