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Case Report

An unusual site of a pericardial cyst in a child: A case report☆,☆☆

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ABSTRACT

Pericardial cysts are rare congenital anomalies, often clinically silent and incidentally found on imaging. However, patients with pericardial cysts may present with chest pain, tachypnea, and, rarely, symptoms secondary to cardiac tamponade. Echocardiography (transthoracic or transesophageal) and chest computed tomography (CT) scan with contrast are diagnostic modalities of choice in patients with pericardial cysts. Conservative management is justified in asymptomatic patients, while a surgical approach is recommended in symptomatic patients. Here, we describe the case of a 12-year-old boy who underwent imaging during the coronavirus disease 2019 (COVID-19) pandemic and was incidentally found to have a pericardial cyst.

Introduction

A *pericardial cyst* is a congenital anomaly induced by the herniation of the pericardial sac in the fetus. It is a rare clinical entity with an estimated incidence of 1 per 100,000. These benign lesions in the middle mediastinum represent about 6%-7% of all mediastinal masses. Previous studies concluded that a pericardial cyst forms when communication with the pericardial cavity becomes obliterated. Most patients are asymptomatic at diagnosis. However, patients with pericardial cysts may present symptoms resulting from compression of adjacent structures or complications due to infection, rupture, or hemorrhage. Mass effect on the right-sided cardiac chambers can lead to engorged superficial veins, hepatomegaly, and ascites [1]. The clinical manifestations include chronic cough,

Abbreviations: CXR, chest X-ray; CT, computed tomography; COVID-19, coronavirus disease 2019; ED, emergency department; CPAM, congenital pulmonary airway malformation; PCR, polymerase chain reaction.

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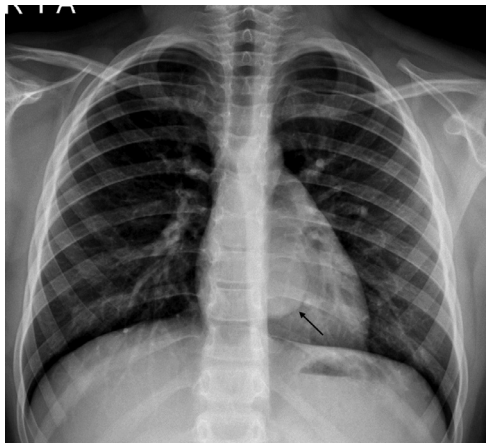

Fig. 1 – Chest X-ray (CXR) shows a well-defined oval lesion in the left paravertebral region behind the cardiac shadow (black arrow).

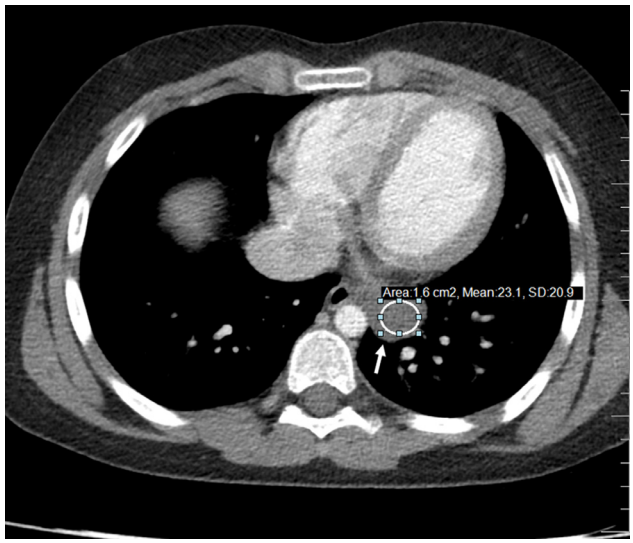

Fig. 2 – On the axial image of the thorax in postcontrast computed tomography (CT) scan, there is a well-defined low-attenuated lesion inferior to the left pulmonary vein in continuation with pericardium in favor of pericardial cyst (white arrow).

chest pain, dyspnea, retrosternal pressure sensation, or sudden respiratory distress [1,2]. The right cardiophrenic angle is shown to be the most frequent location of pericardial cysts (70%), followed by the left cardiophrenic angle (22%) and rarely posterior or anterior mediastinum (8%). A pericardial cyst is often detected on the chest X-ray (CXR) as a soft tissue density. However, further studies such as transthoracic echocardiography and computed tomography (CT) scans can be performed to delineate tissue characteristics. On CT scans, pericardial cysts often appear as well-defined ovoid homogenous masses [3]. Although short follow-up periods with echocardiography are considered conservative management of pericardial cysts, surgical resection is recommended in symptomatic patients or patients with growing pericardial cysts [1].

