



Case Report

Anaesthetic management of a pericardial cyst excision via right thoracotomy in a young female: A case report

Samidha Waradkar¹, Naba Mateen Madoo^{1*}, Vignesh Ramesh¹

¹Dept. of Anaesthesia, Lilavati Hospital and Research Centre, Mumbai, Maharashtra, India.

Abstract

Pericardial cysts are rare benign mediastinal lesions that may present with compressive symptoms depending on their size and location. Anaesthetic management of patients undergoing excision of such cysts can be challenging due to their proximity to vital cardiopulmonary structures, the potential for intraoperative complications, and the need for one-lung ventilation (OLV) to facilitate surgical access during thoracotomy. We report the perioperative anaesthetic considerations in a 37-year-old female scheduled for excision of a pericardial cyst via a right thoracotomy approach.

Keywords: Pericardial cyst, Thoracotomy, Anaesthesia, Mediastinal mass, Airway management, One-lung ventilation

Received: 05-03-2025; **Accepted:** 26-05-2025; **Available Online:** 05-06-2025

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

Pericardial cysts are rare, benign congenital anomalies with an incidence of 1 in 100,000 individuals and comprise approximately 6–7% of mediastinal masses.¹ While many remain asymptomatic and are incidentally detected during imaging studies, larger cysts or those located adjacent to vital structures may produce compressive symptoms such as chest pain, dyspnea, cough, or dysphagia.²⁻³ Surgical excision remains the treatment of choice for symptomatic pericardial cysts or when there is uncertainty in diagnosis.²

Thoracic surgical approaches, such as thoracotomy, often require one-lung ventilation (OLV) to provide optimal exposure and protect the non-operative lung. OLV presents anaesthetic challenges including hypoxia, hypercarbia, and ventilation-perfusion mismatch.⁵⁻⁶ A double-lumen endotracheal tube (DLT) is the standard tool for lung isolation, with the left-sided DLT preferred for right thoracic procedures.⁵

Anaesthesiologists must be prepared to address potential complications associated with OLV, including hypoxia (treated with CPAP to the non-ventilated lung or intermittent

two-lung ventilation), hypercarbia (adjusting respiratory rate or switching to two-lung ventilation), increased airway pressures, and cardiovascular compromise due to cyst manipulation, which would require immediate hemodynamic support and possibly cessation of surgical manipulation.⁶

This case report discusses the anaesthetic management of a 37-year-old female who underwent surgical excision of a symptomatic pericardial cyst via right thoracotomy, highlighting the importance of tailored OLV strategies and perioperative vigilance to ensure a safe and uneventful outcome.

2. Case Presentation

A 37-year-old female, weighing 54 kg and 160 cm tall (BMI: 21.1 kg/m²), presented with complaints of intermittent chest pain and dysphagia for one year and fever since a week. There was no history of breathlessness, palpitations, or syncopal episodes. The patient reported no significant past medical history other than the presenting symptoms with a functional capacity of >4 METs. Physical examination was unremarkable, except for mild chest tenderness. Routine laboratory investigations were within normal limits, which

*Corresponding author: Naba Mateen Madoo
Email: nabamnm@gmail.com

included hemoglobin of 12.6 g/dL, hematocrit of 38.6%, white blood cell count of 10140/ μ L, platelet count of 333 x 10⁹/L, serum creatinine of 0.73 mg/dL, normal electrolytes, and a normal chest X-ray, and no known allergies. ECG shows sinus tachycardia, 2D Echocardiography demonstrated a preserved ejection fraction of 60%, with a well-defined extracardiac cyst within the pericardium causing indentation over the right atrium. No regional wall motion abnormalities or valvular pathology were noted.

Contrast-enhanced CT chest revealed a well-defined cystic lesion measuring 4.3 x 4.2 x 4.7 cm in the middle mediastinum, abutting the posterior-superior aspect of the right atrium and indenting the right wall of the thoracic esophagus without luminal compromise (**Figure 1**)

Due to the proximity of the cyst to major cardiovascular structures, a cardiac surgeon was kept on standby during the procedure as a precautionary measure in case of intraoperative complications or vascular involvement. Preparedness for massive blood transfusion was also ensured, including availability of cross-matched blood and rapid transfusion equipment.

