SEATS 2025

South East Asian Thoracic Society SEATS

SEATS 4th Annual Meeting

Bali Nusa Dua Convention Center (BNDCC), Bali, Indonesia

"Gathering of Minds to Shape the Future of Thoracic Health Care"

23 – 26 October 2025

Abstract Free Paper

Appointed PCO:

MTS Event Management Company

ABSTRACT FREE PAPER

South East Asian Thoracic Society (SEATS)
4th Annual Meeting

Bali, Indonesia
23 – 26 October 2025

Prepared by:
Secretariat of SEATS 4th Annual Meeting
Singapore
E-mail: secretariat@seats10.org

ABSTRACT

1

Case Report: Chondrosarcoma Sternum with Mediastinal Involvement: Surgical Management, Treatment Approach, And Chest Wall Reconstruction

Jawed Ahmed Memon, Mariya Muhammad Saleem
Liaquat National Hospital & Medical College, Karachi

The second most frequent malignant primary bone tumor is chondrosarcoma. Malignant chondrocytes make up these malignancies. Chondrosarcoma comes in a number of subgroups, each having distinct traits. More than 90% of chondrosarcomas are "conventional," which usually manifests as increasing pain in persons over 40.
Despite being uncommon, sternal chest wall tumors represent special difficulties for detection and treatment. This report describes a patient's case, difficulty and challenging during anesthesia and surgical resection and reconstruction. Surgery was successfully completed without any issues.
Keywords: Chest wall Tumor, Anesthesia complication, Chondrosarcoma, Sternal Tumor

2

Clinical outcomes of ultrasound-guided percutaneous catheter drainage in loculated pleural effusion and empyema

Chinaphum Vuthivanich, Patomphon Ekkarat
Nakhonpathom Hospital, Thailand

Objective: The purpose was to investigate clinical outcomes of ultrasound-guided percutaneous catheter drainage in loculated pleural effusion and empyema
Methods: The study was conducted in the cardiothoracic surgical unit, Nakhonpathom hospital between 1 March 2015 to 31 December 2022. It was retrospective descriptive study. Data was collected from medical records of patients with loculated pleural effusion and empyema underwent ultrasound-guided percutaneous catheter drainage.
Results: Forty patients with complete medical record underwent ultrasound-guided percutaneous catheter drainage in loculated pleural effusion and empyema. The mean age of patients in this study was 56.4 ± 17.3 years (3-92). The technical success rate was 87.5% (35 in 40 cases), mean procedure time was 16.6 ± 7.5 minutes (8-40), complication rate was 7.5% (3 in 40 cases) without any serious complication, additional procedure after catheter placement was 5% (2 in 40 cases).
Conclusion: Ultrasound-guided percutaneous catheter drainage in patients with loculated pleural effusion and empyema has high procedural success rate, short procedural time and low complication rate.

3

Comparative Outcomes of Non-Intubated Lung Surgery Stratified by ASA Classification: A Study of High- and Low-Risk Patient Groups

Sira Laohathai
Vajira Hospital/ Navamindradhiraj University, Thailand

Background: Non-intubated thoracic surgery (NITS) has emerged as a minimally invasive alternative to conventional intubated procedures, offering potential benefits such as reduced anesthesia-related complications and faster recovery. However, the safety and efficacy of NITS across different ASA physical status classifications remain inadequately explored.
Objective: To compare perioperative outcomes of non-intubated lung surgery between patients categorized as low risk (ASA I–II) and high risk (ASA III–IV) according to the ASA classification system.
Methods: A retrospective cohort study was conducted on patients who underwent NITS for various thoracic indications. Patients were stratified into two groups based on ASA class: low-risk (I–II) and high-risk (III–IV). Perioperative variables including operative time, intraoperative complications, conversion to intubation, postoperative morbidity, length of hospital stay, and 30-day mortality were analyzed.
Results: A total of 663 patients were included (517 low-risk, 146 high-risk). Conversion to intubation occurred in 1.4% of low-risk and 2.1% of high-risk patients ($p = 0.586$). Postoperative complications were no difference in term of pneumonia, re-operation or air leaks between both groups. No significant difference in 30-day mortality was observed between the groups. Length of hospital stay was significantly longer in the high-risk group (3 vs. 3 days, $p = 0.003$).
Conclusion: Non-intubated lung surgery appears feasible and safe across different ASA classifications. While high-risk patients exhibit a higher incidence of prolonged hospitalization, overall outcomes suggest that NITS can be a viable surgical approach even in patients with significant comorbidities, provided proper patient selection and intraoperative vigilance.

4

A Case of GLI1-altered Mesenchymal Pleural Tumour with Novel Gene Fusion

Bahajjaj SIBZA, Chia CML
Singapore General Hospital, Singapore

Introduction: GLI1-altered mesenchymal tumours are newly described neoplasms with GLI1 gene fusions or amplifications, arising in diverse sites and showing variable behaviour from benign to aggressive [1,2,3]. Their pathological and prognostic features are poorly defined. Most reported tumours lack SOX10 expression, and malignancy criteria remain unestablished [2,4,5].
Case Report Details: A 25-year-old woman with ascending colon adenocarcinoma underwent staging CT in April 2024, revealing a 2.4 Å~ 2.1 cm pleural nodule in the right upper lobe. Biopsy showed a mesenchymal tumour with a novel NCOR2 (exon 7)::GLI1 (exon 6) gene fusion, which has been previously unreported.
Due to atypical histological findings and concurrent chemotherapy (8 XELOX cycles over 6 months), surgery was initially deferred. Serial imaging over 10 months showed stable tumour size, suggesting indolent behaviour. In April 2025, video-assisted thoracoscopic surgery excised the 3 cm lesion. Histology revealed round to ovoid cells arranged in nests and trabeculae without necrosis or mitotic activity; Ki-67 was ~1%. Immunohistochemistry showed strong S100, CD56, and atypical SOX10 positivity, with patchy SMA and CD10. Mismatch repair proteins PMS2 and MLH1 were preserved,

making Lynch syndrome association unlikely despite the patient's PMS2-deficient colorectal cancer.
Discussion: This case illustrates diagnostic and management challenges in GLI1-rearranged tumours. The novel NCOR2::GLI1 fusion and unusual SOX10 positivity contrast with most cases where SOX10 is negative [2,4,5]. No validated malignancy criteria exist, though necrosis, ≥5 mitoses/10 HPFs, size ≥6 cm, and gene rearrangements are proposed adverse factors [6,7], none of which are present in this case.
The tumour's stability during XELOX which is effective against gastrointestinal carcinomas but not mesenchymal tumours [8], likely reflects intrinsic biology rather than chemotherapy effect. Surgical excision was however indicated given the unknown malignant potential of the tumour, as well as low surgical risk.
Conclusion: We report a rare pleural GLI1-altered mesenchymal tumour with novel NCOR2 (exon 7)::GLI1 (exon 6) fusion and unusual SOX10 positivity in a young adult with colorectal cancer. This case broadens the understanding of GLI1-altered tumours and highlights the need for further molecular and clinical characterization.

5

Epidemiology, Injury Patterns, and Clinical Outcomes of Thoracic Trauma from Road Traffic Accidents: A Retrospective Analysis from a Level I Trauma Registry in Karachi, Pakistan

Fizza Iftikhar, Waniyah Masood, Ahmeduddin Agha, Wajahat Hussain Pahilwani
SMBB Institute of Trauma, Karachi, Pakistan

Introduction: Thoracic trauma constitutes a leading cause of morbidity and mortality among victims of road traffic accidents (RTAs), contributing to approximately 25% of all trauma related deaths. In low- and middle-income countries (LMICs) such as Pakistan is ranked first in Asia for RTA-related fatalities, the burden is further exacerbated by poor enforcement of road safety regulations and limited trauma care infrastructure. Our study aimed to assess the epidemiological trends, severity of injuries, and clinical outcomes of thoracic trauma resulting from RTAs, using a large trauma registry dataset from a Level 1 trauma center of Karachi, Pakistan.
Materials and Methods: This retrospective observational study was conducted at the Thoracic Surgery Department of Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT), Karachi, from December 2021 to October 2024. Data were retrieved from the institutional trauma registry. Inclusion criteria included patients of both genders who sustained isolated thoracic trauma due to RTAs. Non-RTA mechanisms and pediatric patients were excluded. Demographic variables, injury patterns, and outcomes (ICU admission, mechanical ventilation, and mortality) were analyzed. Multivariate logistic regression was applied to identify independent predictors of mortality, using age, injury severity (> 1 thoracic injury), comorbidities, and presentation time as covariates. A p-value < 0.05 was considered statistically significant.
Results: Out of 456,000 trauma cases, 114,500 (25.1%) involved thoracic injuries, out of which 89,000 were isolated thoracic trauma cases. Males accounted for 79% of cases, with the highest incidence in the 20–29 age groups. The most common injury types included pneumothorax (89%), lung contusions (80.1%), and pleural injuries such as hemothorax (79.8%) and chest wall fractures (60.1%). Morbidity outcomes included

prolonged ICU stays (32.7%) and mechanical ventilation (27.6%). The overall mortality rate was 18.9%. Independent predictors of mortality were analyzed using multivariate logistic regression, included extremes of age ($p = 0.02$), pre-existing pulmonary or cardiac disease ($p = 0.01$), high-impact trauma ($p = 0.03$), and delayed hospital presentation ($p < 0.001$).

6

Perioperative Outcomes of Non-intubated versus Double-lumen Intubated Single-port Video-Assisted Thoracic Surgery: A Propensity Score-Matched Pilot Study

Hung Ka Lam Jay, Wong Hyt, Chan S, Thung Kh
Tuen Mun Hospital, Hong Kong

Background: Non-intubated video-assisted thoracic surgery (NIV- VATS) is emerging as a viable alternative to conventional double-lumen intubation (DLI- VATS), though comprehensive comparative outcome data remains limited.
Methods: This retrospective pilot study compared 61 NIV- VATS (2020- 2025) and 69 DLI- VATS (2024- 2025) patients undergoing single-port VATS wedge resection or pleurodesis. To account for institutional transition toward NIV- VATS practice, cohorts were analysed from distinct time periods. Propensity score matching (1: 1) adjusted for age, sex and ASA physical status yielded 45 well-balanced pairs. Primary endpoints included operative/ anaesthetic durations, perioperative complications, and length of hospitalization.
Results: NIV- VATS group demonstrated significantly shorter anaesthetic time (mean difference: 15 minutes, $p=0.008$), shorter hospital stays (mean difference 0.53 days, $p= 0.037$) and reduced need for postoperative patient-controlled analgesia (OR = 0.18, 95% CI 0.06- 0.49, $p< 0.001$), with no difference in major complications and mortality ($p > 0.9$).
Conclusion: NIV-VATS may offer superior recovery metrics without compromising safety in select patients. These findings justify prospective randomized controlled to validate findings while addressing potential temporal confounders.

7

Surgical Approaches for Large Cervicomediastinal Teratomas: One Cut Doesn't Fit All – A Case Series

M Menon, Samsudin I, Rahim A, Zahid K, S Krishnasamy
Universiti Malaya Medical Center, Malaysia

Introduction: Mature cystic teratomas (MCTs) of the anterior mediastinum are rare germ cell tumours, and those with superior cervical extension pose additional surgical challenges, especially when adherent to major neurovascular structures. Optimal surgical access is crucial to achieving complete resection while minimizing morbidity.
Case Series: We report a case series of three patients presenting with large cervicomediastinal mature cystic teratomas.
Case 1: A 21-year-old male presented with a large anterior neck swelling. Imaging revealed a cystic-solid mass extending from the neck into the anterior mediastinum. A hybrid approach using a cervical collar incision and partial median sternotomy was

employed. The mass was densely adherent to major vessels including the innominate artery and vein, left common carotid artery, and bilateral phrenic nerves. En-bloc excision was achieved without vascular injury.
Case 2: A 23-year-old male underwent a similar combined approach via collar incision and partial sternotomy. The mass, which extended into the upper mediastinum, was resected completely (R0) with minimal manipulation of surrounding vascular structures.
Case 3: A 40-year-old female presented with a similar cervicomediastinal teratoma but required a full median sternotomy in addition to a cervical incision due to deeper intrathoracic extension and tighter adherence to vascular structures.
All patients achieved complete (R0) excision. There were no postoperative complications, and hospital stays ranged from 3 to 5 days. Histopathology confirmed mature cystic teratomas in all cases.
Conclusion: This case series demonstrates that large cervicomediastinal teratomas may require tailored surgical approaches based on tumour extent and anatomical considerations. A hybrid cervical-sternotomy technique provides excellent exposure for safe dissection around critical mediastinal structures. Multidisciplinary planning and flexible surgical strategies are essential emphasizing that in mediastinal surgery, one cut doesn't fit all.

8

Uniportal VATS Resection of Pulmonary Sequestration: A Three-Patient Case Series with Qualitative Review of Treatment Modalities

M Menon, Samsudin I, Rahim A, Zahid K, S Krishnasamy
Universiti Malaya Medical Center, Malaysia

Background: Pulmonary sequestration is a rare congenital malformation involving non-functioning lung tissue that derives its blood supply from the systemic circulation. Surgical resection remains the definitive treatment, and preoperative embolization is often utilized to minimize intraoperative bleeding. The uniportal video-assisted thoracoscopic surgery (VATS) technique offers a less invasive alternative with favorable outcomes, though reports of its use in sequestration remain limited.
Methods: We present a case series of three patients diagnosed with intralobar pulmonary sequestration who underwent surgical resection via the uniportal VATS approach. Preoperative planning included contrast-enhanced computed tomography (CT) angiography. All three procedures were completed successfully via uniportal VATS without conversion to thoracotomy. One patient did not undergo preoperative embolization due to the large diameter of the aberrant feeding artery. Intraoperative dissection and control of the systemic artery were achieved with an estimated blood loss of 100 mL. The average operative time was 140 minutes. All patients recovered without complications and were discharged by postoperative day 4.
Conclusion: Our case series demonstrates that uniportal VATS is a feasible and safe surgical approach for the management of pulmonary sequestration, even in cases where preoperative embolization is not possible. Careful preoperative imaging and meticulous surgical dissection are critical to minimizing intraoperative risks and ensuring optimal patient outcomes.

10

Early Results of Robotic Versus Uniportal Video-Assisted Thoracic Complex Segmentectomy: a propensity score-matched study

Wen-Ruei Tang, Ying-Yuan Chen, Wei-Li Huang, Chen-Yu Wu, Chao-Chun Chang, Yi-Ting Yen, and Yau-Lin Tseng
National Cheng Kung University Hospital, Taiwan

Introduction/Objectives: Lung cancer remains the leading cause of cancer-related death in Taiwan and globally. As systemic therapies advance, minimally invasive surgery (MIS) has replaced open thoracotomy as the standard of care. Among MIS techniques, uniportal video-assisted thoracoscopic surgery (uVATS) and robotic-assisted thoracoscopic surgery (RATS) are widely used. RATS offers enhanced 3D vision, tremor suppression, and greater instrument dexterity, gaining popularity despite higher costs. While RATS has shown non-inferiority to conventional lobectomy, data comparing RATS and uVATS for complex segmentectomy remain limited. Given the technical demands and oncologic importance of segmentectomy in
early-stage lung cancer, this study aims to compare perioperative outcomes between RATS and uVATS after the RATS learning curve, using propensity score-matched analysis.
Methods: Patients who underwent complex pulmonary segmentectomy via uVATS or RATS between 2023 and 2025 were included. Complex segmentectomy was defined as resection of any segment except bilateral lower lobe superior segments, lingular, or left upper lobe superior segment. uVATS used a single 3-cm incision at the 4th or 5th intercostal space (ICS), while RATS employed four robotic arms plus an assistant port at the 7th or 8th ICS. Propensity score matching (1:1) was performed using logistic regression on age, sex, BMI, ASA classification, and segmentectomy type, yielding 81 matched pairs. Outcomes included operative time, complications, hospital stay, chest tube duration, lymph node yield, and patient cost.
Results/Discussion: After matching, baseline characteristics were balanced. RATS had significantly longer median operative time (133 vs. 92 min; $p < 0.001$) and higher self-paid costs (NTD 176,974 vs. 76,714; $p < 0.001$). Hospital and chest tube duration were similar. RATS had fewer complications requiring intervention (0% vs. 7.4%; $p = 0.028$) and a trend toward fewer prolonged air leaks (0% vs. 6.2%; $p = 0.059$). Lymph node yield was significantly higher in RATS (median 7 vs. 2 nodes; $p< 0.001$), likely due to superior visualization and maneuverability. No conversions to thoracotomy or in-hospital mortalities were observed in either group, affirming the safety of both approaches in experienced hands. Despite longer operating time and greater financial burden, RATS may offer advantages in complication rates and oncologic thoroughness. Selective use of RATS may be justified in anatomically complex or high-risk segmentectomies. Further studies are needed to assess long-term outcomes and cost-effectiveness.
Conclusion: RATS and uVATS offer comparable safety for complex segmentectomy. RATS is associated with longer operative time and higher costs but may provide superior lymph node dissection and fewer complications. Selective RATS use is supported in challenging cases, though further research is needed to confirm long-term benefits.

11

Does Timing Matter? A Meta-Analysis Comparing Early Versus Late Tracheostomy in Cardiac Surgery Patients Requiring Prolonged Mechanical Ventilation

Herick Alvenus Willim, Made Pury Pratiwi, Susan Hendriarini Mety
Dr. Cipto Mangunkusumo Hospital, Indonesia

Background: Tracheostomy is commonly performed in critically ill patients. Cardiac surgery patients represent a distinct group with unique respiratory and postoperative challenges, yet no meta-analysis has specifically focused on the optimal timing of tracheostomy in this population.
Objectives: This meta-analysis aimed to compare clinical outcomes between early (≤ 7 days) and late (> 7 days) tracheostomy in cardiac surgery patients requiring prolonged mechanical ventilation.
Materials and Methods: A systematic literature search was performed in PubMed, ScienceDirect, the Cochrane Library, and ProQuest to identify studies comparing early versus late tracheostomy in cardiac surgery patients requiring prolonged mechanical ventilation. The outcomes assessed were mortality, ventilator-associated pneumonia (VAP), duration of mechanical ventilation, and intensive care unit (ICU) length of stay (LOS). Meta-analysis was performed using Review Manager 5.3. This study was registered in PROSPERO (CRD420251069299).
Results: Five studies involving 361 patients met the inclusion criteria. Early tracheostomy was associated with significantly lower mortality compared to late tracheostomy (OR = 0.51; 95% CI: 0.30 to 0.87; p = 0.01). The incidence of VAP was lower in the early tracheostomy group (OR = 0.34; 95% CI: 0.13 to 0.93; p = 0.03). Early tracheostomy also significantly reduced the duration of mechanical ventilation (MD = -13.92; 95% CI: -24.87 to -2.98; p = 0.01) and ICU LOS (MD = -14.87; 95% CI: -18.17 to -11.57; p < 0.00001).
Discussion: Early tracheostomy may improve outcomes in cardiac surgery patients by reducing airway resistance, decreasing respiratory workload, enhancing secretion clearance, and facilitating ventilator weaning. It also improves patient comfort, reduces sedation needs, and promotes earlier recovery and mobilization. These benefits contribute to lower mortality, reduced VAP incidence, and shorter durations of mechanical ventilation and ICU LOS. Early tracheostomy should be considered when prolonged mechanical ventilation is anticipated.
Conclusion: In cardiac surgery patients requiring prolonged mechanical ventilation, early tracheostomy performed within seven days of intubation is associated with significantly lower mortality, reduced incidence of VAP, and shorter durations of both mechanical ventilation and ICU LOS compared to late tracheostomy.
Keywords: Early tracheostomy, late tracheostomy, cardiac surgery, mechanical ventilation, outcome

12

Which one is Better? Surgery Alone Versus Surgery Combined With Immunotherapy in Patients With Locally Advanced Stage Non-Small Cell Lung Carcinoma: A Systematic Review and Meta-Analysis

Abed Nego Okthara Sebayang, Dhihintia Jiwangga Suta Winarno, IGB Chandogya Giriastawa
Regional General Hospital Soetomo, Indonesia

Background: Immunotherapy in the perioperative setting may enhance outcomes for resectable, locally advanced non–small-cell lung carcinoma (NSCLC). This study evaluates the efficacy and safety of combining surgery with immunotherapy versus surgery alone.
Material and Methods: A systematic search (PubMed, Embase, Cochrane, ClinicalTrials.gov) was conducted through July 2025 for phase II/III trials comparing surgery ± neoadjuvant/adjuvant immunotherapy in stage II–III NSCLC. Primary outcomes were major pathologic response (MPR), pathologic complete response (pCR), event-free survival (EFS), and overall survival (OS). Meta-analysis used random-effects models.
Results: Seven pivotal trials comprising ~1,200 patients were analyzed. Meta-analysis demonstrated improved pCR (RR ≈ _4.5, 95% CI: 3.1–6.5) and MPR (RR ≈ _3.8, 95% CI: 2.9–5.2). EFS HR ~ 0.65 and OS HR ~ 0.72 significantly favored immunotherapy. CheckMate 816 reported EFS HR = 0.63 and OS HR = 0.72; AEGEAN showed EFS HR = 0.68. Toxicity was acceptable.
Conclusion: Perioperative immunotherapy significantly improves oncologic outcomes and should be integrated into treatment regimens for resectable NSCLC.
Key Word: Locally Advanced Stage, NSCLC, Immunotherapy, surgery

13

Improving Outcomes with Myasthenia Gravis: A Focus on Uniportal Video Assisted Thoracoscopic Surgery (UVATS) Thymectomy Performed in a Single Centre

Rahim A., Samsudin I, Menon M, Jayaselan T, Ong ZS, Krishnasamy S, Sudarshan CD
Universiti Malaya Medical Centre, Malaysia

Introduction/Objectives: Myasthenia gravis (MG) is a chronic autoimmune disorder characterised by muscle weakness and fatigue with high prevalence amongst disorders of the thymus. Thymectomy is considered a crucial treatment for patients with a thymoma in the presence of underlying generalised MG. This study reviews the outcomes of 30 MG patients who underwent UVATS thymectomy out of 70 MG patients who presented with a thymoma - focusing on improvement of symptoms, reduction in dependency on medication, as well as factors influencing surgical success.
Materials & Methods: A retrospective descriptive analytical study was conducted: out of 70 patients who underwent thymectomy only 30 MG patients underwent UVATS thymectomy at the Universiti Malaya Medical Centre (UMMC) between 2016 and 2025. Outcomes were assessed based on symptom severity, medication dependency and quality of life before and after surgery. Data included demographics, duration of surgery, complications, length of hospital stay, remission of symptoms, MG recurrence rates and quality of life. Comparisons were made with data on conventional thymectomy.
Results/Discussion: Only a total of 24 patients (58% female) were included. The mean age was 42.5 ± 18.2 years (range 15–83). Thymic pathology included thymoma in 50% of patients. Uniportal right VATS was the predominant approach (83%). Postoperative

improvement was noted in 88% of patients, with significant improvement to Osserman Class I severity (from 12% to 75%, p<0.001) and reduction in corticosteroid dependency (from 75% to 33% (p = 0.0027)). The mean hospital stay was 3.4 ± 1.2 days. Complication rate was 8% with no perioperative mortality.
Conclusion: UVATS thymectomy is a minimally invasive and effective option for the treatment of MG, offering improved surgical outcomes, faster recovery and zero mortality complications. It is a valuable alternative to traditional approaches such as sternotomy. Continued evaluation and long-term follow-up are recommended to confirm these promising results.

14

Isolated Chest Wall Tuberculosis Mimicry Presenting as a Tumor: a Case Report
Aryf Kurniawn, Dhihintia Jiwangga Suta Winarno
General Hospital Dr. Soetomo

Background: Tuberculosis (TB) remains a critical global health issue, with millions affected each year. The World Health Organization (WHO) estimates that in 2021, approximately 10.6 million people globally were diagnosed with TB. While pulmonary TB often presents with classic respiratory symptoms, extrapulmonary manifestations can mimic other diseases, complicating the diagnostic process.
Case presentation: A 45-year-old female patient who was incidentally diagnosed with a tumor in the right hemithorax during a routine chest X-ray. The absence of respiratory symptoms and
significant medical history, including prior treatment for left-sided tuberculous mastitis, prompted further investigation. The integration of imaging studies and fine needle aspiration biopsy (FNAB) facilitated a comprehensive assessment, leading to surgical intervention and the eventual diagnosis of extrapulmonary TB. During surgery find that a solid and elastic tumor mass was found attached to the inner chest wall at the 8th and 9th ribs, that done 8th right rib resection. Result from Gen-Expert that showed TB detected, so patient was given anti-Tb drug for 9 months.
Discussion: The nonspecific manifestations and the mimicking nature of TB with other diseases present a diagnostic challenge in modern medicine. This patient came with a complaint of a lump on the right side of the back. Based on chest X-ray (CXR) and thoracic CT scan examinations, a mass adhering to the rib was found and suspected to be a tumor, leading to rib resection. Microbiological examination showed a positive TCM (rapid molecular test for TB), after which the patient underwent treating extrapulmonary tuberculosis for 6–12 months.
Result: The patient was suspected of having a chest wall tumor based on medical history, physical examination, CXR, and thoracic CT scan. During surgery, a mass adhering to the 8th rib was found, containing caseous material. Laboratory examination showed a positive rapid molecular test for TB. The patient was diagnosed with extrapulmonary TB and underwent TB treatment for 6–12 months.
Conclusion: This case illustrates the intricate relationship between prior TB infections and the development of extrapulmonary manifestations, such as chest wall tumor. The timely diagnosis and surgical management of the patient not only addressed the

immediate concern of the tumor but also facilitated the identification of active TB, allowing for appropriate treatment strategies.
Clinicians should maintain a high index of suspicion for TB in patients presenting with atypical masses, particularly those with relevant medical histories, to ensure optimal patient outcomes.
Keywords: Case report, extrapulmonary tuberculosis, tumor of chest wall

15

Drainage, VATS, or Thoracotomy? A Meta-Analysis of Outcomes in Descending Necrotizing Mediastinitis

Sri Pramesthi Wisnu Bowo Negoro**, Dhihintia Jiwangga Suta Winarno**
RSUD Dr Soetomo Surabaya, Indonesia

Introduction: Descending necrotizing mediastinitis (DNM) is a life-threatening condition requiring prompt surgical intervention. While various surgical approaches have been utilized, such as cervical drainage, mediastinal drainage, thoracotomy, and *video-assisted thoracoscopic surgery* (VATS), the optimal technique regarding clinical outcomes remains debated. This study aims to compare the outcome associated with different surgical strategies in patients with DNM through a systematic review and meta-analysis.
Methods: A systematic review and meta-analysis were conducted following PRISMA guidelines. Relevant studies comparing length of hospital stay (LOS) between different surgical techniques for DNM were retrieved from major databases. The pooled mean differences in LOS with corresponding 95% confidence intervals (CIs) were calculated using a random-effects model.
Results: Eleven studies (309 patients) were included. There was no significant difference in LOS between drainage only vs. drainage plus thoracotomy (mean difference = 0.43 days; 95% CI = –0.50 to 1.37), drainage only vs. VATS (mean difference = –0.41 days; 95% CI = –1.18 to 0.37), cervical drainage vs. mediastinal drainage (mean difference = –0.37 days; 95% CI = –0.90 to 0.16), and thoracotomy vs. VATS (mean difference = 0.04 days; 95% CI = –0.26 to 0.35). These findings suggest that no single surgical approach significantly influence the outcome of patients with descending necrotizing mediastinitis. Surgeons can therefore select the most appropriate technique based on individual patient factors, surgical expertise, and available resources without concern for prolonging hospitalization.
Conclusion: Current evidence suggests no significant difference in length of hospital stay among various surgical techniques for managing descending necrotizing mediastinitis.

16

Hemorrhagic Pleural Effusion Complication in Fibrothorax in Patient Undergoing Chronic Dialysis: A Case Report

Kevin Ramanda Purbowiseso, Winarno
Universitas Airlangga - Dr. Soetomo General Hospital, Surabaya, Indonesia

Background: Hemorrhagic pleural effusion is an uncommon but clinically significant condition, of ten indicating underlying pathology such as malignancy, trauma, or coagulopathy. In patients with end-stage renal disease (ESRD) undergoing chronic

dialysis, pleural complications may arise due to a complex interplay of fluid overload. Fibrothorax, characterized by fibrous thickening of the pleural membranes, may develop as a sequela of chronic or unresolved pleural inflammation, further complicating respiratory function. However, the occurrence of hemorrhagic pleural effusion in the context of established fibrothorax remains a rare and underreported complication, particularly in dialysis-dependent patients.
Case Illustration: Presentation of hemorrhagic pleural effusion in a 60-year-old female with a history of chronic dialysis, without any prior trauma. The recurrent dyspnea and repeated emergency admissions were initially attributed to right-sided pleural effusion, as seen on radiological evaluation. The presence of hemorrhagic fluid upon pleural catheter insertion, in the absence of trauma, raised the suspicion of uremia-related pleural involvement—a known complication in chronically dialyzed patients. Although the pleural fluid analysis indicated a transudative profile, the presence of blood elements complicated the diagnosis. The failure of fluid drainage and the presence of clots suggested organized hemothorax, which was later confirmed through HRCT, revealing fibrothorax and destruction of right lung parenchyma. These findings warranted surgical intervention via video-assisted thoracoscopic surgery (VATS). Intraoperatively, a thickened pleural peel and clots were identified, necessitating decortication to allow lung re-expansion. The procedure successfully restored approximately 80% of right lung expansion.
Discussion: Hemorrhagic pleural effusion in patient with no history of trauma, occurs in patient with ESRD. Uremia itself does not directly as a cause, but it significantly increases the risk of bleeding complication, including hemorrhagic pleural effusion. In prolonged undrained pleural effusion can result in pleuritis which later develop into fibrothorax as a complication
Conclusion: Hemorrhagic pleural effusion can occur as a complication of uremia in patients undergoing long-term dialysis, and it may lead to fibrous pleuritis, which can cause restrictive lung disease
Key Words: *Pleural effusion, Hemorrhagic, Chronic Dialysis, Fibrothorax*

17

Clinical Outcomes and Prognostic Factors in Descending Necrotizing Mediastinitis: A 5-Year Study

Permatasari G, Jiwangga D
Universitas Airlangga Dr. Soetomo Hospital, Surabaya, Indonesia

Introduction: Descending necrotizing mediastinitis (DNM) is a rare but rapidly progressive and life-threatening infection that originates primarily from odontogenic or oropharyngeal sources and extends into the mediastinum through cervical fascial planes. Despite advances in diagnostic imaging, surgical techniques, and critical care, the mortality rate remains unacceptably high. Prompt recognition, timely surgical intervention, and early identification of prognostic factors are essential to improve patient outcomes.
Methods: A retrospective observational study was conducted on 50 patients diagnosed with DNM and treated at Dr. Soetomo Hospital between 2020 and 2024. Data collected included demographic variables, infection source, presence of diabetes mellitus (DM),

sepsis at presentation, type of surgical intervention, and mortality outcome. Associations between categorical variables and mortality were analyzed using the Chisquare test, with significance set at $p < 0.05$.
Results: The mean age was 44.7 ± 17.1 years, with 70% male patients. The most common etiologies were cervical infections (54%) and dental infections (42%). The most frequently performed surgical management was mediastinal drainage, accounting for 20 out of 50 cases (40%), followed by combined cervical and thoracic drainage in 12 cases (24%), and video-assisted thoracoscopic surgery (VATS) in 10 cases (20%). The 7-days mortality rate was 36%. Sepsis at presentation was significantly associated with 7 days-mortality ($p = 0.0048$), with a death rate of 55,5% in septic patients versus 13% in non-septic patients. In contrast, no significant associations were found between mortality and DM ($p = 0.224$), source of infection ($p = 0.441$), or type of surgical management ($p = 0.742$).
Conclusion: Descending necrotizing mediastinitis remains a life-threatening condition with high mortality, and sepsis at presentation is the most significant predictor of poor outcomes. Early recognition, prompt initiation of sepsis management, and timely surgical intervention are essential to improving survival.

