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Local anaesthetic thoracoscopy practice in the United Kingdom in 2024 - a snapshot survey

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Short title: Local anaesthetic thoracoscopy practice in the UK

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Abstract

Introduction Local anaesthetic thoracoscopy (LAT) is widely available in the United Kingdom (UK). It is often the investigation of choice for unexplained exudative pleural effusions. There are no agreed national standards regarding LAT, with many sites following locally developed guidelines. The last survey of UK practice was in 2017.

Methods An electronic survey was circulated to UK Pleural Society (UKPS) members and through direct communication with centres known to be undertaking LAT. Invited centres were requested to distribute the survey further.

Results 37 responses were included. LAT remains the preferred investigation for an undiagnosed exudative pleural effusion (32/37, 87%). The number of trained thoracoscopists ranged from 1 to 6. Thirty centres (81%) had dedicated thoracoscopy lists with varying frequency. Nineteen (51%) centres routinely admitted patients post thoracoscopy (compared to 76% in 2017). Thirty centres (81%) did not routinely administer antibiotics. Thirty-five centres (95%) routinely used sedation, the commonest agent being midazolam, typically in combination with an opiate. Eleven centres (30%) utilised other pre-medications, whilst 8/37 (22%) of centres administered intravenous fluids. Where a minimal effusion is present 27/37 (73%) would induce a pneumothorax. Eleven (29%) centres would perform LAT for pleural infection. Only 11/37 (30%) of centres have on-site thoracic surgical support.

Conclusions There is wide variation in LAT practice amongst UK centres. These results support the need for identifying best practice and standardisation of LAT practices, with outcome reporting. These survey results will form the basis of applications to the national and international respiratory societies to develop relevant standards.

Introduction

Local anaesthetic thoracoscopy (LAT), otherwise known as medical thoracoscopy or pleuroscopy, is the preferred method for investigating an undiagnosed exudative pleural effusion [1]. It offers a multi-modality approach: a therapeutic approach where pleural fluid can be drained to relieve symptoms, a diagnostic approach where abnormal areas of parietal pleura can be directly visualised and targeted for biopsy, and a preventative approach with the ability to perform interventions such as pleurodesis and indwelling pleural catheter insertion for fluid control [2]. The diagnostic performance of LAT is superior to image guided biopsy, with a diagnostic yield of over 90% [1,2]. Furthermore, LAT is safe, with retrospective data demonstrating a 1.8% major complication rate and mortality rate of 0.3% [3].

Only 11 centres in the United Kingdom (UK) were known to offer a LAT service in 1999. This number has steadily increased, with 17 centres identified in 2004, 37 in 2009 and 49 in 2017 [4–6]. LAT can be performed under sedation, with reduced operating room time, shorter hospital stays, lower perioperative mortality and reduced costs when compared to the more traditionally used video-assisted thoracoscopic surgery (VATS) [7].

Despite its popularity and now established nature, there are no agreed thoracoscopy standards in the UK, leading to a significant variability in practice between individual centres [5]. This concern was raised nearly 20 years ago but a solution is yet to be agreed [6]. A survey of LAT practice in 2017 demonstrated variations, particularly in pre-procedural preparation, the use of prophylactic antibiotics, the choice of sedation agents and duration of omission of antiplatelet agents, reflecting a lack of robust evidence and standards. The survey did however demonstrate similarities in equipment used and technical approaches, providing a useful overview of UK practice [5]. We aimed to repeat this survey to investigate whether UK practice has changed since 2017 and to highlight areas to be addressed in any future standards.

Methods

A 31-question survey was created on Google Forms (Alphabet Inc, California, United States of America) (Supplementary material 1) and cascaded via the UK pleural Society (UKPS) membership and through direct communication with sites known to be undertaking LAT. Invited centres were requested to distribute the survey further. The lead pleural practitioner at each site was requested to complete the survey, which was open from the 22nd of May to the 20th of June 2024.

Results

Forty-two responses were received. Five responses were excluded, 2 due to duplication, 2 from non-UK locations and 1 site not currently performing LAT. The final analysis included responses from 37 centres (Supplementary material 2), 11 of which (30%) had on-site cardiothoracic surgical services (Figure 1).

Indications for LAT

LAT remains the preferred method of investigation for an undiagnosed unilateral exudative pleural effusion, with 32 of 37 (87%) centres utilising LAT as the first line investigation following a non-diagnostic cytology result from pleural aspiration. Three centres (8%) preferred physician led ultrasound (US) guided pleural biopsy, 2 centres (5%) preferred VATS. LAT was also used for pleural infection (including suspected tuberculosis effusion) at 11/37 (30%) of centres.

