

# **Provision of day-case local anaesthetic thoracoscopy: a multicentre review of practice**

## **Corresponding author:**

Ioannis Psallidas, PhD

Oxford University NHS Foundation Trust, Old Road, Churchill site, OX3 7LE, Oxford, United Kingdom

Email: [ioannispsallidas@ndm.ox.ac.uk](mailto:ioannispsallidas@ndm.ox.ac.uk)

Telephone: +44 (0) 1865257104 Fax: +44(0) 1865 857109

Ioannis Psallidas,

Oxford Centre for Respiratory Medicine and Oxford Respiratory Trials Unit, Oxford, UK  
Oxford University Hospitals NHS Foundation Trust, Oxford, UK

John P Corcoran,

Oxford Centre for Respiratory Medicine and Oxford Respiratory Trials Unit, Oxford, UK  
Oxford University Hospitals NHS Foundation Trust, Oxford, UK

Janet Fallon,

Musgrove Park Hospital, Taunton, UK

Oliver Bintcliffe

Academic Respiratory Unit, University of Bristol, Southmead Road, Bristol, UK, BS10 5NB.

Pasupathy Sivasothy

Cambridge University Hospital NHS Trust, Medicine, Cambridge, United Kingdom of Great Britain and Northern Ireland

Nick Maskell,

Academic Respiratory Unit, University of Bristol, Southmead Road, Bristol, UK, BS10 5NB.

Fabien Maldonado,

Division of Allergy, Pulmonary and Critical Care Medicine, Vanderbilt-Ingram Cancer Center, Vanderbilt University School of Medicine, Nashville, TN, USA and Mayo clinic, Rochester, MN.

Justin Pepperell,

Musgrove Park Hospital, Taunton, UK.

Najib M Rahman,

Oxford Centre for Respiratory Medicine and Oxford Respiratory Trials Unit, Oxford,  
UK Oxford University Hospitals NHS Foundation Trust, Oxford, UK

### **Declaration of interests**

No conflict of interest exists for all authors.

**Key words:** Pleural diseases, local anaesthetic thoracoscopy, pleural effusion, mesothelioma, malignant pleural effusion

**Total word count:** 770

### **INTRODUCTION:**

Pleural disease is a common health problem and it is estimated to affect over 3,000 people per million population (1). Pleural effusion is the most common condition among the group and in approximately 75% of cases the clinical history, physical examination, radiographic techniques and pleural fluid analysis will identify a cause for the pleural effusion, with the remaining 25% requiring further invasive diagnostic procedures (2).

An increasing trend has been seen in the number of centres performing local anaesthetic thoracoscopy (LAT) as a gold-standard diagnostic and/or therapeutic procedure (3). There is previous evidence from a single site that the technique can be performed on a day-case basis without compromising its efficacy and safety (4). This is the first multicentre study assessing LAT as a day case procedure and includes data from 4 centres in the UK and 1 centre in the USA. The primary aim of this paper was to report data on safety, feasibility and outcomes of day-case LAT.

### **METHODS**

#### **Study design and participants**

This is a retrospective review of prospectively collected data conducted in 5 centres (United Kingdom – Oxford University Hospitals NHS Foundation Trust; Taunton and Somerset NHS Trust; North Bristol NHS Trust; Cambridge University Hospitals NHS Foundation Trust; United States of America – Mayo Clinic, Rochester, MN).

From 01.01.2010 until 01.01.2015 patients who were investigated and/or treated with LAT were included in this study. Each centre initiated the use of day-case LAT at different time-points within the study period and therefore data were collected across a range of time periods for each individual site. Inpatients who had LAT as part of their clinical management were excluded from the analysis, as these patients were already admitted to and remained in hospital for reasons unrelated to the procedure.

### **Procedure**

All procedures were performed in either a procedure suite or operating theatre, using standard techniques (5). Ultrasound (US) examination was performed prior to all procedures, and all centres used pneumothorax induction where necessary for small effusions. At the end of the procedure an indwelling pleural catheter (IPC) was inserted if felt to be indicated (e.g. symptomatic management of malignant pleural effusion (MPE)).

### **Study approval**

In discussion with the institutional research governance team, this study was deemed to be an audit of current practice not requiring specific ethical approval.

