Pericardial cyst: revisited

Alok K. Sharma[a], Surendra Patel[b], Danishwar Meena[a], Mritunjay Kumar[c], Manoj Kamal[d], Atul Kaushik[e]

Departments of [a]Cardiothoracic and Vascular Surgery, [b]Trauma and Emergency Cardiothoracic Surgery, [d]Anaesthesiology and Critical Care, [e]Cardiology, All India Institute of Medical Sciences, Jodhpur, Rajasthan, [c]Department of Anaesthesiology, Critical Care and Pain Medicine, All India Institute of Medical Sciences, Delhi, India

Correspondence to Surendra Patel, Mch, Department of CTVS, All India Institute of Medical Sciences, Basni Industrial Area Phase II, Jodhpur, Rajasthan 342005, India.
Tel: +91-9460153747;
e-mail: drsurendrapatel15@yahoo.com

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Pericardial cysts are rare mediastinal abnormalities, which are usually congenital but may also be acquired after cardiothoracic surgery. Pericardial cysts are most commonly located at the cardiophrenic angle or, rarely, in the posterior or anterior superior mediastinum. The majority of pericardial cysts are asymptomatic and are found incidentally on imaging studies. Our case was an 18-year-old female with a diagnosis of ostium secundum atrial septal defect (ASD). She was planned for surgical closure of ASD. On the opening of the pericardium, a pericardial cyst of around 3.0×2.0-cm size, filled with clear fluid, was found in the aorta–pulmonary artery groove. Marsupialization of the cyst was done followed by routine direct suture closure of ASD. Postoperative recovery was uneventful, and the patient was discharged on the third postoperative day. Histopathology of tissue confirmed our diagnosis. Our aim to present this case report is to show an incidental finding of the pericardial cyst at a rare location and to discuss its perioperative implications.

Keywords:
atrial septal defect, marsupialization, mediastinal cyst, pericardial cyst

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Introduction

Pericardial cysts are rare benign intrathoracic lesions and most commonly located at a cardiophrenic angle (51–70% on the right-side angle and 22–38% on the left-side angle) or, rarely, in the posterior or anterior superior mediastinum or other atypical locations (8–11%) [1]. About 50–75% of pericardial cyst are asymptomatic [2,3] and have an uneventful natural course. Symptomatic pericardial cyst presents with dyspnea, chest pain, or persistent cough.

Case report

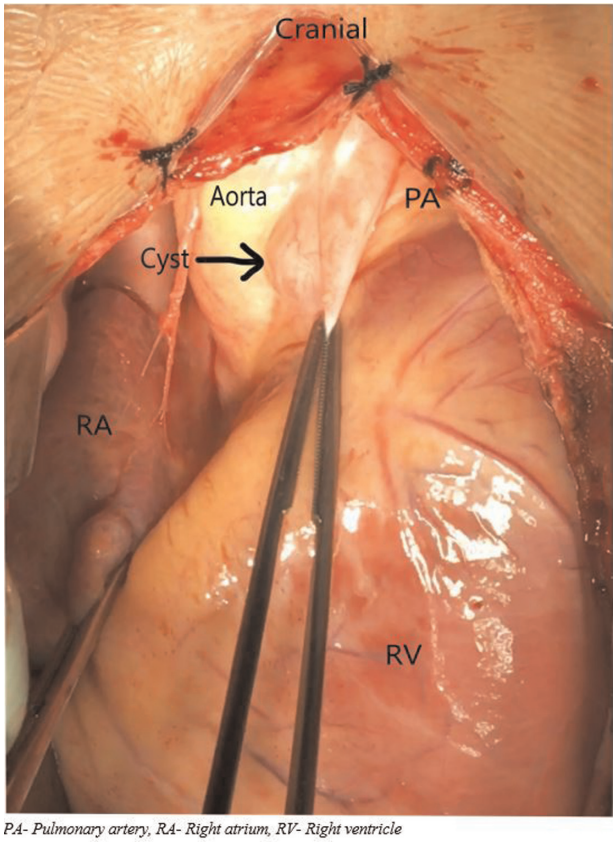
An 18-year-old female patient came to our outpatient department with complaints of shortness of breath and mild chest pain for the last 6–7 months. Transthoracic two-dimensional echocardiogram revealed a large ostium secundum atrial septal defect (ASD) (28 mm) with a left-to-right shunting. On opening of the pericardium for ASD closure, we found a unilocular pericardial cyst filled with clear fluid, around 3.0×2.0-cm size, in the aorta–pulmonary artery groove (Fig. 1). Marsupialization of the cyst was done and the cyst wall was sent for histopathological examination. ASD was closed using direct suture-closure technique on standard cardiopulmonary bypass. Postoperative recovery was uneventful, and the patient was discharged on the third postoperative day. Histopathological examination of excised tissue showed a fibrocollagenous cyst wall containing a few smooth muscle fibers, adipocytes, and a few congested vessels. The cyst was lined by a single layer of mesothelial cells consistent with pericardial cyst.