The patient was counselled about the surgical procedure and risks associated with one-lung ventilation (OLV). Informed high-risk consent was obtained. ASA physical status was classified as II.

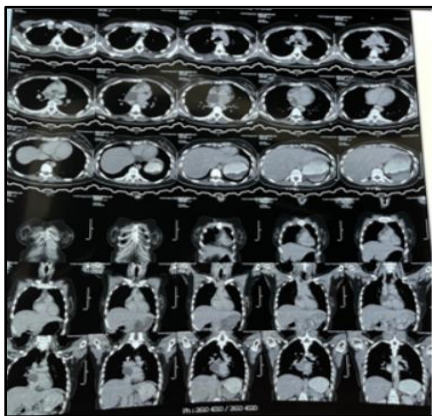


Figure 1: CECT Chest



Figure 2: Adequate right lung collapse

3. Anesthetic Management

Preoperative assessment included detailed airway evaluation, which revealed a mouth opening of more than 5 cm, thyromental distance of more than three finger breadths, full neck movement, and Mallampati classification II. Standard ASA monitors, including electrocardiography (ECG), non-invasive blood pressure (NIBP), pulse oximetry (SpO₂), capnography (EtCO₂), and temperature monitoring, were applied. An 18G IV cannula was secured in the right upper limb. After securing the IV line, a thoracic epidural was placed at the T8-T9 level using a 16-gauge Touhy needle in the sitting position under local anaesthesia, ensuring adequate analgesia for the thoracic surgery. 0.2% ropivacaine with fentanyl (2 mcg/mL) at 6 mL/hr, started post-induction and continued for 48 hours postoperatively.

Preoxygenation was performed using 100% oxygen via a tight-fitting face mask for at least 3 minutes, ensuring an end-tidal oxygen concentration (EtO₂) above 90%. The patient was premedicated with fentanyl 100 mcg, midazolam 1 mg, glycopyrrolate 0.2 mg, and ondansetron (Emset) 4 mg IV to provide sedation, prevent secretions, and reduce the risk of nausea and vomiting. Anaesthesia was induced with propofol 100 mg and cisatracurium (Cisblock) 8 mg. The airway was secured using a left-sided 35 Fr double-lumen endotracheal tube (DLT) under video laryngoscopic guidance. Correct placement was confirmed by auscultation and fiberoptic bronchoscopy. An arterial line was inserted into the left radial artery for continuous blood pressure monitoring and a central venous line was placed in the right internal jugular vein for fluid management and central venous pressure monitoring. The patient was positioned in the left lateral decubitus position. Anaesthesia was maintained with sevoflurane in a 50:50 oxygen–air mixture, supplemented by intermittent boluses of cisatracurium

One-lung ventilation (OLV) was initiated upon pleural opening by isolating the right lung to provide optimal exposure for the right thoracotomy. Mechanical ventilation was set to a lung-protective strategy with low tidal volumes (5–6 mL/kg of predicted body weight), peak inspiratory pressure limited to <30 cmH₂O, and a respiratory rate adjusted to maintain normocapnia or mild permissive hypercapnia. Positive end-expiratory pressure (PEEP) of 4–5 cmH₂O was applied to prevent atelectasis, and action of inspired oxygen (FiO₂) was titrated to maintain SpO₂ > 90%.

Continuous suction was applied to the right lung to aid in deflation during the procedure and allow better surgical access. Hemodynamics remained stable with no significant desaturation episodes during OLV

Complication management strategies included preparedness for CPAP to the non-ventilated lung, intermittent two-lung ventilation, or increasing FiO₂. No desaturation or hypercarbia occurred. Hemodynamic parameters remained within normal range: HR 70–95 bpm,

BP 110-130/70-85 mmHg, SpO₂ 98-100%, EtCO₂ 34-38 mmHg.

