

Marsupialisation of Giant Bronchogenic Cyst through Right Anterior Mini-thoracotomy: A Case Report

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ABSTRACT

Bronchogenic cysts are common mediastinal lesions; however, intrapericardial occurrence is exceedingly rare. The authors report the case of a 50-year-old female who presented with persistent cough and right shoulder pain of three months' duration. The patient is a known case of systemic hypertension and diabetic type 2 for 5 years and patient was taking medication for the same for 5 years, bronchial asthma, or pulmonary tuberculosis. Clinical examination was unremarkable. Contrast-Enhanced Computed Tomography (CECT) of the chest revealed a large, well-defined intrapericardial cyst causing significant compression of the Left Atrium (LA) and displacement of adjacent mediastinal structures without evidence of invasion. Given the symptomatic presentation and anatomical complexity, surgical management was undertaken. The patient underwent marsupialisation through a minimally invasive right anterior mini-thoracotomy. Intraoperatively, the cyst was found to be densely adherent to surrounding vital structures, including the pulmonary artery and LA, precluding safe complete excision. Approximately, 200 mL of thick mucinous fluid was aspirated, and the cyst wall was opened, everted, and plicated. The postoperative course was uneventful. The patient was extubated early, remained haemodynamically stable, and was discharged on Postoperative Day (POD) 4. Histopathological examination confirmed the diagnosis of a bronchogenic cyst. At the six-month follow-up, the patient remained asymptomatic, with no evidence of recurrence. The present case highlights marsupialisation as a safe and effective alternative in selected complex cases where complete excision carries significant risk.

Keywords: Cardiac compression, Foregut malformation, Intrapericardial lesion, Surgical drainage technique

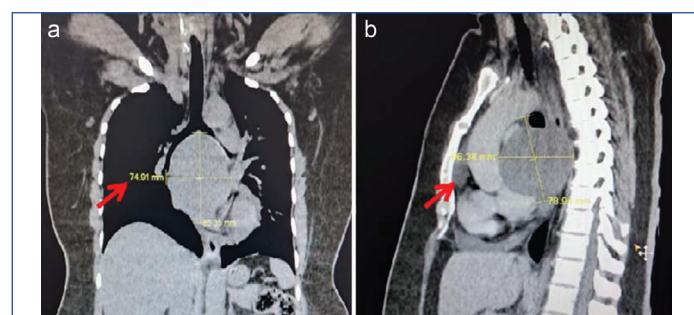
CASE REPORT

A 50-year-old female presented with persistent cough and right shoulder pain for three months, with no associated cardiac or respiratory symptoms. The patient is a known case of systemic hypertension and diabetic type 2 for 5 years and patient was taking medication for the same for 5 years. There was no prior history of coronary artery disease, bronchial asthma, or pulmonary tuberculosis.

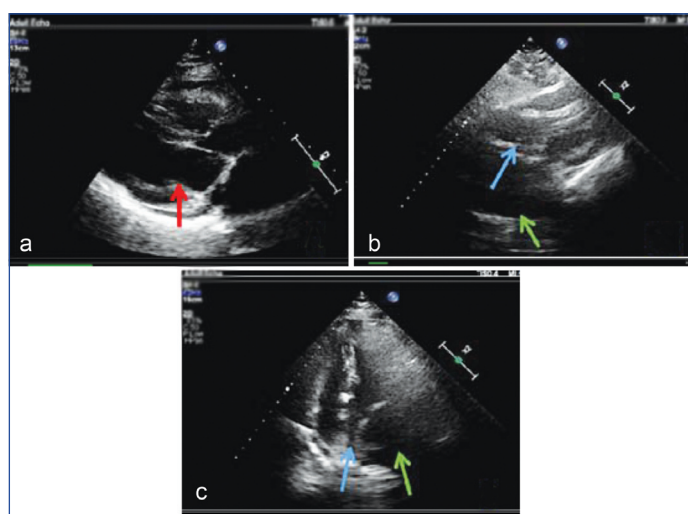
Physical examination and laboratory investigations were unremarkable.