Case presentation

We present a 12-year-old boy with posterior mediastinal opacity incidentally detected on CXR. During the coronavirus disease 2019 (COVID-19) pandemic, he was referred to the pediatric medical center due to upper respiratory symptoms. Approximately 3 days prior to admission, he suffered from a runny nose, frequent sneezing, and a severe sore throat. He also complained of mild epistaxis the night before admission, followed by bloody sputum before arrival at the emergency department (ED). Physical examination revealed a dry nose. However, no respiratory distress or abnormal breath sounds were detected. Due to cough productive of bloody sputum, hemoptysis secondary to epistaxis was among the first in the differential diagnosis list. He was unvaccinated against COVID-19 and had no significant past medical history. Because of the COVID-19 pandemic, his initial medical workup contained a negative polymerase chain reaction (PCR) test. CXR was also performed for further evaluation. No lung parenchymal tissue involvement was demonstrated on CXR, except for a well-defined soft tissue opacity in the left paravertebral region behind the cardiac shadow (Figs. 1 and 3). According to the differential diagnoses of this cystic lesion, such as congenital pulmonary airway malformation (CPAM) or hydatid cyst, a chest CT scan with contrast was ordered. A well-defined low-attenuated lesion adjacent to the pulmonary vein behind the left atrium was evident on the CT scan along the pericardium, consistent with a pericardial cyst (Figs. 2 and 3).

Moreover, transthoracic echocardiography confirmed the presence of a pericardial cyst abutting the posterior wall of the left atrium (Fig. 4). The upper respiratory symptoms of the patient resolved after a few days. Hemoptysis did not recur. He remained asymptomatic, and the mass did not increase in size during the 6-month follow-up.

Discussion

A pericardial cyst is a benign congenital aberration, usually less than 5 cm in diameter. Pericardial cysts are often discovered incidentally on imaging modalities, with the right cardiophrenic angle being the most common location [3]. Our patient's lesion was 35 × 21.7 mm in diameter and was found on CXR for an unrelated clinical condition. The cyst was adjacent to the left lower pulmonary vein on the CT scan, a unique location for pericardial cysts. Transthoracic echocardiography is a common modality for diagnosing pericardial cysts [1].

Antonini-Canterin introduced 2 cases of pericardial cysts that were diagnosed by transesophageal echocardiography due to their unusual locations. The cyst was detected in the posterior of the right pulmonary artery in the first patient. However, the cyst of the other patient was located in the inlet of the left atrium and interfered with the drainage of pulmonary veins. Transesophageal echocardiography was used

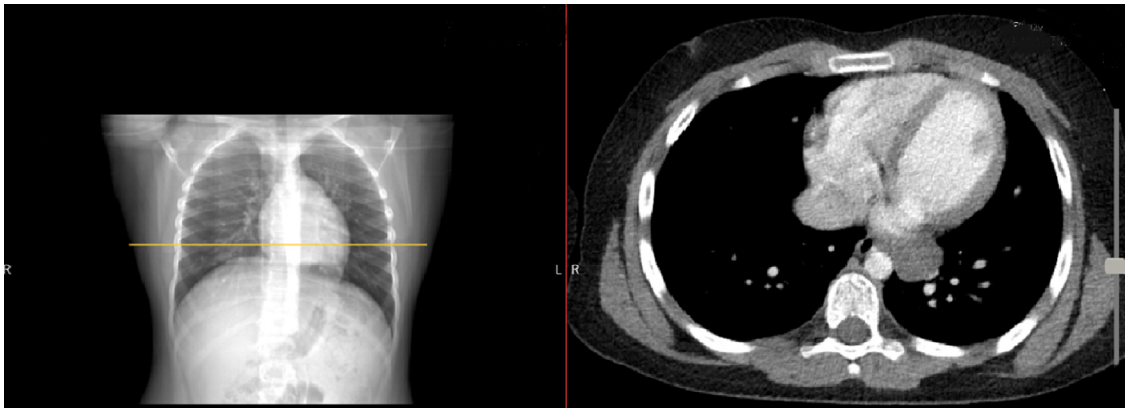

Fig. 3 – A same cut in the chest X-ray (CXR) and the axial image of the thorax in postcontrast computed tomography (CT) scan shows a well-defined lesion in continuation with the pericardium.

