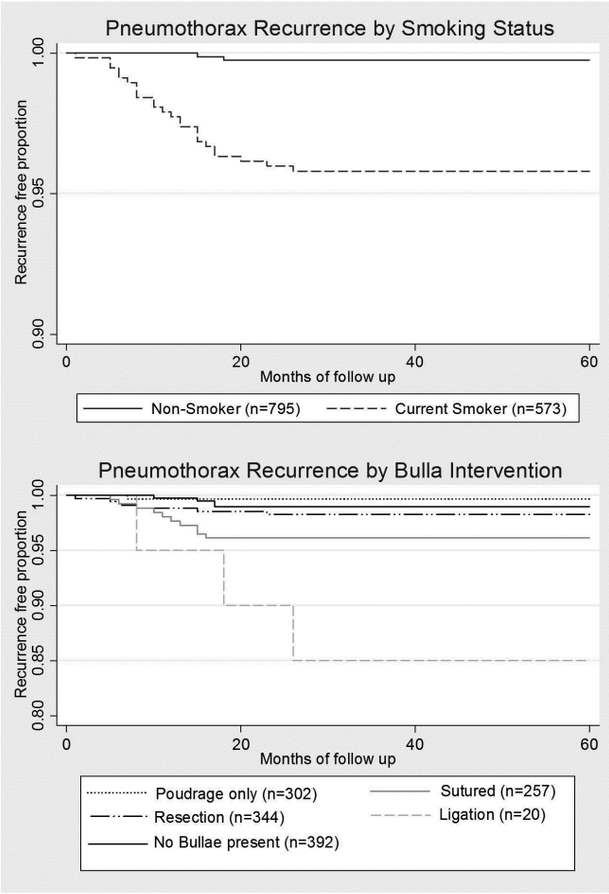
Methods Patients undergoing VATS for PSP at Carlo Forlanini hospital in Rome between January 2000 and December 2012 were prospectively collected. All patients underwent talc poudrage. Targeted surgical techniques were selected based on the presence of air leak and Vanderschueren stage. Patients had regular clinical and radiological follow-up for a minimum of 2 years. Surgical details, demographics and smoking histories were collected at baseline and data on duration of hospital stay, complications and recurrence rates were collated.
Results 1415 patients underwent VATS for PSP during the trial period. The majority of patients were male (76.2%). Median age was 25.3 years (IQR 21.0–29.4). The majority of patients underwent surgery due to recurrent pneumothorax (92.2%). Median length of stay was 5 days (IQR 5–6). 47 patients had incomplete follow up in December 2014 and so complete recurrence data is available for 1368 patients.



Abstract S22 Figure 1

VATS had a low complication rate of 2%, the majority of which was prolonged air leak (1.7%). Recurrent pneumothorax occurred in 26 patients (1.9%) over a median follow up of 8.5 years. Recurrence rates were significantly higher in current smokers at the time of surgery (24/573–4.2%) than in non-smokers (2/796–0.25%) $p < 0.001$. Bullae suturing (3.9%) and ligation (15%) were associated with statistically significant higher rates of recurrence compared with poudrage alone when controlled for smoking status and Vanderschueren stage.
Conclusions The marked difference in recurrence rates between smokers and non-smokers suggests that this factor is of key importance in predicting recurrence risk after VATS. This study demonstrates a low incidence of recurrence for patients undergoing VATS for PSP. Bullae ligation and bullae suturing appear to be associated with a higher risk of recurrence.