Chest radiograph revealed a retrosternal mass. CECT chest showed a well-defined, thin-walled homogeneous cystic lesion in the subcarinal region, involving the middle mediastinum [Table/Fig-1]. The cyst caused splaying of the carina, narrowing of the left main bronchus, and compression of the LA, without evidence of infiltration. Echocardiogram confirmed normal biventricular function with left atrial compression [Table/Fig-2].

After induction of anaesthesia with a 35 Fr left-sided double-lumen tube for lung isolation, the patient was positioned in left lateral decubitus. A



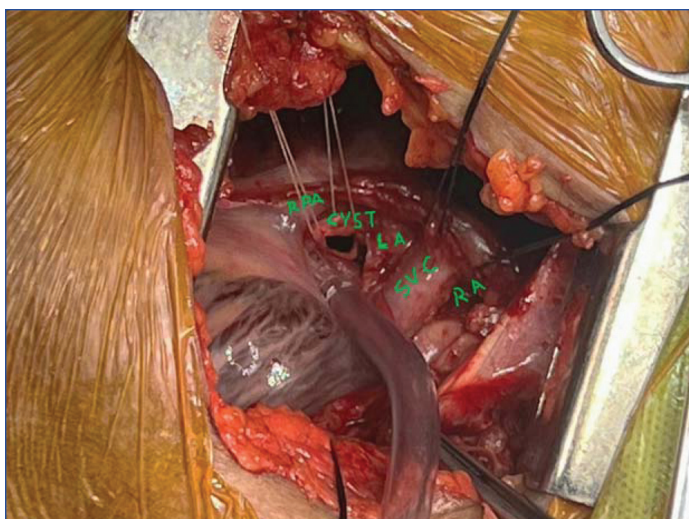
[Table/Fig-1]: CECT of the Chest showing an intrapericardial cyst; a) Coronal view demonstrating a well-defined, fluid-attenuating cystic lesion (red arrow) in the middle mediastinum; b) Sagittal view confirming the cyst's close relation to the LA and pulmonary artery (red arrow), consistent with an intrapericardial bronchogenic cyst.



[Table/Fig-2]: Transthoracic echocardiography showing a cystic lesion compressing cardiac chambers: a) Parasternal long-axis view showing an anechoic cystic structure (red arrow) adjacent to the LA; b) Apical four-chamber view revealing extrinsic compression over the LA (blue arrow) and left ventricle (green arrow); c) Modified apical view again demonstrating the cyst (blue arrow) causing mild indentation over the posterior wall of the LA (green arrow).

6 cm right anterior mini-thoracotomy was made in the 5th intercostal space. The pericardium was opened 2 cm anterior to the right phrenic nerve. The cyst was identified intra-pericardially, encircling the Superior Vena Cava (SVC) and occupying the space between the Right Pulmonary Artery (RPA) and the roof of the LA with dense adhesions [Table/Fig-3]. SVC was carefully dissected and looped for retraction. The cyst was punctured, and Approximately, 200 mL of thick whitish mucinous fluid was aspirated. Samples were sent for microbiology and histopathology.

Due to dense adhesions and proximity to vital structures, complete excision was not feasible without resorting to cardiopulmonary bypass or deep hypothermic circulatory arrest. Hence, marsupialisation was



[Table/Fig-3]: Intraoperative image showing the intrapericardial bronchogenic cyst. The cyst (labelled CYST) is seen intimately adherent to the Right Pulmonary Artery (RPA), superior vena cava (SVC), and LA. Right Atrium (RA) and pericardial reflections are also visualised. Marsupialisation was performed to avoid injury to adjacent vital structures

performed: the cyst wall was widely opened, everted, and plicated with horizontal mattress sutures (2-0 Ethibond with pledgets). The cavity was irrigated with povidone-iodine (Betadine). A 28 Fr pleural drain was placed, and layered closure was completed.

