

All PET-CT reports carried out since 2007 with the mention of pleura/pleural within the request or report were reviewed. Radiological reports and patient records were examined, scans requested primarily for assessment of the pleura were included. Indication, radiological diagnosis, final diagnosis, presence of histological confirmation and duration of follow-up were determined. All patients with at least 6 months follow-up were analysed.

185 PET CT scan reports were reviewed, of which 28 were carried out primarily for assessment of pleural disease. 9 were found to have high SUVs suggestive of malignancy. 7 of which were demonstrated to be mesothelioma, 1 pleural tumour, 1 recurrence of non-small cell lung cancer. The remaining 19 were reported to have low SUVs, consistent with benign pleural disease.

For those with PET findings consistent with benign pleural disease, follow up data was available for a median of 12 months (Min 6- Max 66). One patient underwent pleural biopsy, which was consistent with benign disease. None of those designated as benign pleural disease based on PET-CT appearances were subsequently found to have pleural malignancy.

Our findings are consistent with previously published data and support the utility of PET-CT scanning in differentiating benign from malignant pleural disease in a clinical setting.

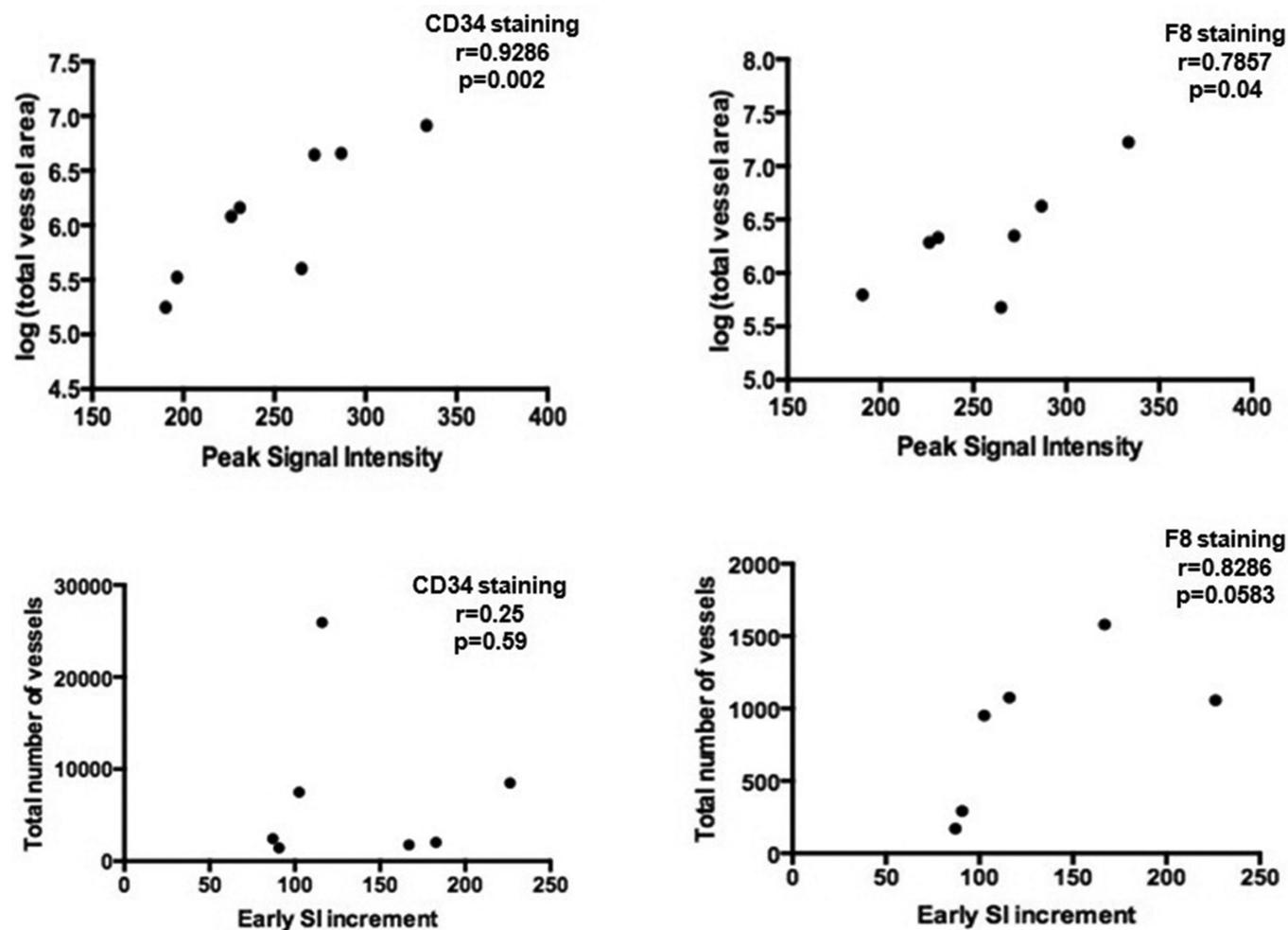
#### S44 EARLY CONTRAST KINETICS DURING MAGNETIC RESONANCE IMAGING IN PATIENTS WITH SUSPECTED MESOTHELIOMA