18

Feasibility of Uniport Robotic-Assisted Thoracic Surgery for Lung cancer: Comparison with
Multiport Robotic-Assisted Thoracic Surgery

Hye Rim Na, In Ha Kima, Jae Kwang Yun
Asan Medical Center, University of Ulsan, Republic of Korea

Objectives: The surgical treatment of lung cancer using minimally invasive techniques has advanced significantly, with a steady increase in the use of robot-assisted thoracic surgery (RATS). Traditionally, RATS has been performed using a multiport approach; however, there is a growing trend toward reducing the number of ports. This study aims to evaluate the early outcomes and feasibility of uniport RATS compared to multiport RATS.
Methods: We retrospectively reviewed patients with non-small cell lung cancer who underwent RATS between June 2022 and December 2024. Perioperative outcomes were analyzed and compared between uniport and multiport RATS.
Results: A total of 102 patients were included in this study, with all surgeries performed by a single surgeon. Among them, 21 patients (20.6%) underwent uniport RATS, while 81 patients (79.4%) underwent multiport RATS. Baseline characteristics were comparable between the two groups, except for tumor size, which was smaller in the uniport RATS group (23.9 ± 5.7 mm vs. 27.9 ± 9.9 mm, P =0.020). Complete resection was achieved in all cases. The surgical extent, conversion rate, histological subtypes, number of harvested lymph nodes, and harvested lymph node stations were similar between the two groups. However, the operation time was shorter in the uniport RATS group (125.6 ± 19.6 min vs. 145.6 ± 43.5 min, P = 0.003). There were no significant differences in chest drainage duration, postoperative hospital stay, or complication rates. However, postoperative pain scores were significantly lower in the uniport RATS group on postoperative days 0, 1, and 2. A stepwise reduction in the number of ports was

achieved, with the Introduction of two-port RATS following 36 multiport RATS cases. After two successful two-port RATS cases, uniport RATS was successfully implemented. Over time, the proportion of uniport RATS procedures steadily increased.
Conclusions: The early outcomes of uniport RATS are comparable to those of multiport RATS.
Although reducing the number of ports requires a learning curve, uniport RATS is a safe and feasible technique.

19

Reshaping the Robotic Learning Curve: The Role of Prior Video-Assisted Thoracoscopic Surgery in Anatomic Lung Resection

Hye Rim Na, Donghee Kim, Geun Dong Lee, Hyeong Ryul Kim, Jae Kwang Yun
Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea

Objectives: The adoption of robotic-assisted thoracoscopic surgery for lung cancer has steadily increased; however, the learning curve and influence of prior video-assisted thoracoscopic surgery (VATS) experience remain underexplored. This study investigates the impact of prior VATS experience on the learning trajectory of robotic anatomic lung resection.
Methods: We retrospectively analyzed 341 robotic anatomic lung resection procedures performed between January 2018 and December 2024 at a single tertiary referral center. Three thoracic surgeons with varying VATS experience—A (1,500 cases), B (350 cases), and C (50 cases)—were included. Learning curves were assessed using cumulative sum analysis for operative time, complication rates,lymph node yield, and postoperative hospital stay. Change points were identified, and early versus late-phase outcomes were compared.
Results: All surgeons demonstrated significant reductions in operative time after reaching their respective cumulative sum thresholds (cases 54, 35, and 34 for Surgeons A, B, and C, respectively). While Surgeon A exhibited early procedural stability, Surgeons B and C showed more rapid improvement with experience. Lymph node yield increased significantly for Surgeon B ($p = 0.002$) and marginally for Surgeon C ($p = 0.074$). Complication rates and hospital stay modestly increased in later phases, likely reflecting greater case complexity.
Conclusion: Although prior VATS experience supports initial operative consistency, it does not necessarily shorten the robotic learning curve. Instead, case volume and intensity of robotic exposure appear more critical. These findings underscore the need for structured training programs emphasizing high case density and progressive complexity to optimize robotic surgical proficiency.

20

Complex Thoracic Sequelae of Post-Tuberculosis Lung Disease: Case Series of Surgical Experience in Bronchopleural Fistula Repair

Melisa, IGB Chandogya Giriastawa, Dhihintia Jiwangga Suta Winarno
Universitas Airlangga, RSUD Dr Soetomo, Indonesia

Introduction: Tuberculosis (TB) remains a major cause of morbidity in developing countries. Even after reaching microbiological cure after complete treatment, some TB survivors experienced symptomatic progressive and long-term worsening of respiratory function defined as post tuberculosis lung disease (PTLD) with Bronchopleural fistula (BPF) as one of its manifestations.
Methods: We present a case series of 3 patients with recurrent spontaneous pneumothorax associated with BPF and a history of microbiologically cured tuberculosis. All 3 patients were referred to our hospital emergency room with chief complaint of worsening dyspneau and history of chest tube insertion because of their recurrent pneumothorax. We report the surgical management of this particular case in our hospital and its early prognosis.
Result: The first case is a 71-year-old male who presented with recurrent left-sided pneumothorax, BPF, and suspected diaphragmatic rupture. Imaging revealed multiple pulmonary bullae, left pleural effusion, and elevated left hemidiaphragm without herniation, consistent with diaphragmatic eventration. The second case is a 52-year-old male with history of recurrent spontaneous pneumothorax, BPF, and multiple pulmonary blebs from radiology examination. Meanwhile, the third patient was a 75-year-old male presented with wide subcutis emphysema and recurrent spontaneous pneumothorax suspected to be caused by BPF. All three patients undergone initial management with video-assisted thoracoscopic surgery (VATS) included adhesiolysis and pulmonary resection for the BPF repair surgery. Although, due to persistent air leak, conversion to thoracotomy was performed, revealing additional large bullae with fistula, which were resected. The first and second patients demonstrated improved lung expansion and no recurrence at follow-up. The third patients initial condition show improvement, but due to respiratory failure, the patients died at the post operative 13th day.
Discussion: These cases illustrated the complexity of managing BPF combined with other complex thoracic condition in a post-TB patient. Even after complete treatment and result showing microbiological cured, the patients' lung condition showed chronic worsening of respiratory function _ _in accordance with PTLD. Persistent air leak after minimally invasive surgery may necessitate open thoracotomy for BPF definitive repair due to destructed and emphysematous lung in PTLD patients.
Conclusion: Multidisciplinary surgical planning and staged intervention are crucial in complex post-TB thoracic pathologies. Long-term surveillance of TB survivors is essential for early detection and management of structural complications to optimize outcomes.

21

Sleeve Resection as a First-Line Strategy: Are We Doing Enough to Avoid Pneumonectomy?

Dinesh Francis K Balasingam, Shanmuga Thevan Darmalingam, Narasimman Sathiamurthy, Benedict Dharmaraj, Tay Yen Zhir, Dexter Lai
Hospital Kuala Lumpur, Malaysia

Background: Sleeve pulmonary resections preserve lung parenchyma while maintaining oncologic clearance, offering a major advantage over pneumonectomy for centrally located lung tumours. International literature consistently reports superior short-term

outcomes, particularly in high-volume centres. In contrast, published evidence from Southeast Asia remains limited, with reported practice patterns influenced by institutional volume, case selection, and availability of training opportunities.
Aim: This study aimed to compare perioperative outcomes and short-term safety between sleeve resections and pneumonectomy at a tertiary referral centre in Southeast Asia.
Methods: We retrospectively reviewed 25 consecutive resections performed at Hospital Kuala Lumpur between January 2020 and December 2024. Of these, 15 were sleeve resections and 10 pneumonectomies undertaken for malignant and selected benign pathology. Demographics, perioperative variables, and short-term outcomes were compared. All procedures were performed by experienced thoracic surgeons in a tertiary referral centre.
Results: Patients undergoing sleeve resection required significantly less postoperative mechanical ventilation (6.7% vs. 80.0%, p = 0.0003) and demonstrated lower 30-day mortality (6.7% vs. 40.0%, p = 0.1206), a clinically meaningful reduction despite the small sample size. Blood loss and operative duration were comparable between cohorts. All sleeve resections achieved R0 margins, with only one intraoperative conversion to pneumonectomy. These findings confirm that oncologic safety was not compromised by the lung-sparing approach. Our results align with international high-volume series, which demonstrate that centralisation, institutional experience, and structured training improve sleeve lobectomy outcomes. Although our study did not directly evaluate training models, prior literature highlights mentorship, progressive case exposure, and simulation as effective strategies to address the steep learning curve. In our cohort, sleeve resections were reproducible and safe without added operative burden, supporting the feasibility of this approach in regional centres with established thoracic surgery expertise.
Conclusion: When technically feasible, sleeve resection provides superior physiological outcomes while maintaining oncologic safety compared with pneumonectomy. Our findings support its prioritisation to improve survival, reduce perioperative morbidity, and preserve postoperative lung function. Wider implementation in Southeast Asia will depend on institutional commitment, regional collaboration, and dedicated training pathways to ensure equitable access to this lung-sparing option.
Keywords: Sleeve lobectomy, pneumonectomy, lung preservation, ventilatory outcomes, thoracic oncology, surgical training

22

VATS Surgical Management of Pulmonary Hydatid Cyst
Ihsan Alloubi, Taha Hasni Alaoui, Youssef Motiaa, Siham Rachidi Alaoui
Universitary Academic Hospital of Tangiers, Morocco

Background: Hydatid cyst disease, caused by Echinococcus granulosus, remains a significant parasitic infection in endemic regions. While open thoracotomy has been the traditional surgical approach, the role of minimally invasive techniques like Video-Assisted Thoracoscopic Surgery (VATS) is expanding. This study aimed to assess the outcomes of VATS in the treatment of pulmonary hydatid cysts and to identify the preoperative radiological features that predict its successful application, with a focus on recurrence rates.

Methods: A retrospective review was conducted on 47 patients who underwent VATS for pulmonary hydatid cysts between December 2019 and June 2025. Data were analyzed, focusing on preoperative radiological findings (cyst size, location, and presence of complications), intraoperative factors, and postoperative outcomes. Key metrics included symptom resolution, hospital duration, morbidity, re-operation rates, and recurrence rates. The decision to proceed with VATS was based on favorable radiological features, primarily small size and the absence of complications.
Results: A total of 47 patients underwent VATS for pulmonary hydatid cysts. The most frequent presenting symptoms were cough, chest pain, and dyspnea. Preoperative imaging confirmed that all patients selected for VATS had small, non-complicated cysts. Parenchyma-sparing procedures, such as cystotomy and capitonnage, were performed successfully in all cases. The conversion rate to open thoracotomy was 7 patients (14.9%) due to severe adhesions or intraoperative cyst rupture. Postoperative outcomes were excellent for patients who completed the VATS procedure, with shorter hospital stays and less pain. Re-operation was required in three cases; two of these were for recurrent disease and one was for a postoperative complication. Our low recurrence rate in the VATS group suggests that the technique itself is not a primary factor in recurrence, an observation that aligns with findings from other studies comparing VATS to open surgery. The overall morbidity was low, and no deaths were reported in this series.
Conclusion: For small, non-complicated pulmonary hydatid cysts, VATS is a safe and effective surgical approach that yields excellent postoperative outcomes. The successful application of VATS is heavily dependent on favorable preoperative radiological features. Our findings, while not from a direct comparative study, suggest that VATS does not increase the risk of recurrence when compared to open surgery, provided strict patient selection criteria are followed. This minimally invasive technique offers significant advantages, including reduced pain, a shorter hospital stay, and a faster recovery, making it a preferred option for appropriate candidates.

23

Atypical Presentation of Pulmonary Hydatid Cyst Mimicking Lung Cancer: A Case Report

Ihsan Alloubi, Taha Hasni Alaoui, Siham Rachidi Alaoui
Universitary Academic Hospital of Tangiers, Morocco

Background: Pulmonary hydatid cyst disease is a parasitic infection typically presenting as a cystic lesion. While usually a straightforward diagnosis on imaging, its presentation can be highly variable. This case report highlights a rare and diagnostically challenging instance where a pulmonary hydatid cyst in a high-risk patient perfectly mimicked a malignant lung tumor on imaging, leading to a misdiagnosis.
Case Presentation: A 47-year-old male with a significant 40-pack-year smoking history presented with symptoms of chest pain and hemoptysis. A chest CT scan revealed a spiculated, solid pulmonary nodule, a feature highly suspicious for malignancy in a patient with his risk factors. A subsequent CT-guided biopsy was inconclusive, failing to provide a definitive diagnosis. Consequently, the patient underwent diagnostic surgery, assuming a lung cancer resection was needed.

Diagnosis and Management: During the intraoperative and subsequent histopathological examination, the mass was unexpectedly identified as a pulmonary hydatid cyst. The cyst was successfully resected, and the patient had an uneventful postoperative recovery. This definitive diagnosis, reached only after surgical resection, underscores the limitations of preoperative imaging and biopsy in such rare cases.
Conclusion: This case serves as a critical reminder of the wide spectrum of presentations for pulmonary hydatid cysts. Even in high-risk patients with imaging findings highly suggestive of malignancy, hydatid disease should be considered in the differential diagnosis, especially in endemic areas. Vigilance and a high index of suspicion are crucial to prevent misdiagnosis, avoid unnecessary extensive surgery, and ensure the appropriate management of these unusual but curable lesions.

24

Timing is Everything: Surgical Strategies for Descending Necrotizing Mediastinitis - A Systematic Review

Adhyasta Nata Prawira S, Dhihintia Jiwangga S. W, I Gusti Bagus Chandogya G. A
Universitas Airlangga - Dr. Soetomo General Academic Hospital, Indonesia

Background: Descending necrotizing mediastinitis (DNM) is a rapidly progressing, lifethreatening infection originating from cervical and oropharyngeal regions, with high mortality if not promptly addressed. Optimal surgical timing is critical but remains uncertain. This systematic review aims to assess the relationship between intervention timing and outcomes such as mortality in patients surgically treated for DNM.
Methods: This systematic review was conducted in adherence to PRISMA guidelines using three databases (PubMed, ScienceDirect, and Cochrane). The databases were independently searched for studies analysing the relationship between timing aspects such as early surgical intervention, ICU and hospital length of stay and outcomes like mortality and complications in patients with descending necrotizing mediastinitis. Subsequently, through collaborative discussion among the authors, studies deemed most relevant to the Objectives of this review were selected. Quality of studies was evaluated using the MINORS Quality Appraisal Tool.
Results: A total of 635 papers after duplicates remove are screened. Title and screening found that 576 papers are irrelevant, and of the 46 papers to be fully reviewed. Respectively 20 and 21 studies were excluded as most had interventions and outcomes unrelated to this systematic review. 150 samples were identified from the 5 included studies. Most patients had type I DNM (34%, n = 49) from previous odontogenic infections (61%, n = 91). The most common surgical intervention was cervicotomy with substernal drainage (25%, n = 36). One study showed no difference in mortality between surgical techniques and ICU stays; two studies found that early intervention improved survival and outcomes, while the other two identified a significant association between shorter hospital/ICU stays and enhanced outcomes ($p<0.01$).
Conclusion: Timely surgical intervention and shorter hospital or ICU stays are linked to improved survival and outcomes in DNM patients. Early diagnosis and prompt treatment are essential to reducing mortality and adverse outcomes.
Keywords: Descending Necrotizing Mediastinitis, Surgical Procedures, Timeto Treatment, Mortality

25

Chest Wall Desmoid Tumour: A Case Series

Lai DZR, Segar S, Tay YZ, Balasingam DFK, Dharmaraj B, Sathiamurthy N
Kuala Lumpur Hospital (HKL), Malaysia

Introduction: Desmoid tumour is a rare fibroblastic proliferation that develops in the deep soft tissues. Only 10 to 20% of all deep fibromatoses are originated from chest wall, but it is well known for its aggressive infiltrative growth pattern, and its tendency towards local recurrence. Nevertheless, it lacks metastatic potential.
Material: We report a case series of desmoid tumour of the chest wall who underwent surgical resection at our institution between January 2018 and December 2024. Four patients (one man and three women) were identified, with median age of 46.5 years (range 27 to 64 years). Progressive chest wall swelling was the sole complaint at presentation. Cross sectional imaging showed chest wall mass, invading the clavicle (3 cases), the ribs (3 cases), the scapula (1 case), the subclavian vessel (1 case) and the sternum (2 cases). Two of the patients has incomplete resection (resection margin is involved but there is no recurrence in follow-up imaging). The outcome was favorable in all four cases, with no recurrence to date.
Discussion: Due to the complex anatomy and potential functional impact, surgical resection of chest wall desmoid tumour aims for R0 margins when feasible, complemented by reconstructive techniques to restore chest wall stability and function. R1 resection is acceptable if achieving R0 resection is expected to cause excessive morbidity. Imaging modalities like Magnetic Resonance Imaging play a crucial role in diagnosis and assessment, while histopathology examination is confirmatory. Multidisciplinary approach is mandatory to plan treatment strategies that are tailored to each individual patient, based on the symptomatology, tumor progression, and anatomical involvement, with options including observation, systemic therapy, radiotherapy, and surgery. Long-term surveillance with imaging after surgery remains essential due to the potential for late recurrences.
Conclusion: Desmoid tumour of the chest wall is a locally aggressive lesion, with high local recurrence rate. Management strategy is based on multidisciplinary Discussion. In terms of surgical approach, complete surgical resection if feasible, and timely follow-up is crucial in managing such cases.

26

A Mediastinal Metamorphosis: Rare Angiosarcomatous Transformation of a Mediastinal Germ Cell Tumour

Samsudin I, M Menon, Rahim A, Len En Yean, S Krishnasamy.
Universiti Malaya Medical Center, Malaysia

Introduction/Objectives: Mediastinal germ cell tumours (GCTs) are rare, usually anterior mediastinal and seen in young males. While most teratomas are benign, malignant transformation is uncommon. Angiosarcomatous transformation is exceedingly rare and highly aggressive. We present a case of mediastinal teratoma with angiosarcomatous transformation, emphasizing the diagnostic and management challenges.

Materials and Methods: A 19-year-old male presented with a large anterior mediastinal mass inseparable from lung, diaphragm, and pericardium. Initial sternotomy was abandoned due to bleeding and adhesions. Neoadjuvant BEP chemotherapy achieved minimal response. A second surgery using combined right VATS, redo sternotomy, and hemi-clamshell incision enabled en bloc resection with wedge lung resection, pericardial reconstruction, and diaphragmatic plication.
Results/Discussion: Histopathology confirmed angiosarcomatous transformation of a mature teratoma, with atypical endothelial-lined vascular channels. Such transformation is extremely rare and carries a poor prognosis due to aggressive biology and relative chemo-resistance. Despite limited chemotherapy response, radical surgery achieved complete macroscopic clearance. Recovery was uneventful, highlighting the role of a multidisciplinary approach and the feasibility of aggressive surgical resection in complex mediastinal tumours.
Conclusion: Angiosarcomatous transformation in mediastinal GCTs is rare but significantly worsens prognosis. Thorough histopathology, individualized oncologic strategies, and multidisciplinary surgical planning are essential for optimal outcomes.

27

Beyond the Peritoneum: Multivisceral Resection of Appendiceal Mucinous Carcinoma with Pseudomyxoma Peritonei and Left Thoracic Extension via Left Hemi-Clamshell Approach

Samsudin I, M Menon, Rahim A, S Krishnasamy
Universiti Malaya Medical Center, Malaysia

Introduction/Objectives: Pseudomyxoma peritonei (PMP) usually remains confined to the peritoneal cavity, with thoracic extension being extremely rare. Involvement of cardiopulmonary structures creates major diagnostic and therapeutic challenges, often requiring complex surgical and reconstructive strategies. We present a case of appendiceal mucinous carcinoma with PMP and left thoracic extension, managed with a left hemi-clamshell approach and chest wall reconstruction.
Materials and Methods: A 39-year-old male with prior appendiceal mucinous carcinoma and abdominal cytoreductive surgery developed progressive dyspnoea. Imaging revealed massive thoracic involvement of pleura, pericardium, diaphragm, and lung, with mediastinal shift and dextrocardia. A multidisciplinary team planned radical resection. A left hemi-clamshell thoracotomy provided wide exposure. En bloc resection included wedge lung resection, pleura, pericardium, and diaphragm, with intrapericardial stapling to release tumour adherent to cardiac structures. Chest wall and diaphragm were reconstructed using vascularized anterolateral thigh and tensor fascia lata flaps with rib plating.
Results/Discussion: Complete macroscopic resection was achieved. Histopathology confirmed appendiceal mucinous carcinoma with PMP invading thoracic tissues. Postoperative recovery was uneventful, with early extubation and restored pulmonary function. Three-month follow-up imaging showed no recurrence and reversal of mediastinal shift. This case demonstrates the feasibility of aggressive surgery in thoracic PMP. The hemi-clamshell incision provided superior exposure and intrapericardial access

compared with conventional thoracotomy. Plastic reconstructive support was essential for chest wall stability and functional recovery.
Conclusion: Thoracic extension of PMP is exceptionally rare and technically demanding. A left hemi-clamshell approach with intrapericardial stapling and advanced reconstruction enables radical resection while preserving cardiopulmonary function. Successful outcomes require meticulous planning, multidisciplinary collaboration, and technical versatility.

28

A Rare Case of Mediastinal Cavernous Lymphangioma in a Young Woman: A Family Tragedy Revisited

Samsudin I, M Menon, Rahim A, S Krishnasamy
Universiti Malaya Medical Center, Malaysia

Introduction/Objectives: Mediastinal lymphangiomas are rare, accounting for less than 1% of mediastinal masses, with cavernous subtypes even less frequent. They may remain asymptomatic or cause compressive symptoms. We report a case of an incidentally detected mediastinal cavernous lymphangioma in a young woman with a striking family history of her sibling's death from cerebral lymphangioma, raising the possibility of familial predisposition.
Materials and Methods: A 22-year-old woman was referred after a routine chest X-ray revealed an anterior mediastinal mass (7–8 cm). She was asymptomatic despite compression of the trachea, heart, and pericardium. Family history revealed her 7-year-old sister had died from a brain lymphangioma. CT confirmed a well-circumscribed cystic mass without invasion. Surgical excision was performed via uniportal right VATS. The cyst was decompressed with a purse-string suture, followed by careful dissection from adjacent structures including the phrenic nerve, superior vena cava, and brachiocephalic vein.
Results/Discussion: The lesion was excised completely without complication. Histopathology confirmed cavernous lymphangioma with dilated endothelial-lined vascular spaces containing lymphatic fluid. Postoperative recovery was uneventful. While mediastinal lymphangiomas are typically symptomatic at presentation, this case was incidental despite significant mass effect. Complete surgical excision remains the treatment of choice, and uniportal VATS provided safe, minimally invasive access. The family history suggests possible genetic susceptibility, although no hereditary pattern is clearly defined in lymphangiomas.
Conclusion: Mediastinal cavernous lymphangiomas are extremely rare but clinically important lesions. This case demonstrates the safety and efficacy of uniportal VATS resection and raises the possibility of familial predisposition, warranting further study. Detailed family history and early imaging may be critical in detecting such rare vascular anomalies.

29

Video-Assisted Thoracoscopic Surgery versus Sternotomy in Mediastinitis: A Systematic Review

Abed Nego Okthara Sebayang, Dhihintia Jiwangga Suta Winarno, IGB Chandogya Giriastawa
Universitas Airlangga - Dr. Soetomo General Hospital, Indonesia

Introduction: Mediastinitis is a severe complication after cardiothoracic surgery, associated with high morbidity and mortality. Conventional management involves debridement via sternotomy, but video-assisted thoracoscopic surgery (VATS) has emerged as a less invasive alternative. This systematic review compares outcomes of VATS and sternotomy in mediastinitis.
Methods: A systematic search of PubMed, Scopus, and Web of Science was conducted (up to August 2025) following PRISMA guidelines. Studies comparing VATS and sternotomy in mediastinitis were included. Extracted data included perioperative outcomes, length of stay, complications, and mortality.
Results: Ten studies (n = 582 patients) were included. VATS was associated with reduced length of stay, shorter ICU stay, lower surgical trauma, and faster recovery compared with sternotomy in selected patients. Mortality was comparable between groups (VATS: 8–12%; Sternotomy: 10–15%). Complication rates, including re-infection and reoperation, were similar, though VATS was linked to lower postoperative pain and shorter drainage duration.
Conclusions: VATS represents a feasible and safe alternative to sternotomy for mediastinitis in carefully selected patients. Sternotomy remains necessary in extensive infection or hemodynamically unstable cases. Larger multicenter randomized studies are required to confirm long-term benefits.

30

Constant-Rate Intravenous Indocyanine Green Infusion for Anatomical Segmentectomy: A Case Report of Enhanced Intersegmental Plane Visualization

Han Sa, Kan Cs
Hospital Sultan Idris Shah, Malaysia

Introduction: Anatomical pulmonary segmentectomy is a parenchyma-sparing alternative to lobectomy in selected patients with early-stage non–small cell lung cancer. Accurate identification of the intersegmental plane during minimally invasive surgery is challenging, particularly when nodules are not visible on the visceral pleura. Indocyanine green (ICG), a fluorescent dye, has been adopted for intraoperative near-infrared imaging. While bolus intravenous injection produces only transient fluorescence, constant-rate infusion offers brighter and more sustained visualization, potentially improving surgical precision.
Methods: We present a 66-year-old man with hypertension, dyslipidaemia, and a history of rectal adenocarcinoma treated with neoadjuvant chemotherapy and low anterior resection. Surveillance computed tomography (CT) scan revealed a solid pulmonary nodule with ground-glass changes and spiculated margins in the superior segment of the left lower lobe. Although a CT-guided biopsy was negative, the lesion remained

suspicious and resection was performed. The patient underwent left video-assisted thoracoscopic superior segmentectomy using constant-rate intravenous ICG infusion. ICG (25 mg in 10 ml sterile water) was administered at 12.5 mg/min via an infusion pump. Near-infrared imaging showed all lung segments fluorescing green except the superior segment, which was resected en bloc with an Endo-GIA stapler. Recovery was uneventful, and he was discharged on day four. Histopathology confirmed primary lung adenocarcinoma with clear margins.
Discussion: Precise delineation of the intersegmental plane is essential to ensure oncologic adequacy while preserving lung function. While ICG bolus injection improves accuracy, its short-lived and sometimes heterogeneous fluorescence restricts its usefulness. Constant-rate infusion provides stable fluorescence and clearer demarcation of intersegmental borders, minimizing operative uncertainty and reducing the need for repeated injections. Early evidence suggests superior fluorescence intensity and longer retention compared to bolus dosing, with no increase in adverse events.
Conclusion: This case highlights the feasibility and advantages of constant-rate intravenous ICG infusion during segmentectomy. The technique enhances visualization of intersegmental planes, facilitates minimally invasive resection, and may represent an important step toward improving precision in parenchyma-sparing lung surgery.

31

The Role of Surgery in Treating Complications of Esophageal Foreign Bodies
Nguyen, H. B., Vu, H. V, Chau, P. T., Nguyen, V. D. Q, Tran, M. Q.
Cho Ray Hospital, Vietnam

Introduction: Esophageal foreign bodies require timely removal to prevent life-threatening complications. While endoscopy is successful in most cases, certain situations necessitate surgery. Complicated esophageal foreign bodies have a high mortality rate if not promptly treated. The optimal approach for diagnosis and surgery remains a research question.
Materials and Methods: A retrospective study from 2018 to 2024 included 72 patients with esophageal foreign bodies and complications. Patients were divided into medical and surgical treatment groups.
Result: Common foreign bodies were bones (69,4%) and dentures (16,7%), with an average size of 4cm. Flexible endoscopy removed foreign bodies in 27,8%, rigid endoscopy in 34.7%, and in 37.5% cases, endoscopy was unsuccessful. Complications included esophageal wall abscess, mediastinitis, esophageal perforation, and periesophageal abscess. Among the patients, 25 received medical treatment (4 later required surgery), and 37 underwent surgery (30 successful after the first surgery). Seven patients needed a second surgery due to infection and esophageal fistula, resulting in four deaths.
Conclusion: Complicated esophageal foreign bodies are often large and detected late. Endoscopic removal success rate is relatively low. Comprehensive evaluation using CT is required for esophageal perforation and periesophageal abscess. Surgery results have significantly improved, despite a high mortality rate.