The patient was extubated on table and shifted to Intensive Care Unit (ICU) with stable haemodynamics. The drain was removed on POD 1, and she was discharged home on POD 4. Histopathology with Haematoxylin and Eosin (H&E) stain confirmed the diagnosis of bronchogenic cyst [Table/Fig-4a-c]. At 6-month follow-up, she remained asymptomatic with no recurrence on imaging.

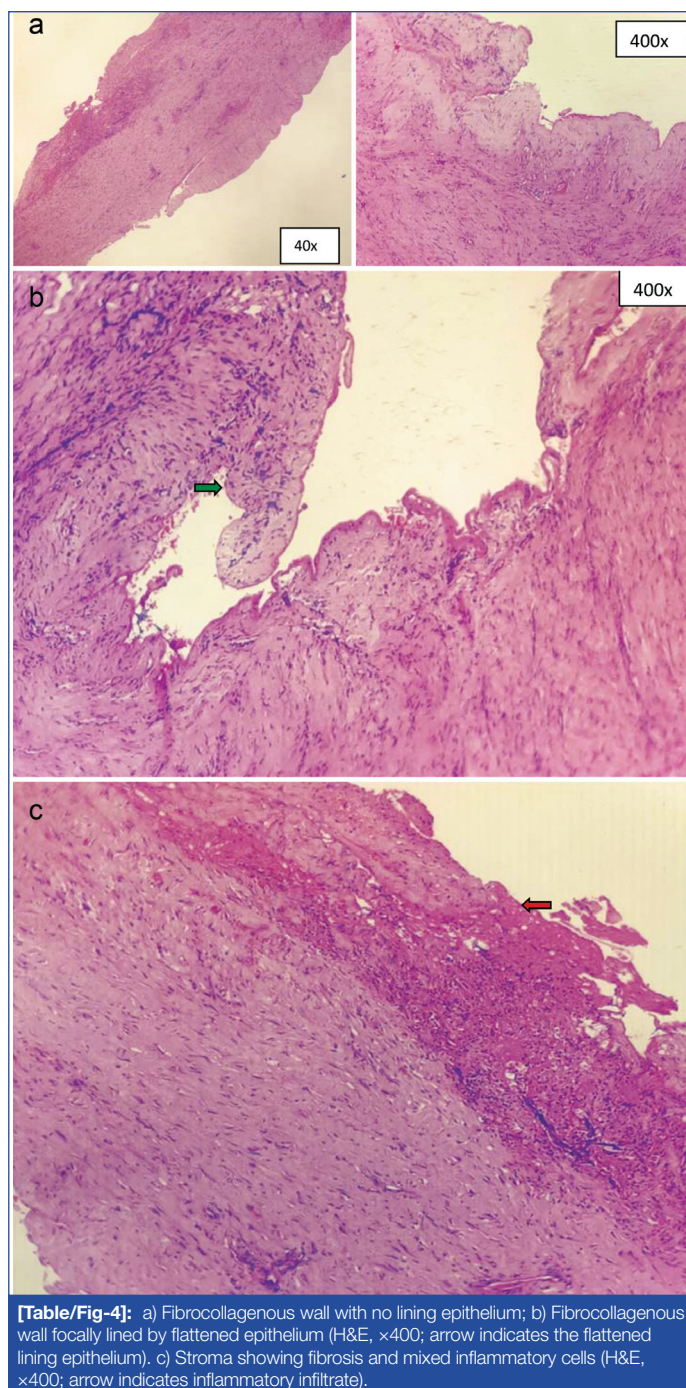
DISCUSSION

Bronchogenic cysts are congenital anomalies derived from the primitive foregut, representing 10-15% of mediastinal tumours and 50-60% of mediastinal cystic lesions [1]. Although most bronchogenic cysts are asymptomatic, they may present with compressive symptoms or complications such as infection, bronchial fistula, pneumothorax, or rarely, malignant transformation [1].

