Abstract P273 Figure 1 Top panel – statistically significant correlation between ^{129}Xe CSSR-derived alveolar septal thickness (ST) and ^3He diffusion-weighted MRI-derived apparent diffusion coefficient (ADC) of helium in the alveolar airspace. Bottom panel – corroboration of the ^{129}Xe CSSR method as a probe of gas-exchange using the whole-lung transfer factor, DLCO

exquisite depiction of pulmonary ventilation. In addition, MR measurement of the apparent diffusion coefficient (ADC) of ^3He gas has proven clinical utility in assessment of emphysema. Furthermore, xenon is soluble and is a promising marker of pulmonary gas-exchange. The motivation of this work was to demonstrate non-invasive quantification of whole-lung septal thickness (ST) and helium ADC in subjects with idiopathic pulmonary fibrosis (IPF) and systemic sclerosis (SSc) using ^{129}Xe and ^3He MR.

Methods Hyperpolarised ^{129}Xe spectroscopy was performed on ten healthy volunteers (23–74 yrs), four subjects with SSc and four with IPF at 1.5 T. A chemical shift saturation recovery (CSSR) method was used to assess the dynamics of xenon uptake into parenchymal tissues and blood and to derive quantitative information about lung microstructure. From the subject cohort, six volunteers and seven patients were also scanned at 1.5 T with a diffusion-weighted sequence to determine ^3He ADC values. For comparison with MR experiments, standard pulmonary function tests including the diffusing capacity of carbon monoxide (DL_{CO}) were performed.

Results Pulmonary function was significantly worse in both SSc and IPF subjects than healthy volunteers ($\text{DL}_{\text{CO}} < 45\%$ in IPF patients). Both ^{129}Xe CSSR ST and ^3He ADC values were elevated in subjects with SSc, and to a larger degree in those with IPF, compared with healthy volunteers (Figure 1, top). These two MR metrics correlated significantly, suggesting that fibrotic remodelling of tissue both degrades gas-exchange efficiency and induces alveolar widening causing less-restricted gas diffusion (although emphysema was reported for only one subject on CT). The ^{129}Xe CSSR-derived ST values correlated well with whole-lung DL_{CO} (Figure 1, bottom) and in healthy volunteers, ST increased with age ($p < 0.05$).

Conclusions Hyperpolarised ^{129}Xe and ^3He MR techniques are sensitive to small changes in gas-exchange efficiency and alveolar surface geometry, respectively. These two factors appear to have an intrinsic link, identified in the presence of fibrotic lung disease without obvious emphysema. Further application of these MR techniques may prove useful in the diagnosis/assessment of different forms of ILD.

P274 ANTI-SYNTHEASE SYNDROME: VALIDITY OF ANA AS A SCREENING TOOL – THE OXFORD ILD SERVICE EXPERIENCE

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Background Anti-synthetase syndrome (ASS) is characterised by interstitial lung disease (ILD), myositis, arthropathy, fever, Raynaud's, and mechanic hands associated with antisynthetase antibodies (including Jo-1, PL-7 and PL-12). ILD is the major determinant of mortality in ASS.

ANA is commonly used to screen for autoimmune diseases. If negative, in many centres extractable nuclear antigens (ENAs) are not tested. This study aims to highlight the inadequacy of this approach.

Method We retrospectively examined consecutive patients in the Oxford ILD and Rheumatology services with ASS-ILD between 2009–2014. CT scans were reviewed to identify the pattern of ILD. Immunology, lung function and medication were identified from patient records.

Results 24 patients were identified with ASS-ILD: age 33–78 years (mean 54); 9 male, 15 female. Disease severity was assessed by lung function at presentation: FVC 42–118% (mean 77.9%) predicted, TLco 10–99% (mean 56%) predicted.

Only 1 of 24 (4.2%) were ANA positive (titre 1:80). 18 of 24 (75%) had a positive ENA screen (ELISA): 13 Jo-1; 4 Jo-1 and Ro-52; and 1 Ro. 6 (25%) patients had a negative ENA screen. 5 of these had a positive myositis blot (1 Jo-1, 3 PL-7, 1 PL-12) and 1 was negative for all 3 autoantibodies. Of 7 patients who were Jo-1 positive on ENA screen, 4 had a negative Jo-1 myositis blot.

CT patterns of disease: organising pneumonia (OP; $n = 7$), non-specific interstitial pneumonia (NSIP; $n = 7$), OP/NSIP overlap ($n = 9$), acute interstitial pneumonia (AIP; $n = 1$). There was no relationship between anti-synthetase antibody and CT pattern.