Training and infrastructure

The median number of trained, independent physician thoracoscopists was 3 (range 1-6), with the majority (35/37, 95%) of centres having 2 or more.

Thirty centres (81%) had a dedicated thoracoscopy list with frequency varying between weekly (17/37, 46%), ad-hoc (12/37, 32%), twice a week (5/37 14%) and alternate weeks (3/37, 8%). LAT is most frequently performed in

endoscopy departments (19/37, 51%), with a further 7/37 (19%) performed in theatres. The remaining centres use dedicated pleural procedure rooms or a separate “dedicated procedural area” (Figure 2).

Pre-procedural preparation

Thirty-three (89%) centres would not perform LAT whilst the patient is taking clopidogrel, if omitting prior to procedure, most centres would advise for 7 days (21/37, 57%) or 5 days (13/37, 35%).

A formal safety checklist, or sign-in/sign-out procedure, was used at 34/37 (92%) of centres.

Most centres (30/37, 81%) do not routinely administer prophylactic antibiotics. Of those who did administer antibiotics routinely, 6 out of 7 centres (86%) used intravenous co-amoxiclav or flucloxacillin.

Intravenous fluids are routinely administered at 8/37 (22%) of centres, either before, during or after LAT.

Eleven centres (30%) routinely administer some form of pre-medication separate to those used for sedation, including tranexamic acid, metoclopramide, atropine, naproxen, paracetamol or morphine.

Sedation and anaesthesia

Sedation is routinely used for LAT at 35/37 (95%) of centres. A combination of midazolam and an opioid (either morphine, pethidine, fentanyl, remifentanil and alfentanil) is the most frequently used method at 32/37 (87%) of centres. Sedation is usually administered by physicians or nursing staff at 36/37 (97%) of centres. One centre (3%) had formal anaesthetic support for the use of propofol in combination with fentanyl or remifentanil.

Four centres (11%) routinely used intercostal nerve blocks for additional anaesthesia; one centre (3%) utilised erector spinae plane blocks performed by anaesthetists.

Equipment and technique

Rigid thoracoscopes are most frequently used for LAT, with both standard size and ‘mini’ thoracoscopes used at 27/37 (73%) of centres. Semi-rigid scopes were used at 8/37 (22%) of centres; 2/37 (5%) had access to both. All reporting sites utilised single port access.

Where a minimal effusion is present, 27/37 (73%) of respondents would induce a pneumothorax to proceed with LAT, the remainder would abandon the procedure.

Twenty-six (70%) centres routinely performed pleurodesis at the time of LAT. Talc poudrage was the most common method of pleurodesis (26/37 70%) followed by talc slurry (4/37, 11%), the remaining centres administer talc on a case-by-case basis.

When indicated, indwelling pleural catheters are inserted during LAT at 30/37 (81%) of centres. Additionally, some centres performed adhesiolysis (20/37, 54%), pleural lavage (3/37, 8%) and electrocautery (2/37, 5%) during LAT, where indicated and equipment was available.

Post procedural care

Nearly half of the centres, 19/37 (51%), routinely admitted patients post thoracoscopy. Thoracic suction was routinely applied at 9/37 (24%) of centres, varying from immediately post-procedure (4/37, 11%) to being started after moving to a ward environment (5/37, 14%). One centre (3%) only applied suction if talc was instilled.

Most centres (27/37, 73%) did not have standard operating procedures (SOP) for complications associated with LAT. In centres that did, SOPs were available for intercostal artery bleeding (6/10, 60%), persistent air leak (6/10, 60%), surgical emphysema (6/10, 60%), talc pleurodesis associated complications (4/10, 40%), pleural venous bleeding (3/10, 30%) and severe pain (3/10, 30%).

Post procedural documentation

A range of different methods for procedural documentation are used, including entries in paper medical notes, electronic patient records, dedicated software and dictated letters. Twenty-eight centres (76%) had a local database.

Table 1 shows some of the key comparisons between the 2017 and 2024 surveys.

Discussion

This survey provides an up to date account of LAT practice in the UK, highlighting recent changes in practice and on-going variation across centres.

There has been a drop in utilising LAT as the first-line investigation for an exudative pleural effusion, following a non-diagnostic cytology result. In the 2017 survey 95% of centres preferred LAT as the first line investigation, compared with 87% from our current survey. This is due to 3 centres adopting US guided pleural biopsy as the preferred investigation, of which two previously utilised LAT in the 2017 survey, the other centre did not participate in the 2017 survey. Despite this, there has been an increase in the median number of trained LAT practitioners from 2 to 3 [5].