### **RESULTS:**

A total of 521 procedures were performed in total across the five centres. Nineteen procedures (3.6%) were excluded from the analysis due to missing data. A day-case procedure was undertaken in 242/502 (48.2%) patients during the study period (Figure 1) with the remainder admitted to hospital following thoracoscopy. In 40/242 (16.5%) patients LAT was abandoned before or during the procedure with the most common causes being an inability to induce a pneumothorax; the identification of

absence of lung sliding on thoracic ultrasound; mechanical equipment failure; and abnormalities in a patient's observations during the procedure that resulted in early cessation of the procedure. In 17/40 cases in which LAT was not possible the procedure was converted to US-guided pleural biopsies on the table with establishment of the underlying diagnosis in 15/17 (88.2%) of these cases. Technical information relating to the procedure is presented in table 1.

Of all day case thoracoscopy patients, an underlying diagnosis was established in 196/202 (97%, Figure 1). The vast majority (238/242, 98.3%) of day-case LAT were performed without complications. Two cases were complicated by vasovagal reactions during or following the procedure, 1 case by late pleural infection (7 days post procedure) resulting in readmission; and 1 case in which the patient developed significant pain post-procedure and required opioid analgesia to achieve symptom control.

## **DISCUSSION**

This is to our knowledge the first multicentre study exploring the experience of performing day-case LAT. This study demonstrates that in selected patients and experienced centres, LAT can be performed safely as a day-case procedure in a variety of centres of differing characteristics including size, population and means of healthcare service provision models without compromising patient safety.

The overall excellent diagnostic yield of the procedure (97%) suggests that LAT could be performed earlier in the diagnostic pathway of pleural patients. Our results indicate that in selected patients LAT could be potentially used as the first and only test needed to obtain a definitive diagnosis. For those who have macroscopically malignant disease, talc poudrage can be performed at the same time the fluid control.

In summary, our dataset demonstrates that day-case LAT can be integrated successfully into pleural service provision across a range of healthcare settings including both tertiary university and district general hospitals. This can offer a more

convenient alternative to the traditional inpatient approach whilst maintaining an excellent diagnostic yield and safety profile.

### **Funding**

Psallidas I is the recipient of a REPSIRE2 European Respiratory Society Fellowship RESPIRE2 – 2015 – 7160. Rahman NM is funded by the National Institute Health Research (NIHR) Oxford Biomedical Research Centre. The founding sources had no role in writing the manuscript or the decision to submit it for publication. Psallidas I and Rahman NM had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

### **Authors' contributions**

IP and NMR conceived the article, collected and analysed the data, wrote the manuscript and take responsibility of the integrity of the work as a whole.

JPC, OB, JF, PS, NM, JP, FM provided data on cases, critically revised and approved the final manuscript.

IP and NMR had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

### **References**

1. Hooper C, Lee YC, Maskell N, Group BTSPG. Investigation of a unilateral pleural effusion in adults: British Thoracic Society Pleural Disease Guideline 2010. *Thorax* 2010; 65 Suppl 2:ii4-17.
2. Colins Tr, Sahn SA. Thoracocentesis, clinical value, complications, technical problems and patient experience. *Chest* 1987; 91:817-822.
3. Bhatnagar R, Corcoran JP, Maldonado F, Feller-Kopman D, Janssen J, Astoul P, Rahman NM. Advanced medical interventions in pleural disease. *Eur Respir Rev.* 2016 Jun;25(140):199-213.
4. Depew ZS, Wigle D, Mullon JJ et al. Feasibility and safety of outpatient medical thoracoscopy at a large tertiary medical center: a collaborative medical-surgical initiative. *Chest* 2014; 146:398-405.

5. Rahman NM<sup>1</sup>, Ali NJ, Brown G, Chapman SJ, Davies RJ, Downer NJ, Gleeson FV, Howes TQ, Treasure T, Singh S, Phillips GD; British Thoracic Society Pleural Disease Guideline Group. Local anaesthetic thoracoscopy: British Thoracic Society Pleural Disease Guideline 2010. *Thorax*. 2010 Aug;65 Suppl 2:ii54-60.