Discussion

Pericardial cyst occurs in 1/100 000 individuals and accounts for 7% of mediastinal masses and 33% of all mediastinal cysts [4,5]. It is mostly detected incidentally in middle-aged adults without any sex predilection. Although mostly of congenital origin, it may also result from pericarditis, bacterial or parasitic infection (hydatid cyst), trauma, and cardiac surgery. These benign intrathoracic lesions are most commonly located at a right cardiophrenic angle in 51–70% of patients and in 22–38% of patients on the left cardiophrenic angle [1]. Pericardial cysts are found rarely in the posterior or anterior superior mediastinum or other atypical locations [1]. Our patient was a young female, and the cyst was located in the middle mediastinum in the groove between the aorta and pulmonary artery, which is quite a rare presentation of the pericardial cyst [1,6].

Congenital pericardial cysts are formed as a result of the failure of fusion of one of the mesenchymal lacunae that form the pericardial sac [5]. Most of these cysts do not cause any symptoms (50–75%) and are found

Figure 1



PA- Pulmonary artery, RA- Right atrium, RV- Right ventricle

Location of the pericardial cyst.

incidentally during routine chest radiograph or echocardiography [2]. The symptomatic pericardial cyst usually presents with dyspnea, chest pain, fever, persistent cough, hemoptysis, or easy fatigability, and is the result of compression of adjacent anatomical structures like superior vena cava, right or left atrium, right or left ventricle, right main bronchus, or infection [2]. X-ray chest usually shows smooth, round homogeneous radiodensity present at either of the cardiophrenic angle (right>>left) touching the anterior chest wall and posteriorly to the hemidiaphragm [7]. Large-sized cysts or those with more than 5-mm thick wall can be visualized on echocardiography [8]. Additionally, used diagnostic methods include computed tomography (CT) scan and MRI. The pericardial cyst appears as oval, thin-walled, and well-defined homogeneous masses on cardiac CT with fluid attenuation slightly more than the water. On MRI, they have a distinctive manifestation of intermediate-to-low signal intensity on T1-weighted sequences and high signal intensity on T2-weighted sequences. MRI helps in precise localization and characterization and is considered to be the best modality for the diagnosis and follow-up of a pericardial cyst [8]. The differential diagnosis of PC includes tumors (from the heart, pericardium, mediastinum, and diaphragm), ventricular aneurysm, pericardial hematoma, foramen of Morgagni diaphragmatic hernia, and a large pericardial fat pad [9,10].

Pericardial cysts are usually unilocular, smooth, and vary in size from 2 to 28 cm[5]. In our patient, it was unilocular, smooth-walled, and had a size of 3.0×2.0 cm. Complications of pericardial cysts include rupture, hemorrhage in the cyst, erosion into adjacent structures like SVC, right-ventricular wall, and bronchus, cardiac tamponade, and even sudden death can occur [11]. Management of pericardial cyst depends on the symptoms. If the patient is asymptomatic, serial echocardiography is enough. However, if the patient is symptomatic or reveals an increase in the size of the cyst or has a solid component in the cyst cavity in the serial follow-up, incidentally found during any other cardiac–thoracic surgical procedures, a cyst resection is warranted by thoracotomy or sternotomy or video-assisted thoracic surgery [2]. Aspiration of the cyst has also been used, but one-third of the patients have shown recurrence.

Perioperative management of pericardial cyst is dependent on its size, location, and the resultant compression on adjacent structures. There is a rare association of autosomal-dominant polycystic kidney disease with pericardial cysts, so evaluation of renal function may be imperative. Perioperative concerns for large pericardial cysts may include [12]:

(1) Compression of SVC and the right atrium, leading to decreased preload necessitating wide-bore intravenous cannula (in the lower limbs too) and fluid resuscitation.
(2) Compression of right-ventricular or left-ventricular outflow tract obstruction – chances of hypotension, induction with drugs with minimum hemodynamic consequences, and use of vasopressors.
(3) Compression of the bronchus – difficulty in lying supine or airway collapsibility after anesthetic induction. May need awake fiber-optic intubation or inhalational induction.
(4) Rupture of the infected cyst may lead to intrathoracic contamination. If it is a hydatid cyst, a severe allergic or anaphylactic reaction can happen.
(5) Arrhythmias, especially supraventricular arrhythmia – correction of hypovolemia, hypoxia, or electrolyte abnormalities during the perioperative period.

(6) Pain relief for sternotomy/thoracotomy or video-assisted thoracic surgery – using opioid boluses or infusion, thoracic epidural, paravertebral block, serratus anterior plane block, intravenous paracetamol, and NSAIDs.

Enlargement of the pericardial cyst at the aortopulmonary groove can result in airway and pulmonary outflow tract obstruction. Our patient had no symptoms because of the pericardial cyst, and as it was an incidental finding, diagnosed while performing open-heart surgery for ASD, we managed it by doing marsupialization of the pericardial cyst, but we should be aware of the presence of such anomaly and associated concerns.

Conclusion

Although most of pericardial cysts are benign intrathoracic masses and most are asymptomatic and diagnosed incidentally, we are reporting this case due to its very rare location in the aorta–pulmonary artery groove in the middle mediastinum and very few reported cases in the young-age group [6].

Compliance with ethical standards

This study was not funded by any institution, and there was no conflict of interest. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from individual participants included in the study.

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Conflicts of interest

There are no conflicts of interest.

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