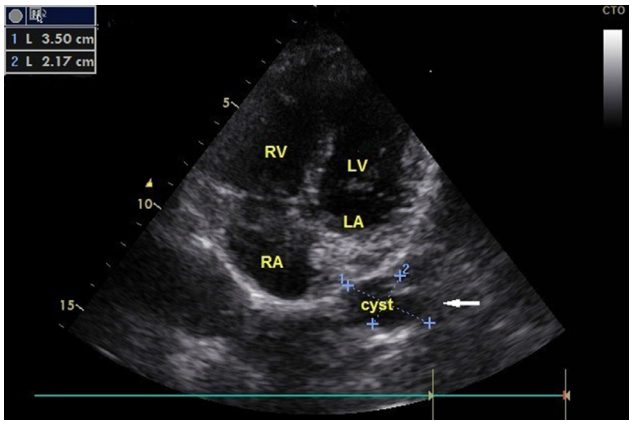

Fig. 4 – Apical 4-chamber view of transthoracic echocardiography demonstrates a 35 x 21.7 mm cystic lesion abutting the posterior wall of the left atrium (white arrow). LA, left atrium; RA, right atrium; LV, left ventricle; RV, right ventricle.

to assess the definite diagnosis of lesions in these 2 patients. Meanwhile, the other differential diagnoses, such as aneurysms, were ruled out [4].

In most patients, pericardial cysts are identified between the third and fifth decades of life [1]. In contrast, it was diagnosed in our patient at the age of 12 years.

Considering the most common ages at which pericardial cysts develop, solid tumors, neurogenic tumors, sarcoma, lymphoma, and bronchogenic carcinoma should be among the first in the differential diagnosis list. However, differential diagnoses may be different in our patient in terms of age range, including diaphragmatic hernia, bronchogenic cyst, abscess, and large vessel aneurysm [5].

Although most patients remain clinically silent, pericardial cysts may occasionally present with cough, dyspnea, or chest pain. Despite the benign nature of pericardial cysts, they can cause fetal complications such as cardiac tamponade [1].

Treatment options for these cysts include observation, percutaneous drainage, and surgical excision [1].

In asymptomatic cysts such as our patient, conservative management with echocardiographic follow-up is justified because pericardial cysts tend to resolve spontaneously [3]. During follow-up visits, physicians assess whether the cysts have ruptured, become infected, or are hemorrhagic. They also evaluate any mass effects on vital structures [1].

Surgical removal is the definitive treatment for pericardial cysts due to the low risk of complications [1,3]. It remains to be determined whether surgical excision can be considered a treatment of choice in cases with a younger age at diagnosis, such as our patient, to prevent rare fatal complications.

Conclusion

Pericardial cysts are rare benign structures and are often clinically dormant. Conservative management with regular echocardiographic follow-up is recommended in asymptomatic patients. However, surgical excision is considered a choice in symptomatic patients.

Author contributions

Conceptualization, F.M. and R.S.; methodology, F.M., N.P., R.R. and Z.R.; validation, F.M. and Z.R.; formal analysis, F.M. and R.S.; investigation, Z.R., N.P. and R.R.; resources, F.M.; writing—original draft preparation, Z.R.; writing—review and editing, F.M.; writing—revision, F.M.; visualization, F.M. and Z.R.; project administration, F.M., R.S. and Z.R.; funding acquisition, none. All authors have read and agreed to the published version of the manuscript.

Ethics approval and consent to participate

The authors declare that the work described has been carried out in accordance with the Declaration of Helsinki of the

World Medical Association revised in 2013 for experiments involving humans.

Availability of data and materials

All of the data for the current study are available.

Patient consent

The authors declare that this report does not contain any personal information that could lead to the recognition of the patient. Written informed consent for the publication of this case report was obtained from our patient and his parents.

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