Complete surgical excision is the standard management for most mediastinal bronchogenic cysts and is associated with low recurrence rates and excellent long-term outcomes [2]. In recent years, minimally invasive approaches such as Video-Assisted Thoracoscopic Surgery (VATS) and robotic-assisted surgery have gained popularity due to their advantages of reduced postoperative pain, shorter hospital stay, and faster recovery [2,3]. Preoperative differential diagnoses considered were thymoma, thymic hyperplasia, lymphoma, germ cell tumour, retrosternal goiter, and thymic cyst. These were ruled out based on radiological characteristics, intraoperative findings, and histopathological confirmation of a bronchogenic cyst.

In the present case, although a mini-anterior thoracotomy provided excellent exposure, the cyst's intimate adherence to the pulmonary artery, SVC, and LA rendered total excision unsafe. Therefore, marsupialisation, a rarely reported but viable alternative, was chosen. This technique ensured effective drainage, minimised the risk of recurrence, and avoided injury to vital mediastinal structures. Additionally, the limited incision contributed to reduced postoperative pain and faster recovery.

Several similar cases have been reported in the literature. Martinod E et al., described twenty patients with mediastinal bronchogenic cysts who underwent thoracoscopic surgery. Complete thoracoscopic excision was successfully performed in 13 cases. Conversion to thoracotomy was required in seven cases due to intraoperative bleeding in two patients and dense adhesions to vital structures in five patients [4].



[Table/Fig-4]: a) Fibrocollagenous wall with no lining epithelium; b) Fibrocollagenous wall focally lined by flattened epithelium (H&E, x400; arrow indicates the flattened lining epithelium). c) Stroma showing fibrosis and mixed inflammatory cells (H&E, x400; arrow indicates inflammatory infiltrate).

Similar operative difficulties have been reported in a 53-year-old female with a giant bronchogenic cyst causing recurrent respiratory infections and cardiac compression, where thoracoscopic resection required conversion to thoracotomy because of severe pleural adhesions and intraoperative bleeding. Such cases highlight the importance of tailoring the surgical approach according to cyst size, adhesions, and proximity to vital mediastinal structures [5].

Aydin Y et al., documented 13 cases of mediastinal cysts managed via VATS, and observed that proximity to major vessels was a key determinant in the choice of technique; in two patients, complete excision was abandoned in favour of partial resection and drainage due to the risk of vascular injury [6]. These reports corroborate our experience and reinforce the role of marsupialisation as a safe and effective alternative when complete excision carries prohibitive risk.

CONCLUSION(S)

The present case demonstrated that marsupialisation through a minimally invasive anterior thoracotomy is a safe and effective alternative for managing complex intrapericardial bronchogenic cysts when standard excision poses excessive risk. Individualised surgical planning remains critical to achieving optimal outcomes.

Acknowledgement

The authors wish to acknowledge the writing support of Dr Kavitha Babu, Research Writer, SRM MCH& RC during the preparation of the case report, which helped in preparing the draft.

Authors’ contribution: NRR, SVI are the lead surgeons for the case and performed clinical analysis; SD is the cardiac anaesthesiologist; AA performed all the radio diagnosis. NRR prepared the manuscript. All authors read and approved the final version of the manuscript.

Funding statement: The authors gratefully acknowledge the financial support by SRM Medical College Hospital and Research Centre, Faculty of Medicine and Health Sciences, SRMIST, Kattankalathur, Chengalpattu, Tamil Nadu, India, for bearing the defrayed costs of publishing the present article.

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AUTHOR DECLARATION:

- Financial or Other Competing Interests: As declared above
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

PLAGIARISM CHECKING METHODS: [\[Jain H et al.\]](#)

- Plagiarism X-checker: Feb 03, 2026
- Manual Googling: May 21, 2026
- iThenticate Software: May 23, 2026 (7%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

Date of Submission: [Jan 08, 2026](#)
Date of Peer Review: [Mar 10, 2026](#)
Date of Acceptance: [May 26, 2026](#)
Date of Publishing: [Sep 01, 2026](#)