32

Patterns of Thoracic Surgical Management in Children: A 7-Year Descriptive Study at Dr. Soetomo General Academic Hospital (2018-2024)

Tampubolon, Gold Sunday Palm., Winarno, Dhihintia Jiwangga Suta., Rizki, Mohamad., Giriastawa, I Gusti Bagus Chandogya.
Dr. Soetomo General Academic Hospital–Universitas Airlangga, Indonesia

Background: Pediatric thoracic surgery spans emergencies and reconstructions across infections, trauma, tumors, congenital anomalies, and ICU-related complications. Pediatric-specific guidance for entities such as spontaneous pneumothorax, empyema, and mediastinal masses is evolving and practice varies across settings.
Methods: Retrospective descriptive review of all patients aged 0–18 years undergoing thoracic procedures at Thoracic Cardiac and Vascular Surgery Department of Dr. Soetomo General Academic Hospital (2018–2024). Core variables: sex, age, diagnosis, procedure; indication-specific narratives compiled from operative logs.
Results: Over 7 years there were 689 patients (male 408, female 281); mean age 9.65 years (SD 6.36), median 11.0 (IQR 13.0). Indications (non-exclusive) included pneumothorax 210 (30.5%) -including 43 (6.2%) pneumothorax cases due to trauma-, pleural effusion (non-empyema) 259 (37.6%)-including pleural effusion related to mediastinal tumors-, empyema 54 (7.8%), thoracic trauma 87 (12.6%) -including pneumothorax-, and tumors 144 (20.9%)-mediastinum 31, chest-wall 7, other non-primary lung thoracic masses 106. Tube thoracostomy dominated acute care; thoracotomy (and selective VATS) addressed organized infection, tumor resection, trauma hemostasis/repair, diaphragmatic repair, airway and chest-wall problems. No primary lung tumors and no pneumonectomies occurred; only one lobectomy (for lung abscess).
Conclusions: Practice patterns align with contemporary pediatric evidence favoring early minimally invasive strategies for empyema, symptom-guided pneumothorax pathways, and biopsy-first paradigms for mediastinal masses.
Keywords: pediatric thoracic surgery; thoracotomy; VATS; pneumothorax; pleural effusion

33

Nodal Upstaging Evaluation After Robotic-Assisted Lobectomy for Non-Small Cell Lung Cancer: A Retrospective Single Center Analysis In Vietnam.

Nguyen, H. B., Truong, C.N., Tran, M. Q., Nguyen, M.D.
Cho Ray Hospital, Vietnam

Background: Lobectomy and lymph node dissection are the standard of care for the radical treatment of non-small cell lung cancer (NSCLC). The identification of metastatic lymph nodes after surgery is of great prognostic significance for subsequent treatment and long-term patient follow-up. This study aims to determine the rate of nodal upstaging and disease stage after surgery, as well as to evaluate the effectiveness of robotic-assisted thoracoscopic surgery (RATS) in the treatment of NSCLC patients at Cho Ray Hospital, Vietnam.
Methods: We conducted a retrospective review of NSCLC patients who underwent robotic-assisted thoracoscopic lobectomy and lymph node dissection at Cho Ray

Hospital. Lymph node dissection was performed in compliance with the American College of Surgeons Commission on Cancer guidelines, requiring the dissection of at least three mediastinal lymph node stations and one hilar lymph node station.
Results: From June 2023 to August 2024, a total of 65 patients underwent RATS. The mean age was 62.4 years, and 50.8% were male. The majority of cases involved the right lung (52.3%, n=34) and the upper lobe (64.6%, n=42). Preoperative clinical staging (cTNM) was as follows: IA (29.2%), IB (13.9%), IIA (20%), IIB (24.6%), and IIIA (12.3%). The mean operative time was 2.44 hours, and the mean hospital stay was 3.6 days. There were no major complications. Subcutaneous emphysema occurred in 5 patients (7.7%) and resolved spontaneously. Two patients (3%) were converted to open surgery due to densely adherent lymph nodes. The rate of nodal upstaging was 15.4% (10 patients), with pN1 upstaging at 4.7% and pN2 upstaging at 10.7%.
Conclusions: Robotic-assisted thoracoscopic lobectomy and lymph node dissection are safe and feasible approach especially regarding the accuracy of mediastinal lymphadenectomy.
The rates of complications and conversion to open surgery are low (7.7 % and 3%, respectively). The rate of nodal upstaging after RATS was 15.4%, with pN2 upstaging being the most common finding. These results can lead to a more precise pathological stage of the disease and, if necessary, to more accurate postoperative treatment.

35

Advantages of Single Port VATS Thymectomy Via Subxiphoid Approach at Lady Reading Hospital Peshawar

Mohammad Abid, Viqar Aslam
Lady Reading Hospital, Pakistan

Objective: To compare outcomes of single port sub-xiphoid VATS thymectomy with trans-sternal thymectomy.
Study Design: Retrospective study
Place and Duration of Study: This study was conducted at the Lady Reading Hospital Peshawar for 6 months, Medical records of last 5 years from January, 2018 to June, 2022.
Materials and Methods: All patients that underwent thymectomy by sub-xiphoid VATS or trans-sternal approach were included. VATS indication included Masaoka stage I-II thymoma (diameter <5 cm). Patients were divided into two groups depending upon approach taken for thymectomy, viz. single port sub-xiphoid VATS and trans-sternal thymectomy. SPSS v23.0 was used for data analysis. To test for comparison between outcomes of sub-xiphoid and trans-sternal thymectomy, either independent t-test or Mann-Whitney U tests were applied keeping p-value <0.05 as statistically significant.
Results: 70 patients underwent S-VATS while 55 T-VATS. Mean operative time, blood loss, post-operative pain, duration of chest tube and hospital stay in S-VATS group 87.68 ± 43.15 minutes, 78.19 ± 49.44 ml, 2.65 ± 0.59, 2.98 ± 1.29 days and 4.1± 1.88 days respectively. In T-VATS group, the mean values were 108.33 ± 45.25 minutes, 125.44 ± 98.15 ml, 5.2 ±1.21, 3.19 ± 2.11 days and 5.4 ± 2.14 days, respectively. A significant difference of p<0.01 was reported in-between both the groups [Table II]. A total of 10 post-operative complications were observed in S- VATS group while 14 in T-VATS group.

Conclusion: Both intra-operative and post-operative outcomes were in favorable towards S-VATS when compared with that of T-VATS. Further studies are required to validate the findings of this study.

36

A perspective way of managing Corrosive Ingestion

Muhammad Kaleem Ullah, Muhammad Abid
Nishtar Medical University Hospital, Pakistan

Objective: To review our experience of management of corrosive injury to upper gastrointestinal tract and to develop management protocols for this difficult clinical problem.
Methodology: This retrospective observational study was conducted in thoracic surgery unit Nishtar Hospital Multan from October 2003 to March 2021.All patient having history of corrosive ingestion whether acute or chronic were included in study. Demographic, clinical, radiological, endoscopic data pre and per-operative findings, and operative procedure(s) performed were recorded. Based on this data a protocol is developed so that the best management option can be chosen in a particular corrosive injury complex.
Results: A total of 5037 patients underwent management for corrosive ingestion injury. 3022 were female and 2015 were male. Age ranged from 2-55 years with a mean age of 24.6 years. Dysphagia was present in all the patients. In addition to dysphagia, additional presentations include hemetemsis, vomiting, oral ulceration and stridor. Cause of injury in 97% of the patients was a suicidal attempt where as in 3% of the patients (including all the children) had accidental ingestion of corrosive. Procedures performed were Oesophagoscopy and dilatation in 3475 patients, Dysjunction (drainage gastrostomy and feeding duodenostomy after separating stomach from duodenum) in 380 patients, Jaboulay's Pyloroplasty in 720 patients, Colonic interposition in 340 patients, Roux-En-Y Esophagojejunostomy in 149 patients, feeding jejunostomy in 127 patients, Near total Gastrectomy and Roux-En-Y Gastrojejunostomy in 74 and Bifid Stomach Tube in 70 patients. Our protocol of management of corrosive intake is given below in tabulated form which we developed as a learning consequence of our experience.
Conclusion: Corrosive intake can present with a wide variety and severity of combination of laryngeal, pharyngeal, esophageal, gastric and duodenal injuries. This calls for carefully designing the management plan in each individual, considering his/her particular needs.

37

The Utility of Cone Beam CT-Guided Intraoperative Indocyanine Green Localization for Small Lung Lesions in Thoracoscopic Surgery in Thailand

Nateetorn Sriauypornchai, MD, Suparauk Geanphun, MD
Siriraj Hospital, Thailand

Background: Accurate localization of small pulmonary nodules is crucial for effective resection during video-assisted thoracoscopic surgery (VATS). Two primary approaches are commonly used: preoperative indocyanine green (ICG)-guided localization using computed tomography (CT) and intraoperative localization with cone-beam CT (CBCT).

This study compares the outcomes of these two techniques in terms of localization time, surgical efficiency, visualization clarity, and patient recovery.
Method: A retrospective analysis was conducted in five cases of VATS pulmonary nodule resection at Siriraj Hospital between 2022 and 2024. One case utilized preoperative CT-guided ICG localization, while four cases employed intraoperative CBCT-guided ICG localization. Key outcomes measured included localization time, total operation duration, clarity of visualization, hospital stay, and postoperative complications. Descriptive statistics summarized the data, and comparisons between the groups were made.
Results:

- Localization Time: Intraoperative CBCT-guided localization demonstrated a shorter average localization time (mean: 30 minutes) compared to the preoperative case, where additional time was required due to patient transfer between imaging and surgery.
- Clarity of Visualization: Intraoperative localization provided superior visualization clarity, with real-time imaging allowing precise identification of nodule boundaries, minimizing tissue disruption and enhancing surgical precision. Preoperative localization, while effective, exhibited limitations due to potential ICG diffusion during patient transfer.
- Operation Duration: Intraoperative localization showed an average operation duration of 123.75 minutes, slightly longer than the preoperative case, which took 107.3 minutes. However, the improved visualization contributed to better nodule targeting and resection accuracy.
- Hospital Stay: Both approaches resulted in a similar hospital stay of approximately 3 to 4 days.
- Complications: No postoperative complications were observed in either group, indicating the safety of both techniques.

Conclusion: Intraoperative CBCT-guided ICG localization offers faster nodule targeting, enhanced clarity of visualization, and avoids logistical delays associated with preoperative localization. These findings underscore its potential as an efficient and precise technique for minimally invasive thoracic surgery, particularly in settings where time efficiency, surgical precision, and visualization clarity are critical.

38

Predictors of Surgical Outcomes in Patients Undergoing Decortication for Empyema: A Retrospective Analysis from a Thoracic Surgery Center.
Fizza Iftikhar, Wajahat Hussain, Waniyah Masood
Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Pakistan

Introduction: Empyema thoracis remains a significant global health challenge, particularly in regions with high tuberculosis prevalence. Decortication via open thoracotomy or video-assisted thoracoscopic surgery (VATS) is the definitive surgical management in chronic empyema where medical therapy fails. However, outcomes are influenced by multiple factors including timing of referral, etiology, and preoperative interventions. Our study aims to evaluate surgical outcomes and identify predictors of

reoperation in patients undergoing decortication for both parapneumonic and tuberculous empyema.
Materials and Methods: We conducted a retrospective cohort study at the Department of Thoracic Surgery, SMBB Institute of Trauma, Karachi, from January 2023 to December 2024. A total of 271 patients aged 18–60 years undergoing decortication for empyema were included. Both open and VATS approaches were assessed. Patients with post-traumatic empyema or comorbidities were excluded. Demographic data, clinical characteristics, time to referral, type of intervention, and surgical outcomes along with predictors associated with re-exploration were analyzed. Statistical analysis was performed using SPSS 23.0, p-value of <0.05 was considered significant for all statistical tests.
Results: Of the 271 patients, 58% were male and 42% female, with a mean age of 23.3 years. The majority of cases (58%) were due to tuberculous empyema, while 42%were parapneumonic. Late referral (>2 weeks from symptom onset) was observed in 92% of patients. Preoperative interventions included tube thoracostomy (68%), thoracocentesis (21%), image-guided drainage (12%).Surgical approach was open thoracotomy in 59% and VATS in 41% of cases. A total of 32 patients (11.8%) required redo surgery, primarily open window thoracostomy (82%). On univariate analysis, delayed referral beyond two weeks was significantly associated with an increased risk of requiring redo surgery (p = 0.003). Similarly, patients who underwent multiple preoperative interventions, particularly those with prior chest tube placements had a significantly higher likelihood of reoperation (p = 0.01). Age, etiology, and surgical approach were not statistically significant predictors of redo surgery.
Conclusion: Our findings align with existing literature underscoring the importance of early surgical intervention in empyema to minimize complications. Early decortications, particularly within the first two weeks of symptom onset may reduce the need for extensive redo procedures and improve overall prognosis.

39

Epidemiology, Injury Patterns, and Clinical Outcomes of Thoracic Trauma from Road Traffic Accidents: A Retrospective Analysis from a Level I Trauma Registry in Karachi, Pakistan

Fizza Iftikhar, Wajahat Hussain Pahilwani Waniyah Masood
Shaheed Mohtarma Benazir Bhutto Institute of Trauma Karachi, Pakistan

Introduction: Thoracic trauma constitutes a leading cause of morbidity and mortality among victims of road traffic accidents (RTAs), contributing to approximately 25% of all trauma related deaths. In low- and middle-income countries (LMICs) such as Pakistan is ranked first in Asia for RTA-related fatalities, the burden is further exacerbated by poor enforcement of road safety regulations and limited trauma care infrastructure. Our study aimed to assess the epidemiological trends, severity of injuries, and clinical outcomes of thoracic trauma resulting from RTAs, using a large trauma registry dataset from a Level 1 trauma center of Karachi, Pakistan.
Materials and Methods: This retrospective observational study was conducted at the Thoracic Surgery Department of Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT), Karachi, from December 2021 to October 2024. Data were retrieved from the

institutional trauma registry. Inclusion criteria included patients of both genders who sustained isolated thoracic trauma due to RTAs. Non-RTA mechanisms and pediatric patients were excluded. Demographic variables, injury patterns, and outcomes (ICU admission, mechanical ventilation, and mortality) were analyzed. Multivariate logistic regression was applied to identify independent predictors of mortality, using age, injury severity (> 1 thoracic injury), comorbidities, and presentation time as covariates. A p-value < 0.05 was considered statistically significant.
Results: Out of 456,000 trauma cases, 114,500 (25.1%) involved thoracic injuries, out of which 89,000 were isolated thoracic trauma cases. Males accounted for 79% of cases, with the highest incidence in the 20–29 age groups. The most common injury types included pneumothorax (89%), lung contusions (80.1%), and pleural injuries such as hemothorax (79.8%) and chest wall fractures (60.1%). Morbidity outcomes included prolonged ICU stays (32.7%) and mechanical ventilation (27.6%). The overall mortality rate was 18.9%. Independent predictors of mortality were analyzed using multivariate logistic regression, included extremes of age ($p = 0.02$), pre-existing pulmonary or cardiac disease ($p = 0.01$), high-impact trauma ($p = 0.03$), and delayed hospital presentation ($p < 0.001$).
Discussion: Our study underscores the substantial clinical and economic burden of thoracic trauma from RTAs in urban Pakistan. While most injuries were survivable with timely interventions (e.g., tube thoracostomy in >90%), delayed presentation and comorbidities significantly increased mortality risk. The age-based injury patterns suggest differential vulnerabilities among age groups. Our study highlighted the need for targeted prevention strategies and early trauma response systems.
Conclusion: Thoracic trauma from RTAs remains a critical public health issue with a high burden of morbidity and mortality. Early diagnosis, rapid transport, and prehospital care are essential in mitigating fatal outcomes. Our findings emphasize the need for strengthening trauma systems and public awareness to reduce RTA-related thoracic injuries and deaths.

40

Salvaging Tuberculosis Diagnosis in Advanced HIV Disease with Urine Lipoarabinomannan Testing: Four Cases from a Resource-Limited Setting

Yusuf Aulia Rahman, Lina Herliyana, Muhammad Labib MY Bima
Abdul Moeloek General Hospital of Lampung, Indonesia

Background: Indonesia is among the highest TB-burden countries, and tuberculosis (TB) remains the leading cause of death among people living with HIV (PLHIV). In advanced HIV disease (AHD), profound immunosuppression results in atypical presentations and frequent false negatives in sputum-based diagnostics, delaying TB treatment. Urinary lipoarabinomannan (LAM) is a simple, low-cost, point-of-care test with higher yield in patients with low CD4 counts. Despite WHO recommendations since 2016, LAM has not been integrated into Indonesia's HIV guidelines.
Case presentation: We report four PLHIV with AHD in whom conventional TB diagnostics were negative or inconclusive.

- A 22-year-old female with transfusion-dependent thalassemia had extensive negative TB workup; urine LAM was positive, and anti-TB therapy led to recovery.
- A default HIV case with abdominal pain was diagnosed with disseminated TB only after positive LAM and improved on treatment.
- A 22-year-old male with suspected CNS TB had no microbiological confirmation; LAM positivity guided therapy with marked improvement.
- A male with Kaposi's sarcoma and pulmonary symptoms had negative sputum tests but positive LAM, supporting TB treatment alongside chemotherapy.

Discussion: Patients with AHD often cannot produce sputum and have atypical imaging, limiting conventional TB diagnostics. In these cases, urine LAM enabled timely initiation of anti-TB therapy, resulting in clinical improvement. As a rapid and practical point-of-care test, LAM can address a critical diagnostic gap in resource-limited settings.
Conclusions: Urine LAM testing can salvage missed TB diagnoses among PLHIV with AHD and should be considered for integration into national HIV/TB programs in Indonesia.
Keywords: tuberculosis, advanced HIV disease, lipoarabinomannan (LAM), Point-of-care diagnostics, resource-limited settings.

41

Minimally Invasive Surgery for Giant Mediastinal Tumour: A Comprehensive Review of Recent Literatures With Comparison to South East Asian (SEA) Population and Experience in Our Centre in Malaysia, As a Multi-Racial Country.
Sangaraamunisen Ramachandran, Kan Chan Siang
Serdang Heart Centre, Malaysia

Introduction: Giant mediastinal tumours, traditionally resected through open approaches such as median sternotomy or thoracotomy, remain technically challenging due to their size, proximity to critical structures, and risks of perioperative morbidity. With recent advancements, minimally invasive surgery (MIS); including video-assisted thoracoscopic surgery (VATS), uniportal/subxiphoid approaches, and robotic- assisted thoracic surgery (RATS); is increasingly applied to selected patients. While robust data exist from Europe, China, and Taiwan, evidence from Southeast Asia (SEA) remains limited.
Methods: We reviewed published studies (2015–2025) on MIS for giant mediastinal tumours
(≥8–10 cm), searching MEDLINE, Embase, Scopus, Web of Science, Cochrane, and grey literature. Eligible studies reported perioperative outcomes (operative time, blood loss, conversion, complications, R0 resection, length of stay). Findings were compared with MIS cases for giant mediastinal tumours managed at Serdang Heart Centre, Malaysia (Jan–Aug 2025) and south east asian population.
Results/Discussion: Twenty-one studies were included. MIS approaches demonstrated perioperative safety, with median operative times of 120–240 minutes, blood loss <300 mL in most cases, conversion rates of 6–15%, and morbidity rates of 5–18%. R0 resection exceeded 85%, and length of stay was shorter with MIS (median 3–5 days) compared to sternotomy (7–10 days). Robotic approaches enabled safe resection of tumours >10 cm,

challenging size as a strict contraindication. Reported challenges included limited thoracic workspace, tumour adherence to great vessels, capsule fragility, adhesions, and anaesthetic risks from airway/vascular compression. Suggested criteria for MIS candidacy included encapsulated tumours without major vessel invasion, favourable imaging features, and availability of experienced surgical and anaesthetic teams. At our centre, four of seven MIS resections were completed successfully, while three required conversion to sternotomy due to tumour extraction difficulty or vascular risk. Patients undergoing MIS had reduced pain scores, blood loss (<200 mL), shorter hospital stays (3–5 days), and faster mobilisation (<1 day). Conversion to open surgery should not be considered as a surgical failure and the most important factor should always be patient safety, complete R0 resection and prevention of tumour seeding.
Conclusion: MIS is a feasible and increasingly preferred option for giant mediastinal tumours, offering favourable perioperative outcomes and oncologic safety in selected patients. Tumour size alone should not preclude MIS when appropriate expertise and contingency planning are in place. Our early Malaysian experience aligns with global evidence, supporting MIS as a viable strategy in the SEA population. Prospective multicentre studies with long-term follow-up are needed to refine patient selection and operative guidelines.

42

Innovative Technique in Pectus Excavatum Reconstruction: Modified Ravitch with Willital-Hegemann Approach and Modified Puruhito Pectus Bar

Dwintasari M, Puruhito, Winarno DJS, Chandogiya IGB, Bornie MC, Laksono GAK
Dr. Soetomo Hospital, Airlangga University, Indonesia

Introduction: Pectus excavatum is the most common congenital chest wall deformity, with an incidence of 1 in 300–400 live births and a male predominance of up to 4:11,2. Traditional correction methods include the Ravitch procedure using metal or titanium bars since the 1950s. However, due to high costs and limited availability in Indonesia, a more affordable alternative, the Modified Puruhito Pectus Bar, has been developed to provide effective and accessible correction.
Case description: A 13-year-old male presented with a progressively worsening sternal depression, first noticed at 9 years of age. He reported no limitation in daily activities. Growth and developmental milestones were normal, and no other congenital anomalies were detected. On examination,hemodynamics were stable, and a visible anterior chest wall depression was noted. Thoracic CT scan demonstrated a Haller index of 3.9 (maximum transverse diameter 218 mm / minimum anteroposterior distance 55 mm). The patient underwent surgical correction using the Willital-Hegemann approach combined with the Modified Puruhito Pectus Bar. A midline vertical incision was made, and the skin and subcutaneous tissues were dissected bilaterally to expose the sternum. Sequential wedge resections of the bilateral costochondral joints of ribs 4–6 were performed, followed by a transverse wedge osteotomy of the upper sternum. The depressed sternum was then mobilized and elevated anteriorly. A 20 cm stainless-steel Puruhito pectus bar was contoured to match the patient's thoracic curvature and introduced substernally, traversing from the right to left chest wall. The bar provided stable sternal elevation. Postoperatively, the patient was managed with wide adhesive dressings and a thoracic

corset. He demonstrated early mobilization on day 1 and was subsequently discharged on postoperative day 4 in good condition.
Discussion: Pectus excavatum, with surgery indicated in severe cases, particularly when the Haller index is ≥3.25 or when functional or psychosocial symptoms are present3,4. While the Ravitch and Nuss procedures remain standard approaches5,6, the use of pectus bars has gained popularity for their cosmetic and functional benefits7. In this case, correction was achieved using the Modified Puruhito Pectus Bar through the Willital-Hegemann Approach, a modification of the Ravitch technique. This low-cost alternative allowed effective sternal elevation, early mobilization, and favorable short-term recovery, demonstrating its value as an affordable option in resource-limited settings.
Conclusion: The Modified Puruhito Pectus Bar combined with the Willital-Hegemann approach offers an effective, safe, and accessible option for surgical correction of severe pectus excavatum. This method broadens treatment availability in developing countries without compromising clinical outcomes.

43

A Window to the Past Relevant in the Present- A Continuing Sixteen Year Experience with Modified Eloesser Flap Operation

Gnanamuthu BRD, Benjamin RB, David N, Umakanth SCS, Vinay MR.
The Christian medical College Hospital, India

Introduction: Complicated Empyema Thoracis (CET), continues to be a major burden for thoracic surgeons in developing countries. A complex interplay of delayed presentation, inadequate early management, resistant organisms, entrapped, fibrosed and damaged lung with poor nutritional status make its management a challenge. Conventional strategies used for treating uncomplicated empyema Thoracis (ET), are unsuccessful in these situations.
An archaic surgical technique, the modified Eloesser flap operation (MEO), referred to as the window procedure, first described in 1935, and now extinct in the developed countries, is the best weapon against this scourge. We analyzed the continuing role of this ancient technique in the management of CET in a tertiary hospital in India.
Aim: To analyze the details of MEO in the treatment of CET
Objective: To study the presentation, management strategy, outcomes and follow up details of patients with CET who underwent MEO.
Materials and methods: The details of all the patients who underwent MEO between 2009 and 2025 in our institute were retrieved from the database. The investigations done and the surgical details were analysed. The patients were followed up to assess the healing process and their subjective quality of life.
Results and Discussion: Over this 16 year period, 230 patients underwent MEO, constituting 36% of all surgeries done for ET. The mean age was 38.4 years with a male: female ratio of 3.8:1. The mean duration of symptoms was 8.8 months. At admission, broncho or pleuro cutaneous fistulae and a past history of treatment for tuberculosis was present in two thirds. Diabetes Mellitus was documented in 35.6%, malnutrition in 22.1%, and sepsis in 17.8%. The surgery was carried out as an emergency in 17.3 %. MEO to manage the complication of an earlier surgery was done in 15.6%. Three patients were

operated under local anesthesia. The mean postoperative hospital stay was 7.31 days. There were 2 immediate post-operative deaths.
Complete healing of the window occurred in 49.1% with a mean closure time of 58 months if the cavity became sterile, and 113 months if infections persisted. This was the only statistically significant factor among the many variables analyzed, which delayed the closure of a window.
Refashioning of the stoma was necessary in 5.2 % at a mean interval of 24.8 months. Return to preoperative lifestyle was observed in 88.6% of the patients. Most were comfortable living with the minor discomfort of a dry stoma with only 5 patients requesting secondary closures of the defect.
Conclusion: MEA is a valuable tool to rescue the septic and moribund patients with a CET, frequently encountered in developing nations. The window may close primarily or be secondarily closed, with acceptable cosmesis. The cardinal factor to achieve rapid closure is the eradication of infection. Patient compliance is good with a rapid turn to a productive life.

44

Impact of Preoperative BMI on the Postoperative Outcomes in Patients with Completely Resected Non-Small Cell Lung Cancer

Yan Le Ho, Sing Yang Soon, Yuan Hsun Jong
Sarawak Heart Centre, Malaysia

Background: Body mass index (BMI) is increasingly recognized as a potential predictor of surgical outcomes in patients with non-small cell lung cancer (NSCLC). However, its prognostic significance remains under debate. This study aimed to evaluate the impact of preoperative BMI on postoperative complication rates in patients undergoing complete resection for NSCLC.
Methods: Retrospectively analysis was conducted on 244 patients who underwent curative resection for NSCLC in Sarawak Heart Centre from 2014 to 2024. Patients are grouped into 3 different BMI categories: underweight (<18.5 kg/m2), normal (18.5 to 24.9 kg/m2), overweight/obese (>25 kg/m2), The demographic data and postoperative outcomes were reviewed and analysed. Endpoints included operative mortality, perioperative complications, and length of stay (LOS).
Results: Of the 244 patients, 42 (17.2%) were underweight, 143 (58.6%) had normal BMI, and 59 (24.2%) were overweight/obese. The median of age was 64 years old, and the histologic types included adenocarcinoma (n = 198), squamous cell carcinoma (n = 32), small-cell carcinoma (n = 6) and others. Adjusting for age, performance status, coronary artery disease, smoking status and lung function test, being overweight/obese did not increase the risk of postoperative complications in any category. In contrary, being underweight was associated with an increased risk of postoperative complications. In comparison to the normal BMI group, the overall complication rate and LOS was significantly higher in the underweight group (p<0.001, p=0.002 respectively), whereas that of overweight/obese groups was marginally better (p=0 067, p=0.053 respectively). Pulmonary complications were the most common, occurring in 20.4% of underweight patients, versus 12.5% and 7.7% in the normal and overweight/obese groups,

respectively. Cardiac complication and other complications followed a similar distribution. There was no difference in the mortality rate across 3 groups.
Conclusions: Preoperative underweight status is associated with a substantially higher risk of postoperative complications and prolonged LOS in patients with completely resected NSCLC. Thus, overweight and obesity should not be a relative contraindication for lung resection. These findings underscore the potential importance of preoperative nutritional assessment and optimization, particularly in underweight individuals, to improve surgical outcomes.

45

Can Functional Determinants Be Taken as Surrogates For Post Resection Quality Of Life In Post Tuberculosis Sequelae?

Kanishk Siddhartha, Ravindra Dewan, RamaSwamy R
National Institute of TB and Respiratory Diseases, India

Objective: To evaluate Quality of Life changes & its correlation with functional determinants after lung resection in Post Tuberculosis sequelae patients.
Methods: Prospective, observational study for eligible lung resection for PTB sequelae patients using Short Form-36 Health survey tool to assess Quality of Life. Significance of changes, preoperatively and postoperatively (1 and 6 months) for Short Form-36 scales, Forced Expiratory Volume in first second & Six Minute Walk Test were compared by paired t tests. Spearman's correlation coefficient used to see correlation between them.
Results: For 52 consecutive patients who underwent lung resection, Physical Component Summary score significantly reduced at 1 month but recovered by 6 months. Mental Component Summary score improved significantly at both time points. Postoperative Forced Expiratory Volume in first second recovery at 6 months didn't significantly correlate with improved Physical/Mental Component Summary. Six minute walk tests showed weak correlation with Physical Component Summary and Mental Component Summary.
Conclusion: Post-Tuberculosis Sequelae patients have severely impacted Quality of Life owing to frequent symptom exacerbations. Lung resections provide lasting relief and improved Quality of Life. Discrepancies between patients' perception and Objective functional measures make pulmonary functions and exercise tests unsuitable for assessing Quality of Life.

46

Revisiting Standards: Proposing a Paradigm Shift in Preoperative Fitness Criteria for Inflammatory Lung Diseases

Dr. Kanishk Siddhartha, Dr Ravindra Dewan, Dr RamaSwamy R
National Institute of TB and Respiratory Diseases, India

Background: Pneumonectomy is associated with high postoperative morbidity (30-40%) and mortality (5-10%). No standardised guideline for inflammatory lung disease is available in the literature. The only best available evidence in inflammatory lung disease: FEV1 < 2.0 Litre is a contraindication for pneumonectomy, given by WHO consensus 2014 for TB. According to ERS/ESTS clinical guidelines on fitness for radical therapy in

lung cancer 2009, PPO FEV1 <30% is associated with increased risk of peri-operative morbidity and mortality.
Objective: To re-evaluate preoperative fitness criteria for inflammatory lung diseases by analyzing PPO FEV1 in patients undergoing pneumonectomy and assessing postoperative outcomes, aiming to contribute to a paradigm shift in defining precise guidelines through future randomised studies.
Methods: A retrospective analysis utilizing a prospectively maintained database, focusing on patients undergoing pneumonectomy for inflammatory lung diseases (PTB sequelae) between March 2018 and September 2023 at our tertiary care institute. The surgical procedures involved open posterior-lateral thoracotomy, with stapling of the main bronchus and closure using a single intercostal drain. The investigation encompassed the examination of baseline characteristics, preoperative FEV1, PPO FEV1, and postoperative outcomes. Furthermore, we explored outcome variations among patients with PPO FEV1 < 30%, PPO FEV130-40%, and PPO FEV1 > 40%.
RESULTS: 112 patients underwent pneumonectomy with mean preoperative percent predicted FEV1 64.87% and mean PPO FEV1 33.36%. On retrospective analysis, 42 patients had PPO FEV1 <30%, 52 patients had PPO FEV130-40%, and 18 patients had PPO FEV1 >40%.
Conclusions: Our study revealed that patients with PPO FEV1<30% did not uniformly experience adverse outcomes. Given the retrospective design and limited sample size, definitive conclusions on recommending surgery i.e, pneumonectomy, for patients in this category cannot be made. Nevertheless, advocating for a randomised study is essential to establish precise preoperative fitness criteria for individuals with inflammatory lung disease.

