

Thoracoscopy Service

Anantham Devanand

Respiratory and Critical Care Medicine

Singapore General Hospital



Getting started

- Training
- Equipment
- Nursing personnel
- Patient selection
- Thoracoscopy
- Post procedure care

Training

Interventional Pulmonary Procedures*

Guidelines from the American College of Chest Physicians

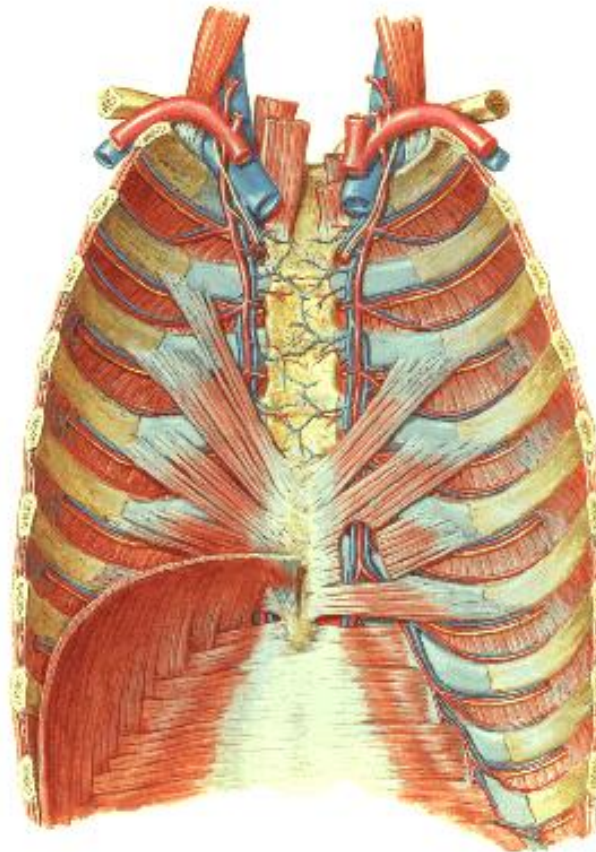
Armin Ernst, MD, FCCP; Gerard A. Silvestri, MD, FCCP; and David Johnstone, MD, FCCP; for the ACCP Interventional Chest/Diagnostic Procedures Network Steering Committee†

Training Requirements

Physicians performing this procedure should have ample experience, excellent knowledge of pleural and thoracic anatomy, mature judgment in interpreting radiographic images related to pleural disease, and sufficient surgical skill. Trainees should perform at least 20 procedures in a supervised setting to establish basic competency. To maintain competency, dedicated operators should perform at least 10 procedures per year.

Anatomy

Anterior Thoracic Wall
Internal View



Blood supply to Parietal Pleura

- Costal Pleura
 - Intercostal arteries
 - Branches from internal mammary artery
- Mediastinal Pleura
 - Bronchial arteries
 - Internal mammary artery
- Apex
 - Subclavian arteries
- Venous drainage via perbronchial veins and directly into venae cavae

Innervation of the pleura

- Visceral pleura is devoid of somatic innervation
- Parietal pleura is innervated by somatic fibres
 - Apex, mediastinum and diaphragm by phrenic nerve
 - Lateral chest wall by intercostal nerves

Equipment and Personnel

Equipment

- Scope Trolley
 - LTF Semi-rigid Thoracoscope
 - Suction tubings X 2
 - 1 attached to scope
 - 1 attached to suction catheter

Equipment

- Procedure Trolley
 - Chest tube insertion set
 - Sterile dressing set
 - Sterile drapes, surgical gowns, towel clips
 - Biopsy forceps 55CR
 - Spray catheter for lignocaine
 - Straight blade
 - Sutures 2/0 Prolene; 2/0 Mersilk
 - Trochar 8 mm
 - Nelathon catheter #16
 - 20 cc syringe and needle for lignocaine
 - 60cc Bulb syringe
 - Talc powder 3-6g
 - Biopsy strips
 - 20F chest tube
 - Pleurovac chest drain