S23 AMBULATORY PERCUTANEOUS LUNG BIOPSY WITH EARLY DISCHARGE AND HEIMLICH VALVE MANAGEMENT OF IATROGENIC PNEUMOTHORAX – A NEW MODEL FOR THE UK

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Aim To determine if an early discharge radiology-led percutaneous lung biopsy (PLB) service, incorporating ambulatory outpatient small calibre Heimlich valve chest drain (HVCD) to treat pneumothorax, is potentially safe and advantageous to the NHS.
Methods A prospective study of 489 consecutive outpatient image-guided PLBs, performed between March 2011–March 2015, was conducted. Patients were discharged at 30 min if no pneumothorax was present; repeat 60-minute CXR was performed if a small asymptomatic pneumothorax was noted. If stable, patients were discharged. In enlarging or symptomatic pneumothorax, patients were discharged with HVCD *in situ* and followed up for drain removal. Data on complications was concurrently collected, including pneumothorax rates, numbers of patients requiring HVCD and failed early discharge. A retrospective blinded pulmonary function test (PFT) analysis was also performed at the end of the study period.
Results 489 PLBs were performed with diagnostic accuracy of 97.8%. 402 (82.2%) patients were discharged at 30 min, all without further incident. 87 patients developed pneumothorax (17.8%). 35 patients with a small stable, asymptomatic pneumothorax were discharged at 60 min without complication. 52 patients required HVCD, with 5/52 proceeding to PLB with drain in-situ: 38/52 (73.1%) had drain removal at 24 h and 14/52 (26.9%) at 48 h, with none requiring HVCD greater than 48 h. 4/489 patients were admitted, for social issues.

A blinded retrospective review of PFT data, available in 212/489 patients, revealed 28 with FEV1 <1l. 22/28 (78.6%) were discharged at 30 min without incident; 6/28 patients (21.4%) developed post –PLB pneumothorax with three (10.7%) requiring outpatient HVCD, for 24 h duration.
Conclusion This prospective study of 489 consecutive outpatient PLBs, novel in the NHS setting, provides evidence for a paradigm shift in current UK lung biopsy practice: (i) early discharge PLB, facilitated by use of ambulatory HVCD, is safe and expeditious, thereby enabling more prompt lung cancer diagnosis; and (ii) use of outpatient HVCD is clinically and economically beneficial, saving precious hospital beds whilst also facilitating lung biopsy in severely emphysematous patients with negligible morbidity.

S24 LUNG PARENCHYMAL ASSESSMENT IN PRIMARY AND SECONDARY PNEUMOTHORAX - A CASE-CONTROL STUDY

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10.1136/thoraxjnl-2015-207770.30

Introduction Primary pneumothorax has been defined as occurring in patients with no known lung disease but the assumption that the underlying lung is normal is increasingly contentious. The purpose of this case-control study is to evaluate lung structure and quantify the extent of any emphysema in patients with primary and secondary spontaneous pneumothorax compared with a control group without pneumothorax and to assess the influence of smoking on this process

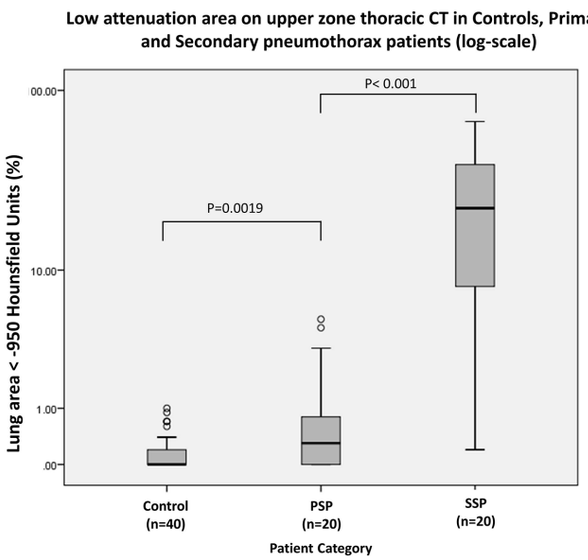
Methods 20 patients with primary pneumothorax (PSP), 20 patients with secondary pneumothorax (SSP) and 40 control patients with computed tomography scans suitable for quantitative analysis were evaluated. Demographics and smoking histories were collated. Quantitative evaluation of low attenuation areas of the lung was performed using semi-automated software. The percentage of segmented lung below the low attenuation threshold value of -950 Hounsfield units was calculated, based on a previously validated threshold.[1] The extent of emphysema-like destruction was also assessed visually by an experienced consultant chest radiologist.