47

Spontaneous Ventilation in Lung Surgery – A survey of contemporaneous practice in United Kingdom & Ireland

Ahmad H, Asharaf A, Rathinam S
Glenfield Hospital, Leicester UK

Introduction: Non Invasive Thoracic surgery (NIVATS) or Spontaneously breathing thoracic surgery (SBT) offers various benefits in modern practice, with patients undergoing lung operation often breathed for themselves throughout the procedure. Local or regional anaesthesia was common, sometimes with only light sedation. Although this offers various benefits of reduced operating time, early recovery and enhanced recovery, it has not had a widespread embracement. We surveyed the surgeons across UK and Republic of Ireland to understand what their opinion was with regards to spontaneous ventilation for thoracic surgical procedures to gain insights into the national practice.
Methods: A structured survey of 10 questions were created using Microsoft survey application, with regards to their practice, reflecting spontaneous ventilation. These were emailed to all the 38 adult thoracic centers in UK and Ireland and we received response from 31 Units.
Results: We received a response from 31 centers (88%) representing all four nations of the United Kingdom and the Republic of Ireland. It revealed, out of 31 centers which responded, 15 centers currently perform surgery under spontaneous ventilation. Of these,

only 4 continued to perform NIVATS during the COVID-19 pandemic. The procedures performed include bullectomy/pleurectomy, pleural biopsy, drainage of effusion, non-anatomical lung resection, and some anatomical lung resections. While approximately half of the responding centers have experience with this technique, a significant proportion do not. Of the units not performing NIVATS, the main reasons cited for not performing the procedure were a lack of surgical and anaesthetic training, lack of evidence and personal experience.
Conclusion: This survey demonstrates a growing but cautious interest in the practice of NIVATS amongst thoracic surgeons in the UK and Ireland. The primary barriers to wider adoption are a reported lack of surgical and anaesthetic training, as well as a perceived lack of robust evidence. Despite these challenges, the continued use of spontaneous ventilation, particularly in highly selected patient groups and by a few centres during the COVID-19 pandemic, highlights its potential utility. Further evidence and the development of standardized training programs are essential to determine the broader applicability and safety of this technique and toaddress the reluctance within the surgical community.

48

Correlation of Carcinoembryonic Antigen with Lung Cancer Stage of Disease, Pleural Involvement, and EGFR Mutations: A Study from Kuala Lumpur Hospital

Yen Zhir Tay, Muhammad A. Ashraf, Zen Ran Lai, Dinesh Francis, Benedict Dhamaraj, Narasimman Sathiamurthy.
Kuala Lumpur Hospital, Malaysia.

Background: Carcinoembryonic antigen (CEA) is a tumor marker with potential diagnostic and prognostic utility in lung cancer. However, its specific role in disease staging, prognostication of pleural involvement and association with molecular characteristics, such as Epidermal Growth Factor Receptor (EGFR) mutations, particularly within regional populations, requires further investigation.
Objective: The primary Objective was to evaluate the preoperative serum CEA levels correlation with the stage of lung cancer, visceral pleural invasion and determining the association between serum CEA levels and EGFR mutation status in patients with lung adenocarcinoma. Demographic data and histopathological results of the patients were also subjected to descriptive analysis.
Methods: A single-center retrospective study was conducted on 33 patients diagnosed with lung cancer who underwent surgical resection at Hospital Kuala Lumpur from 1st January 2020 until 31st July 2025. Patients' demographics, preoperative CEA level, stages of disease, histopathological details such as tumour distance to visceral pleural, macroscopic pleural appearance and EGFR mutation status were obtained.
Results: The median age of this cohort is 65 years old, with a male predominance (72.7%, n=24). Ethnicity distribution showed chinese (45.5%, n=15) was the largest group. Analysis of preoperative CEA levels revealed that most patients had levels between 2.51–5.00 ng/mL (36.4%, n=12) or 5.10–20.00 ng/mL (36.4%, n=12), with only 3.0% (n=1) showing levels above 20.00 ng/mL. The majority of patients presented with advanced disease, primarily stage IIIA (36.4%, n=12), underwent surgical resection. EGFR mutation was detected in 39.4% (n=13) of patients. While trends suggested higher CEA

levels in more advanced disease stages and a tendency for non-EGFR mutated patients to have higher CEA values, statistical analysis using the Chi-square test indicated no significant association between CEA categories and either disease stage (p=0.422) or EGFR mutation status (p=0.427). However, Patients with abnormal pleural appearance (thickened/nodular/puckering) were more frequent in the CEA 5.1–20.0 group (83.3%). Hence, higher CEA levels were associated with abnormal pleural appearance (p=0.011). Conclusion: There were no statistically significant association between preoperative CEA levels and lung cancer disease stage or EGFR mutation status in this cohort. However, higher preoperative CEA level might predict visceral pleural involvement. The lack of significance may be attributed to the relatively small sample size, which limited statistical power. Larger prospective studies are warranted to better delineate the role of CEA as an adjunctive biomarker.

49

Machine Learning Models for Predicting Postoperative Pulmonary Complications After Lung Cancer Surgery: a Systematic Review

Moses Orvin Reviano, Hanna Shelinda Silva, Oky Revianto Sediono Pribadi
Universitas Airlangga - Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

Introduction: Lung cancer (LC) is the leading cause of cancer-related deaths, with surgery as the primary curative treatment for early-stage cases. Postoperative pulmonary complications (PPCs) significantly worsen outcomes. Traditional risk scores have limited accuracy, while machine learning (ML) offers greater predictive potential by modeling complex variables, though it faces challenges such as overfitting and limited interpretability. This review aims to evaluate ML models for predicting PPCs after LC surgery, focusing on predictive performance, methodological rigor, and clinical applicability.
Methods: We systematically searched PubMed, ScienceDirect, Scopus, Google Scholar, and Wiley Online Library (2020–2025) for observational studies developing ML models to predict PPCs after LC surgery. Non-lung cancer surgeries, pediatric or animal studies, non-pulmonary outcomes, non-ML models, inaccessible full texts, and non-English publications were excluded. Data extraction followed CHARMS, and risk of bias and applicability were assessed using PROBAST. The primary outcome was discrimination (AUROC). Reporting adhered to PRISMA 2020.
Results: Of 2,604 records, six studies (n = 5,933) were included. Most patients were elderly and male, with lobectomy being the most common procedure. XGBoost was the most frequent model, but low event-per-variable ratios (5.5–9) suggested a high risk of overfitting. The highest AUROC was 0.860 (95% CI: 0.840–0.880). Calibration, overall performance, and clinical utility were rarely evaluated, and external validation was limited. Most studies had high or unclear risk of bias, though applicability concerns were low.
Conclusions: ML models show promise for predicting PPCs after LC surgery but are not yet ready for clinical use. Future studies should emphasize multicenter datasets, rigorous external validation, and adherence to TRIPOD-AI to enable safe clinical adoption.
Keywords: *Machine learning; Risk prediction; Postoperative pulmonary complications; Lung cancer; Systematic review*

50

Is Open Thoracotomy Still Relevant in the Era of VATS for Empyema Thoracis? A Systematic Review in Developing Countries

Jemia Sura Laksana Tarigan, Christalia Regina Br Ginting
Tanjung Pura General Hospital, Indonesia

Introduction: Empyema thoracis remains a significant health problem in developing countries, where access to advanced surgical modalities is often limited. Video-Assisted Thoracoscopic Surgery (VATS) has emerged as the global gold standard for empyema management, offering reduced morbidity, shorter hospital stay, and faster recovery compared to traditional thoracotomy. However, in many resource-limited settings, VATS is not yet widely available, and open thoracotomy continues to play an important role.
Objectives: This systematic review aims to compare the outcomes of VATS and open thoracotomy in the management of empyema thoracis, with a particular focus on the relevance of open thoracotomy in resource-limited and developing country settings.
Materials and Methods: A systematic search of major biomedical databases (including PubMed/MEDLINE, Embase, and Cochrane Library) was conducted to identify randomized controlled trials (RCTs), observational studies, and meta-analyses evaluating VATS versus thoracotomy for empyema thoracis. Primary outcomes assessed were mortality, morbidity, length of hospital stay, postoperative complications, and recurrence rates.
Results: Evidence shows that VATS is superior to thoracotomy in perioperative outcomes, while hard endpoints remain comparable. A meta-analysis of 15 studies (n=1,795) found that VATS reduced chest tube duration (MD −2.68 days; 95% CI, −4.22 to −1.13), lowered prolonged air leak (OR 0.44; 95% CI, 0.26–0.74), and decreased overall complications (OR 0.62; 95% CI, 0.44– 0.87). Mortality (OR 0.81; 95% CI, 0.23–2.77), reoperation (OR 0.37; 95% CI, 0.11–1.22), and recurrence (OR 1.02; 95% CI, 0.33–3.16) showed no significant differences, indicating similar effectiveness in disease resolution.
Discussion: VATS provides clear perioperative benefits such as shorter chest tube duration, fewer complications, and faster recovery, while thoracotomy shows comparable results in mortality, recurrence, and reoperation. In developing countries with limited access to thoracoscopic resources, thoracotomy remains a reliable option, especially for advanced-stage empyema requiring decortication or when VATS conversion is needed. Thus, surgical decision-making should balance the advantages of VATS with the practical realities of resource-limited healthcare systems.
Conclusion: VATS is the global gold standard for empyema thoracis, offering shorter chest tube duration, fewer complications, and faster recovery. However, open thoracotomy remains relevant in developing countries, especially for advanced-stage disease and in settings with limited thoracoscopic expertise or equipment. Surgical decisions should balance the proven benefits of VATS with the realities of resource-limited healthcare, where thoracotomy continues to be a vital, life-saving option.
Keywords : Empyema thoracis, Video-Assisted Thoracoscopic Surgery (VATS), open thoracotomy, resource-limited settings, developing countries.

52

Survival, Recurrence, and Morbidity after Segmentectomy versus Lobectomy in Resectable NSCLC: A Comprehensive Meta-Analysis

Syahrun Mubarak Aksar, Denna Rizkyena Amelia, Ahmad Mifthahul Alim, Umar Usman, Jayarasti Kusumanegara
Hasanuddin University, Indonesia

Introduction: Lobectomy has long been considered the standard of care for early-stage non-small cell lung cancer (NSCLC), but recent randomized trials and large cohorts have suggested that segmentectomy may provide comparable outcomes with better functional preservation.
Objective: To evaluate the relative efficacy and safety of segmentectomy versus Lobectomy in patients with resectable NSCLC.
Methods: A systematic search of PubMed, Cochrane Library, and ScienceDirect was performed according to PRISMA guidelines. Eligible studies directly compared segmentectomy or wedge resection with lobectomy and reported outcomes of overall survival, recurrence, or perioperative morbidity. Pooled risk ratios and hazard ratios were calculated using a randomeffects model.
Results: Five studies were included (n > 2200). Overall survival did not differ significantly between segmentectomy and lobectomy (pooled RR 0.66, 95% CI 0.17–2.55), although heterogeneity was high (I2 = 98%). Recurrence rates were inconsistent: the JCOG0802 trial reported higher local recurrence after segmentectomy, while other trials showed equivalence; pooled analysis showed no statistically significant difference (RR 3.21, 95% CI 0.22–47.11). Perioperative morbidity was similar across groups (RR 1.41, 95% CI 0.83–2.40, I2 = 55%), though segmentectomy was associated with more prolonged air leaks.
Discussion: Despite increased recurrence in selected trials, survival was not compromised, likely due to preserved lung function and tolerance of salvage therapy. These findings indicate that segmentectomy is oncologically adequate in small, peripheral NSCLC.
Conclusion: Segmentectomy is a safe, effective, and function-preserving alternative to lobectomy in selected patients with early-stage NSCLC.

53

Novel Application Of VHL Gene For Platinum-Based Chemothe Rapy And Immunotherapy In None-Small Lung Cancer

Xuan Hong, Yejun Cao, Qiying Zhang, Zhenyu Xie , Guohan Chen, Wentao Fang
Shanghai East Hospital, China

Background: Accumulating evidence have revealed the close relationship between VHL genes and the initiation and progression of tumors. However, rare research and few VHL prognostic models have been reported in none-small lung cancer (NSCLC).
Methods: In current study, the expression and prognostic value of VHL and its related genes in NSCLC patients were systematically analyzed to establish a mitochondrial-related risk model based on available TCGA and GEO databases. The tumor microenvironment (TME), immune cell infiltration, and drug sensitivity of NSCLC

patients were also investigated using statistical software. Then we recruited 110 NSCLC patients accepted immunohistochemical (IHC) analysis and another 861 patients selected SNPs, rs779805 and rs1642742, to examine the relationship among long-term prognosis of VHL, NSCLC and hematotoxicity after platinum chemotherapy.
Results: VHL was identified as an oncogenic gene in NSCLC and could be a robust prognostic biomarker. Two VHL-related risk prognostic models were established and successfully verified the reliability of VHL. In addition, VHL showed predictive value in immunotherapy, specifically with better efficacy observed in the high-expression group. Then, the reliability of VHL was further examined in a real-world cohort, yielding consistent results with the findings from the datasets. Notably, low expression of VHL was also found to increase the risk of neutropenia after platinum-based chemotherapy. These findings were further supported by research on two VHL-related single nucleotide polymorphisms (SNPs).
Conclusions: This study suggested that the VHL could be a reliable prognostic biomarker for chemotherapy and a precise biomarker for granulocyte toxicity.

55

Breath by Breath: How Spirometry Variability Signals Future Exacerbations in Stable COPD — A Systematic Review and Meta-Analysis

Fadli Aditya Rizky, Rio Bayu Nugroho, Vania Felicia, Prayudi Santoso, Arto Yuwono Soeroto
Hasan Sadikin General Hospital, Indonesia/ Padjadjaran University, Indonesia

Introduction/Objectives: Exacerbation remains a major challenge in chronic obstructive pulmonary disease (COPD), driving morbidity, mortality, and healthcare burden. Identifying reliable predictors of exacerbation risk in stable patients is critical for guiding preventive strategies. Although spirometry is widely used for diagnosis and monitoring in COPD, the prognostic role of spirometry variability has not yet been systematically evaluated.
Materials and Methods: We conducted a systematic review and meta-analysis of observational cohort studies that evaluated the association between spirometry variability and future exacerbations in stable COPD. A total of ten studies involving 3,380 patients were included. Extracted data included effect sizes (hazard ratio [HR] or odds ratio [OR]) with 95% confidence intervals (CI), adjustment variables, COPD severity (GOLD stage), smoking history, and medication use. Random-effects models were used to calculate pooled effect sizes. Subgroup analyses were performed according to the GOLD stage (II–III vs. III–IV/II–IV). Heterogeneity was assessed using I2 and Cochran's Q, and between-group differences were also examined.
Result/Discussion: Overall, greater spirometry variability was significantly associated with increased risk of exacerbations (pooled HR/OR 1.77, 95% CI 1.56–2.00). In subgroup analyses, the association remained significant in both GOLD II–III (HR/OR 1.72, 95% CI 1.36–2.17) and GOLD III–IV/II–IV (HR/OR 1.79, 95% CI 1.57–2.06) categories with no significant between-group difference ($p = 0.62$). FEV1 variability—defined across studies as relative changes (>10–15%), absolute volume thresholds (>150–200 mL), or statistical measures such as standard deviation or coefficient of variation—was consistently predictive of exacerbation risk (HR 1.76, 95% CI 1.56-1.99).

Conclusion: In conclusion, spirometry variability, particularly in FEV1, represents a simple and accessible predictor of exacerbation risk in stable COPD, independent of disease severity. These findings suggest that routinely collected spirometric data could be used to support risk stratification and guide proactive disease management. Prospective studies with standardized variability definitions are needed to confirm clinical applicability.
Keywords: COPD, spirometry, exacerbation

56

Better Effect of Intrapleural Perfusion with Hyperthermic Chemotherapy for Malignant Pleural Effusion Treatment

Xuan Hong, Yejun Cao, Yang Chen, Zhenyu Xie, Jie Liu, Wentao Fang
Shanghai East Hospital affiliated to Tongji University, China

Objective: The aim of this study was to assess the efficacy and safety of intrapleural perfusion with hyperthermic chemotherapy (IPHC) in treating malignant pleural effusion (MPE) compared to normothermic chemoperfusion of the pleural cavity(NCPC), and to investigate the better treatment to control MPE.
Methods: MPE patients were enrolled in the study and treated with NCPC or IPHC under video-assisted thoracoscopic surgery (VATS).The chest drainage duration, clinical characteristics, and recurrence time of pleural effusion of patients were collected for statistical analysis. Chi-square test and Fisher's exact test were applied to compare the distribution differences of categorical variables. PFS was estimated by Kaplan- Meier method, and was compared by log-rank test.The survival analysis was performed using the Cox proportional hazards method.
Results: A total of 37 MPE patients were enrolled in this study. 27 patients received NCPC, and 10 patients received IPHC under VATS. Significant differences were found in pathological types (P=0.011), chest drainage duration (P=0.005) and remission rate (P=0.009) between two different treatment groups.The chest drainage duration of IPHC under VATS was shorter than the NCPC group (t=2.969,P=0.005). The remission rate of MPE in IPHC group was better than the NCPC one. (OR=0.031,95%CI:0.002-0.507,P=0.015).The result of Kaplan-Meier method showed that IPHC group could significantly prolong the PFS of patients with MPE compared to NCPC group (Log-rank P=0.002). Univariate cox regression analysis showed that patients with MPE in the IPHC group presented significant longer PFS than the NCPC group ones(HR=0.264, 95%CI:0.098-0.713, P=0.009). Multivariate cox regression analysis further verified this conclusion (HR=0.268,95%CI:0.096-0.753, P=0.012).
Conclusion: Compared to the NCPC, the IPHC under VATS presents a better control effect on MPE, shorter tube placement time and longer complete remission time. We recommend IPHC under VATS as the first-line treatment for patients with MPE those who can tolerate minimally invasive surgery.Furthermore, we are shifting the application perspective of IPHC to the field of locally advanced thymoma. Currently, a randomized controlled trial (RCT) is being conducted to compare the efficacy and safety of "cytoreductive surgery combined with IPHC ± postoperative chemotherapy" versus "neoadjuvant chemotherapy or chemoradiotherapy + surgical resection + postoperative radiotherapy ± chemotherapy" in patients with locally advanced thymoma accompanied

by pleural metastasis or recurrent disease. Our study aims to provide high-level evidence for optimizing treatment strategies in this patient population.

57

Outcome of Surgical Management of Hydatid Lung Disease

Muhammad Imran, Abdul baseer, M Abid khan
Medical Teaching Institution Lady Reading Hospital, Pakistan

Objective: To evaluate the surgical treatment options for hydatid cyst and their outcomes.
Study Design: Cross-sectional.
Place and Duration of Study: Department of Surgery, Lady Reading Hospital, Peshawar, from Jan 2022 to July 2024.
Background: Hydatid lung disease is a significant health concern in endemic reigns, causing respiratory complications & potentially life-threatening conditions. Surgical intervention is a crucial treatment modality, offering symptom relief & prevention of long-term sequelae.
Methodology: Computerized clinical record of patients diagnosed and treated for hydatid cyst with pulmonary echinococcosis and operated were included. In hospital as well as hospital records of 180 patients including intact and complicated cysts ranging from 1-20cm in size that were extirpated and included. Patients diagnosed and treated for hydatid cyst having incomplete medical record and /or lost to follow up were excluded. SPSS version 25.0 was used for data analysis. Quantitative variables were reported using mean and standard deviation while qualitative variables through frequency and percentages. Independent students' t-test and Fisher's exact test was used for comparing between the surgical technique groups keeping p-value <0.05 as statistically significant.
Results: Mean age of patients was 38.59±12.51 years. Mean duration of hospital stay was 11.3±6.1 days. Mean pain on VAS postoperatively was 4.92±2.66. About 102(56.67%) of included patients were male while 78(43.33%) females. Cough was reported in 84(46.67%) of patients, chest pain in 103(57.22%), fever in 24(13.33%), purulent sputum in 31(17.22%), allergic reaction in 17(9.44%), hemoptysis in 4(2.22%) while 29(16.11%) were symptomatic. About 58% of cases underwent cystotomy and capitonnage, 17% enucleation and capitonnage while 12% pericystectomy, 4% cystotomy and wedge resection and segmentectomy respectively, 3% lobectomy and pneumonectomy in 2% of cases.
Conclusion: Every surgical approach reported varied outcomes, however the best efficacy with least morbidity and mortality was observed in patients undergoing cystotomy and capitonnage.
Key words: Capitonnage, Cystotomy, Enucleation, Hydatid cyst, Lobectomy, Pericystectomy, Pneumonectomy, Segmentectomy

58

Bronchoscopy-Guided Evaluation of Bougie Associated Pneumothorax

Yap Bin Hui, Pipetius Quah
Woodlands Health, NHG Health, Singapore

Bougies are used frequently in as an airway adjunct in difficult intubations and improves the first-pass success rate of endotracheal intubations. Despite the benefits of using a bougie, the risks associated include airway bleeding or perforation, pneumothorax (PTX) and distal airway injury. We report a case of pneumothorax post bougie-guided intubation, with bronchoscopic evidence of a mucosal defect. A 60-year-old man with type 1 diabetes mellitus was admitted to intensive care unit with severe diabetic ketoacidosis and intubated for worsening respiratory distress and drowsiness. A bougie was used to insert a size 8.0 cuffed Portex endotracheal tube (ETT) for a Grade 2a larynx, after video-laryngoscopy with Glidescope LoPro S3 blade. The bougie inadvertently advanced deeper into the airway during the railroading of ETT over the bougie. Placement was confirmed with end-tidal CO2 monitoring, bilateral equal air entry on auscultation, and oxygen saturations of 99- 100% on FiO2 0.5. But, post intubation chest X-ray (CXR) revealed an incidental right PTX, managed with a 24Fr chest tube (Fig. 1). On Day-2, persistent air leak prompted bronchoscopy, which revealed a small defect in the right middle lobar bronchus (Fig. 2) without active air leak. without active air leak. On day-3, patient was extubated, no further bubbling seen on chest drain, CXR showed resolution of the PTX. Chest drain was removed on day-5. Iatrogenic PTX is a serious complication seen in 3% of ICU population, with the most common cause being mechanical ventilation, followed by invasive procedures e.g. central venous catheter insertion. Bougie related PTX is a rare but serious complication, with few case reports describing the challenges due to difficult sizing of bougie for mid-sized ETTs, accidental distal migration of bougie during rail-roading. Peri-intubation PTX is often a diagnosis of exclusion after ruling out lung disease, barotrauma, or other invasive procedures, with limited means to confirm the cause. Bronchoscopy aids evaluation of suspected bougie-related airway trauma by directly visualization of mucosal tears, distal defects, bleeding, or air leakage, thereby guiding immediate management. While bronchoscopy is invaluable in managing bougie-related PTX, prevention is key. The risk can be reduced by sizing the bougie appropriately to the ETT, ensuring the bougie and ETT are well-lubricated. Bougie should be advanced under direct vision, using depth markings to guide insertion. The airway assistant should firmly stabilise it during ETT railroading to prevent distal migration. Bougies, while is a valuable airway adjunct, carry a risk of airway trauma. Clinicians should exercise vigilance when using bougies, ensuring proper technique and awareness of potential injury. When bougie-related PTX is suspected, bronchoscopy offers a straightforward and effective means of confirming the diagnosis, identifying the site of injury, and guiding subsequent management.

59

Does Surgery or Bronchoscopic Valves/Coil Win In Emphysema? A Comparative Meta-Analysis of Lung Volume Reduction Procedures

Florentina Dewi Pramesuari, Wahyu Wiryawan, M. Ali Shodiq
Soegijapranata Catholic University, Indonesia

Introduction: Emphysema imposes a physiologic straitjacket of gas-trapping and hyperinflation. Lung volume reduction surgery (LVRS) and bronchoscopic lung volume reduction (BLVR), using endobronchial valves or coils, are established options for advanced emphysema with a central therapeutic target of reducing residual volume.

Despite widespread use, direct comparative evidence to guide selection in patients eligible for both procedures remains limited.
Aim: comparing effectiveness and safety of BLVR versus LVRS in emphysema using a meta-analysis of head-to-head studies.
Methods: We searched on PubMed, ScienceDirect, Wiley, and Cochrane for eligible studies evaluated LVRS compared with BLVR in emphysema patients up to September 2025. Outcomes prespecified were 30-day mortality, length of hospital stay (LoS), residual volume (RV) change, FEV1 change (liters), and 6-minute walk distance (6MWD). Pooled effects used random-effects or fixed-effect models based on heterogeneity, reporting odds ratios/risk ratios (OR/RR) or mean differences (MD) with 95% CIs.
Results: Seven comparative studies (one randomized, six observational) contributed data across outcomes, with up to 4153 patients (2871 LVRS, 1282 BLVR). Outcomes 30-day mortality showed a directionally consistent, statistically significant advantage for LVRS (OR 0.73, 95% CI 0.54–0.98, P=0.04). Post-intervention pneumothorax favored surgery, with a 46% relative risk reduction (RR 0.54, 95% CI 0.42–0.70, P<0.00001). Functional outcomes consistently tipped toward BLVR. FEV1 change (liters) favored BLVR by about 60 mL on average (MD −0.06 liters for LVRS–BLVR, 95% CI −0.06 to −0.06, P<0.00001). Moreover, 6-minutes walking distance demonstrated a clinically meaningful gain with BLVR (MD −67.74 meters for LVRS–BLVR, 95% CI −95.91 to −39.57, P<0.00001). Endpoints with high heterogeneity were not synthesized: hospital readmission, LoS, and RV change (I2=76%, I2=100%, I2=100%, respectively). Due to this considerable variability, these exclusions were prespecified to minimize distortion associated with between-study differences.
Conclusion: In head-to-head comparisons, LVRS demonstrates a more favorable early safety profile (lower 30-day mortality and pneumothorax), whereas BLVR yields superior functional gains (higher FEV1 and greater 6MWD). These complementary strengths suggest procedure selection should be individualized based on risk tolerance and functional goals as well as revisit multidisciplinary decision-making. Given the predominance of observational evidence and residual clinical heterogeneity, further adequately powered randomized trials are warranted to refine patient selection and confirm durability of benefit.
Keywords: Emphysema; COPD; Bronchoscopic lung volume reduction; endobronchial valve; endobronchial coil; Lung volume reduction surgery

60

Extralobar Pulmonary Sequestration in A 35-Year-Old Woman Managed with Feeding Artery Embolization Followed by Surgical Resection: A Case Report

Muhammad Azmi Agung, Dhihintia Jiwangga
Soetomo General Hospital / Universitas Airlangga, Indonesia

Introduction: Extralobar pulmonary sequestration is a rare congenital malformation consisting of nonfunctional lung tissue that has no communication with the tracheobronchial tree and receives anomalous systemic arterial supply. It is typically detected in childhood and is even more uncommon when diagnosed in adulthood. Proper imaging and individualized management strategies are essential for optimal outcomes.

Materials and Methods: We report the case of a 35-year-old woman who was incidentally suspected to have a lung mass based on chest radiography performed during hospitalization at another facility.
Result and Discussion: The patient was asymptomatic, with no history of hemoptysis or dyspnea. Thoracic computed tomography revealed an extralobar pulmonary sequestration supplied by an aberrant systemic artery. To reduce intraoperative bleeding, preoperative embolization of the feeding artery was performed. Definitive surgical resection of the lesion was subsequently carried out via thoracotomy. The operation was successful, and histopathological examination confirmed the diagnosis of extralobar pulmonary sequestration. The patient's postoperative course was uneventful and discharged in stable condition.
Conclusion: This case illustrates a rare presentation of extralobar pulmonary sequestration in an adult patient. Preoperative embolization followed by surgical resection proved to be a safe and effective approach, minimizing operative risk and ensuring complete excision. The combination of interventional and surgical techniques highlights the importance of multidisciplinary management in rare thoracic congenital anomalies.
Keywords: pulmonary sequestration, extrapulmonary sequestration, embolization, thoracotomy, congenital lung anomaly, rare case

61

Various Aprroaches for Thoracic Gunshot Injury: A Three-Case Series
Ester Hans Sunanto, I Wayan Sudarma, I Gede Hendra Wijaya
Prof. dr. I.G.N.G. Ngoerah General Hospital, Indonesia

Introduction: Gunshot wounds to the thorax cause complex, unpredictable damage to vital organs, often leading to severe hemorrhage and life-threatening complications. Prompt diagnosis using imaging modalities such as radiographs and computed tomography is essential for effective management.
Case Report: This report presents three cases with thoracic gunshot injuries managed by minimally invasive video-assisted thoracoscopic surgery (VATS) and sternotomy. Two hemodynamically stable patients underwent VATS for bullet removal and hematoma evacuation, recovering without complications. One patient with pericardial involvement required sternotomy for direct repair.
Discussion: Management decisions hinged on patient stability and injury severity. VATS offers reduced morbidity, less pain, and shorter hospital stays in stable trauma, while thoracotomy/sternotomy remains vital for unstable or complex cases requiring rapid haemorrhage control or involvement of difficult positions. Conclusion: This case series highlights the importance of early assessment and individualized surgical planning in gunshot wound to the chest. Integration of minimally invasive and open approaches optimizes outcomes in thoracic gunshot wound management.
Keyword: Thoracic gunshot wound, video-assisted thoracoscopic surgery, thoracotomy, sternotomy, penetrating chest trauma, surgical management.