Patient selection

Indications

- Diagnostic: pleural effusions of unknown origin
 - Yield > 90% for malignancy and TB
- Therapeutic: Pleurodesis
 - Malignant effusions
 - Pneumothorax recurrence prevention
- Therapeutic: empyemas
 - Adhesiolysis, drainage and optimal chest tube placement
- Really cool but be very careful
 - Resection of blebs and bullae
 - Lung biopsy for the diagnosis of ILD
 - Sympathectomy

Contraindications (Absolute)

- Lack of a pleural space
- Type 2 respiratory failure not attributable to effusion
- Positive pressure ventilation
- Uncorrectable coagulopathy

Contraindications (Relative)

- Fever/ongoing sepsis (besides empyema)
- Uncontrolled cough
- Unstable hemodynamics
- Unable to lie in the lateral decubitus position for at least 1 hour
- Pulmonary arterial hypertension, SVCO
- Morbid obesity

Consent

ORIGINAL ARTICLE

Prospective evaluation of flex-rigid pleuroscopy for indeterminate pleural effusion: Accuracy, safety and outcome

PYNG LEE,¹ ANNE HSU,¹ CONSTANCE LO¹ AND HENRI G. COLT²

¹Department of Respiratory and Critical Care Medicine, Singapore General Hospital, Singapore, and ²Pulmonary and Critical Care Medicine, University of California, Irvine Medical Center, Orange, California, USA

| | |
|---|-----|
| Diagnostic accuracy of flex-rigid pleuroscopy (%) | 96 |
| Sensitivity | 94 |
| Specificity | 100 |
| Negative predictive value | 88 |

Prospective evaluation of flex-rigid pleuroscopy for indeterminate pleural effusion: Accuracy, safety and outcome

PYNG LEE,¹ ANNE HSU,¹ CONSTANCE LO¹ AND HENRI G. COLT²

¹*Department of Respiratory and Critical Care Medicine, Singapore General Hospital, Singapore,* and ²*Pulmonary and Critical Care Medicine, University of California, Irvine Medical Center, Orange,*

Table 3 Indicators of the safety and accuracy of pleuroscopy

| Variables | Values |
|---|-------------------|
| Procedure | |
| Median time to pleuroscopy (days) | 3 (range, 2–4) |
| Median dose of midazolam (mg) | 2 (range, 2–3) |
| Median duration of procedure (min) | 30 (range, 30–40) |
| Median pain score (VAS) | 2 (range, 2–3) |
| Complications | |
| Major | 0 |
| Minor | |
| Fever | 8 (16%) |
| Perioperative pain requiring additional IM analgesia (VAS 5, range 4–6) | 5 (10%) |
| Mortality at 30 days | 0% |