2.1. Surgical course

The pericardial cyst was found adherent to the pericardium and right lung. Meticulous dissection ensured complete excision without hemodynamic instability. The surgery lasted 150 minutes with an estimated blood loss of 200 ml and there were no injuries to surrounding structures, including the right atrium or esophagus. The surgical team achieved optimal exposure using the OLV strategy. Close communication with the surgical team was maintained, particularly during cyst dissection to monitor for arrhythmias or hemodynamic instability. (**Figure 2**)

2.2. Postoperative management

At the conclusion of the surgery, the patient was reversed from neuromuscular blockade and extubated uneventfully in the operating room after confirming adequate spontaneous respiration, hemodynamic stability, and full recovery of consciousness. Pain was effectively managed via the thoracic epidural catheter, and the patient reported a Visual Analogue Scale (VAS) pain score of 2/10 in the immediate postoperative period. She was subsequently shifted to the intensive care unit (ICU) for postoperative monitoring and observation. Her recovery remained uneventful.

4. Discussion

Pericardial cysts are uncommon benign lesions, most often congenital in origin, and typically discovered incidentally on imaging. They are usually located at the right cardiophrenic angle but may be found in other mediastinal regions.^{1,3} While many pericardial cysts are asymptomatic, larger cysts can cause compressive symptoms depending on their proximity to adjacent structures such as the heart, esophagus, trachea, or lungs.²

Pericardial cysts are thought to arise due to incomplete coalescence of fetal lacunae during the development of the pericardium. Several treatment modalities have been described, including percutaneous aspiration, ethanol sclerosis, or surgical resection via VATS, thoracotomy, or median sternotomy.

Surgical excision is indicated for symptomatic cysts or when malignancy cannot be ruled out.² Thoracotomy or video-assisted thoracoscopic surgery (VATS) are the standard approaches, with the choice influenced by cyst size, location, and surgeon preference.² Surgery is generally advised for symptomatic or enlarging cysts due to the potential risk of malignant transformation, infection, rupture, or compression and erosion of nearby vital structures.⁴

In our case, since the cyst was located in the middle mediastinum abutting the right atrium and thoracic esophagus, a right thoracotomy was the preferred approach to provide optimal exposure for safe excision.

OLV using a left DLT remains the gold standard for right thoracotomy. Bronchial blockers can be considered when DLT placement is difficult, such as in patients with abnormal airway anatomy.⁵ In this case, a DLT was appropriate.

From an anaesthetic perspective, several considerations are critical in such cases. One-lung ventilation (OLV) is often essential to facilitate surgical exposure in thoracic procedures.⁶ In this patient, a left-sided double-lumen tube (DLT) was used to isolate the right lung. The left-sided DLT is generally preferred due to the more predictable anatomy of the left main bronchus, especially when surgical access is on the right side.⁵

OLV is associated with physiological challenges, particularly the risk of hypoxia due to ventilation-perfusion (V/Q) mismatch. To mitigate this, we employed a lung-protective ventilation strategy using low tidal volumes, limited airway pressures, and appropriate levels of PEEP.⁷ FiO₂ was adjusted to maintain adequate oxygenation, and continuous suction to the operative lung improved surgical exposure. The intraoperative course remained stable, highlighting the effectiveness of these strategies.

In patients with SVC or airway compression, IV access in the lower limbs and a semi-recumbent position are advised to reduce risks like increased intracranial pressure. Induction of general anaesthesia can worsen airway obstruction due to loss of muscle tone and positive pressure ventilation. In such cases, inhalational induction or awake fiberoptic intubation may be preferred. However, our patient had no compressive symptoms, allowing safe administration of standard anaesthetic techniques.⁸

Pain management is another key component of thoracic anaesthesia. Effective analgesia facilitates early ambulation, respiratory effort, and overall recovery.⁹ We utilized a thoracic epidural, which provided excellent postoperative analgesia and contributed to the patient's smooth recovery, as evidenced by a low immediate postoperative VAS score.