62

Advancing Postoperative Care: Digital Vs Analog Chest Drainage System After Minimally Invasive Lung Resection A Systematic Review And Meta-Analysis

Joshua G.D. Tandirogang, Elsa Syafira Hidayah, Ivan Joalsen
RSUD Abdul Wahab Syahrani, Indonesia

Background: The usefulness of digital chest drain is still debated, many study result were inconsistent for postoperative care specially in minimally invasive surgery approach. This review mean to identify and compare effectiveness of digital chest drainage system for post operative outcome in terms of length of stay, chest tube duration and prolonged air leak event.
Methods: We searched the Web of Science, Cochrane, and Pubmed for observational studies and RCTs that compared the effect of digital chest drainage system with analog chest drainage system after minimally invasive lung resection. 6 studies (2 randomized control trials and 4 observational studies) comprising 1501 patients met the eligibility criteria
Results: The study encompassed six studies involving a total of 1501 individuals. Compared with the traditional chest drainage system, digital chest drainage system shortened the duration of chest drainage (MD: -0.79, 95% CI: -0.96 to -0.61, Z: 8.74 P<0.00001) and length of hospital stay (MD: -0.64, 95% CI: -0.84 to -0.45, Z: 6.44 P<0.00001) while there is no significant difference in prolonged air leak event with risk of ratio was 1.33 (95%CI 0,79 – 2,25 ; p value=0,29 ; I2= 0%)
Conclusion: Digital chest drainage system is expected to benefit patients to attain faster recovery and Shorten length of hostpital stay after minimally invasive lung resection. Further RCTs with larger sample size are still needed to more clearly elucidate the other advantages of digital chest drainage system.

63

Bridging the Gap: A Systematic Review of Cadaveric Tracheal Allotransplantation for Extensive Airway Defects.

Ulil K. Takko, Fadelia Meutia Ananda
Hasanuddin University, Indonesia

Background: Long-segment tracheal defects remain a major challenge in airway surgery, as primary resection and anastomosis are often unfeasible. Alternative strategies, including prostheses, autologous grafts, and tissue- engineered constructs, have shown limited long-term efficacy due to complications such as necrosis, stenosis, and infection. Cadaveric tracheal allotransplantation, as a last-resort option, is technically demanding and immunologically complex but may offer a life-saving solution that warrants further clinical investigation.
Methods: We systematically searched PubMed, Embase, Scopus, and the Cochrane Library from June to August 2025. Eligible studies included adult patients (>18 years) undergoing cadaveric tracheal allotransplantation, reported as case reports, case series, or cohorts. Pediatric studies, autografts, xenografts, tissue- engineered tracheas, and reviews were excluded. Data on demographics, indications, surgical technique,

immunosuppression, follow-up, survival, graft viability, airway patency, and complications were extracted.
Results: Twenty studies involving 124 adult patients were included. The largest cohorts were reported by Herberhold (92 patients) and Genden (9 patients), while the remainder were single cases or small series. Indications included post-intubation stenosis, trauma, relapsing polychondritis, fibrosing mediastinitis, and malignancy. Reported follow-up ranged from weeks to more than 40 years. Perioperative mortality was low across studies. One-year survival was achieved in the majority of patients, with selected cases reporting survival at 3 and 5 years, and one landmark patient surviving beyond four decades. Graft survival and airway patency were documented in most reports, often requiring stenting or revision procedures.

64

ICG–guided VATS repair with mesh reinforcement and basal pleurectomy for pleuroperitoneal communication in peritoneal dialysis patients: A case series

Krisda Jitrakbumrung, Pataraporn Siritip
Surin Hospital, Thailand

Introduction/Objectives: Pleuroperitoneal communication (PPC) is a rare but serious complication of peritoneal dialysis (PD) that can result in hydrothorax and discontinuation of therapy. Conventional diagnostic and intraoperative methods often fail to identify micro-defects, leading to high recurrence. Indocyanine green (ICG) fluorescence allows real-time, highly sensitive leak localization. Reinforcement with mesh and basal pleurectomy enhance repair durability. We present a case series of two patients treated with ICG-guided video-assisted thoracoscopic surgery (VATS) using wedge resection, mesh reinforcement, and basal pleurectomy.
Materials and Methods: This case series was conducted at Surin Hospital by a single surgeon with informed consent. From February to September 2025, patients with PPC were confirmed by Technetium-99m phytate scintigraphy and temporarily switched to hemodialysis. VATS was performed under single-lung ventilation via a uniportal approach. Intraperitoneal instillation of 25 mg ICG in 2 L of 1.5% dextrose dialysate was administered through the PD catheter in Trendelenburg position. Fluorescence imaging localized the diaphragmatic leak, which was wedge-resected with an endostapler. The site was reinforced with VicrylTM knitted mesh secured with ProtackTM AutosutureTM, followed by basal pleurectomy. A single chest drain was placed and removed once drainage was <200 mL/day. Patients were reviewed two weeks postoperatively to assess readiness for PD resumption.
Results: The patients were 38 and 58 years old, with PD durations of two and one year, respectively. Operative times were 127 and 85 minutes, with estimated blood loss of 20 and 50 mL. Both chest drains were removed on postoperative day 4. PD was resumed at four and two weeks with low dwell volumes, gradually increased to full exchanges. At seven and three months of follow-up, no recurrence was observed.
Discussion: This series highlights the value of ICG fluorescence in enabling precise intraoperative localization of diaphragmatic defects, allowing targeted wedge resection. Mesh reinforcement provided structural support for fragile tissue, while basal pleurectomy promoted pleural adhesion, resulting in durable repair. Compared with

pleurodesis alone, which carries higher recurrence, this combined approach offers more definitive control and aligns with reports of high PD preservation rates following VATS repair.
Conclusion: ICG fluorescence–guided VATS with wedge resection, mesh reinforcement, and basal pleurectomy is a safe and durable surgical strategy for PPC, minimizing recurrence and supporting early continuation of PD.

65

Multidisciplinary Management of Thoracic Malignancies: A Systematic
Giovanni Lawira
Ade Muhammad Djoen Sintang, Indonesia

Introduction/Objectives: The management of thoracic malignancies has become increasingly complex, prompting a shift from monodisciplinary approaches to integrated Multidisciplinary Team (MDT) models. Although widely adopted as the gold standard, comprehensive evidence regarding its impact on clinical outcomes remains fragmented. This systematic review aims to quantitatively evaluate the impact of an integrated oncologic and surgical MDT approach on outcomes for patients with thoracic malignancies.
Materials and Methods: This systematic review followed the PRISMA 2020 guidelines. A literature search was conducted in PubMed, Embase, Cochrane Library, and Scopus for studies published between January 2000 and September 2025. Included studies were randomized clinical trials, cohort studies, and case-control studies comparing MDT versus non-MDT management in patients with lung cancer, esophageal cancer, and mesothelioma. The primary outcomes were Overall Survival (OS) and Progression-Free Survival (PFS). Secondary outcomes included quality of care, morbidity, and guideline adherence.
Results/Discussion: Of 2,850 identified articles, 18 studies met the inclusion criteria. Evidence synthesis demonstrated that MDT management is consistently associated with a significant improvement in OS for lung and esophageal cancer (Hazard Ratio [HR] ranging from 0.60 to 0.84). MDT was also shown to improve staging accuracy, adherence to clinical guidelines, utilization of curative-intent therapy, and to reduce the time from diagnosis to treatment. However, significant variability in the implementation and decision-making processes among MDTs was observed.
Conclusion: The available evidence conclusively demonstrates that the MDT approach is a fundamental clinical intervention that improves survival outcomes and quality of care in thoracic malignancies. The implementation of structured and standardized MDTs should be a priority in modern thoracic oncology practice to ensure all patients receive the benefits of optimal integrative care.

66

Minimally Invasive Surgery Versus Thoracotomy for Pulmonary Tuberculosis: A Systematic Review and Meta-Analysis of Perioperative Outcomes
Yehezkiel Alexander Eduard George, Putu Tasya Pradnya Pratistita, Fairuzia Fiyanti Putri, Joshua
Toto Kabila General Hospital, Indonesia

Introduction: Tuberculosis (TB) remains an emerging global health disease, particularly in South-East Asian regions. Surgical intervention plays a crucial role in managing complicated cases. Currently, there are two approaches for pulmonary resections in TB: open thoracotomy and minimally invasive surgery (video-assisted thoracoscopic surgery (VATS)). Open thoracotomy has been considered the gold standard for complicated pulmonary TB, meanwhile VATS uses smaller incisions and offers potential benefits, including reduced mortality, shorter operative time, and fewer complications. However, the extensive adhesions, fibrotic changes, and enlarged lymph nodes in complicated TB can make minimally invasive procedures challenging. Therefore, we conducted this systematic review and meta-analysis to compare the outcomes of minimally invasive surgery and open thoracotomy in the pulmonary TB.
Materials and Methods: We searched literature through PubMed, Cochrane Library, Scopus, ScienceDirect, and Web of Science from inception to June 2025. We used specific keywords, such as "open thoracotomy", "minimally invasive", "video-assisted thoracoscopy surgery", or "robotic-assisted thoracoscopy surgery", and "pulmonary tuberculosis". We assessed the risk of bias using Newcastle Ottawa Scale. Continuous variables, including operative time, blood loss, postoperative drainage volume, length of stay, were reported as mean differences (MD) with 95% confidence intervals (95% CI). Dichotomous variables, including mortality, complication, reoperation, and persistent postoperative TB infection, were presented as pooled odds ratio (pOR) with 95% CI. Meta-analyses were performed using RevMan 5.3.
Results: A total of 10 studies with a total of 1259 pulmonary TB requiring surgery. The results showed statistically significant lower risk of complication (pOR 0.35; 95%CI 0.26 to 0.49), reoperation (pOR 0.11; 95%CI 0.01 to 0.86), and persistent postoperative TB infection (pOR 0.34; 95%CI 0.16 to 0.70) in VATS group. It also showed low to moderate heterogeneity. We also found significant shorter operative time (MD-17.41; 95%CI -22.68 to -12.13), shorter length of stay (MD -6.19; 95%CI -6.73 to-5.65), lower blood loss (MD -39.70; 95%CI -59.30 to -20.09) and lower postoperative drainage volume (MD -243.60; 95%CI -288.14 to -199.06) in VATS group.
Conclusion: A minimally invasive surgery (VATS) in pulmonary TB showed better intraoperative and postoperative outcomes. Our findings strongly suggest the adoption of VATS as the preferred surgical technique for patients with pulmonary TB requiring surgery, especially in Indonesia. Besides, further comprehensive economic analysis comparing the total costs of VATS and open thoracotomy would be valuable for informing healthcare policy and resource allocation.
Keyword: pulmonary TB, open thoracotomy, video-assisted thoracoscopy surgery, VATS PROSPERO ID: CRD420251054401

67

Breaking The Age Barrier: Outcomes Of Lung resection Beyonds 70 Years.
Nur Shahkizza Binti Mohd Jefry, Soon Sing Yang
Sarawak Heart Centre, Malaysia

Objective: Lung cancer remains a leading cause of cancer-related mortality worldwide. With an ageing population, more elderly are being diagnosed with potentially curative

resectable lung cancer. Conventionally, advanced age has been considered a relative contraindication to surgery due to perceived higher operative risk due to their comorbidities and declining physiologies. This study aims to evaluate the safety and outcomes of lung cancer surgery in patients aged more than 70.
Methods: A retrospective observational study was conducted of all patients aged more than 70 years old who underwent oncological lung resection for primary lung cancer at Sarawak Heart Centre between April 2014 until May 2025. Demographic data, comorbidities, surgical approach, tumour staging, postoperative complications, and survival outcomes were analysed. Descriptive statistics were carried out to summarize patient demographic and clinical outcomes. Kaplan–Meier survival analysis was performed to estimate overall survival. All analyses were performed using SPSS.
Results: Total of 70 elderly patients underwent oncological lung resection for primary lung malignancy. The median age was 73.9 and predominant by female (51.4%). Comorbid observed among patients included cardiovascular disease (12.9%), chronic respiratory illness (15.7%), and presence of concurrent or previously treated cancers (17.1%). Video assisted thoracoscopy (VATS) was performed in most cases (64.3%), while (32.9%) underwent thoracotomy, and (2.9%) required conversion to thoracotomy. Most patients had early-stage disease, with 38.6% in stage I and 31.4% in stage II; 30% had advanced stage III. The postoperative complication rate was (21.5%), with the most frequent being prolonged air leak (11.4%) followed by cardiovascular complications (5.7%) and postoperative pneumonia (4.3%). Median postoperative hospital stay was 6 days. Mean survival was highest in Stage II (95.9 months, 68.2%), followed by Stage I (44.8 months, 74.1%) and Stage III (35.4 months, 52.4%). The 1-year survival rate was 84.6%, while 3-year and 5-year survival rate was reported as 78.5% and 72.3% respectively. No deaths reported within the first 3 months indicating that both the 30- day and 90-day mortality rates are 0%.
Conclusions: Lung cancer surgery in advanced age is feasible and safe in appropriately selected patients. Despite the presence of comorbidities and physiological decline associated with ageing, lung resection in elderly patients can be performed with acceptable morbidity and mortality. With comprehensive preoperative evaluations, multidisciplinary decision-making, and adherence to ERAS protocols, advanced age should not be considered a contraindication to surgical treatment. These findings underscore the importance of individualised, risk-based surgical decision-making in the growing elderly population.

68

Inherited perspiration, acquired liberation: Institutional case series of VATS sympathectomy for familial primary hyperhidrosis across generations

Azman A, Ramzisham ARM
The National University of Malaysia, Malaysia

Introduction/Objectives: Primary hyperhidrosis is a chronic, benign, yet socially disabling disorder, most commonly affecting the palms, axillae, and soles. It is believed to result from sympathetic overactivity and shows strong familial clustering, with autosomal dominant inheritance and variable penetrance. Despite being non-life-threatening, it significantly impacts quality of life, limiting interpersonal interactions,

academic performance, occupational productivity, and psychological well-being. Video-assisted thoracoscopic sympathectomy (VATS) is the gold-standard treatment for severe cases refractory to conservative management, providing immediate symptom resolution and high long-term success rates. However, reports documenting familial patterns across different ethnicities over extended periods remain limited.
Materials and Methods: We present a combined institutional experience spanning 15 years involving two sibling pairs. Historical cohort (2010): Two Chinese siblings (15 and 17 years) with disabling palmar and plantar hyperhidrosis underwent bilateral VATS sympathectomy (T2–T4). Both achieved immediate and sustained symptom resolution at 12 months, with no compensatory hyperhidrosis or major complications. Contemporary cohort (2025): Two Malay brothers (21 and 23 years) presented with lifelong severe palmar and plantar hyperhidrosis (HDSS 4/4), unresponsive to topical therapy and lifestyle measures. Both underwent bilateral VATS sympathectomy (T2–T4, with nerve of Kuntz division when present), achieving immediate dryness, early discharge, and marked improvement in quality of life. Neither developed Horner's syndrome, pneumothorax, or early compensatory hyperhidrosis.
Results/Discussion: This series highlights the familial and likely genetic nature of hyperhidrosis across ethnicities. Prevalence estimates range from 0.6–5%, with 30–65% of patients reporting a positive family history. Beyond physical discomfort, hyperhidrosis contributes to social withdrawal, anxiety, and reduced confidence. Both historical and contemporary cases demonstrate that VATS sympathectomy is reproducible, durable, and highly effective (>95% immediate success in large series), with minimal complications when performed in specialized centers. Spanning two generations and distinct ethnic groups, this experience underscores consistent efficacy and supports careful level selection (T2–T4) to minimize compensatory sweating, although long-term surveillance is needed.
Conclusion: Familial hyperhidrosis warrants early recognition, counseling, and timely surgical referral when conservative measures fail. This combined case series illustrates that VATS sympathectomy is a safe, minimally invasive, and transformative intervention, providing lasting symptom relief and improved quality of life across generations and ethnic backgrounds.

69

When rare meets real: Comparative insights from two unusual presentations of lung adenocarcinoma managed with VATS lobectomy

Azman A, Er CY, Karupiah,Md Ali NA,Mohd Dani NH,Ramzisham ARM
The National University of Malaysia, Malaysia

Introduction/Objectives: Lung cancer remains the leading cause of cancer death globally, but its epidemiology is changing. Up to 20% of cases occur in never-smokers and are increasingly linked to occupational, environmental, or biological factors. Adenocarcinoma, the most common subtype, can arise in non-tobacco contexts and present atypically. Video-assisted thoracoscopic surgery (VATS) lobectomy is the preferred approach for resectable disease, offering oncological equivalence to open surgery with reduced morbidity. We present two contrasting left-sided adenocarcinomas

managed with VATS lobectomy to illustrate diagnostic and operative challenges beyond the smoking paradigm.
Materials and Methods: Case 1 – Left Upper Lobectomy A 61-year-old Malay woman, lifelong non-smoker with prolonged occupational exposure to industrial cleaning agents, presented with haemoptysis. Imaging showed a cavitating left upper-lobe mass; biopsy confirmed invasive acinar- predominant adenocarcinoma. PET-CT demonstrated FDG-avid hilar involvement without distant disease. She underwent VATS left upper lobectomy with systematic mediastinal dissection. Histology showed lymphovascular invasion, Spread Through Air Spaces (STAS), and station 6 nodal metastasis (pT2aN1M0, Stage IIIA). She was referred for adjuvant cisplatin-based chemoradiotherapy.
Case 2 – Left Lower Lobectomy A 50-year-old man with diabetes, hypothyroidism, longstanding growth-hormone deficiency and prior smoking underwent VATS bullectomy for a large left lower-lobe bulla found incidentally. Histology unexpectedly revealed invasive mucinous adenocarcinoma (pT2a) with STAS and positive staple-line margins. PET-CT showed no distant uptake but indeterminate postoperative changes. Multidisciplinary review recommended completion surgery; he underwent elective VATS left lower lobectomy with systematic lymphadenectomy (stations 5, 6, 9–11). Final pathology confirmed pT2aN0M0. Recovery was uneventful and adjuvant therapy was deferred pending MDT review.
Result/Discussion: Both patients required VATS lobectomy, yet their pathways differed. Case 1 exemplifies carcinogenesis in a never-smoker with occupational exposure; Case 2 illustrates how invasive mucinous adenocarcinoma may masquerade as benign bullous disease and be PET-occult. Histopathology dictated management in both, prompting adjuvant therapy in Case 1 and completion resection in Case 2. Surgically, both cases reaffirm VATS lobectomy as a versatile, oncologically sound approach with lower morbidity than thoracotomy, while emphasising the need for intraoperative adaptability and multidisciplinary decision-making.
Conclusion: These cases illustrate the heterogeneity of lung adenocarcinoma beyond smoking-related disease. They underscore the value of exposure history, pathological vigilance, and surgical adaptability in guiding management. VATS lobectomy proved reliable and oncologically sound, reinforcing its role as the standard of care in modern thoracic surgery.

70

Intrapulmonary Chondroma: A Rare Benign Tumor in an Exceptional Location
Maulidya Ayudika Dandanah, Putri, Orlando, Silaban, Widyasanto
Siloam Hospital Lippo Village, Indonesia

Background: Primary intrapulmonary chondroma is a rare benign lung tumor, distinct from hamartomas. Its pathogenesis is unclear, with theories including mesenchymal metaplasia or embryonic cartilage rests. Radiologically, it appears as a calcified nodule but is indistinguishable from other pulmonary lesions without histology. Although prognosis is excellent after excision, its rarity warrants reporting to aid differential diagnosis of calcified lung nodules.

Case Description: A 53-year-old woman with hypertension, type 2 diabetes, and dyslipidemia was referred for evaluation of nodules found on routine chest imaging. She reported a chronic, mild, nonproductive cough without fever or weight loss. Her family history included breast cancer. Repeat X-ray showed right lobe consolidation with pleural thickening; CT revealed a 2.2 × 1.9 × 1.7 cm cystic nodule in the second segment of the right upper lobe and fibrosis in the fifth segment. Laboratory and spirometry results were unremarkable. Given suspicion of a benign lesion but uncertainty regarding its nature, a Video-Assisted Thoracic Surgery (VATS) wedge resection was performed. Intraoperatively, a well- defined superior lobe mass was observed. Frozen section (Vries coupe with paraffin block) revealed benign cartilage with atypical cells, suggestive of intrapulmonary chondroma, prompting complete excision. Postoperative recovery was uneventful. At 10-day follow-up, chest X-ray showed a rounded opacity at the resection site without complications.
Discussion: Intrapulmonary chondroma (IPC) is rare but should be considered when evaluating Solitary pulmonary nodules. Its imaging features mimic pulmonary hamartomas but lack fat or epithelial elements, necessitating histopathologic confirmation. IPC may proliferate despite benign behavior, making surgical resection preferable to observation. VATS is well established for benign thoracic lesions, offering safe excision, reduced pain, and shorter hospital stays. Literature supports its use as a diagnostic and therapeutic tool for borderline benign nodules. Another important consideration is Carney triad— a rare association of pulmonary chondroma, gastric gastrointestinal stromal tumor, and extra-adrenal paraganglioma. No additional lesions were found in this patient, but long-term surveillance is advised as other tumors may appear metachronously.
Conclusion: IPC, although rare and typically benign, should be included in the differential diagnosis of solitary pulmonary nodules. VATS wedge resection provides definitive diagnosis and treatment with favorable outcomes. Ongoing follow-up remains prudent due to its potential link with Carney triad.

71

Impact of Enhanced Recovery Protocols on Thoracic Surgery Outcomes in Asian Populations: A Systematic Review and Meta-Analysis

Millenia, M.S, Pratama, B., Alzikri, H.R., Soetisna, T.W.
Harapan Kita Nasional Cardiovascular Center Hospital, Indonesia

Background: Enhanced Recovery After Thoracic Surgery (ERATS) has been increasingly implemented to optimize perioperative care and accelerate postoperative recovery. Previous studies have shown potential benefits of ERATS across the world. However, the overall impact of ERATS in Asian populations remains uncertain.
Methods: A systematic review and meta-analysis was performed to evaluate the effectiveness of ERATS compared with conventional perioperative care in thoracic surgery. Primary outcomes included postoperative length of stay (LOS), drainage duration, and pulmonary complications. Secondary outcomes included intraoperative blood loss and operative time.
Results: Across nine studies, ERATS was associated with significantly shorter hospital stay (MD –1.82 days, 95% CI –2.17 to –1.48) and reduced drainage duration (MD –1.38

days, 95% CI –1.98 to –0.83). Intraoperatively, ERATS showed a trend toward lower estimated blood loss (MD –65.28 mL, 95% CI –157.79 to –27.23, p=0.10), while operative duration did not differ significantly between groups (MD –18.59 hours, 95% CI –49.27 to 12.10, p=0.18). ERATS significantly reduced pulmonary complications, particularly air leakage, atelectasis, and pulmonary infection, although no significant difference was observed in the incidence of postoperative arrhythmia.
Conclusion: ERATS significantly improves recovery outcomes in Asian thoracic surgery patients, with shorter hospital stay, reduced drainage duration, and fewer pulmonary complications. Although intraoperative benefits were less consistent, the overall evidence supports ERATS as an effective perioperative strategy. Importantly, ERATS studies across the world consistently demonstrate significant reductions in postoperative morbidity and length of stay, reinforcing its role as a global standard of care in thoracic surgery.

72

Single-Centre Analysis of Patient Demographics and Perioperative Trends in Video-Assisted Thoracoscopic Surgery

Stevanus Orlando, Putri, Dandanah
Siloam Hospital Lippo Village, Indonesia

Background: Video-assisted thoracoscopic surgery (VATS) has become a fundamental minimally invasive approach in thoracic surgery, offering reduced postoperative discomfort, shorter hospital stays, and expedited recovery compared with conventional thoracotomy. A comprehensive understanding of patient demographics and perioperative patterns is essential for optimizing surgical planning, allocating resources efficiently, and improving procedural outcomes, particularly in institutions where minimally invasive thoracic techniques are developing.
Methods: A retrospective descriptive study was conducted at Siloam Hospitals Lippo Village Karawaci, including all patients who underwent video-assisted thoracoscopic surgery (VATS) between January 2023 and September 2025. Patient data were retrieved from operative records and hospital databases. Variables collected included age, sex, height, weight, smoking status, presenting symptoms, comorbidities, and final diagnoses. Descriptive statistics were used to summarize demographic characteristics and perioperative trends.
Results: A total of 19 patients were identified. The mean age was 53.6 ± 13.2 years, with 52.6% male and 47.4% female representation. The mean weight 63.9 ± 18.6 kg, mean height 162.3 ± 9.4 cm and mean operative time 153.7 ± 86.3 minutes. Most patients were non-smokers 78.9%, and only 21.1% had a smoking history. Regarding comorbidities, diabetes mellitus and tuberculosis were each present in 21.1% of patients, dyslipidemia 5.3%, cancer 10.5%, hypertension 31.6%, and heart disease 42.1% patients. The most common presenting symptom was dyspnea 42.1%, followed by cough 26.3% and chest pain 10.5%. Less frequent complaints included chest discomfort 5.3%, hemoptysis 5.3%, and asymptomatic cases discovered incidentally 10.5%. Final diagnoses were diverse. Adenocarcinoma accounted for the largest proportion 26.3%. Pneumothorax and Schwarte each represented 10.5%. Abscess, aspergiloma, atelectasis, benign lipoma,

chondroma, emphysema mediastinum, hematopneumothorax, lung bullae, lung cyst, and thymoma were each observed in single cases each 5.3%.
Conclusion: This single-centre analysis demonstrates that VATS is a versatile and reliable minimally invasive technique for a wide range of thoracic conditions, with adenocarcinoma representing the most frequent indication. The demographic patterns and comorbidity profiles observed in this cohort provide important local benchmarks for surgical planning and workflow optimization. These findings support the continued integration of VATS into routine thoracic practice and underscore the value of expanding multi-centre evaluations to refine perioperative protocols and improve patient outcomes.

73

Uniportal VATS Resection of Thoracic Schwannomas: A Single-Centre Multi-Case Series

Len En Yean, Sivakumar A/L Krishnasamy, Irwan Bin Samsudin
Universiti Malaya Medical Centre, Malaysia

Introduction: Thoracic schwannomas are rare, slow-growing benign neurogenic tumours, most frequently located in the posterior mediastinum. Complete surgical excision remains the treatment of choice, traditionally achieved through open thoracotomy or multiportal video-assisted thoracoscopic surgery (VATS). With advances in minimally invasive thoracic surgery, the uniportal VATS technique has gained popularity for its potential advantages in postoperative pain control, faster recovery, and improved cosmesis. However, published experience with uniportal VATS specifically for thoracic schwannoma remains scarce, with most reports limited to isolated cases.
Methods: We conducted a retrospective review of four patients who underwent uniportal VATS resection of thoracic schwannomas at Universiti Malaya Medical Centre between 2024 and 2025, analysing clinical features, tumour characteristics, operative details, and outcomes.
Results: The series included four patients (2 male, 2 female; aged 17–77 years). All thoracic schwannomas were successfully excised en bloc via uniportal VATS without conversion to thoracotomy. Tumours ranged from 2×3 cm to 7×7 cm, located at the thoracic inlet, posterior mediastinum, and chest wall, with some adherent to pleura or lung. Operating time ranged from 1–2 hours, and no intraoperative complications occurred. Postoperative drains were removed within 1–2 days, with a mean hospital stay of 3–5 days. Histopathology confirmed benign schwannomas in all cases, and no recurrence was observed during follow-up.
Conclusion: Uniportal VATS provides a safe and effective minimally invasive approach for thoracic schwannoma excision, even in large, adherent, or anatomically challenging tumours. This four-case series highlights its feasibility with excellent perioperative outcomes and no recurrence during follow-up.

74

Feasibility and safety of outpatient chest tube management—experience from an Indian high-volume center.

Abhishek Mohan, Shyam Sundar Rengan, Haritha Therese Joseph, Rohit Kumar Rathi, Roman Dutta, Sabyasachi Bal
Sir Ganga Ram Hospital, India

Introduction/Objectives: Prolonged air leak or excessive drainage commonly delays intercostal drain (ICD) removal and extends hospital stay after thoracic surgery. While outpatient ICD management has been reported internationally, most published experiences come from high-income countries with nurse-led clinics and specialized telehealth platforms. Evidence from low- and middle-income countries (LMICs) is sparse. We aimed to evaluate the feasibility, safety, and cost-effectiveness of outpatient ICD management in a high-volume tertiary centre, using a simple telemonitoring protocol.
Materials and Methods: We included 137 consecutive patients discharged with ICDs between January 2024 and August 2025. Patients were managed at home using either digital suction devices or passive underwater seal systems. Follow-up consisted of daily monitoring via WhatsApp, supplemented by weekly outpatient visits. Data recorded included demographics, procedure performed, device used, length of initial hospital stay, duration of outpatient ICD management, and complications. Outcomes assessed were complication rates, readmissions, outpatient management duration, and estimated cost savings.
Results/Discussion: Outpatient ICD management was successful in 127 patients (92.7%) without the need for emergency intervention. The mean outpatient duration was 7.1 days (median 5, range 1–34). Complications occurred in 10 patients (7.3%), including empyema in 3 (2.2%). No mortality was recorded. Estimated cost savings averaged INR 86,617 per patient (~USD 1,040), with a net total saving of INR 11,866,500. This approach reduced inpatient occupancy, improved bed turnover, and was achieved without nurse-led home care or expensive telehealth platforms, demonstrating practicality in resource-constrained settings.
Conclusion: Outpatient ICD management, supported by digital drainage systems and simple WhatsApp-based telemonitoring, is safe, feasible, and cost-effective. By reducing complications, improving bed turnover, and lowering healthcare costs, this model provides a reproducible strategy for LMIC healthcare systems.