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**Introduction and objectives** The biology of Malignant Pleural Mesothelioma (MPM) is poorly understood, reflected in inexplicable heterogeneity in survival and therapeutic responses. Tumour angiogenesis has been identified as a therapeutic target and high tumour vascularity-to-stroma ratio is a poor prognosis marker. We report preliminary results of a pilot study conducted to establish and validate dynamic contrast-enhanced (CE) magnetic resonance imaging (MRI) methodology for the non-invasive assessment of MPM tumour vascularity.

**Methods** 15 patients with suspected MPM were recruited prospectively. All had Pleural MRI (3T Siemens) 3–5 days prior to Medical Thoracoscopy (MT). Imaging protocols were developed utilising patients 1–6. In the remaining 9, T1-weighted VIBE images were acquired (single isotropic volume in the coronal plane) at baseline and 4.5, 9 and 13.5 min post-injection of Gadolinium contrast (0.1 mmol/kg). Signal Intensity (SI) was measured within 15 regions of interest containing representative



Abstract S44 Figure 1 Relationships between contrast kinetic parameters and tissue vascularity

pleural tissue at each time point and summarised as Mean (+/-SD).

Pleural biopsies were obtained at MT in 8/9 patients who underwent complete CE-MRI. Paraffin-embedded tissue was available for 6/8 and stained with Factor VIII and CD34 immunostains. Blood vessel numbers and total vessel area were measured using quantitative image-analysis software (Leica Biosystems, U. K.) and correlated against contrast kinetic parameters (early SI increment (0–4.5 min) and peak SI), using Spearman's test. Patients were followed-up in a specialist pleural clinic and survival recorded.

**Results** Mean age was 75 years (+/- 7). 93% (n = 14) were male. Final diagnoses were: MPM (n = 6), lung adenocarcinoma (n = 1), breast adenocarcinoma (n = 1), renal cell carcinoma (n = 1), Benign Asbestos Pleural Effusion (n = 4), rheumatoid arthritis-related effusion (n = 1) and haemothorax (n = 1).

Figure 1 demonstrates relationships identified between contrast kinetic parameters and tissue vascularity. Mean follow-up was 267 (+/- 149) days, over which time mortality for MPM patients exhibiting early peak CE was 100% (n = 2/2) vs. 0% (n = 0/1) for late peak CE (log rank p = 0.2).

**Conclusions** We have established a functional MRI protocol for use in MPM. Within the limitations of this pilot study, early CE kinetics appear to reflect pleural tissue vascularity. Further work is ongoing to fully assess the diagnostic, prognostic and predictive value of this imaging biomarker.

#### S45 HOW SUCCESSFUL ARE MEDICAL THORACOSCOPISTS AT PREDICTING MALIGNANCY?

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**Introduction** Use of medical thoracoscopy by physicians to diagnose malignant pleural disease is increasing. Thoracoscopy is also used therapeutically to pleurodesis (talc poudrage), at the time of biopsy, to minimise pleural effusion recurrence. However, this relies on the physician being confident of their diagnosis macroscopically.