Day case provision of LAT has increased since 2017. Previously 76% of centres routinely admitted patients, falling to 51% in this survey [5]. This could be due to increasing NHS bed pressures in the post-COVID era and increasing acceptance of ambulatory and day case management of pleural disease. The use of talc pleurodesis may influence the decision to admit a patient, however some UK centres are now performing talc poudrage and IPC as a day case procedure. [8,9].

Since 2017 there has been an increase in centres exclusively using semi-rigid scopes, increasing from 8% in 2017 to 22% in our current survey [5]. The reason for their popularity is not clear, though given most respiratory physicians will be experienced with flexible bronchoscopes, the learning curve may not be as steep [3]. It is worth noting that the diagnostic yield between semi-rigid and rigid thoracoscopes is comparable, and so the use of either type is probably operator dependent [3].

There have also been changing trends in post procedural care. Fewer centres routinely perform pleurodesis, 70 % in the current survey compared to 84% in 2017. This could be due to more centres opting for IPC insertion over talc pleurodesis, as IPC use has steadily increased in the UK over the last decade [10]. Furthermore, the threshold is now lower for choosing thoracoscopy for exploration of the pleural cavity and biopsies, in the diagnostic pathway of undiagnosed exudative pleural effusions [1]. This is a culture change from thoracoscopy largely being performed in those with a high clinical suspicion of pleural malignancy. Therefore, where a non-malignant process is considered, practitioners may not be keen to undertake talc pleurodesis.

There remains variation, particularly in pre-procedural preparation. The routine use of antibiotics, fluids and pre-medication differed between centres. There appeared to be uniformity in the approach towards intravenous sedation, with all but 2 centres routinely offering sedation. Most centres utilise combination midazolam and opioids, in a similar approach to sedation used for bronchoscopy. However, it is not clear from our survey what doses of opioids are utilised and to what extent these are utilised for their analgesic effect.

Most centres do not have SOPs in place for potential complications of LAT. Whilst many centres will have staff competent to recognise and manage complications, the lack of SOPs could lead to adverse events as most centres do not have onsite cardiothoracic support. Whilst the risk of major complication from LAT is low [3], the potential for harm is high given its invasive nature. Our survey has not captured complication rates, and there are no centralised processes for reporting and auditing this information.

The weaknesses of this study include those that are inherent to any survey, such as recall bias of the respondents and sampling bias. One of the main limitations of this survey is the unknown number of centres performing LAT in the UK. Therefore, it is not clear what proportion of UK centres our data represents. However, even accepting this sampling bias, we have identified important variations in practice that require addressing. The survey was distributed through a national society and cascaded via loco-regional pleural networks, which introduces a degree of selection bias. Reminders were sent to increase response rates, and all attempts made to capture as many centres doing thoracoscopy as possible. Furthermore, as mentioned above, given this was a self-reported survey, there is a degree of subjectivity of the responses and the potential for recall bias.

Conclusions and future directions

There is ongoing wide variation in practice amongst centres undertaking LAT in the UK; we suggest two approaches to address this. Firstly, the development of a central database for the reporting of LAT procedures performed would be crucial for auditing practice and assessing complications, in line with other specialities performing invasive procedures [11]. The high proportion of centres already having access to a local database of LAT procedures suggests this should be achievable on a national scale. Secondly, the development of national or international standards around LAT would help standardise practice, in line with other national guideline committees [12]. This survey will form the basis of the relevant applications to national and international respiratory societies.

Acknowledgements

The authors would like to thank all practitioners who contributed to the survey (Supplementary material 2).

Statement of Ethics

This study was performed in accordance with the Declaration of Helsinki. Ethical approval was not required in line with local guidelines. Written consent was not required to participate as this was a survey of practitioners, with data collected on current practices in UK hospitals. No patient data was collected as a part of this survey.

Conflict of Interest Statement

DDF has research time supported by funding from the NIHR Senior Clinician and Practitioner Award. RB has received consulting fees from Rocket Medical UK, not related to the work under consideration. All other authors do not declare any conflicts of interests.

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Author Contributions

The authors contributed to the manuscript as follows: AA, RB and DDF were responsible for the concept, design and data acquisition. All authors performed data analysis. RW drafted the manuscript, which was reviewed and approved by all authors.

Data Availability Statement

All data generated or analysed during this study are included in this article and its supplementary material files. Further enquiries can be directed to the corresponding author.