75

Case Report of Plasmacytoma: A Rare Case Study Tumor in the Chest Wall

Antonius Sarwono Sandi Agus, Anissa Tasya Ayuningtyas
Qolbu Insan Mulia Hospital, Indonesia

Background: Plasmacytomas are neoplastic lesions originating from monoclonal plasma cells, primarily involving bone marrow or soft tissues. They exist as solitary lesions or as part of multiple myeloma. Solitary plasmacytomas typically manifest as localized bone or extramedullary masses. Diagnosis relies on imaging, histopathology, and ancillary

tests like serum protein electrophoresis. This case highlights a rare sternal plasmacytoma with an unusual clinical presentation.
Case Description: A 55-year-old male presented with six months of chest discomfort, initially diagnosed and treated as cardiac disease without improvement. Subsequently, a growing chest mass prompted referral. Thoracic CT revealed a destructive sternal mass (6.5 × 5.6 × 4.1 cm), suspected to be sarcoma. Thoracic ultrasound showed a solid mass with ambiguous pericardial/pleural attachment. The patient underwent sternotomy with tumor resection and chest tube placement. Initial histopathology suggested malignant lymphoma or thymoma, but immunohistochemical analysis (performed at a reference center) confirmed plasmacytoma (CD138+, light chain restriction). Postoperative management included chest physiotherapy, incentive spirometry, and adjuvant radiotherapy.
Discussion: Plasmacytomas rarely involve the sternum and can mimic other malignancies clinically and radiologically. This case illustrates the diagnostic challenge, as the mass was initially misdiagnosed as cardiac disease and then suspected to be sarcoma. Immunohistochemistry was indispensable for definitive diagnosis, differentiating it from lymphoma and thymoma through plasma cell- specific markers. Surgical resection remains a cornerstone for solitary plasmacytomas, followed by radiotherapy to reduce recurrence. Multidisciplinary management is crucial for optimal outcomes.
Conclusion: This case emphasizes the importance of considering rare malignancies like plasmacytoma in atypical presentations. A thorough diagnostic workflow, including advanced immunohistochemistry, is essential for accurate diagnosis. Multimodal treatment involving surgery, radiotherapy, and rehabilitation ensures comprehensive management. This report underscores the need for heightened clinical vigilance and multidisciplinary collaboration in diagnosing and treating rare thoracic tumors.

76

Rib Fractures and Pulmonary Complications: Risk Stratification of High-Risk Patients in an Indonesian Tertiary Trauma Center

Ihsanul Amal, Nadila Yang
dr. Sardjito General Hospital, Indonesia

Introduction: Rib fractures, the most frequent thoracic injury affecting up to 40% of trauma patients, are associated with a significant risk of pulmonary complications such as pneumothorax, haemothorax, and lung contusion (25–62%). However, fracture patterns correlated with pulmonary injury remain poorly described in Indonesia. This study examines the epidemiology of rib fractures and their pulmonary complications to improve risk stratification and management.
Methods: A retrospective cross-sectional study was conducted on 162 patients aged >18 years with rib fractures admitted to dr. Sardjito General Hospital, Yogyakarta, Indonesia between January 2022 and December 2024. Rib fractures were confirmed by X-ray or CT scan. Extracted data included age, sex, number of fractured ribs, fracture location (anterior, lateral, posterior), and type of pulmonary complication. Associations between variables and pulmonary complications were analyzed using Chi-square or Fisher's exact tests as appropriate. Variables including age, number of fractured ribs, and fracture location were entered into multivariate logistic regression to identify independent risk

factors. Multivariate analysis was limited to variables available in the dataset; comorbidities such as COPD and smoking were not assessed.
Results & Discussion: Among 162 patients (86.4% male, mean age 50.6 ± 14.4 years), 47.5% had 3–5 rib fractures, with lateral fractures predominating (37.7%). Pulmonary complications occurred in 83%, most commonly lung contusions (81.5%) and hemothorax (51.1%), with some patients having multiple complications. Road traffic accidents were the leading cause (72.8%). Bivariate analysis showed number of fractured ribs ($p = 0.010$), fracture location ($p = 0.117$), and age ($p = 0.304$) were included in multivariate logistic regression. Multivariate analysis confirmed >5 rib fractures markedly increased pulmonary complication risk (OR 7.36; 95% CI 1.42–38.23; $p = 0.018$), whereas age and fracture location were not significant. Ten patients had flail chest, all of whom developed pulmonary complications, highlighting this subgroup as particularly high-risk. High complication rates parallel other Southeast Asian cohorts, emphasizing early recognition. Patients with >5 rib fractures or flail chest should be prioritized for close monitoring, aggressive pain management, and ICU-level care. The number of rib fractured and flail chest may serve as simple, actionable markers for risk stratification, guiding timely interventions in thoracic trauma.
Conclusion: Patients with over five rib fractures have a significantly higher risk of pulmonary complications. Early detection through imaging and clinical assessment enables timely intervention, potentially reducing morbidity and improving outcomes.

77

Systematic Review and Meta Analysis of prevention Air Leak management strategies with sealants and stapler after Lung Resection

Muhammad Ilham Juraij, Dhihintia Jiwangga Suta; IGB Chandogya; Mohamad Rizki
Dr. Soetomo General Academic Hospital, Indonesia

Introduction: Post-resection air leaks exhibit marked incidence variation, potentially triggering severe complications including pneumothorax, infection, and respiratory compromise. These events substantially elevate morbidity through extended hospitalization, ICU needs, and reoperation rates. While modern stapling innovations and surgical expertise have reduced persistent leaks, available interventions from pleural tents to bio-sealants demonstrate limited universal efficacy. Thus, non- selective sealant use lacks clinical justification. Aims to evaluate the therapeutic efficacy of intraoperatively deployed surgical sealants and stapling devices in preventing Persistent Air Leak (PAL).
Methods: This systematic evidence synthesis was executed in full compliance with PRISMA 2020 reporting standards. Comprehensive literature retrieval spanned seven biomedical databases: PubMed, Scopus, Web of Science, ProQuest, Cochrane Central Register of Controlled Trials (CENTRAL), and Google Scholar. All quantitative syntheses were conducted using Review Manager (RevMan) software version 5.4.
Results: Surgical sealants significantly reduced prolonged air leak incidence OR 0.56, 95% CI 0.43–0.75; p=0.0001, air leak duration MD -1.49 days, 95% CI -2.30 to -0.67; p=0.0003, chest tube duration -1.02 days, 95% CI -1.68 to -0.36; p=0.002), and hospital stay MD -1.17 days, 95% CI -1.89 to -0.45; p=0.001. Stapler reinforcement showed non-significant PAL reduction; OR 0.60, 95% CI 0.28–1.25; p=0.17 and air leak duration impact MD -0.82 days, 95% CI -1.97 to 0.33; p=0.16, but reduced chest tube duration

MD -0.47 days, 95% CI -0.88 to -0.07; p=0.02) without affecting hospitalization MD 0.17 days, p=0.84).
Conclusion: sealant application demonstrates efficacy in reducing PAL incidence, air leak duration, chest tube dependency, and hospitalization length versus staplers, which show limited evidence notwithstanding study heterogeneity limitations.
Keywords: Persistent air leak; Surgical sealants; Stapler reinforcement; Lung resection

78

Predictors of Conversion and Outcomes of VATS Decortication for Tuberculous Empyema: A Single Center Experience in a Tuberculosis Endemic Country

Juliana, Dhihintia Jiwangga; IGB Chandogya
Dr. Soetomo General Academic Hospital, Indonesia

Background: Indonesia carries one of the world's highest tuberculosis (TB) burdens, contributing ~10% of global cases, with an incidence of 394 per 100,000 annually. While pulmonary TB predominates, extra-pulmonary involvement—including pleural TB—accounts for up to 16–19% of cases. Tuberculous empyema represents a severe sequela, often presenting late with fibrothorax and trapped lung, necessitating surgical decortication. Video-assisted thoracoscopic surgery (VATS) offers a minimally invasive alternative to thoracotomy, yet outcomes and predictors of conversion remain underreported in Indonesian centers.
Methods: We performed a retrospective single-center review of 12 consecutive patients with tuberculous empyema undergoing attempted VATS decortication at Dr. Soetomo General Hospital, Surabaya, between January 2024 and August 2025. Demographic, intra-operative, and postoperative variables were analyzed. Primary outcomes included feasibility of VATS, conversion to thoracotomy, and postoperative morbidity. Statistical comparisons employed Mann–Whitney U and Fisher's exact tests.
Results: Twelve patients (mean age 37.7 ± 18 years, 67% male) were included. Four patients (33.3%) required conversion to thoracotomy. Univariate analysis showed that age ($p = 0.39$), TB duration ($p = 0.71$), operative time ($p = 0.71$), and intraoperative blood loss ($p = 0.87$) were not significantly associated with conversion. However, intraoperative complications were strongly predictive of conversion (75% vs 0%, $p = 0.018$). Postoperative outcomes tended to be worse in converted patients, with longer chest tube duration (8.5 vs 6 days, $p = 0.22$), longer hospitalization (13.5 vs 11 days, $p = 0.72$), and more frequent complications (25% vs 0%, $p = 0.33$), although these differences did not reach statistical significance. No peri-operative mortality was observed.
Conclusion: VATS decortication for tuberculous empyema was feasible and safe in this Indonesian cohort. However, prolonged TB duration and intra-operative complications were significant predictors of conversion to thoracotomy, which in turn was associated with longer postoperative drainage and hospitalization. Early referral and careful patient selection are essential to optimize outcomes in TB-endemic regions.
Keywords: Tuberculous empyema, VATS decortication, thoracotomy, tuberculosis, Indonesia

79

The Impact of Gaming Experience on Performance in Ion Robotic Bronchoscopy Simulation Training

Ahmad H, Rathinam A, Chandarana K, Rathinam S
Glenfield Hospital, Great Britain

Background: The Ion robotic bronchoscopy platform enables minimally invasive access to pulmonary nodules but requires a steep learning curve. Simulation-based training offers a safe environment for skill development, and prior studies suggest gaming may enhance technical ability. We investigated the influence of gaming background, enjoyment, and stress on simulator performance.
Methods: Twenty-six participants from a single university hospital (38% physicians, 42% nurses/allied health, 8% administrators, 12% students) were assessed. Gaming backgrounds included: none (50%), minimal (15%), active (23%), and former (12%). Training was performed on the Ion simulator with basic and advanced driving modules. Metrics included targets hit, collision time, coordinated motion, completion time, and star rating (0–3). Self-reported enjoyment and stress were rated 0–10.
Results: Enjoyment correlated with better performance, while stress negatively impacted outcomes. Repetition improved results in the basic course (+0.423 stars per attempt) but produced minimal gains in the advanced course (+0.083). Students performed best (2.67 stars), outperforming physicians and nurses. Active gamers achieved higher scores than non-gamers (2.4 vs. 1.56 stars) and showed greater improvement with repetition (+1.33 vs. +0.31 stars in basic tasks). However, non-gamers improved more in collision avoidance (–0.298s vs. –0.008s) and coordination scores, suggesting gamers prioritized speed over precision.
Discussion: Findings align with surgical training literature, indicating gaming enhances visuospatial skills and task performance. Gamers improved faster but displayed less refinement in precision metrics, highlighting a need to balance efficiency with safety. Enjoyment clearly facilitated performance, whereas stress hindered it, suggesting value in gamified, engaging training environments with stress-reduction strategies. The plateau in advanced tasks indicates repetition alone is insufficient, emphasizing structured feedback and coaching for higher-level skills.
Conclusion: Gaming experience enhances robotic bronchoscopy simulation performance, particularly in learning rate and competency scores. Engagement promotes better outcomes, while stress impairs them. Basic skills improve with repetition, but advanced tasks require structured instruction. Training programs should integrate simulation early, use gamified approaches to foster engagement, and address stress management. Individual learner profiles, including gaming background, may inform tailored training strategies.

80

Surgical Outcomes of Decortication in Tubercular and Non-Tubercular Empyema: A Comparative Study

Abhishek Mohan, Shyam Sundar Rengan, Rohit Kumar Rathi, Roman Dutta, Sabysachi Bal
Sir Ganga Ram Hospital, India

Introduction/Objectives: Tuberculosis remains a major public health burden in South Asia, where empyema thoracis is a frequent and challenging complication. It is often believed that patients with tubercular empyema (TbE) experience poorer surgical outcomes compared to those with non-tubercular empyema (nTbE). However, most existing studies are limited by small sample sizes. We aimed to compare demographics, peri-operative outcomes, and 90-day mortality between TbE and nTbE patients undergoing decortication.
Materials And Methods: This retrospective analysis included 88 consecutive patients who underwent decortication for empyema over 20 months (January 2024–August 2025) at a tertiary care center in New Delhi, India. Categorization into TbE and nTbE was based on intraoperative culture results. Data analyzed included demographics, prior interventions, operative approach, conversion to open surgery, operative time, postoperative complications, duration of chest drain, length of hospital stay, re-intervention, and 90-day mortality. Comparative analysis was performed between the two groups.
Results/Discussion: Of 88 patients (TbE n=42; nTbE n=46), TbE patients were younger (39.4 ± 17.1 vs 45.8 ± 18.6 years, p=0.101) with similar sex distribution (male 81.0% vs 73.9%; p=0.431). Prior aspiration was more frequent in TbE (67% vs 46%; p=0.047), while prior ICD and STK use were similar. Operative time was significantly longer in TbE (242 ± 69 vs 203 ± 62 minutes; p=0.008). Operative approach distribution and conversion rates did not differ (p=0.510). Postoperative outcomes were comparable: hospital stay (4.4 vs 5.3 days; p=0.162), chest drain duration (9.6 vs 8.0 days; p=0.184), prolonged air leak (17% each; p=0.928), re-intervention (7% vs 15%; p=0.320), and 90-day mortality (5% vs 9%; p=0.678).
Conclusion: Although TbE patients had longer operative times and more frequent prior interventions, overall peri-operative outcomes and 90-day mortality were comparable to nTbE. These findings challenge the perception that tubercular empyema carries poorer surgical outcomes. Decortication remains a safe and effective procedure in both groups and should be considered early.

81

Video Assisted Thoracoscopic Surgery for Patients with Catamenial Pneumothorax from Thoracic Endometriosis: Considering Lesions on the Diaphragm.

Maethus Taepattanasat, Suparauk Geanphun
Siriraj Hospital, Thailand

Introduction/ Objectives: Catamenial pneumothorax (CP) is a pneumothorax occurring between 24 hours before and 72 hours after the onset of menstrual cycle, frequently linked to diaphragmatic defect. This single-center retrospective study reviewed outcome of video assisted thoracoscopic surgery (VATS) considering lesion on diaphragm.
Materials and methods: We review female diagnosed with CP who underwent VATS between 2017-2023; prior thoracotomy cases were excluded. Retrospective data was collected, including demographic data, intraoperative finding, surgical management, complication, hormonal treatment. Outcome included recurrence, length of stay, chest-tube duration, complication.

Result/Discussion: Twenty-five patients (mean age 37.9 ± 7.3years) were included. All presented with right-sided pneumothorax. Diaphragmatic endometriosis was identified in all cases, predominantly perforation (72%). Mechanical stapler resection was performed in 22 cases (88%); suture or plication was used in the remainder. Overall recurrence was 3 cases (12%) with all recurrence occurred in mechanical stapler resection group. Pulmonary wedge resection was performed in 19 cases and was associated with recurrence. Pleurodesis was done in all cases. Type of pleurodesis did not associate with outcome.
Conclusion: CP accounted for majority of pneumothorax in reproductive-age female. VATS is preferred approach for CP, provided excellence diagnostic yield. Diaphragmatic perforations were associated with recurrence risk. Mechanical stapler is safe and effective. Type of pleurodesis did not influence outcomes.

82

Optimizing Outcomes in Lung Resection: Meta-Analysis of Evidence- Based Interventions to Prevent and Manage Prolonged Air Leak

Pahala Rumahorbo, Marcella Sanjaya
Siloam Hospitals, Indonesia

Introduction: Prolonged air leak (PAL) remains one of the most frequent and challenging complications after anatomical lung resection. PAL is associated with longer chest tube duration, increased postoperative complications, delayed discharge, and higher costs. Although various strategies—including digital chest drainage systems, low suction protocols, pleurodesis, sealants, and phrenic nerve cryoneuroablation—have been introduced, their benefits have not been consistently defined. Our objective is to evaluate the effect of different preventive and management interventions on the incidence of PAL, chest tube duration, and hospital stay following anatomical lung resection.
Methods: Following PRISMA guidelines, we conducted a systematic review and meta-analysis of randomized and observational studies that assessed strategies to prevent or reduce PAL after anatomical lung resection. Outcomes included PAL incidence, chest tube duration, and hospital length of stay. Pooled odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using fixed- or random-effects models depending on heterogeneity.
Results: Eight RCT studies including over 1,000 patients met the eligibility criteria. Pooled analysis demonstrated that these interventions significantly reduced the risk of PAL compared with standard care (OR = 0.45, 95% CI 0.28–0.72, p = 0.0009; I2 = 14%). The interventions were also associated with a marked reduction in chest tube duration (MD = –1.12 days, 95% CI –1.19 to –1.06, p < 0.00001; I2 = 94%) and a shorter hospital stay (MD = –0.59 days, 95% CI –0.87 to –0.31, p < 0.0001; I2 = 66%).
Conclusion: Interventions such as digital drainage systems, low suction protocols, pleurodesis, sealants, and phrenic nerve cryoneuroablation reduce PAL incidence and expedite recovery after anatomical lung resection. Their integration into standardized perioperative pathways can improve outcomes and resource utilization. Further multicenter studies are needed to confirm these findings and define optimal protocols.
Keywords: chest tube, lung resection, PAL

83

Endobronchial Adenocarcinoma Initially Presenting with Neurological Deficits due to Brain Metastases: A Case Report

Hakka Azasiyasa, Jimmy Tanamas, Farida, Fathur Nur Kholis, Thomas Handoyo, Banteng Hanang Wibisono
Diponegoro University/ Kariadi Hospital, Indonesia

Introduction: Lung cancer is the leading cause of cancer-related death worldwide. Adenocarcinoma, the most common histological subtype, often presents at advanced stages with distant metastases. Brain involvement can manifest as the first clinical symptom, obscuring the underlying pulmonary origin.
Materials and Methods: A 62-year-old female presented with progressive headache, decreased consciousness, and tetraparesis. Neurological examination revealed bilateral cranial nerve deficits and hemihypesthesia. Brain MRI with contrast demonstrated multiple rim-enhancing intracranial lesions with vasogenic edema, consistent with metastases. Laboratory evaluation showed elevated D-dimer, reflecting a prothrombotic state. Thoracic imaging identified a 2–3 cm lesion in the right upper lobe bronchus. Flexible bronchoscopy revealed endobronchial masses in RB2 and RB4, from which biopsy, brush cytology, and bronchial washing were obtained. Histopathology confirmed adenocarcinoma with solid growth pattern, and immunohistochemistry showed TTF-1 positivity and p40 negativity, consistent with primary lung adenocarcinoma. Ancillary fistulography demonstrated a rectovaginal fistula tract.
Results / Discussion: The patient was diagnosed with primary pulmonary adenocarcinoma with multiple brain metastases, which initially presented with severe neurological deficits rather than typical respiratory symptoms. This highlights the diagnostic challenges in differentiating intracranial lesions, where a metastatic tumor can mimic a primary brain tumor. The patient's clinical course was further complicated by elevated D-dimer, which pointed to a hypercoagulable state often associated with cancer, and the coexistence of a rectovaginal fistula, underscoring the complexity of the disease. Bronchoscopy and histopathological analysis were crucial in confirming the thoracic origin of the primary tumor. This finding was pivotal in guiding further management, including multidisciplinary treatment strategies tailored to the patient’s performance status, the burden of intracranial and extracranial disease, and the presence of any targetable mutations. This case illustrates the importance of considering primary extracranial malignancies when a patient presents with dominant neurological symptoms to ensure an accurate diagnosis and an effective treatment plan.
Conclusion: Lung adenocarcinoma may first present with neurological deficits due to brain metastases, delaying suspicion of a thoracic primary. Comprehensive evaluation, including neurological imaging, thoracic workup, bronchoscopy, and histopathology is essential for timely diagnosis. A multidisciplinary approach is crucial in managing such complex presentations.

84

Cardiomyopathy in an ART-Adherent Patient: A Case Report

Yusuf Aulia Rahman, M Labib MY Bima
RSUD Abdul Moeloek, Indonesia

Background: HIV-associated cardiomyopathy (HIVAC) was common in advanced HIV infection before antiretroviral therapy (ART), but its presentation has changed in the ART era. Standardized diagnostic and management guidelines remain lacking.
Case Presentation: A 27-year-old man with HIV, adherent to zidovudine/lamivudine/efavirenz for 24 months, presented with dyspnea and heart failure symptoms. Chest radiography showed cardiomegaly, and echocardiography revealed severe left ventricular dysfunction (ejection fraction 22%). Despite sustained viral suppression (40 copies/mL), his CD4 count declined from 200 to 81 cells/μL. He received standard heart failure therapy and his ART was switched to tenofovir/emtricitabine/lopinavir-ritonavir. Symptoms resolved during hospitalization, and after 6 months he remained asymptomatic with improved ejection fraction (44%) and reduced cardiomegaly.
Discussion: HIVAC may result from infectious agents or non-infectious mechanisms such as micronutrient deficiency, autoimmunity, or ART toxicity. In this case, both advanced immunosuppression and prolonged zidovudine exposure were possible contributors, though the precise etiology could not be determined.
Conclusion: HIVAC should be considered in people living with HIV who present with heart failure. Optimized heart failure therapy and timely ART modification may improve outcomes.

85

Segmentectomy versus Lobectomy for Early-Stage Non-Small-Cell Lung Cancer: A Systematic Review and Meta-analysis

Anak Agung Ngurah Nata Tresnawan Putra, Bermansyah, Gama Satria, Ahmat Umar, Aswin Nugraha, Arie H.L Tobing, Indra Hakim Nasution
Moh. Hoesin Hospital, Indonesia

Background: Lobectomy has been the undisputed standard of care for early-stage non-small cell lung cancer (NSCLC) for decades. The emergence of computed tomography screening has led to the detection of smaller, earlier-stage tumors, rekindling interest in anatomical segmentectomy as a lung parenchyma-sparing alternative. This meta-analysis aims to compare the perioperative outcomes of segmentectomy versus lobectomy specifically for early stage NSCLC tumors
Methods: A systematic literature search was conducted across PubMed, Embase, Cochrane Central Register of Controlled Trials, and Web of Science from inception to April 2024. We included studies that directly compared anatomical segmentectomy to lobectomy in patients with early stage NSCLC. Primary outcomes were overall survival (OS) and disease-free survival (DFS). Secondary outcomes included operative time, intraoperative blood loss. Pooled risk ratios (RR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using random- effects models. Heterogeneity was quantified using the I2 statistic.
Results: Eight studies, comprising 5,632 patients (2,625 segmentectomy, 3,007 lobectomy), were included in the final analysis. The pooled analysis demonstrated no significant difference in OS (RR 0.95, 95% CI 0.90–1.01; P=0.09) or DFS (RR 0.92, 95% CI 0.81–1.04; P=0.19) between the two groups. Segmentectomy was associated with a significant reduction in intraoperative blood loss (MD -15.65 mL, 95% CI -27.74 to -

3.55; P=0.01) but required a longer operative time (MD 12.35 minutes, 95% CI 5.41 to 19.29; P=0.0005).
Conclusion: For carefully selected patients with early-stage NSCLC, segmentectomy provides non-inferior long-term survival outcomes compared to lobectomy. While it is a more technically demanding procedure, as evidenced by longer operative times, it offers the significant advantage of reduced blood loss and inherent lung parenchyma preservation. These findings solidify segmentectomy's role as a standard of care option for small, peripheral NSCLC, aligning oncological radicality with functional preservation.
Keywords: Non-small cell lung cancer, NSCLC, segmentectomy, lobectomy, sublobar resection, meta-analysis, overall survival, disease-free survival, minimally invasive surgery.

86

Surgical Treatment for Traumatic Tension Pneumomediastinum for Accidental Drowning in Private Pool

Zanella Yolanda Lie, Dhihitia Jiwangga
Dr Soetomo General Academic Hospital, Indonesia

Introduction: Traumatic tension pneumomediastinum is a rare but life-threatening condition characterized by accumulation of pressurized air within the mediastinum, leading to severe respiratory and hemodynamic compromise. Although pneumomediastinum may occur following trauma, barotrauma, or resuscitation, its occurrence after drowning is exceedingly uncommon, especially in pediatric patients.
Case Description: We report the case of a male pediatric patient who suffered accidental drowning in a private swimming pool. Upon admission, the patient was intubated and sedated, presenting with severe hypoxemia (SpO2 64%), tachycardia (160 bpm), and extensive subcutaneous emphysema. Chest radiography revealed right-sided pneumothorax with pneumomediastinum, and acute respiratory distress syndrome (ARDS) was suspected. An emergency right chest tube insertion released significant air, but persistent subcutaneous emphysema necessitated multiple decompression incisions. Mediastinal drains were inserted via suprasternal and subxiphoid approaches, confirming tension pneumomediastinum. A left chest tube was later placed for bilateral drainage. Despite initial instability, the patient gradually improved under mechanical ventilation with SIMV support and titration of FiO2. The patient required prolonged intensive care for ARDS, airway injury, and infection control, but eventually stabilized, with resolution of fever, reduced subcutaneous emphysema, and successful transition to spontaneous breathing with supplemental oxygen.
Discussion: This case highlights the unique interplay of drowning-related barotrauma and tracheal rupture as causative mechanisms of tension pneumomediastinum. While most cases of pneumomediastinum following near-drowning are managed conservatively, the persistence of massive subcutaneous emphysema and progressive respiratory compromise in our patient required surgical intervention. The mediastinal drains were life-saving, relieving trapped air and stabilizing hemodynamics when chest tubes alone were insufficient. The tracheal rupture identified on CT scan represents a rare pediatric airway injury that further complicated management.

Conclusion: Tension pneumomediastinum following drowning is an exceptionally rare but critical condition that may necessitate surgical decompression when conservative measures fail. Early recognition, appropriate use of mediastinal drainage, and multidisciplinary management—including respiratory support, infection control, and monitoring for airway injury—are essential to optimize outcomes.

87

Unveiling A Rare Entity: Traumaticpancreaticopleural Fistula Presenting Diagnostic And Management Challenges

Arya Utama, Bermansyah, Gama Satria, Ahmat Umar, Aswin Nugraha, Arie H.L Tobing, Indra Hakim Nasution
Central General Hospital Mohammad Hoesin, Indonesia

Background: Pancreatic trauma is a rare abdominal injury (0.2–0.3% of all trauma) but carries high morbidity and mortality. Pancreaticopleural fistula (PPF) is an extremely uncommon complication, accounting for ~0.5% of cases, most often in chronic pancreatitis rather than trauma. A key diagnostic challenge is that post-traumatic pleural effusion is frequently presumed to be hemothorax.
Methods/ Case Presentation: We present a rare case of traumatic PPF in an adolescent after blunt abdominal trauma, emphasizing diagnostic pitfalls for thoracic surgeons. This single case report followed CARE guidelines. Data were obtained retrospectively from medical records, including history, examination, laboratory results, imaging, pleural fluid analysis, treatment, and outcomes.
Discussion: Early recognition of pancreaticopleural fistula is crucial, since delayed diagnosis can lead to unnecessary surgical interventions and prolonged morbidity. A 15-year-old female sustained multi-organ injuries after a motorcycle accident, including a grade III pancreatic laceration. Eleven days later, she presented with dyspnea and a large left pleural effusion. Initially presumed hemothorax, a chest tube drained 210 mL of serohemorrhagic fluid. On postoperative day one, pleural fluid analysis showed hemorrhagic exudate. By day four, the effusion became greenish and turbid; repeat analysis revealed elevated amylase (5,936 U/L) and lipase (>3,000 U/L), confirming PPF. A thoracotomy planned for suspected loculated hemothorax was avoided, and the patient was managed conservatively with drainage, antibiotics, and multidisciplinary monitoring.
Conclusion: This case illustrates the limitations of imaging, as CT could not distinguish hemothorax from PPF. Traumatic PPF, though rare, should be considered in trauma patients with persistent or atypical pleural effusion. Pleural fluid analysis is essential to prevent misdiagnosis and unnecessary thoracotomy, underscoring the value of multidisciplinary collaboration in trauma care.
Keyword: Pancreaticopleural fistula, pancreatic trauma, blunt abdominal trauma, pleural effusion, thoracic surgery.

88

Impact of Enhanced Recovery After Surgery on Length of Stay and Pulmonary Complications in Thoracic Surgery: A Systematic Review and Meta-analysis

Wiwiet Kesumadewi, Bermansyah, Gama Satria, Ahmat Umar, Aswin Nugraha, Arie H.L Tobing, Indra Hakim Nasution
Dr. Moh. Hoesin Hospital, Indonesia

Introduction: Enhanced Recovery After Surgery (ERAS) protocols are increasingly applied in thoracic surgery to reduce length of stay (LOS), postoperative pulmonary complications, yet outcomes remain variable.
Objective: To assess the impact of Enhanced Recovery After Surgery (ERAS) on length of stay and postoperative pulmonary complications in patients undergoing thoracic surgery.
Methods: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. PubMed, Ovid MEDLINE, EMBASE, and the Cochrane Library were searched through August 2025. Eligible studies included randomized trials and cohort studies reporting postoperative outcomes in thoracic surgery with ERAS versus conventional care. Random-effects models generated pooled estimates.
Results: Eight studies (four randomized controlled trials and four cohort studies; 4,264 patients) were included in the analysis. ERAS protocols were associated with a significantly shorter hospital length of stay (MD −1.81 days, 95% CI −3.10 to −0.52, p = 0.006), although moderate heterogeneity was observed (I2 = 62%). Importantly, two large RCTs consistently demonstrated a reduction in postoperative pulmonary complications (RR 0.49, 95% CI 0.35–0.69, p < 0.0001; I2 = 0%), with PPCs defined as atelectasis, pulmonary infection, or respiratory failure. The risk of bias was judged to be low for RCTs and low to moderate for observational studies. Overall, ERAS implementation was associated with enhanced perioperative recovery and reduced pulmonary morbidity in patients undergoing thoracic surgery.
Conclusion: Enhanced Recovery After Surgery (ERAS) protocols in thoracic surgery reduce length of stay and pulmonary complications. Consistent benefits across trials support routine adoption, though multicenter RCTs with standardized protocols are needed to confirm and optimize outcomes.
Keywords: Enhanced Recovery After Surgery, ERAS, thoracic surgery, length of stay, systematic review, meta-analysis

89

Bronchoscope to Scalpel: A Collaborative Strategy in Treating Mucoepidermoid Carcinoma of the Central Airways

Ray Rattu, Eric Daniel Tenda, Sahat Halim, A Mudassir, Oke Dimas Asmara, Almerveldy Azaria Dohong, Ita Juwita, Widya Rosalin, Ida Ayu Prastiwi, David Hutagaol, Yayi Dwina Billianti Susanto
National General Hospital of Dr. Cipto Mangunkusumo, Indonesia.

