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Introduction Tuberculosis remains a significant global disease burden with an estimated 9 million new cases and 1.5 million deaths in 2013. BCG continues to be the only licensed TB vaccine, however it is poorly efficacious against adult pulmonary TB disease and there is a desperate need for a better vaccine to provide greater and more consistent protection. Development of such a vaccine has been hampered by the lack of reliable and validated correlates of protection. A human mycobacterial challenge model, using BCG as a surrogate for Mycobacterium tuberculosis challenge would facilitate improved vaccine selection for progression into future field efficacy testing. In this study we evaluate the effect of two BCG strains at two doses to optimise this model.

Methods 40 healthy BCG-naïve adults were assigned to one of four groups to receive intradermal BCG SSI or BCG Tice at standard or high dose. Two weeks following BCG challenge, skin biopsy from the BCG challenge site was performed. Volunteers were followed up for 28 days from challenge to assess reactogenicity and ensure no safety concerns. BCG mycobacterial load was quantified by solid culture and quantitative PCR.

Results BCG, regardless of strain or dose, was tolerated well and reactogenicity was similar between groups. BCG strain did not significantly affect BCG recovery from skin biopsy, however there was significantly greater recovery from the high dose challenge groups compared with the standard dose. Consistent with previous findings there was an inverse correlation between ex-vivo IFN-γ ELISpot responses to PPD and amount of BCG recovered from the skin biopsies.

Conclusions High dose BCG challenge regardless of strain used, significantly improves the sensitivity of this human mycobacterial challenge model. Practical reasons favour the use of BCG SSI over BCG Tice, as BCG SSI is licensed for intradermal administration in the UK and preparation is more straightforward with less product wastage or variability in dose between vials of BCG SSI. Looking ahead we plan to use this optimised BCG SSI challenge model to evaluate novel TB vaccine candidates in order to improve the selection of which vaccines then progress to expensive field efficacy trials.

IPF diagnosis and prognosis and biomarkers

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Introduction NICE recommends MDT presentation of all patients with suspected ILD. Any benefit of representation post VATS biopsy is unknown.

Methods Our hospital (BHH) provides a regional service for thoracic surgery. All VATS lung biopsies for interstitial lung diseases carried out in 2013 were identified. They were presented post surgery at the ILD MDT where their history, physiology, immunology, original CTs and pathology were reviewed by a fully constituted MDT team including ILD specialist histopathologists, radiologists, clinicians and CNS'. The MDT diagnosis was compared with the original specialist pulmonary histopathology report.

Results 71 patients had qualifying VATS biopsies in 2013. In 21 patients (30%) the MDT diagnosis differed significantly from the original histology report. In a further 12 patients the MDT altered a probable to a definite diagnosis. In 3 patients the MDT reduced the confidence of the histological diagnosis. Hypersensitivity pneumonitis was diagnosed much more confidently by the MDT than the histologist alone. The interpretation of necrotising granuloma was a particular problem from the histology alone; the MDT confirming diagnoses of rheumatoid lung, sarcoidosis or no ILD. It was also possible to achieve specific diagnoses in 5 patients whose biopsies were reported as non-specific fibrosis; NSIP (2), UIP (2), HP (1), and in 2 in whom the original report was resolving pneumonia (both HP). In 10/21 patients there was sufficient evidence to classify the UIP as IPF (7), collagen vascular disease UIP (1), chronic HP UIP (1), and drug induced UIP (1). There was often insufficient exposure and immunological data for the MDT to further characterise UIP and NSIP.

Conclusions The post biopsy MDT changed the diagnosis in 30% compared with the histology report alone. An ILD MDT review with the combination of radiology and pathology and an expert team provided significant extra benefit in terms of a precise diagnosis in patients biopsied with interstitial lung disease in whom the referring physician thought that a diagnosis was not possible without a biopsy. This is not surprising as the histologist is limited by sampling, the radiologist by resolution, and both by the lack of physiology, exposure history and immunology.

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Introduction Despite radiological advancements histology is often needed in the diagnosis of Interstitial Lung Disease (ILD). In order to obtain lung biopsies of adequate size and quality patients traditionally undergo a surgical lung biopsy associated with a mean hospital stay of 3.5 days and a complication rate of up to 28%.[1]

We are the first UK centre to have set up a minimally invasive, day case transbronchial cryobiopsy service in the diagnosis of ILDs.

Aims To establish a transbronchial cryobiopsy service for ILDs and assess complication rates and diagnostic yield.

Methods Patients were selected following discussion at the Interstitial Lung Disease Multidisciplinary Team meeting. Only patients in whom significant diagnostic doubt remained after thorough clinic-radiological work up were considered.

All procedures were performed with the patient self-ventilating under deep sedation with propofol using a flexible bronchoscope and 2.4 mm cryoprobe (ERBE). All but one procedure was performed under fluoroscopy guidance. All but the first two cases were performed following intubation with an uncuffed ET tube (Bronchoflex, Rusch). We introduced prophylactic IV tranexamic acid 1 g as premedication and endobronchial adrenaline routinely as part of our protocol after the first 5 cases. 1–5 samples were taken per procedure from several sub-segments of one lobe pre-selected by CT imaging.