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Figure legends

Figure 1- location of survey responses with red dots indicating on site cardiothoracic services

Figure 2- survey responses indicating the clinical areas where local anaesthetic thoracoscopy is performed

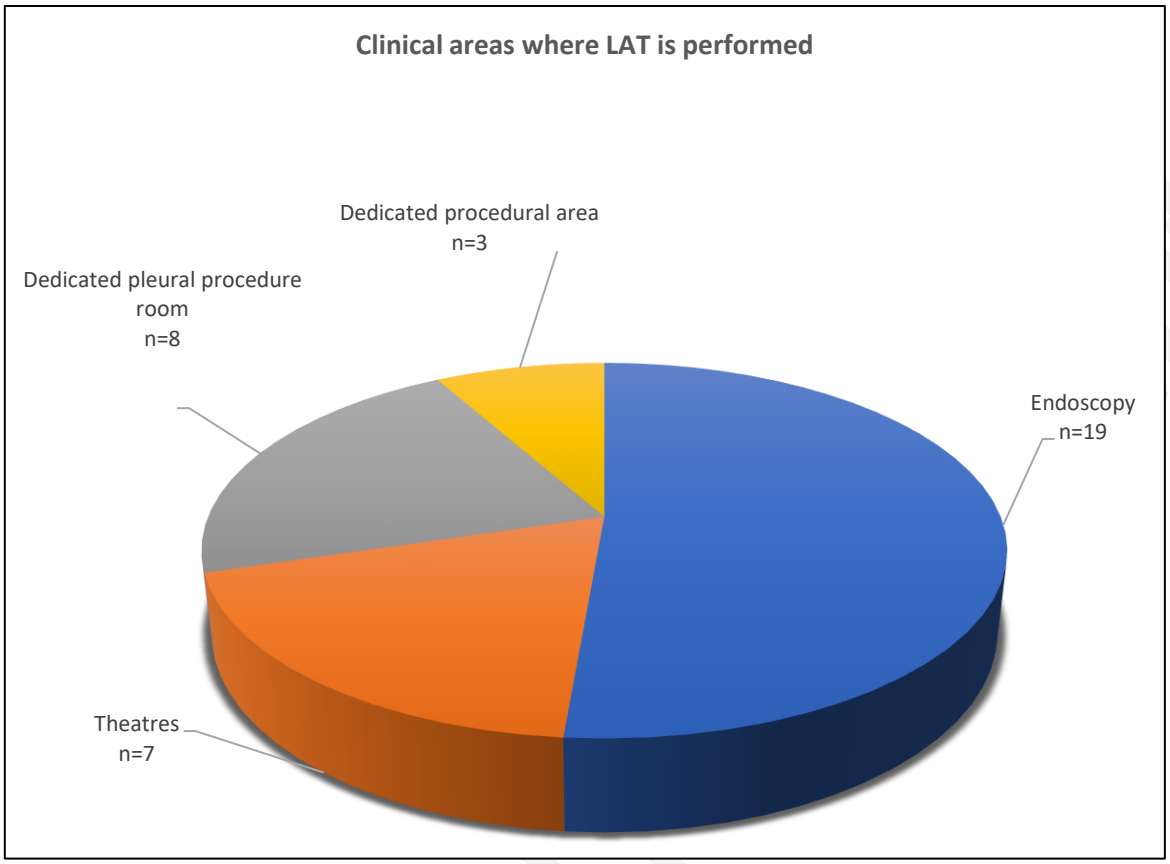

Table 1

	2017	2024
Preferred first line investigation		
LAT	35/37 (94.6%)	32/37 (86.5%)
VATS/surgery	2/37 (5.4%)	2/37 (5.4%
US guided pleural biopsy	0/37	3/37 (8.1%)
Dedicated LAT list	34/37 (91.9%)	31/37 (81.1%)
Location		
Endoscopy	24/37 (64.9%)	19/37 (51.4%)
Theatres	6/37 (16.2%)	7/37 (18.9%)
Dedicated procedural space	7/37 (18.9%)	11/37 (29.7%)
Thoracoscope		
Rigid	31/37 (83.8%)	27/37 (73%)
Semi-rigid	3/37 (8.1%)	8/37 (21.6%)
Both	3/37 (8.1%)	2/37 (5.4%)
Median number of thoracoscopists	2	3
Two or more trained thoracoscopists	31/37 (83.8%)	35/37 (94.6%)
Routine prophylactic antibiotics	9/37 (24.3%)	7/37 (18.9%)
Routine IV fluid use	10/37 (27%)	8/37 (21.6%)
Routine sedation use	33/37 (89.2%)	35/37 (94.6%)
Routine pleurodesis during LAT	31/37 (83.8%)	26/37 (70.3%)
IPC insertion during LAT	31/37 (83.8%)	30/37 (81.1%)
Adhesiolysis during LAT	26/37 (70.3%)	20/37 (54.1%)
On site surgical support	10/37 (27%)	11/37 (29.7%)

Table 1- data from the 2017 and 2024 local anaesthetic thoracoscopy surveys