Introduction/Objectives: Mucoepidermoid carcinoma (MEC) of the central airways is an exceptionally rare salivary gland–type neoplasm, accounting for less than 1% of primary lung tumors. Its initial manifestation as spontaneous pneumothorax is even more unusual,

complicating early recognition and timely intervention. This report presents a case of MEC arising from the left main bronchus, with emphasis on the multidisciplinary approach integrating pulmonology, pathology, and thoracic surgery to optimize patient outcomes.
Materials and Methods: A 50-year-old male with a history of recurrent spontaneous pneumothorax and progressive dyspnea underwent diagnostic evaluation. Radiological imaging (CT and MRI) revealed a cystic lesion within the left main bronchus. Bronchoscopy with endobronchial ultrasound (EBUS) and transbronchial needle aspiration (TBNA), followed by cryobiopsy, confirmed epithelial neoplasm suggestive of salivary gland origin. Laboratory biomarkers (CEA, AFP, LDH, CRP) were assessed. Multimodal diagnostic tools and interventional procedures were employed to establish a definitive diagnosis and determine therapeutic strategy. Following diagnostic confirmation, surgical intervention was planned, consisting of thoracotomy with sleeve resection and bronchial sleeve anastomosis of the left main bronchus, accompanied by mediastinal lymph node dissection.
Result/Discussion: Bronchoscopy demonstrated a smooth-surfaced, obstructive mass. Cytology and histopathology confirmed intermediate-grade MEC with immunohistochemical positivity for CK7, EMA, mucicarmine, and partial p63, with Ki-67 proliferation index of 3%. Initial bronchoscopic debulking was insufficient; thus, thoracotomy with sleeve resection of the left main bronchus and mediastinal lymph node dissection was performed. Microscopic evaluation revealed residual tumor at resection margins but no lymph node metastasis. Given the positive margin status, adjuvant radiotherapy was recommended. Literature supports surgical resection as the gold standard, with bronchoscopic intervention considered in select low-grade cases to preserve lung function. This case highlights the importance of comprehensive imaging, endoscopic sampling, and surgical management in addressing both diagnostic and therapeutic challenges.
Conclusion: Pulmonary MEC remains a rare but important differential diagnosis in central airway tumors and may present with atypical features such as spontaneous pneumothorax. A multidisciplinary team approach is essential to ensure accurate diagnosis, effective treatment, and long-term disease control. Surgical resection with bronchial sleeve anastomosis remains the cornerstone of management, while adjuvant radiotherapy should be considered when margins are compromised.

90

Uniportal VATs ICG-Guided Right Upper Lobe S1+2 segmentectomy

Komen Senngam, Nutnicha Rangchaikul, Boonlawat Homvises
Chulabhorn Hospital, Thailand

This video presents a case of uniportal video-assisted thoracoscopic surgery (VATS) for apicoposterior segmentectomy (S1+2) of the right upper lobe, guided by indocyanine green (ICG) imaging. The patient is a healthy 66-year-old Thai woman with a history of stage I left breast cancer. A part-solid nodule measuring 1.9 × 1.3 cm was detected in the right upper lobe posterior segment on CT in May 2024. After neoadjuvant chemotherapy, the lesion decreased in size but later increased to 1.8 × 1.3 cm post-radiotherapy. Biopsy

confirmed adenocarcinoma, positive for TTF-1 and Napsin-A, and negative for ER, PR, and HER-2.
On the day of surgery, CT-guided transthoracic ICG injection was performed without complications. The patient was positioned in left lateral decubitus, and a uniportal right anterolateral thoracotomy was made at the 4th intercostal space. The lesion was localized using near-infrared imaging and marked with electrocautery. Dissection revealed the right main pulmonary artery and its branches, including A2. After isolating A2, intravenous ICG was administered to demarcate the posterior segment. Due to insufficient margin, apicoposterior segmentectomy was performed. Hilar dissection identified A1 and A3 branches; A1 was ligated and divided. The apicoposterior bronchus was isolated and divided after confirming anterior segment inflation. Intersegmental planes were marked using ICG and inflation demarcation, and lung parenchyma was divided with staplers and Harmonic scalpel. Mediastinal lymph node dissection included stations 9, 7, and 4R. An intercostal nerve block was performed for pain control. Pathology revealed invasive lepidic adenocarcinoma (lepidic 70%, acinar 30%), 1.7 cm in size with 1.0 cm invasive component. Margins were clear (closest 1.2 cm), and all lymph nodes were negative. Final staging was T1bN0M0 (Stage IA2).

91

Mediastinal Seminoma: A Very Rare and Challenging Case Report
Ninditasari Ghina, Sidabutar Elisabeth Agnes, Huswatun Aida Lutfi
Dr. Cipto Mangunkusumo National General Hospital, Indonesia

Background: Mediastinal seminoma is a very rare malignant germ cell tumor, accounting for approximately 1–4% of mediastinal neoplasms. Owing to their indolent growth, these tumors are often detected at a large size. Chemotherapy remains the standard first- line therapy, while the role of surgery and radiotherapy is less well defined.
Case Presentation: We present the case of a 22-year-old male treated at Persahabatan General Hospital who presented with a chronic cough as the sole symptom. Initial imaging revealed a locally advanced anterior mediastinal mass. Serum tumor markers showed elevated beta-human chorionic gonadotropin (β-hCG) with normal alpha-fetoprotein (AFP). CT-guided transthoracic biopsy with histopathology and immunohistochemistry confirmed the diagnosis of seminoma. The patient received six cycles of chemotherapy consisting of bleomycin (30 mg), etoposide (172.6 mg), and cisplatin (34.4 mg). Follow-up CT evaluation using RECIST criteria demonstrated a partial response with a 62% reduction in tumor size; β-hCG levels decreased while AFP remained normal. Due to unresectability from close adherence to vascular structures, the residual tumor was treated with external beam radiotherapy using intensity-modulated radiation therapy (IMRT), delivered in 30 fractions of 2 Gy each. At the most recent follow-up, the patient maintained stable clinical condition with preserved functional status.
Conclusion: Aggressive radiation after cisplatin-based chemotherapy in mediastinal seminoma can achieve favorable outcomes with mild toxicity

92

Combined Primary Closure and Simultaneous Negative Pressure Wound Therapy: A Novel Single-Stage Approach for Chronic Tuberculous Empyema

Antonius Sarwono Sandi Agus, Tasya Ayuningtyas
Qolbu Insan Mulia Hospital, Indonesia

Background: Negative pressure wound therapy (NPWT) following open window thoracostomy (OWT) is a established intervention for chronic empyema, effectively reducing cavity volume and promoting granulation. The standard management is often a staged procedure. This report describes a novel single-stage approach combining OWT with primary closure and immediate NPWT application.
Case Description: A male patient in his 50s with a history of pulmonary tuberculosis presented with chronic tuberculous empyema. Thoracic imaging revealed a large air-fluid level and surrounding consolidation, consistent with a complex empyema cavity. The patient underwent an open window thoracostomy with resection of the sixth and seventh ribs. Following cavity debridement (Clagett procedure), NPWT was instituted immediately over the thoracostomy site and maintained continuously for four weeks.
Discussion: The immediate application of NPWT following primary closure created a sealed environment critical for success. The therapy facilitated apposition of tissue planes, eliminated dead space, and actively drained purulent exudate, reducing bacterial load and local edema. This synergistic combination of mechanical closure and NPWT resulted in a rapid decrease in purulent drainage and robust granulation, effectively addressing the infected cavity in a single procedure and potentially obviating the need for a second major operation.
Conclusion: The concomitant use of primary closure and NPWT during OWT presents a viable and effective therapeutic strategy for managing complex chronic tuberculous empyema. This single-stage approach successfully managed the infection and promoted healing, suggesting a paradigm shift from conventional multi-staged procedures.

95

Surgical Feasibility and Oncologic Outcomes with Perioperative Immunotherapy–Based Regimens in Resectable NSCLC: A Bayesian Meta-analysis of RCTs

Ida Bagus Gede Diva Pidada Rurus, Anak Agung Istri Ajeng Sitoresmi
Udayana University, Indonesia

Background: Surgery can cure resectable NSCLC, yet relapse remains common. Randomized trials have assessed perioperative immunotherapy–based regimens; guidelines recommend chemo-immunotherapy, whereas immunotherapy alone remains investigational. Trial reporting of surgical feasibility and perioperative outcomes is heterogeneous.
Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 guideline was used for the literature search and systematic review. Studies reporting on the treatment effects of perioperative immunotherapy–based regimens (chemo-immunotherapy or immunotherapy alone) with chemotherapy- based controls in resectable NSCLC were included, R0 was the primary endpoint and our secondary endpoints included pCR, MPR, PFS, OS with odds ratio and hazard ratio as

the effect sizes. Weakly informative Student-t and Normal priors were utilized to control for outliers. Risk of bias was assessed using the RoB 2 tool. All statistical analyses and plots were performed and generated using the brms package and R Statistical Software v.4.4.2.
Results: This study included 5 RCTs and analyzed 2508 patients. The pooled effect for R0 resection was OR 1.34 (95% CrI 0.96-1.86), with excellent convergence (R-hat = 1.00) and low heterogeneity ($\tau = 0.26$). For pathological complete response (pCR), the pooled effect reached OR 3.82 (95% CrI 1.04-9.29), with stable chains (R-hat = 1.00) and moderate between-study variability ($\tau = 1.15$). Similarly, major pathological response (MPR) demonstrated a pooled effect of OR 2.63 (95% CrI 0.81-5.89), again with R-hat = 1.00 and moderate heterogeneity ($\tau = 0.99$). For time-to-event outcomes, progression-free survival (PFS) showed a robust pooled effect (HR 1.82; 95% CrI 1.61-2.04), with R-hat = 1.00 and negligible heterogeneity ($\tau = 0.07$). In contrast, overall survival (OS) yielded a smaller and more uncertain pooled effect (HR 1.66; 95% CrI 0.69-2.94), though convergence remained acceptable (R-hat = 1.00) and heterogeneity was low ($\tau = 0.39$).
Discussions: Perioperative immunotherapy–based regimens in resectable NSCLC were associated with higher pCR and favorable improvements in PFS, while maintaining high surgical feasibility (R0 resection). Heterogeneity was generally low to moderate, and convergence across models was achieved. Despite utilizing weak priors, our data still suggests considerable outliers for some variables, suggesting that further high-quality trials are needed to refine these estimates.
Keywords: Non-small cell lung cancer; Perioperative immunotherapy; R0 resection
There are no conflict of interest from any other parties that can increase the bias of risk of the study.

96

Innovative Approach in Surgical Trachea Reconstruction: Tracheal resection with end-to-end anastomosis (TREE) Combine with Cross-field ventilation

Nelly M., Dhihintia Jiwangga
Dr. Soetomo General Academic Hospital, Indonesia

Symptomatic tracheal stenosis is a rare but significant complication of long-term tracheal intubation and mechanical ventilation. Surgical reconstruction of the trachea in this case is highly challenging. Tracheal resection with end-to-end anastomosis (TREE) is the definitive treatment of choice for patients with tracheal stenosis or tumors. However, although TREE has many advantages over conservative treatment in terms of long-term results, it is often not selected as a first-line treatment due to the technical difficulties and risks of perioperative management. TREE should be made safer and more accessible by lowering perioperative risks and improving surgical methods. In this case, patient with tracheal stenosis due to tracheal intubation required resection of the stenosed tissue combine with cross-field ventilation. Small bore endotracheal tube (5,5 mm ETT) firstly placed for maintain ventilation below the stenosis area. After trachea resection, small bore ETT was replaced by 7,5 mm ETT for maintaining adequate ventilation. Another tube was intubated directly into the distal trachea at the operation field. TREE was performed using an absorbable simple interupted suture, firstly from posterior wall of trachea, distal intubation tube removed. The anastomotic procedure was continued up to the anterior

aspect of the tracheal wall. The upper tube was passed beyond the anastomotic site. With this method, TREE surgery for tracheal stenosis could be performed successfully with minimal risk.

97

LOHS And 30-Day Mortality After VATS vs Open Thoracotomy For NSCLC Patient A Systematic Review And Meta-Analysis

Jalaluddin Dzaky, Umar A, Satria G, Bermansyah, Nugraha A, Tobing AHL, Nasution IH
Mohammad Hoesin, Indonesia

Introduction: Video-assisted thoracoscopic surgery (VATS) has increasingly replaced open thoracotomy for lobectomy in non-small cell lung cancer (NSCLC), with evidence suggesting faster recovery and equivalent oncologic safety. However, uncertainty remains regarding its effect on hospital length of stay (LOS) and 30-day mortality across diverse clinical settings.
Objective: To compare postoperative LOS and 30-day mortality following VATS versus open thoracotomy lobectomy in patients with NSCLC through systematic review and meta-analysis.
Methods: We conducted a systematic review in accordance with PRISMA guidelines. PubMed, Embase, Scopus, and Cochrane Library were searched through August 2025. Eligible studies included randomized controlled trials, prospective or retrospective cohorts, and registry-based analyses comparing VATS with thoracotomy and reporting LOS and/or 30-day mortality. Data extraction and quality appraisal were performed independently by two reviewers. Risk of bias was assessed with the Newcastle–Ottawa Scale (NOS). Meta-analysis was performed using RevMan 5.4, calculating mean difference (MD) for LOS and risk ratios (RR) for mortality with 95% confidence intervals (CIs).
Results: Five studies including 3,034 patients met the inclusion criteria. Four studies (2,262 patients) reported length of stay, demonstrating significantly shorter hospitalization with VATS (MD –1.71 days, 95% CI –1.88 to –1.54; $p<0.00001$). Although heterogeneity was substantial ($I2=89\%$), all studies consistently favored VATS. Two studies (2,307 patients) assessed 30-day mortality and found no significant difference between approaches (RR 0.82, 95% CI 0.30–2.24; $p=0.70$; $I2=0\%$). The overall risk of bias was rated low to moderate.
Conclusion: VATS lobectomy is associated with shorter hospitalization without compromising early mortality compared with thoracotomy. These findings support VATS as a safe, minimally invasive alternative for appropriately selected NSCLC patients.
Keywords: non-small cell lung cancer, lobectomy, video-assisted thoracoscopic surgery, thoracotomy, hospital stay, 30-day mortality

98

pCR and MPR as Potential Surrogates for OS and EFS: A Meta- Regression of Neoadjuvant Immunotherapy Trials

Millenia, M.S., William, A., Atmaja, M.S.S., Mahtilda, A., Alzikri, H.R.
Airlangga University, Indonesia

Introduction: Neoadjuvant chemo-immunotherapy has emerged as a new standard of care for resectable non-small cell lung cancer (NSCLC), indicating greater rates of pathological complete response (pCR) and major pathological response (MPR) than chemotherapy alone. However, whether these pathological responses can serve as reliable surrogate endpoints for long-term survival outcomes, such as overall survival (OS) and event-free survival (EFS) remain unclear. To assess the relationship between pCR or MPR rates and survival outcomes in randomized studies of neoadjuvant immunotherapy, we conducted a trial-level meta-regression study.
Methods: A systematic search identified phase II and III trials of neoadjuvant immune checkpoint inhibitors in resectable NSCLC. Data on pCR, MPR, hazard ratios (HR) of OS or EFS, and corresponding 95% confidence intervals were extracted. Log(HR) and standard errors were calculated and pooled using a random-effects model. Trial-level meta regression was performed with pCR and MPR as moderators.
Result: Seven eligible RCT were included. Meta-regression showed a non-significant association between pCR and OS (2 = –0.0138; 95% CI –0.0356–0.0080; p = 0.216) and between pCR and EFS (2 = –0.0069; 95% CI –0.0195 to 0.0058; p = 0.289). Similarly, MPR was not significantly associated with OS (2 = –0.0038; 95% CI –0.0256 to 0.0180; p = 0.732) or (2 = –0.0027; 95% CI –0.0115 to 0.0061; p = 0.547). All analysis demonstrated a consistent negative trend, indicating that higher pathological response rates were directionally associated with improved survival.
Conclusion: Pathological responses (pCR and MPR) demonstrated a consistent but non-significant association with OS and EFS across neoadjuvant immunotherapy trials in resectable NSCLC. These findings suggest that while pCR and MPR remain promising potential surrogate endpoints, current evidence is insufficient for validation. Larger phase III trials with mature survival data are required to establish the surrogacy for long-term outcomes.

99

Diagnostic Challenge: Lung Abscess Mimicking a Tumor in a 7-Month-Old Infant – A Case Report

Jonathan Overian Buon
RSUD Dr. Doris Sylvanus Palangkaraya, Indonesia

Background: Lung abscesses in early infancy are exceedingly rare and may radiologically resemble granulomatous disease or neoplasms. Overlapping symptomssuch as cough, dyspnea, fever, and growth failure complicate differentiation from tuberculosis, fungal infections, congenital malformations, or tumor mimics. These challenges are magnified in resource-limited settings, where advanced microbiology and immunology may be inaccessible.

Case Presentation: A 7-month-old boy presented with one week of cough, dyspnea, intermittent fever, and poor weight gain. Chest radiograph demonstrated a right upper-lobe mass with mediastinal shift, while CT scan revealed a 6 × 7 × 7 cm hypodense lesion with fluid attenuation (14–18 HU) and an air–fluid level, initially suggestive of lung abscess. Empiric intravenous antibiotics were administered for several days, but the clinical improvement remained unsatisfactory. The patient wastherefore scheduled for thoracotomy with decortication until abscess drainage. Intraoperatively, however, no purulent cavity was found; instead, a solid mass occupied the right upper lobe. The procedure was converted to right upper lobectomy with lymph-node excision to exclude malignancy. Histopathology revealed dense mixed inflammatory infiltrates composed of lymphocytes, neutrophils, histiocytes, and plasma cells, with necrosis and hemorrhage, while lymph nodes showed reactive hyperplasia without malignancy. The patient recovered well postoperatively, remained asymptomatic at five-month follow-up, and had a normal chest radiograph, although weight gain was still suboptimal (7.5 kg).
Discussion: Although radiological features suggested abscess, differential diagnoses Included tuberculosis, fungal infection, chronic granulomatous disease, infected congenital malformations, and tumor mimics such as inflammatory myofibroblastic tumor or pleuropulmonary blastoma. Diagnostic certainty was limited by the absence of targeted microbiological tests (AFB smear, PCR, cultures), immunological assays (NBT/DHR), and advanced imaging (contrast-enhanced CT, MRI). Compared to published reports of pediatric granulomatous or neoplastic lung diseases, our diagnostic approach was restricted to clinicoradiologic correlation and postoperative histology. Surgical intervention in this case served as both a diagnostic and therapeutic modality.
Conclusion: Mass-like pulmonary lesions with air–fluid levels in infants do not invariably indicate neoplasm or granulomatous disease. Necrotizing infection with abscess formation remains an important consideration. When medical therapy fails and diagnostic resources are constrained, surgical exploration can provide definitive diagnosis and treatment. Broader microbiologic and immunologic evaluation is recommended whenever available.

100

Quantitative CT Assessment of Vascular and Parenchymal Adaptation After Pneumonectomy Using Advanced Image-Processing Algorithms

Dilara Gürsoy, Şevket Aşurgan, Gökçe Tanıyan, Özkan Doğanay, Ali Özdil, İlker Akçam
Ege University, Department of Thoracic Surgery, Turkey

Introduction: In the aftermath of pneumonectomy, survival with a single lung is contingent on structural While compensatory changes have been qualitatively described, quantitative vascular and parenchymal substrates remain insufficiently defined. This study uses quantitative CT (QCT) with advanced post-processing to characterize vascular remodelling (vessel calibre, counts, tortuosity) and parenchymal volumetric and density (HU) shifts in the contralateral lung.
Materials and Methods: This single-centre retrospective cohort included adults undergoing pneumonectomy for NSCLC in 2024–2025. Of 240 screened cases, 15

patients met inclusion criteria (paired pre- and ≥12-month postoperative CTs of adequate quality and follow-up).
Exclusion criteria were bilateral diffuse disease, infection-related or non-oncologic pneumonectomy, inadequate imaging, or age <18. CTs were processed using 3D-Slicer and in-house segmentation. Analyses focused on lobar/segmental volumetry with parenchymal HU distributions and vascular remodelling metrics (radius, counts, tortuosity). Outcomes were changes in contralateral lobar volume and HU profiles and vascular adaptation. Statistical tests included Kolmogorov–Smirnov for distribution, paired t-test or Wilcoxon for pre/post comparisons, and effect size (Cohen's d). Missing data <5% were managed with complete-case analysis; otherwise multiple imputation. Significance threshold: $p<0.05$.
Results: Among 15 patients, postoperative parenchymal HU values showed consistent decreases versus preoperative levels. Most clustered within a 65–75% change, with mean reduction 70% ($p=0.024$), indicating a homogeneous density decrease. One patient showed a markedly higher change (83%) as an outlier. Vascular tortuosity remained largely stable between pre and postoperative scans, with mean values near 99.6%, indicating minimal structural change. Vascular volumetry revealed a median postoperative increase of 25% compared with baseline, interquartile range 10–30%. Most patients showed increases, though one case demonstrated a 30% decrease. Overall vessel volume increase was statistically significant ($p<0.05$), supporting compensatory vascular remodelling.
Conclusion: This pilot study demonstrates a reproducible QCT workflow to quantify vascular and parenchymal compensation after pneumonectomy. Identifying structural substrates of single-lung adaptation provides a basis for more comprehensive models. Future studies will extend these methods to airway segmentation and integration with clinical data. Conventional preoperative tools (spirometry, CPET, basic radiology) are limited in practicality and accuracy; combining QCT with advanced image-processing may offer a novel, objective framework for perioperative risk stratification in high-risk resections.

101

Enhancing Early Detection of High-Mortality Non-small Cell Lung Carcinoma (NSCLC) with AI-Based Predictive Models: A Meta-Analysis

Fadli Aditya Rizky, Rio Bayu Nugroho, Vania Felicia, Prayudi Santoso, Arto Yuwono Soeroto
Hasan Sadikin General Hospital/Padjadjaran University, Indonesia

Introduction/Objectives: Non-small cell lung carcinoma (NSCLC) is the leading cause of cancer-related deaths globally, with poor outcomes driven by late diagnoses and limited prognostic accuracy. Artificial intelligence (AI) and predictive modelling are increasingly being applied to diagnostic imaging and clinical datasets to enhance early detection and stratify mortality risk.
Materials and Methods: A meta-analysis was conducted of 15 studies published between 2015 and 2023 that evaluated AI-based diagnostic and predictive models for high-mortality NSCLC. Data extraction encompassed study characteristics, machine learning approaches, imaging modalities, and reported diagnostic outcomes, including AUC,

sensitivity, and specificity. Pooled effect sizes were calculated for diagnostic accuracy (odds ratio, OR), mortality risk prediction (hazard ratio, HR), and diagnostic yield (risk ratio, RR). Subgroup analyses were performed based on AI model type and imaging modality.
Result/Discussion: Across 5,787 patients, AI-based tools demonstrated strong discriminative ability for early NSCLC detection, with sensitivity ranging from 80% to 91%, specificity from 76% to 86%, and AUC values between 0.83 and 0.93. Pooled estimates showed: diagnostic accuracy (OR = 4.55, 95% CI: 4.30–4.81), mortality risk prediction (HR = 2.15, 95% CI: 1.97–2.36), and overall diagnostic yield (RR = 1.40, 95% CI: 1.36–1.44). Subgroup analyses showed superior performance for convolutional neural network (CNN) and Transformer-based models (AUC 0.90–0.93), particularly when applied to CT imaging (mean AUC 0.89). In contrast, chest X-ray–based models demonstrated moderate, though clinically meaningful, accuracy (AUC 0.85).
Conclusion: AI-based predictive tools significantly improve early detection and prognostic assessment of high-mortality NSCLC compared with conventional diagnostic methods. Advanced deep learning approaches, particularly those applied to CT imaging, demonstrate the highest accuracy and may facilitate earlier interventions, support clinical decision-making, and ultimately reduce the burden of mortality.
Keywords: Non-small cell lung carcinoma, early detection, artificial intelligence, predictive modelling, diagnostic imaging

102

Neoadjuvant EGFR-Targeted Therapy in Resectable EGFR-Mutant Non-Small Cell Lung Cancer: A Systematic Review and Meta-Analysis

Millenia, M. S. William, A., Atmaja, M.S.S., Jiwangga, D.
Airlangga University, Indonesia

Background: Non–small cell lung cancer (NSCLC) is the most common type of lung cancer, approximately 85% of all cases. Among the emerging driver oncogenes, epidermal growth factor receptor (EGFR) mutation is one of the most clinically significant genetic alterations in NSCLC. While targeted therapies with EGFR tyrosine kinase inhibitors (TKIs) have demonstrated superior efficacy over chemotherapy in advanced and metastatic settings, their role in the neoadjuvant setting for resectable NSCLC remains less well defined. The purpose of this study is to clarify the function of targeted therapy (EGFR-TKIs) in neoadjuvant settings for the treatment of resectable non-small cell lung cancer (NSCLC) with EGFR mutations.
Methods: This study was conducted following the PRISMA 2020 guidelines. Eligible studies were randomized controlled trials comparing targeted therapy with chemotherapy in patients with resectable NSCLC harboring EGFR mutations. The primary outcomes were objective response rate (ORR), R0 resection rate, progression-free survival (PFS), and overall survival (OS). Secondary outcomes are the incidence of grade 3/4 adverse events.
Result: Meta-analysis of three randomized controlled trials (269 patients) showed a numerical trend toward improved overall response rate (ORR) compared with chemotherapy or placebo (RR = 1.45, 95% CI: 0.74–2.84; I2 = 81%; P = 0.28), although this difference did not reach statistical significance. In terms of safety, EGFR-TKIs were

associated with a significantly lower incidence of grade 3–4 adverse events (RR = 0.38, 95% CI: 0.26–0.57; I2 = 0%; P < 0.00001), indicating a more favorable toxicity profile. Surgical outcomes, as measured by the R0 resection rate, showed no significant difference between EGFR-TKIs and chemotherapy/placebo (RR = 1.01, 95% CI: 0.95–1.07; I2 = 6%; P = 0.72). Survival analyses suggested a slight improvement in overall survival (MD = –5.15; P = 0.51) and progression-free survival (MD = 1.01; P = 0.72) with EGFR-TKI therapy, though neither result achieved statistical significance.
Conclusion: Neoadjuvant EGFR-TKIs in resectable EGFR-mutant NSCLC improve tumor response with fewer side effects, without compromising surgical outcomes. Although overall survival benefit remains inconclusive, the consistent improvement in progression-free survival and safety profile suggest EGFR-TKIs are a promising bridging therapy to surgery. Larger, standardized trials are needed to confirm their long-term survival impact.

103

Minimally invasive versus open esophagectomy in Southeast Asia: the first meta-analysis of morbidity and survival

Pahala Rumahorbo, Marcella Sanjaya
Siloam Hospitals, Indonesia

Introduction: Minimally invasive esophagectomy (MIE) has been shown in randomized trials to reduce perioperative morbidity compared with open surgery. However, no meta-analysis has synthesized outcomes from Southeast Asia (SEA), where differences in surgical training, patient selection, and resource availability may influence results. We aimed to compare postoperative morbidity and short-term survival after MIE versus open esophagectomy using regional evidence.
Materials and Methods: We conducted a systematic search of PubMed, Scopus, and regional databases for studies published between January 2010 and December 2024 reporting esophagectomy outcomes from SEA. Eligible designs included single-arm cohorts, case series, or non-randomized cohorts with extractable outcome counts. Duplicate cohorts were excluded. Primary outcomes were overall postoperative complications, anastomotic leak, pulmonary complications, and in-hospital or 30-day mortality. Risk of bias was assessed using the MINORS tool, and certainty of evidence was graded with GRADE. Random-effects models were applied to pool event rates, with subgroup comparisons for MIE versus open surgery. Results: Ten studies encompassing 727 patients were included, of which six reported MIE outcomes (n = 599) and four reported open outcomes (n = 128). The pooled incidence of any postoperative complication was 36.9% (95% CI 32.5–41.3) after MIE compared with 60.9% (95% CI 52.5–69.3) after open surgery, favoring MIE. Anastomotic leak rates were 13.4% vs 10.2%, showing no significant difference between groups. Pulmonary complications were reduced in the MIE cohort (14.0% vs 20.3%), consistent with the pulmonary benefit reported in Western randomized trials. In-hospital or 30-day mortality remained low across all studies (1.5% vs 3.1%), with no excess mortality associated with MIE. Risk of bias was moderate, reflecting non-randomized designs and heterogeneous outcome definitions. Certainty of evidence was rated low to very low across outcomes.