Thoracoscopy

Positioning and selecting insertion site



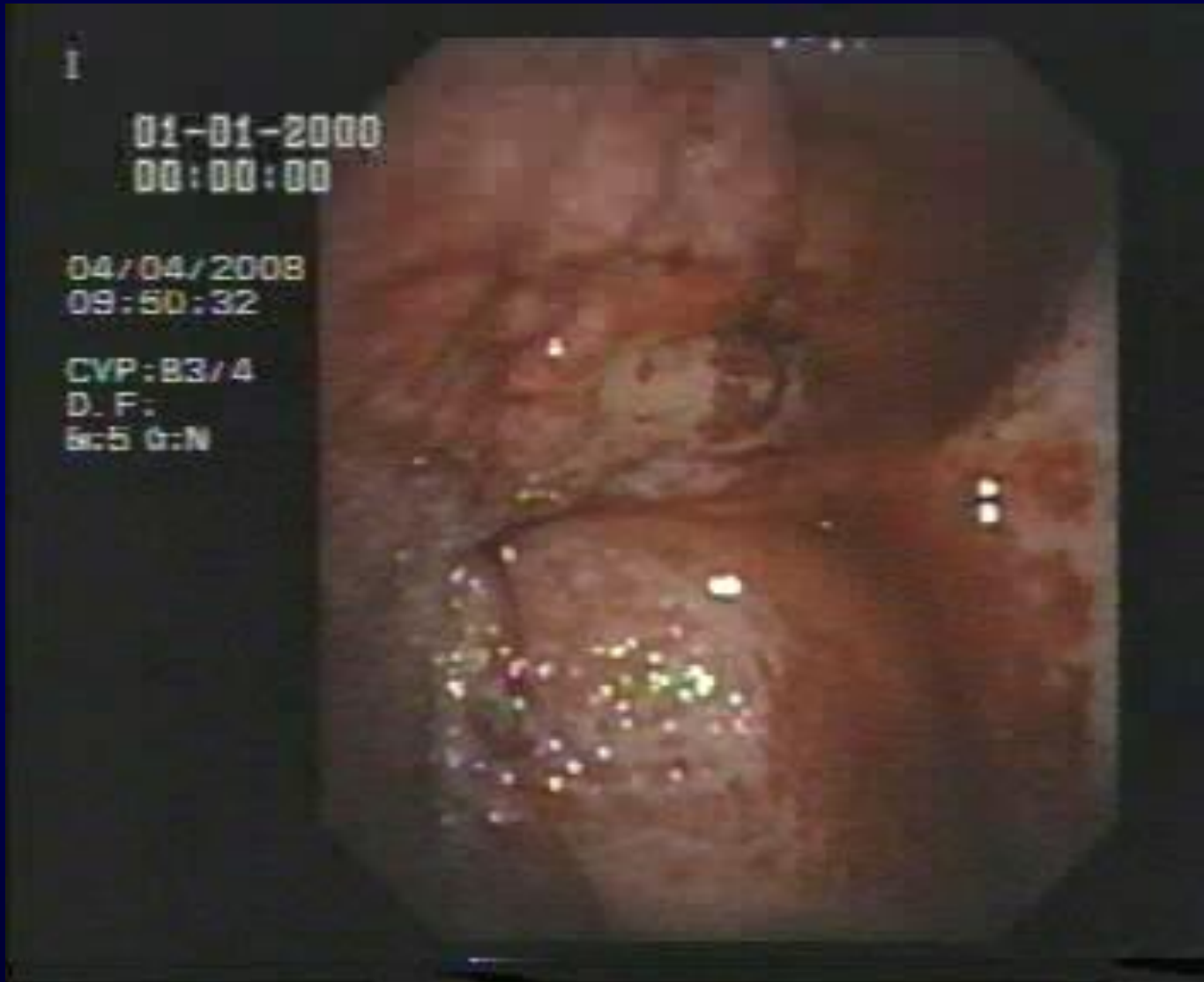
Ultrasound



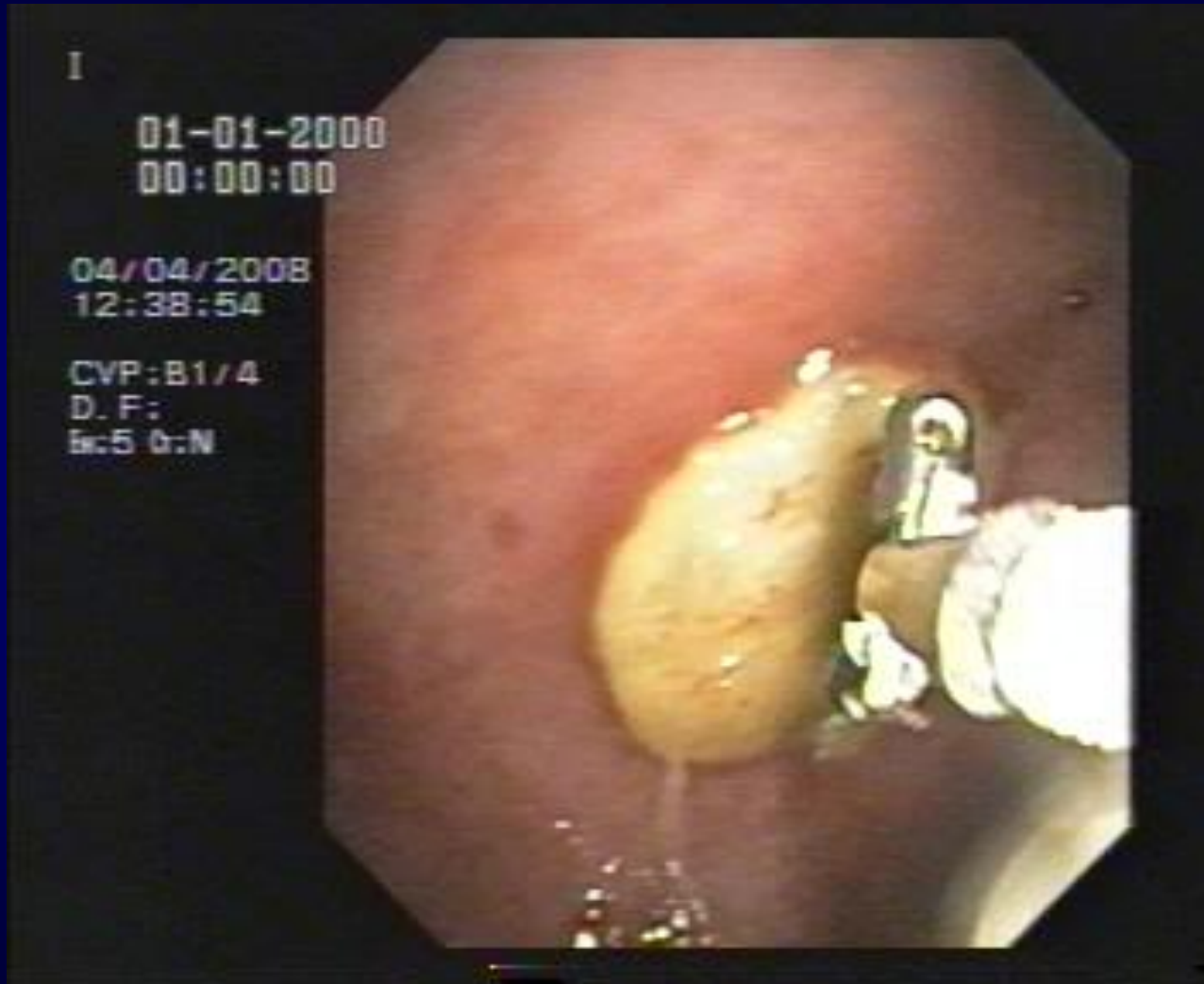
Trochar insertion and drainage



Inspection of pleural space



Biopsies



Ahesiolysis

I

01-01-2000
00:00:00

04/04/2008
12:36:57

CVP: 81/4
D. F.:
6x:5 0:N



01-01-2000
00:00:00

05/03/2008
11:14:05

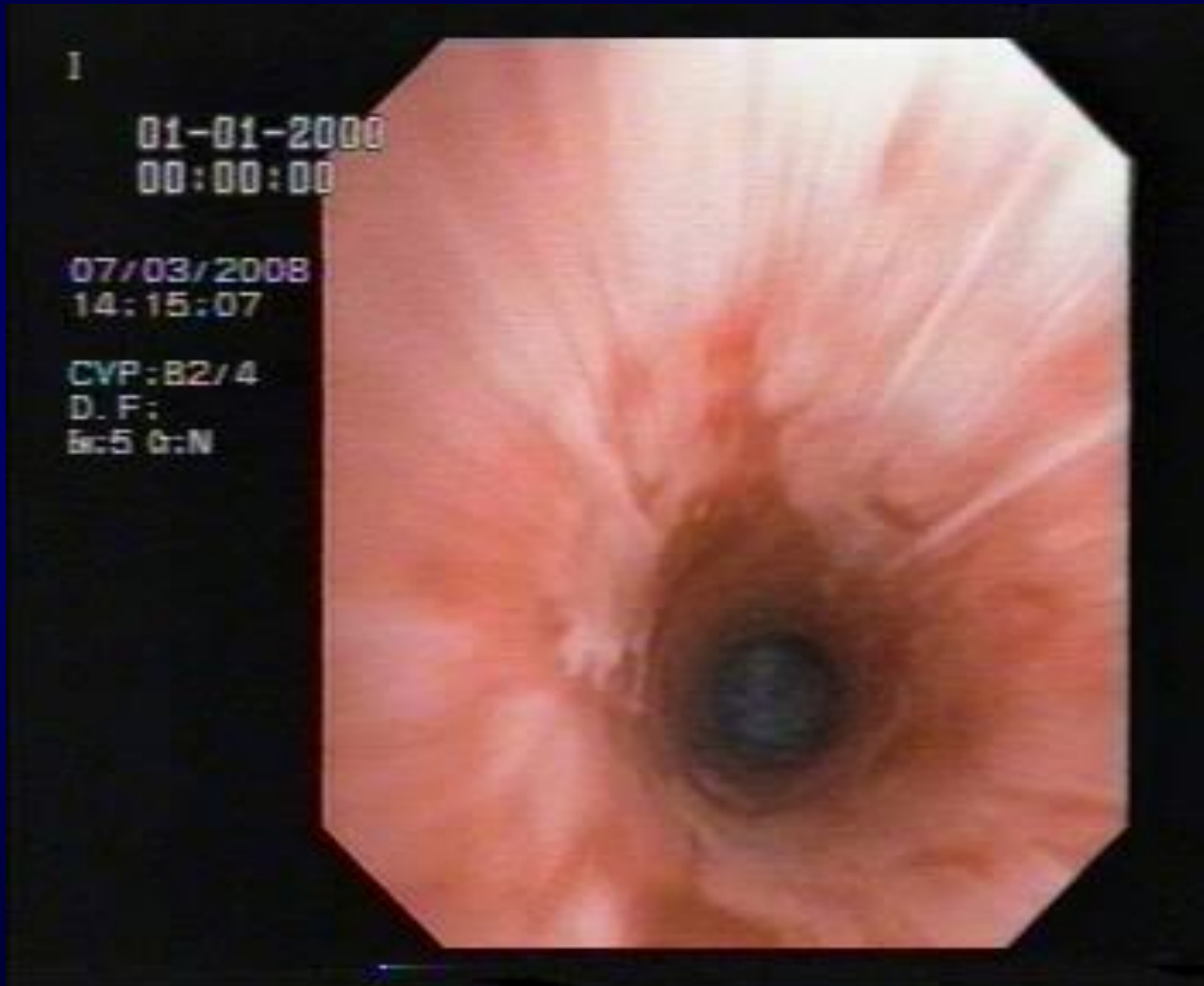
CVP: 82/4
D. F.:
6x:5 0:N



Talc poudrage



Talc poudrage



Intra-operative complications

- Vagal syncope at the time of pleural entry
- Pain at trochar insertion
- Cough when pleural fluid suctioned out
- Hypoxia/hypotension when sedation given
- Bleeding post biopsy

Post procedure care

Early complications

- Wound site pain/discomfort
- Wound infections
- Air-leaks/subcutaneous emphysema
- Fever
- Increased oxygen requirements post pleurodesis
- Sub-optimal chest tube placement
- Bleeding
- Pneumonia
- Pulmonary embolism

Safety of pleurodesis with talc poudrage in malignant pleural effusion: a prospective cohort study

Julius P Janssen, Gareth Collier, Phillippe Astoul, Gian Franco Tassi, Marc Noppen, Francisco Rodriguez-Panadero, Robert Loddenkemper, Felix J FHertth, Stefano Gasparini, Charles H Marquette, Birgit Becke, Marios E Froudarakis, Peter Driesen, Chris T Bolliger, Jean-Marie Tschopp