Results 14 procedures were carried out on 13 patients. 9 patients were male. Mean age 63, mean predicted TLCO 50%; mean number of biopsies 2.7; mean aggregate biopsy size 624 mm^3.

Complications: 2 pneumothoraces requiring chest drain insertion; 1 case of moderate bleeding and 1 case of severe bleeding managed with endobronchial adrenaline and suction only.

All cases were performed as outpatient day cases with patients discharged home 2–4 h after the procedure except the 2 patients requiring chest drains.

Abstract S42 Table 1   Patient characteristics

Case	Sex	Age	Number of biopsies	Aggregate biopsy size in mm^3	Diagnosis
1	M	66	3	1800	Normal lung parenchyma
2	M	75	2	118	UIP
3	F	60	3	410	NSIP
4	M	66	1	125	Interstitial fibrosis
5	M	64	1	60	HP
6	M	44	1	80	NSIP
7	F	73	4	147	HP
8	M	74	5	1200	CLL
9	M	68	2	1120	Interstitial fibrosis
10	M	41	4	810	Organising Pneumonia
11	M	59	3	168	Interstitial fibrosis
12	F	57	4	2000	UIP
13	M	64	1	75	Non-diagnostic
14	F	67	2	pending	pending

Conclusions Our transbronchial cryobiopsy service is comparable in complication rates and diagnostic yield with larger case series from established centres outside the UK. Transbronchial cryobiopsy provides potential for minimally-invasive acquisition of sizeable lung biopsies. Further research is needed to establish whether transbronchial cryobiopsy should replace surgical lung biopsy in selected cases.

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S43   **MORTALITY FOLLOWING SURGICAL LUNG BIOPSY FOR THE DIAGNOSIS OF INTERSTITIAL LUNG DISEASE IN THE UNITED STATES: 2000–2011**

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Introduction Surgical lung biopsy can help to achieve a specific diagnosis in interstitial lung disease, but has associated risks. Most currently available mortality data come from case series.
Objective We aimed to assess in-hospital mortality following surgical lung biopsy for interstitial lung disease in a national secondary care dataset.
Methods Data were obtained from the Nationwide Inpatient Sample, an anonymised yearly sample of US community hospitals developed for the Healthcare Cost and Utilisation Project (HCUP). We identified cases from 2000–2011 using International Classification of Diseases (ICD-9-CM) codes for interstitial lung disease, and procedure codes for surgical lung biopsies. Lung resections and cases of lung cancer were excluded. We estimated numbers of biopsies nationwide and in-hospital mortality, and used multivariate logistic regression to assess risk factors for mortality, adjusting for sex, age, geographic region, co-morbidity, type of operation, and provisional diagnosis.
Results We estimated there to be around 12,000 surgical lung biopsies performed annually for interstitial lung disease in the United States, two-thirds of which were performed electively. In-hospital mortality was 1.7% for elective procedures, but significantly higher for non-elective procedures (16.0%). Male sex, increasing age, increasing co-morbidity, open surgery and a provisional diagnosis of idiopathic pulmonary fibrosis or connective tissue disease related interstitial lung disease were risk factors for increased mortality.
Conclusions In-hospital mortality following elective surgical lung biopsy for interstitial lung disease is just under 2%, but significantly higher for unplanned procedures. The mortality risk and risk factors for death should be taken into account when counselling patients on whether to pursue a histological diagnosis.

S44   **PROGNOSTIC SCORING SYSTEMS FOR IDIOPATHIC PULMONARY FIBROSIS: COMPARISON OF THE COMPOSITE PHYSIOLOGIC INDEX (CPI) AND THE GAP SCORE**

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Idiopathic Pulmonary Fibrosis (IPF) is a progressive, scarring lung disease with a poor prognosis and median survival of 3 years. It is a heterogeneous disorder with varying rates of progression, which presents a challenge for accurate prognostic prediction. The CPI[1] and the GAP[2] score are validated scoring systems for prognostic determination in IPF. However, it remains unclear which is the optimal method for accurate prediction of mortality in IPF. Therefore, a comparison of the predictive ability of the GAP score and CPI was undertaken in a cohort of IPF patients.
Methods Baseline data were collected retrospectively from 213 IPF patients (in accordance with ATS/ERS criteria and MDT consensus) from a single centre in the UK between 19th April 2007 and 14th July 2014. Thirty-eight patients were excluded, either because pulmonary function test results could not be obtained or the patient received a lung transplant during follow-up. Gender, age, FVC and DLCO were used to calculate the GAP score whilst FVC, FEV1 and DLCO were used for the CPI. Spearman's correlation was used to analyse the relationship between GAP score or CPI and survival time. The ability of the scoring systems to predict survival at 1 and 3 years was assessed using ROC curve analysis.