Conclusion: This first SEA-focused meta-analysis demonstrates that MIE reduces overall morbidity and pulmonary complications compared with open esophagectomy, without increasing leak or early mortality. These findings mirror international randomized data and confirm the feasibility and safety of MIE in diverse SEA surgical settings. While encouraging, results should be interpreted cautiously due to reliance on single-arm series and heterogeneity in outcome definitions. Future multicenter prospective studies are needed to strengthen the evidence base and guide best practice in the region.
Keywords: esophagectomy, minimally invasive, southeast asia

104

Empyema Necessitans As A Complication Following Lung Core Biopsy: A Case Report
Idar Sunandar, Dhihintia Jiwangga Suta Winarno, I Gusti Bagus Chandogya Giriastawa
University of Airlangga, Indonesia/ Dr. Soetomo General Hospital, Indonesia

Background: Empyema necessitans (EN) is a condition where purulent fluid from the pleural cavity invades the surrounding soft tissues of the chest wall. We report a rare case of EN occurring in a patient following a CT-guided lung core biopsy.
Case Presentation: We encountered a case involving a 66-year-old male who presented with swelling on the right side of his chest one week prior to hospital admission. The condition was initially treated as a subcutaneous abscess based on patient's CT-guided lung core biopsy, which revealed non-specific inflammation on histopathological examination. Laboratory findings showed leukocytosis and hypoalbuminemia. Chest CT revealed necrotizing pneumonia and fibrosis in the apicoposterior segment of the right upper lobe of the lung. From the surgical exploration, a seropurulent pleural effusion and a fistula extending from the right middle lobe into the subcutaneous tissue were identified. A localized lung abscess was found in the right middle lobe. Both the middle lobe and the inferior portion of the right upper lobe appeared to be destroyed. Wound and abscess fluid sampling were done, followed by a right middle lung lobe lobectomy and wedge resection of the involved inferior segment of the upper lobe adherent to the middle lobe.
Discussion: The case of EN has become increasingly rare with the widespread usage of antibiotics. Optimal management of EN requires a multidisciplinary approach involving thoracic surgeons, pulmonologists, infectious disease specialists, and radiologists. Early recognition and timely intervention are essential to prevent morbidity.
Conclusion: This case highlights that EN can occur as a complication of CT-guided lung core biopsy. The diagnosis of EN requires a comprehensive approach including medical history, physical examination, imaging and laboratory tests. Surgical intervention combined with appropriate antibiotic therapy is often necessary for optimal outcomes.
Keywords: Empyema necessitans, lung core biopsy, lung abscess, lobectomy

105

Pulmonary Laceration and Unilateral Diaphragmatic Paralysis due to Combined Blunt and Penetrating Chest Trauma : A Rare Case Report
Komang Wana Iswara, Putu Wisnu Arya Wardana, I Nyoman Semadi
Bali Mandara General Hospital, Indonesia

Background: Combined blunt and penetrating thoracic trauma represents a rare and diagnostically complex injury pattern that challenges standard management protocols. The synergistic pathophysiology of these dual-mechanism injuries can lead to rapid clinical deterioration. This report details the successful management of such a case, highlighting the diagnostic and therapeutic strategies employed.
Case Presentation: A 40-year-old male was admitted to our hospital from rural hospital after a 4-meter fall, arriving with a penetrating chest wound, and the embedded object had already been removed by the patient prior to hospital arrival, while vital signs remained stable after fluid resuscitation. The initial diagnostic workup included a Focused Assessment with Sonography for Trauma (FAST), which revealed no evidence of free intraperitoneal fluid. Subsequent chest radiograph and computed tomography (CT) confirmed a deep lung laceration in the left upper lobe followed with left hemothorax, a significantly elevated left hemidiaphragm and non-displaced fractures of the left 7th, 8th, and 9th ribs. The patient underwent an emergent left thoracotomy due to left open hemopneumothorax. The lung laceration was repaired via a lung-sparing suture pneumonorrhaphy, the rib fractures were assessed as stable. Therefore, surgical fixation was not performed and the elevated left hemidiaphragm due to paralysis underwent diaphragmatic plication to restore pulmonary function. Postoperatively, the patient was managed in the Intensive Care Unit (ICU) for two days for close monitoring of vital signs. There is no adverse event after postoperative, patient condition was significantly improved after three units of blood transfusion. The patient was discharged on postoperative day fifth and demonstrated excellent functional recovery. Scheduled for a follow-up visit at the outpatient clinic in one week.
Conclusion: Combined blunt and penetrating thoracic trauma may be lethal due to the unexpected extent of internal organ injuries. Rapid multidisciplinary evaluation and management are essential to optimize outcomes.

106

Comparative Effectiveness Of Indocyanine Green Versus Hook-Wire Localization For Pulmonary Nodule Surgery: A Systematic Review

Rama Vinnu Isyawan, Putu Wisnu Arya Wardana, I Nyoman Semadi
Bali Mandara General Hospital, Indonesia

Introduction: Accurate localization of small pulmonary nodules is essential for successful video-assisted thoracoscopic surgery (VATS). While CT-guided hook- wire localization is widely used, it carries risks such as pneumothorax, bleeding, and dislodgement. Indocyanine green (ICG), a near-infrared fluorescent dye, has emerged as a minimally invasive alternative. This systematic review compares the efficacy, safety, and procedural outcomes of ICG versus hook-wire localization.
Materials and Methods: A systematic search of PubMed, Embase, and other databases was conducted up to 2024. Comparative studies evaluating ICG and hook-wire localization in patients undergoing VATS for pulmonary nodules were included. Outcomes of interest included localization success, complications, pain scores, and workflow efficiency. Study quality was assessed using the ROBINS-I tool.
Result: Three retrospective comparative studies involving 429 pulmonary nodules were included. Of these, 175 nodules were localized using ICG and 196 using hook-wire.

Localization success rates ranged from 96.8% to 100% for ICG and 95.6% to 97.4% for hook-wire. Although none of the studies reported statistically significant differences in overall success, hook-wire was associated with dislodgement-related failures in 2.6–4.4% of cases, whereas ICG failures were due to dye diffusion in 3.2% of cases. Pneumothorax was significantly less common in the ICG group. Han et al. reported 6.3% (3/48) in ICG versus 27.3% (9/33) in hook-wire ($p < 0.05$); Wang et al. reported 17.7% (11/62) vs 36.4% (24/66), $p = 0.018$; and Ding et al. showed 27.7% (18/65) vs 28.3% (26/92), $p < 0.05$. ICG also enabled delayed surgery and reduced localization time without loss of accuracy. Fluorescence guidance was effective, particularly for small or ground-glass nodules. All studies had a moderate risk of bias due to their retrospective design.
Conclusion: ICG is a safe and effective alternative to hook-wire localization for pulmonary nodule surgery. It offers comparable localization success with fewer complications, less patient discomfort, and greater procedural flexibility. Further prospective studies are warranted.
Keywords: pulmonary nodule, indocyanine green, hook-wire, video-assisted thoracoscopic surgery, systematic review

107

Surgery in Thoracic Outlet Syndrome due to a Cervical Rib: A Case Report

Warren Lie, Susan Hendriarini Mety, Agung Wibawanto, Ichwan Zuanto, Alvin Sani, Erica Sugandi
Persahabatan Central General Hospital, Universitas Indonesia

Introduction: Thoracic outlet syndrome (TOS) refers to compression of the subclavian vessels and brachial plexus at the superior aperture of the chest. Synonyms include scalenus anticus, costoclavicular, hyperabduction, cervical rib, and first thoracic rib syndromes. Most compressive factors operate against the first rib and produce a variety of symptoms, depending on structure(s) compressed. Diagnosis of thoracic outlet syndrome is complex, management is mostly conservative, but surgical correction is indicated in some cases, especially arterial or venous TOS.
Case description: We report a satisfactory surgery on a 49-year-old female patient with thoracic outlet syndrome due to left cervical rib performed in August 2025 at Persahabatan Central General Hospital, Indonesia. The patient initially presented with arterial, venous, and neurologic symptoms; and was referred from a more rural hospital, where she underwent a successful thrombectomy to the left brachial artery. After thorough preoperative preparation, we performed resection of the left cervical rib via supraclavicular approach. Post-operative cervical MRI and nerve conduction velocity suggest residual sensory and motoric neuropathy due to edema at nerve root level, which subsided with steroid therapy. The patient had a total hospital stay of 2 weeks, follow-up at postoperative week 3 showed improvement of neurological symptoms and no residual arterial/venous symptoms.
Discussion: TOS classifications are based on the pathophysiology of symptoms with subgroups consisting of neurogenic (nTOS), venous (vTOS), and arterial (aTOS) etiologies. Each of the subgroups can be caused by either congenital, traumatic, or functionally acquired causes. Most surgical candidates have nTOS with uncontrolled pain or progressive weakening of the upper extremity. aTos is the least common form of TOS,

but most dangerous, commonly associated with anatomical abnormality such as a cervical rib. Approaches to decompression include supraclavicular, infraclavicular, transaxillary, posterior, and minimally invasive techniques. Surgical principles include excision of anomalous anatomical structures, scalenectomy, neurolysis of the brachial plexus, and resection of the first rib when necessary. Assiduous post operative rehabilitation with appropriate pharmacological therapy is mandatory in order to achieve minimal residual symptoms.
Conclusion: TOS is a rare condition requiring a high index of suspicion for diagnosis, also prompt but accurate management strategy based on etiology. TOS due to a cervical rib is even rarer but can be treated surgically with satisfactory postoperative outcome.

108

Effectiveness and Safety of Transbronchial Cryobiopsy Compared to Conventional Forceps Biopsy in the Diagnosis of NSCLC : A Literature Review

Kurniawan Ade Saputra, Zen Ahmad
RSUP Dr. Moh Hoesin Palembang, Indonesia

Introduction/Objectives: Histopathological diagnosis is a critical step in the management of non-small cell lung cancer (NSCLC). Conventional transbronchial forceps biopsy has long been employed, but it is often limited by the size and quality of specimens, potentially reducing diagnostic accuracy. Transbronchial cryobiopsy (TBCB) has emerged as an alternative technique capable of obtaining larger and better-preserved tissue samples. This study aims to evaluate the effectiveness and safety of TBCB compared with conventional forceps biopsy (CFB) in the diagnosis of NSCLC.
Material and Methods: A literature review was conducted through PubMed, Scopus, and the Cochrane Library using the keywords “transbronchial cryobiopsy,” “forceps biopsy,” and “non- small cell lung cancer.” Eligible studies were original research articles published in the past 10 years, written in English, and directly comparing TBCB with CFB in patients suspected of having NSCLC. The main parameters analyzed included diagnostic yield, specimen size, histopathological quality, and complications such as bleeding and pneumothorax.
Results/Discussion: From a total of 12 articles meeting the inclusion criteria, most reported that TBCB provided a higher diagnostic yield compared with CFB, ranging from 85–95% versus 60–75%. Tissue specimens obtained via TBCB were consistently larger and of higher quality, allowing additional analyses such as immunohistochemistry and molecular testing, which are essential for targeted therapies. However, TBCB was associated with a higher risk of bleeding compared with CFB, although most cases were mild to moderate and manageable with endoscopic interventions. Pneumothorax occurred more frequently with TBCB (4–10%) than with CFB (<2%), but rarely required invasive intervention. Variability across studies was influenced by operator experience, procedural protocols, and the use of adjunctive techniques such as balloon occlusion to control bleeding.
Conclusion: TBCB demonstrates superior effectiveness compared with CFB in the diagnosis of NSCLC, particularly regarding diagnostic yield and tissue quality. Nevertheless, the increased risk of complications, mainly bleeding and pneumothorax, should be carefully considered. Technique selection should be tailored to the patient’s

clinical condition, operator expertise, and available supportive facilities. Overall, TBCB represents a promising biopsy method to improve diagnostic accuracy in NSCLC within the era of personalized therapy.
Keywords: TBCB, CFB, NSCLC

109

Slide Tracheoplasty For Congenital Tracheal Stenosis: A Two-Year Single-Centre Experience

Gunalan Govindarajan, Luqman Haqeem Mohd Khassan, Mohd Faizal Effendi Zulkifli
Hospital Sultan Idris Shah Serdang, Malaysia

Background: Congenital tracheal stenosis (CTS) is a rare but life-threatening condition frequently associated with congenital heart disease. Slide tracheoplasty has become the preferred surgical technique, providing better outcomes compared with patch augmentation or resection with end-to-end anastomosis. Here, we report our two-year experience from a single-centre.
Methods: We retrospectively reviewed all patients who underwent slide tracheoplasty in Hospital Serdang, Malaysia between January 2023 and December 2024. Demographic data, associated anomalies, operative details, postoperative course, complications, and outcomes were analyzed.
Results: Twelve patients (10 males, 2 females) underwent slide tracheoplasty during this study period. The median age at surgery was 8 months (range 2–110) and the median weight was 6.45kg (range 3.5–28.5). 2 children had syndromic associations and 9 (75%) had congenital heart anomalies. All 9 patients with cardiac anomalies underwent concomitant cardiac surgery. The median cardiopulmonary bypass time was 306 minutes (range 153–380). Postoperatively, the median ventilation duration was 6.5 days, with the median ICU stay of 14 days, and the median hospital stay of 30.5 days. Complications occurred in 6 patients (50%), including granuloma formation requiring reintervention, chylothorax, and vocal cord palsy. There was 1 in-hospital mortality (8%) which occurred 5 months after surgery. At median follow-up of 15 months, the majority of survivors had good airway patency and symptom improvement.
Conclusion: Our two-year single-centre experience demonstrates that slide tracheoplasty offers acceptable outcomes, even in patients with complex cardiac anomalies. Multidisciplinary care, meticulous perioperative management and long-term follow-up remain essential for improved survival and airway function.

110

The Role of Deep Learning in Pleural Effusion Diagnosis : A Systematic Review

Ni Nyoman Indirawati Kusuma, Eric Daniel Tenda, Alfino Syahputra, Almerveldy Azaria Dohong
Cipto Mangunkusumo Hospital, Indonesia

Introduction/Objectives: Pleural effusion (PE) is a frequent manifestation of conditions such as heart failure, tuberculosis, malignancies, and pneumonia. Accurate detection, quantification, and etiological classification are crucial for guiding clinical management, yet often depend on expert interpretation and invasive procedures. Artificial intelligence

(AI), particularly deep learning, has emerged as a promising tool to automate detection, reduce operator dependence, and enhance workflow efficiency. This systematic review aims to evaluate the diagnostic performance and clinical utility of imaging-based AI models for pleural effusion diagnosis.
Materials and Methods: A systematic literature search was performed in the Cochrane Library, PubMed, and Google Scholar. A total of 56 records were identified, with 48 remaining after duplicate removal. Following title and abstract screening, 17 full-text articles were assessed, and 12 studies underwent detailed evaluation. Seven studies met all inclusion criteria. Extracted data included study design, sample size, AI architecture, imaging modality, comparator group, performance metrics, and workflow outcomes. Risk of bias was assessed using the QUADAS-2 tool.
Result/Discussion: Seven studies with low or acceptable risk of bias were analyzed. Imaging modalities included chest radiography (n=3), lung ultrasonography (n=2), thoracic CT (n=1), and pleural effusion cytology via whole-slide imaging (n=1). Reported sensitivity ranged from 87.5% to 95%, specificity from 65.1% to 97%, and area under the curve (AUC) up to 0.97. Across modalities, AI models consistently matched or outperformed human experts, with several studies showing higher diagnostic accuracy compared to junior clinicians or radiologists. Workflow benefits were also segmentation efficiency, and enhanced diagnostic throughput. Nonetheless, heterogeneity in datasets, AI architectures, and outcome measures limits direct comparability.
Conclusion: Deep learning models demonstrate strong diagnostic potential in pleural effusion detection, classification, and differentiation of benign versus malignant cases across multiple imaging modalities. Beyond accuracy, AI integration offers measurable gains in workflow efficiency. However, prospective, multi-center studies with standardized protocols are required to validate generalizability and support clinical adoption.

111

Roles of AI in Pulmonologist Field: A Current Narrative Review

Ni Nyoman Indirawati Kusuma, Eric Daniel Tenda, Alfino Syahputra, Almerveldy Azaria Dohong
Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Introduction/Objectives: Artificial intelligence (AI) has emerged as a transformative tool in pulmonology and its related subspecialties. The objective of this review is to summarize recent advances in AI applications across interventional pulmonology, laryngology, tracheobronchology, thoracic surgery, pleural diseases, and esophagology, highlighting its role in enhancing diagnostic accuracy, procedural safety, and personalized patient care.
Material and Methods: A literature review was conducted on 10 peer-reviewed studies published between 2021 and 2025, including systematic reviews, meta-analyses, and narrative reviews. Sources were retrieved from PubMed, Scopus, and specialty journals. The studies were selected for their focus on AI-enabled diagnostic, therapeutic, and workflow optimization tools in pulmonology and associated fields.
Results/Discussion: In interventional pulmonology, AI improves navigational and virtual bronchoscopy as well as endobronchial ultrasound, leading to more accurate lesion

targeting and image interpretation, often surpassing human operators. In laryngology and tracheobronchology, AI supports vocal biomarker-based screening, videolaryngoscopic lesion detection, and standardized swallowing assessment, with quantitative analysis enhancing reproducibility. Thoracic surgery benefits from AI-assisted preoperative imaging analysis, nodule classification, and metastasis prediction using radiomics and deep learning. Intraoperative augmented reality and robotic-assisted systems further enhance surgical precision, while postoperative predictive analytics allow for early complication detection. In pleural diseases, AI-enhanced imaging techniques, such as elastography and contrast-enhanced ultrasound, improve differentiation between benign and malignant conditions, fluid characterization, and automated pleural volume quantification, reducing the need for invasive procedures. In esophagology, AI applied to endoscopic imaging achieves high sensitivity and specificity in early cancer detection and depth of invasion assessment, often surpassing conventional endoscopists.
Conclusion: AI holds considerable promise in revolutionizing pulmonology-related specialties by improving diagnostic precision, procedural safety, and patient outcomes. Overcoming data limitations, ensuring transparency, and establishing clear regulatory frameworks are essential to enable safe, equitable, and widespread adoption of AI in clinical practice.

112

From Monotherapy to Combination: Nivolumab Alone versus Nivolumab and Ipilimumab for Patients with Non-Small-Cell Lung Cancer Patients

Brigitta Ellycia Sitepu, Kyra Modesty, Nurfadjriah Fintari Butar Butar, Ari Probandari, Bela Dirk
Sebelas Maret University, Indonesia

Introduction: One of the leading causes of cancer death globally is non-small-cell lung cancer (NSCLC), which frequently requires immunotherapy at advanced stages for better results. Immunotherapy medications disrupt the mechanism that PD-L1 (programmed death-ligand 1), a protein present on the surface of tumor and immune cells, enables the immune system to identify and eliminate cancer cells. While combination therapy involving nivolumab and ipilimumab (a CTLA-4 inhibitor) has demonstrated potential in boosting anticancer immune responses, nivolumab, a PD-1 inhibitor, is approved as monotherapy for a number of purposes. The purpose of this systematic review is to evaluate the safety and effectiveness of nivolumab monotherapy for non-small-cell lung cancer (NSCLC) against combination immunotherapy using nivolumab + ipilimumab.
Materials and Methods: A systematic review was conducted following the PRISMA guidelines. Eligible studies included clinical trials and randomized-controlled trial studies published in English from 2020 to 2025. The search strategy was implemented in databases including PubMed, Scopus, and ScienceDirect, using keywords related to the combination of nivolumab and ipilimumab compared to nivolumab alone in NSCLC patients. The risk of bias was assessed using the Cochrane Risk of Bias 2.0.
Results/ Discussion: Nine studies were included for full-text data extraction. Three studies stated that higher objective response rates were found in combination of nivolumab and ipilimumab. A group with programmed death-ligand 1 (PD-L1)≥50% that received combination therapy had a higher survival rate than single therapy, including

with PD-L1 ≥1% group, according to progression-free survival and overall survival. Although the combination's pneumonitis rates were statistically higher than those of nivolumab alone, they were nevertheless clinically tolerable. Furthermore, immunotherapy prior to surgery had no effect on the results or safety of lung cancer surgery and resections on-trial achieved R0 (100%), meaning it was feasible and effective because no microscopic residual tumor was left. Most studies has low low risk of bias using ROBINS-I.
Conclusion: Nivolumab and ipilimumab provided durable benefit in NSCLC, enhances response in the neoadjuvant setting and shows promising effects after chemoradiation. Adverse events showed tolerable immunology toxicities. Overall, nivolumab monotherapy offers benefits with a favorable safety profile in certain populations, while dual blockade should be reserved for settings with proven long-term survival advantage or enhanced pathologic response. Further studies should refine the patient selection using biomarkers.
Keywords: Non-small-cell lung cancer, nivolumab, ipilimumab

113

Emerging Trends in the Use of Cryotherapy for Central Airway Obstruction: A Systematic Review

Ni Nyoman Indirawati Kusuma, Eric Daniel Tenda, Alfino Syahputra, Almerveldy Azaria Dohong
Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Introduction/Objectives: Central airway obstruction (CAO) presents significant challenges in the management of both malignant and benign airway conditions. Cryotherapy has emerged as a promising modality for CAO treatment. This study aims to systematically assess the long-term effectiveness and safety of cryotherapy, focusing on clinical outcomes such as symptom relief, airway patency, and complications.
Material and Methods: A systematic review was conducted using PubMed, SAGE, SpringerLink, and ScienceDirect databases to identify studies published between 2015 and 2025. Eligible studies included human participants and focused on cryotherapy for CAO. Data extraction was independently performed by two reviewers. Study quality was appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Tools, and the review adhered to PRISMA guidelines, including a PRISMA flow diagram of study selection.
Results/Discussion: Cryotherapy showed encouraging results in CAO management, providing significant symptom relief, particularly in dyspnea and cough. Long-term follow-up demonstrated reduced requirements for repeated interventions and a low complication rate. Nonetheless, the need for additional therapeutic sessions was observed, suggesting that combining cryotherapy with other modalities such as balloon dilation or electrocautery may further improve outcomes. These findings support cryotherapy as a viable treatment but also highlight areas for optimization.
Conclusion: Cryotherapy is a safe and effective approach for managing central airway obstruction, offering sustained symptom relief and maintaining airway patency. Further comparative research is recommended to establish its role relative to alternative therapies and refine its clinical application.

114

Diagnostic Accuracy and Procedural Efficiency of Endobronchial Ultrasound-Guided Biopsy Techniques for Peripheral Lung Cancer: A Systematic Review

Ni Nyoman Indirawati Kusuma, Eric Daniel Tenda, Alfino Syahputra, Almerveldy Azaria Dohong
Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Introduction/Objectives: Peripheral lung cancer diagnosis is often hindered by the limited accessibility of lesions through conventional bronchoscopy. Endobronchial ultrasound (EBUS)- guided techniques, including radial probe EBUS with guide sheath (EBUS-GS) and EBUS-guided transbronchial biopsy (EBUS-TBB), have emerged as minimally invasive options that may enhance diagnostic accuracy and efficiency. This study aimed to evaluate the diagnostic yield, safety, and molecular testing adequacy of EBUS-guided biopsy techniques for peripheral pulmonary malignancies.
Material and Methods: A systematic review was conducted using PubMed, ScienceDirect, and SAGE databases. Eligible studies included prospective trials and retrospective cohorts assessing diagnostic performance, complication rates, and suitability of biopsy samples for molecular analysis (EGFR, ALK). Outcomes of interest included diagnostic yield, procedural safety, and concordance of molecular results with surgical specimens.
Results/Discussion: Four studies were analyzed, comprising two retrospective cohorts and two randomized controlled trials. Diagnostic yields ranged from 75% to 88%, with higher accuracy in lesions <3 cm. Incorporation of rapid on-site evaluation (ROSE) significantly improved sensitivity, shortened procedure duration, and reduced the number of biopsy passes. Complication rates were low (0–2%), with no significant increase associated with EBUS use. One trial demonstrated high molecular concordance between EBUS-obtained samples and surgical tissue, with EGFR and ALK results showing concordance rates of 97% and 100%, respectively. These findings highlight the robustness of EBUS-guided biopsy for both diagnosis and precision oncology applications.
Conclusion: EBUS-guided biopsy techniques represent reliable, safe, and minimally invasive approaches for diagnosing peripheral lung cancer. The ability to obtain samples adequate for molecular profiling further supports their integration into diagnostic pathways. Larger multicenter studies are warranted to confirm these findings and optimize their role in routine clinical practice.

115

Silicone Stent and Balloon Dilation for Tracheobronchial Stenosis Secondary to Tuberculosis: A Case Report

Sahat Halim, Eric Daniel Tenda, Almerveldy Azaria Dohong
Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Introduction/Objectives: Airway complications in pulmonary tuberculosis are uncommon but potentially life-threatening. Among these, tracheobronchial stenosis can cause severe dyspnea. We present a case of post-tuberculosis airway stenosis successfully managed

with silicone stent placement and balloon dilation, highlighting their role in restoring airway patency.
Material and Methods: A male patient presented with progressive shortness of breath that had worsened over the past two weeks, accompanied by wheezing for two months. He had been diagnosed with pulmonary tuberculosis two months prior and was on regular anti-tuberculosis therapy. He denied a history of diabetes mellitus or hypertension. Pulmonary examination revealed decreased vesicular breath sounds on the left lung, bilateral coarse crackles, and wheezing.
Results/Discussion: Bronchoscopy demonstrated tracheal stenosis with additional narrowing at the left main bronchus. The patient underwent balloon dilation of the left main bronchus followed by silicone stent placement in the trachea. These interventions immediately improved airflow, reduced wheezing, and relieved dyspnea. This outcome underscores the pivotal role of interventional pulmonology in managing airway stenosis. In tuberculosis patients with persistent respiratory symptoms, timely use of stenting and balloon dilation can prevent progression to critical airway obstruction and dramatically improve quality of life.
Conclusion: This case highlights the effectiveness of balloon dilation and silicone stenting in treating tracheobronchial stenosis secondary to tuberculosis. Prompt recognition and intervention are essential, as these procedures can rapidly restore airway function and provide significant clinical benefit.

116

Neoadjuvant Chemo-Immunotherapy Versus Chemotherapy Alone in Resectable Non-Small Cell Lung Cancer

Ricard Fernando Bangun, Yolanda Patrisia
RS Grandmed Lubuk Pakam, Indonesia

Introduction/Objectives: Neoadjuvant chemo-immunotherapy (nCIT) is becoming an option that many thoracic teams now consider for resectable non-small cell lung cancer (NSCLC). Previous reports, like Rossi (2025), showed clear survival and pathological gains. What is still less certain is how this approach affects the operation itself—resection rates, safety in the perioperative period, and whether surgery becomes harder or not. This review was designed to bring together both oncologic and surgical aspects in one place, so the picture is more complete for daily practice.
Materials and Methods: We searched PubMed, Embase, Cochrane Library, and DOAJ (Jan 2021–Jan 2025). The focus was on randomized trials, cohort studies, and meta-analyses. Main outcomes were pathologic complete response (pCR) and major pathologic response (MPR). Secondary outcomes included R0 resection, conversion to thoracotomy, perioperative complications, and survival endpoints (EFS/OS). PRISMA flow was followed, and 9 studies with about 3,500 patients were finally included.
Results: nCIT consistently gave better tumor response compared with chemotherapy. pCR ranged around 24–30% versus 4–7%, and MPR was close to 40–45% compared to 15–20%. The big phase III trials—CheckMate-816, KEYNOTE-671, and AEGEAN—also confirmed longer event-free survival, across PD-L1 groups. From the surgical side, results were reassuring: R0 resections stayed above 95%, conversion rates

Discussion: Recent analyses (Bardoni 2025, Wu 2025) show that achieving pCR/MPR is strongly linked with better EFS. Still, there are open questions: staging systems differ, regimens are not identical, and biomarkers are inconsistently applied. Long-term OS is also immature. Unlike earlier reviews that mainly emphasized oncologic benefit, this paper gives equal weight to the surgical story, which is important for real-world decision-making.
Conclusion: Overall, nCIT appears to improve outcomes without making surgery riskier in resectable NSCLC. By balancing oncologic results with perioperative experience, this review suggests nCIT is moving toward standard care, though more data on OS and biomarkers will be essential before it is fully established.

117

AI Lights the Way: Transforming Thoracic Oncology from Tragedy into Triumph - A Systematic Review

Ricard Fernando Bangun, Yolanda Patrisia
RSU Sembiring Deli Tua, Indonesia

Introduction/Objectives: Thoracic healthcare often carries painful stories: lung cancers discovered too late, operations made more dangerous by poor visibility, and outcomes lost to chance rather than precision. Artificial Intelligence (AI) has emerged as a new compass, not to replace physicians, but to guide them with sharper eyes and steadier hands. This work aims to show how AI can move thoracic oncology and surgery from a system marked by tragedy into one defined by earlier detection, safer procedures, and renewed hope.
Materials and Methods: A structured review was performed using open-access studies (2021–2025) focusing on three domains: (1) AI-assisted early detection of pulmonary nodules from CT and chest radiographs, (2) AI-guided intraoperative navigation during robotic or minimally invasive thoracic surgery, and (3) predictive machine learning models for postoperative outcomes and complications. Only studies with external validation, adequate sample size (>100 patients or public datasets), and performance metrics (sensitivity, specificity, AUC) were included.
Results/Discussion: Evidence shows AI consistently improves accuracy and workflow. Deep learning models predicted nodal metastasis on CT and PET/CT with AUC 0.84–0.90. A multi-reader study reported that AI support increased early lung cancer detection on chest radiographs by 17–25%, especially for stage I–II tumors often overlooked by humans. AI-enhanced navigation shortened operative time, improved clear margins, and helped localize small nodules invisible to the pleural surface. Beyond numbers, AI reduced repetitive workload, minimized errors, and gave clinicians more time for judgment and empathy. Challenges remain—data bias, lack of standardization, and ethical concerns—but emerging tools such as explainable AI and federated learning are building trust for wider clinical adoption.
Conclusion: Artificial Intelligence is no longer a distant promise; it is an urgent tool to address today's tragic gaps in thoracic healthcare. Applied responsibly, AI enables earlier diagnoses, safer resections, and personalized strategies while reinforcing, not replacing, the role of human compassion. By weaving AI into daily practice, we move from reactive medicine to proactive care, turning missed chances into saved lives. This embodies the

spirit of "Gathering of Minds to Save the Future of Thoracic Healthcare"—uniting human expertise and artificial intelligence to transform tragedy into triumph, and uncertainty into hope.

Keywords: Artificial Intelligence, thoracic oncology, lung cancer, early detection, robotic surgery, precision healthcare

118

Early Experience with Robotic Assisted Bronchoscopy at a UK Tertiary Centre

Ahmad H, Mohammed R, Sudhir R, Panchal R, Caruana E, Rathinam S, Nakas A
Glenfield Hospital, Leicester UK

Background: Robotic assisted bronchoscopy (RAB) has emerged as an alternative for diagnostics and lesion localisation for pulmonary lesions; particularly those that are small or peripherally located. We report our first year's of experience with RAB at a single tertiary referral centre in the UK.

Methods: A retrospective review was conducted of all RAB procedures performed between September 2024 and August 2025. Procedural indications, lesion characteristics, diagnostic yield, and complications were assessed.

Results: Total of 147 procedures were analysed. Procedures were carried out as planned in 95% (139/147). The intended outcomes were achieved in 70% (100/142), with most failures attributable to non-diagnostic histology despite successful biopsy. Localisation and immediate/delayed resection cases were universally successful.

Complications occurred in 8% (12/146) of procedures, most commonly pneumothorax (n=2), bleeding (n=3), desaturation (n=2), arrhythmia (n=1), surgical emphysema (n=1), bronchospasm (n=1), and one case of stroke on induction. Complications were predominantly minor (Clavien–Dindo I–II), with one severe bleed requiring transfusion and ICU admission (Clavien–Dindo IV) and one pri-procedural stroke and subsequent mortality (Clavien–Dindo V). Equipment failure was reported in 2/147 cases (1%) and seven cases of minor intraprocedural delays.

Conclusion: This study demonstrates that RAB can be implemented with high procedural fidelity and an acceptable safety profile. While complications were infrequent and mostly minor, the risk of severe events highlights the need for ongoing vigilance. Diagnostic yield remains limited by non-diagnostic histology, but is expected to improve with adoption of advanced biopsy tools such as cryobiopsy.

RAB is a feasible and safe technique for lung biopsy and localisation in its early adoption phase. Ongoing optimisation of tissue acquisition strategies and equipment reliability is required to improve diagnostic yield and minimise cancellations. These findings will inform local governance, national benchmarking, and future service development.