The identification of an ASS antibody significantly changed management in most patients; 17 were treated with (iv) cyclophosphamide and rituximab was added to 8 cases.

Conclusion The identification of an anti-synthetase antibody is central to diagnosis and significantly impacts on patient management. This data demonstrates that ANA is an inadequate screening test. If ASS is clinically suspected, ENA testing should be performed despite a negative ANA result. The data also demonstrate that either an ENA screen or a myositis blot used in isolation lack the required sensitivity. These tests need to be used in combination to avoid false negative results.

P275 EBUS OR EUS IN THE DIAGNOSIS OF SARCOIDOSIS?

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Introduction The utility of endoscopic ultrasonography in the diagnosis of sarcoidosis was shown in the GRANULOMA trial.¹ However, in the study, two thirds of samples were obtained using Endoscopic Ultrasound (EUS) via the gastrointestinal tract, and one third by Endobronchial Ultrasound (EBUS). Since this does not reflect typical practice in many areas, we assessed the diagnostic sensitivity of EBUS in suspected sarcoidosis and whether sampling nodes not accessible by EUS confers benefit.

Methods We retrospectively collected data relating to 128 consecutive patients in two separate experienced centres, who underwent EBUS over a 3 year period (2011–2013) with a pre-test differential diagnosis of sarcoidosis. Final diagnosis was based on decision at subsequent clinic review.

Results 129 EBUS procedures were performed in 128 patients (57% male, mean (range) age 49 (22–79) years. 221 nodal stations were sampled (median of 2 stations each patient) with no significant complications. Concurrent trans-bronchial biopsy (TBB) was carried out in 30 patients and endobronchial biopsy (EBB) in 10.

Overall diagnostic sensitivity (for each biopsy procedure alone) was as follows: EBB 44%, TBB 50%, EBUS 71%, while combining EBUS with EBB/TBB conferred a sensitivity of 79%.

Diagnostic sensitivity of EBUS was 77% for stage 1 and 62% for stage 2 sarcoidosis, and increased according to number of

92%).

Sensitivity from EUS-accessible nodes (Stations 7 and 4) was 72%, while this was 56% in EUS-inaccessible nodes (Stations 2, 10 and 11). If EUS-accessible nodes were present and sampled, additional sampling of EUS-inaccessible nodes did not further the diagnosis.

Conclusions In suspected sarcoidosis, the diagnostic yield of EBUS was 71%. Using additional bronchial biopsy techniques increased this by 8%. Mediastinal nodes, accessible by both EUS and EBUS, would appear to be the preferred site of sampling. However, EBUS allows sampling of nodes not accessible to EUS, which may be diagnostic if there is isolated hilar lymphadenopathy.

REFERENCE

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P276 CHARACTERISATION OF REFLUX AND ASPIRATION IN IDIOPATHIC PULMONARY FIBROSIS; AN INTEGRATED APPROACH

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Background Idiopathic pulmonary fibrosis (IPF) is a progressive condition with limited treatment options and median survival of 3–5 years. Gastro-oesophageal reflux (GOR) has been described in up to 90% of patients. Pulmonary aspiration has been suggested to contribute to IPF, with calls for aggressive antireflux therapy. We investigated reflux and aspiration in an unselected IPF cohort.

Methods Symptoms were assessed using a validated questionnaire. Patients with IPF underwent oesophageal manometry, pH-impedance analysis and a standardised bronchoalveolar lavage (BAL). Pepsin and bile salts were quantified in lavage supernatant using a validated ELISA and tandem mass spectrometry, respectively. Patient management was planned by an “aerodigestive” multidisciplinary team.

Results 35 patients were studied. Oesophageal manometry suggested normal oesophageal function in 46%. pH-impedance demonstrated supranormal GOR in 24 patients (69%). In nine of these, the combination of clinical history and structured questionnaire revealed no evidence of GORD. BAL pepsin concentrations were higher than those measured in four healthy volunteer controls: median 9.0 ng/ml (range 0–35) vs 1.1 ng/ml (0–3); $p = 0.02$. Bile salt concentrations were comparable in the two groups. To date, none of these patients have undergone fundoplication.

Discussion Oesophageal physiology and BAL assays may be combined to investigate reflux and aspiration in IPF. Our data suggest that acid reflux and weakly acid reflux is common and frequently asymptomatic. Our study suggests the need for carefully integrated assessments to inform potential treatment of reflux in IPF. High levels of oesophageal dysmotility and patient complexity support a cautious approach to antireflux surgery, which may be facilitated by multidisciplinary review.

Abstract P275 Figure 1

stations sampled (1 station 66%, 2 stations 70%, ≥ 3 stations