Central venous access and invasive arterial monitoring were employed due to the proximity of the cyst to major cardiovascular structures and the need for meticulous fluid and hemodynamic management. Although no intraoperative complications occurred in this case, the anaesthesia team must always be prepared for rapid hemodynamic changes, arrhythmias, or airway compromise, especially in surgeries involving the mediastinum.⁶

Effective communication with the surgical team is essential, particularly for mediastinal surgeries where vascular or cardiac involvement may necessitate rapid intervention. Preparation for massive bleeding, arrhythmias, or airway compromise must be part of the anaesthetic plan.

This case underscores the importance of individualized perioperative planning, vigilant intraoperative monitoring, and a multidisciplinary approach in managing thoracic

surgeries involving mediastinal masses. A thorough preoperative evaluation, particularly of cardiopulmonary status, detailed airway assessment, and readiness for potential complications are vital for ensuring patient safety and optimizing outcomes.

5. Conclusion

The anaesthetic management of pericardial cyst excision, particularly via thoracotomy, necessitates a comprehensive understanding of thoracic anatomy, vigilant perioperative planning, and a multidisciplinary approach. This case highlights the importance of individualized anaesthetic strategies including meticulous airway and ventilation planning, invasive monitoring, and effective pain management through thoracic epidural analgesia. One-lung ventilation using a left-sided double-lumen tube provided optimal surgical exposure without compromising patient safety. A thorough preoperative assessment and intraoperative vigilance, along with seamless communication between anaesthesiologists and surgeons, contributed to the successful and uneventful outcome. This case reinforces the value of preparedness, adaptability, and protocol-driven care in the management of mediastinal lesions such as pericardial cysts.

6. Source of Funding

None.

7. Conflict of Interest

None.

8. References

1. Patel J, Park C, Michaels J, Rosen S, Kort S. Pericardial cyst: case reports and a literature review. *Echocardiography*. 2004;21(3):269–72.
2. de Perrot M, Fischer S, Bründler MA, Sekine Y, Keshavjee S. Thoracoscopic resection of pericardial cysts. *Ann Thorac Surg*. 2002;74(5):1707–10.
3. Shanmuganathan K, Sagel SS. Mediastinal cysts: demonstration by CT. *AJR Am J Roentgenol*. 1988;151(1):55–8.
4. Zhang WM, Maimaitiaili A, Aizezi R, Abulimiti K, Yan F, Huo Q. Surgical Management of Pericardial Cysts: A Single-Center Retrospective Study. *Cureus*. 2023;15(11):e49298
5. Campos JH. Lung isolation techniques for patients with difficult airway. *Curr Opin Anaesthesiol*. 2010;23(1):12–7.
6. Slinger P, Campos JH. Anesthesia for thoracic surgery. In: Miller RD, Eriksson LI, Fleisher LA, Wiener-Kronish JP, Cohen NH, Young WL, editors. *Miller's Anesthesia*. 8th ed. Philadelphia: Elsevier Saunders; 2015. p. 1942–2006.
7. Della Rocca G, Langiano N, Baroselli A, Pompei L, Costa MG. Perioperative lung protective ventilation strategy in thoracic surgery: where are we now? *J Thorac Dis*. 2018;10(14):S1680–4.
8. Alqassieh R, Al-Balas M, Al-Balas H. Anesthetic and surgical considerations of giant pericardial cyst: Case report and literature review. *Ann Med Surg (Lond)*. 2020;55:275–9.
9. Zubrzycki M, Liebold A, Skrabal C, Reinelt H, Ziegler M, Perdas E. Assessment and pathophysiology of pain in cardiac surgery. *J Pain Res*. 2018;11:1599–611.

Cite this article: Waradkar S, Madoo NM, Ramesh V. Anaesthetic management of a pericardial cyst excision via right thoracotomy in a young female: A case report, *Southeast Asian J Case Rep Rev*. 2025;12(2):45–48.