Results The extent of emphysema and percentage low attenuation area was greater in PSP patients compared with controls matched for age and smoking history (Median 0.25 vs 0.00, p = 0.019) and was also higher in SSP compared with PSP patients (16.15 vs 0.25, p < 0.001). PSP patients who smoked had significantly greater low attenuation area than PSP non-smokers (0.7 vs 0.1, p = 0.034). No such difference was detected between smokers and non-smokers within the control group (0.0 vs 0.05, p = 0.798).

Conclusions The majority of patients with PSP had quantifiable evidence of parenchymal destruction and emphysema. The presented data is supportive of the hypothesis that there is likely to be a spectrum of lung damage ranging from 'normal patients' through to patients with SSP, and rather than a clear distinction between PSP and SSP these conditions exist on a continuum.

REFERENCE

1 Heussel CP, Herth FJ, Kappes J, *et al.* Fully automatic quantitative assessment of emphysema in computed tomography: comparison with pulmonary function testing and normal values. *Eur Radiol*. 2009;**19**(10):2391-402



Abstract S24 Figure 1

Sleep apnoea and hypoventilation: screening and treating high risk populations

S25 ESTABLISHING A NORMAL RANGE IN DRIVING SIMULATOR PERFORMANCE USING STANDARD DEVIATION OF LANE POSITION (SDLP) IN AN ADVANCED PC –BASED DRIVING SIMULATOR (MINIUOLDS)

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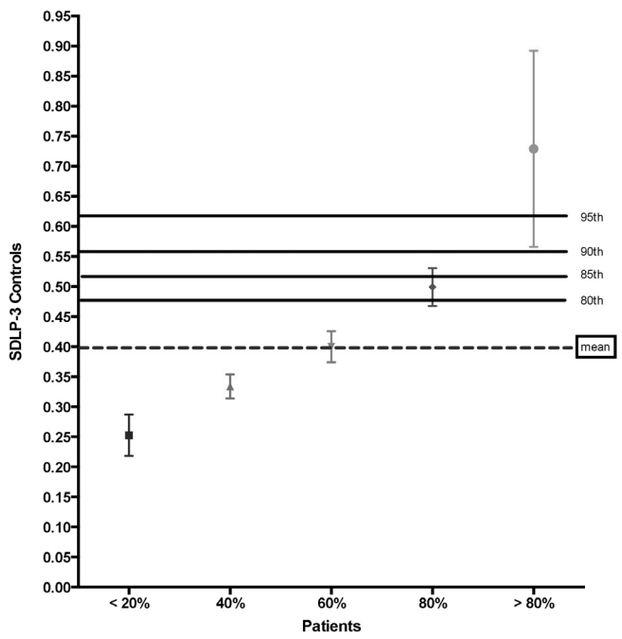
Introduction Some patients with OSAS are at higher risk of being involved in road traffic accidents. No objective tests have been shown to predict reliably whether an individual is safe to drive or not and there is significant variation in the advice given by the clinicians. Using a continuously measured variable (SDLP) on an advanced PC-based driving simulator the at risk patients can be identified with a high degree of accuracy. We have now compared driving performance based on SDLP in controls and untreated OSAS patients and have established a normal range.

Methods 129 untreated male OSAS patients (Age 53+/-12, ESS 14+/-5, ODI 41+/-26, BMI 36+/-8,) and 79 male controls (Age 56+/-15, ESS 4+/-3, BMI 28+/-8) were recruited in the study. All performed a simulator run after initial acclimatisation. The simulator run consisted of eight epochs and on average needed 7 min to complete one epoch driving at 70 miles per hour. The simulator layout was designed in line with the UK highways agency road standards. The mean SDLP in epoch-3 (SDLP3) was compared between the two groups using unpaired T-test. The SDLP3 in the patient group was evaluated and this was compared with the mean and 95th centile values of SDLP 3 among the controls.



Abstract S25 Figure 1