A survey was conducted of regular thoracoscopists to establish the current practise related to medical thoracoscopy and a video of previous thorascopies (with known histology) was used to assess the accuracy of macroscopic evaluation of pleural disease.

**Methods** 20 video clips recorded during thoracoscopy in Oxford were combined into a short video (30 s per clip): including a selection of cases with malignant (13) and benign disease (7), intentionally including some cases which were deemed "unclear". A survey of thoracoscopists was conducted via email. Respondents were asked to state whether each clip showed malignant or benign disease, scoring their confidence in their diagnosis (out of 10), whether they predict trapped lung and if

they would perform pleurodesis. Gold standard of diagnosis was the histology result.

**Results** Procedural survey: 16 physicians responded from 12 tertiary referral centres: 13 consultants and 3 specialist registrars. 15 (94%) had performed >30 thorascopies each. Four institutions (25%) perform between >10 thorascopies per month; 12 (75%) between 1–10 per month. Only 6 (38%) perform thorascopies as day cases. All perform rigid rather than flexible thorascopies.

**Video survey:** Of the 20 video clips, the mean number of correct answers was 12.4 (62%). Respondents were more confident of their answers (out of 10) when correct (7.1/10) than incorrect (6.1/10). In cases deemed malignant, 69% would have performed talc pleurodesis; however, 17% would have pleurodesed patients who had benign disease (See Table). Respondents only correctly predicted trapped lung in 2.6/20 cases (13%).

**Conclusion** Despite being experienced thoracoscopists, only 62% correctly diagnosed malignant or benign on video clips. The majority would appropriately perform pleurodesis, but 17% may have inappropriately pleurodesed benign disease. There are limitations to this small survey using short thoracoscopy clips, but this data suggests caution is required when considering making diagnosis on macroscopic appearance and deciding whether the lung is trapped.

#### Basic mechanisms in COPD pathogenesis

##### S46 PHAGOCYTOSIS BY BLOOD NEUTROPHILS IS NOT ATTENUATED IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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**Rationale** All COPD phenotypes have airway neutrophilia but, despite this, bacteria associated infections are common, relate to decline and a significant proportion of patients have persistent airway colonisation. This is suggestive of innate immune dysfunction. *In vitro* studies have shown reduced neutrophil migratory accuracy in COPD (Sapey, Stockley *et al.* 2011) however, the ability of the neutrophil to contain bacterial infection upon arrival at a site of infection is poorly understood. Literature regarding the phagocytic ability of neutrophils from patients with COPD is conflicting and inconclusive. It is unclear whether responses change depending on the bacterial species present. We hypothesised that neutrophil phagocytosis during COPD is impaired, predisposing patients to increased inflammation and reduced bacterial clearance.

**Methods** Blood neutrophils were isolated from stable-state COPD patients and healthy age-matched controls (HC). Phagocytosis of both opsonised (with 10% pooled COPD serum) and unopsonised pHrodo™-conjugated *Staphylococcus aureus* bioparticles (SA, n =

**Abstract S45 Table 1** Survey results: mean number of correct answers with mean level of confidence scores for the answers (those correct vs those incorrect), and whether the respondent would perform pleurodesis or not

Respondent's grade	Number (%)	Mean # of correct answers/20 (SD)	Mean level of confidence			Decision to Pleurodesis	
			For correct answers (/10)	For incorrect answers (/10)	All answers (/10)	% in "Malignant"	% in "Benign"
Consultant	13 (81%)	12.8 (2.0)	7.1	6.1	6.7	74%	21%
Registrar	3 (19%)	11.0 (0.0)	7.1	6.3	6.7	48%	0%
<b>Total / Overall</b>	<b>16 (100%)</b>	<b>12.4 (1.9)</b>	<b>7.1</b>	<b>6.1</b>	<b>6.7</b>	<b>69%</b>	<b>17%</b>