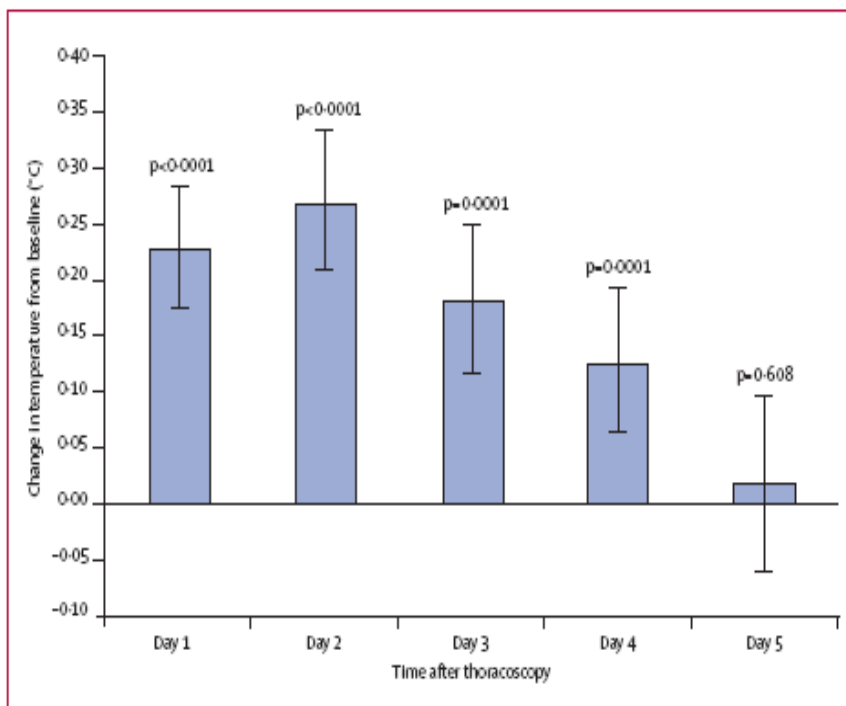


Figure 1: Mean temperature increase from baseline
Bars show 95% CI.

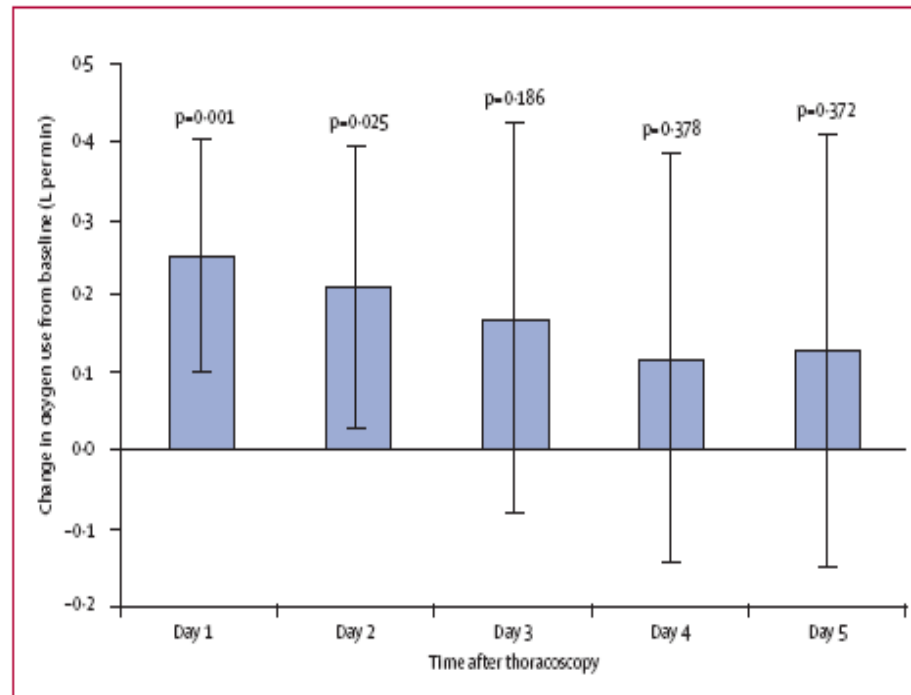


Figure 2: Mean increase in supplemental oxygen use from baseline
Bars show 95% CI.

Late complications

- Failed pleurodesis
- Empyema
- Pleurocutaneous fistula
- Tumour seeding at thoracoscopic port and chest tube site

anantham.devanand@sgh.com.sg