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## Case Report

## Pericardial cyst: An unusual cause of chest pain

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## ABSTRACT

Pericardial cysts are uncommon paracardiac lesions, usually located within the right cardiophrenic space. They usually do not cause symptoms and are detected by chance. Chest X-ray, echocardiography, and chest computed tomography or magnetic resonance imaging are useful diagnostic tools. We report a case of a man with symptomatic pericardial cysts of unusual location, review the literature, and discuss the diagnostic approach and treatment options.

**<Learning objective:** Pericardial cysts are uncommon mediastinal lesions, diagnosed safely when suspected by echocardiography and computed tomography or magnetic resonance imaging. An invasive therapeutic approach should be preferred in symptomatic cases.>

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## Introduction

Pericardial cysts represent benign mediastinal tumors that are diagnosed mostly by chance, as they rarely cause symptoms. Most of them are located in the right cardiophrenic space with diameters ranging from 1 to 5 cm [1,2]. During the differential diagnosis of patients with chest pain, clinicians must be aware of this group of lesions, when localized pericardial effusion is noted with echocardiography. Nevertheless, after safe diagnosis, the best treatment strategy seems not to be clearly defined and a direct invasive therapeutic approach should be the option only for patients with overt symptoms and indications.

## Case report

A 51-year-old man presented to our emergency department (ED) due to worsening left-sided pleuritic chest pain for three days. He described recurrent symptoms during the last year for which he was taking painkillers occasionally. He denied having shortness of breath, cough, fever, or syncope/palpitations and his past medical history was unremarkable. A chest X-ray was negative for cardiomegaly but revealed an abnormal round opacity behind the left heart shadow (Fig. 1a). An acute coronary event was ruled out by serial normal electrocardiograms (ECGs) and biochemistry.

Transthoracic echocardiographic study revealed normal chamber sizes and left ventricle (LV) systolic function, without regional wall motion abnormalities. There was no valvular heart disease and no pericardial effusion. A large cyst-consistent mass was notable behind the left apex (Fig. 1b). The patient underwent chest magnetic resonance imaging (MRI) and the study identified a 4 cm × 6 cm × 10 cm thin-walled cyst with no solid components at the left cardiophrenic angle, between left cardiac apex and left lateral thoracic wall. The location and morphology were typical of a pericardial cyst (Fig. 2a–c). MRI also revealed a second, much smaller (1 cm) pericardial cyst adjacent to the right posterolateral wall of left atrium (Fig. 2d). The patient was referred for thoracic surgical evaluation. The significantly larger left pericardial cyst was considered responsible for the patient's symptoms and the surgical approach via thoracotomy was preferred over video-assisted thoracoscopy in the preoperative evaluation. The patient underwent successful surgical excision of the large cyst at the left cardiophrenic angle. The removed thin-walled cyst was unilocular, contained serous fluid and consisted of a layer with mesothelial cells and collagenous tissue. No evidence of inflammation, hemorrhage or malignancy was detected. At his 18-month follow-up the patient remained totally asymptomatic with no echocardiographic evidence of recurrence.

## Discussion

Pericardial cysts are uncommon, benign paracardiac lesions. They represent about 6–7% of total mediastinal masses. Over 75% of them are right-sided and about 22% left-sided, located within

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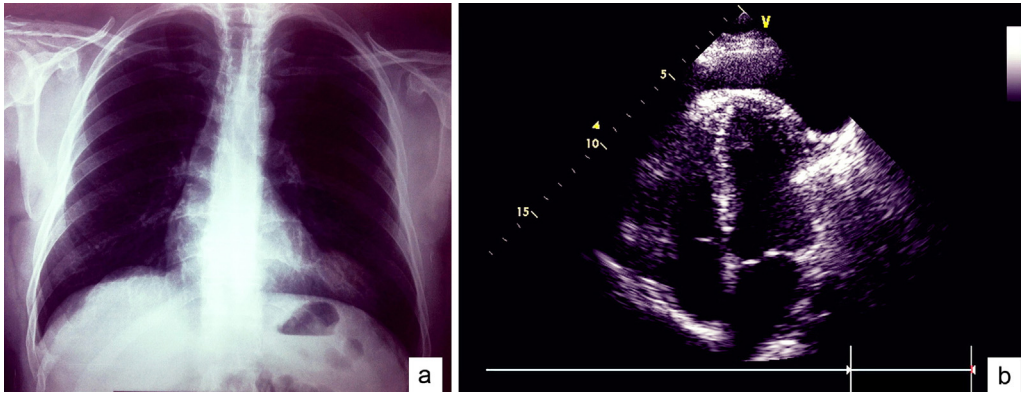


Fig. 1.

Chest X-ray posteroanterior view suggestive of a left cardiophrenic mass (a). Apical four-chamber view of transthoracic echocardiogram revealing an oval, fluid-filled, echolucent structure, adjacent to the left ventricular apex and a further smaller, rounded structure projecting into the left atrium (b).

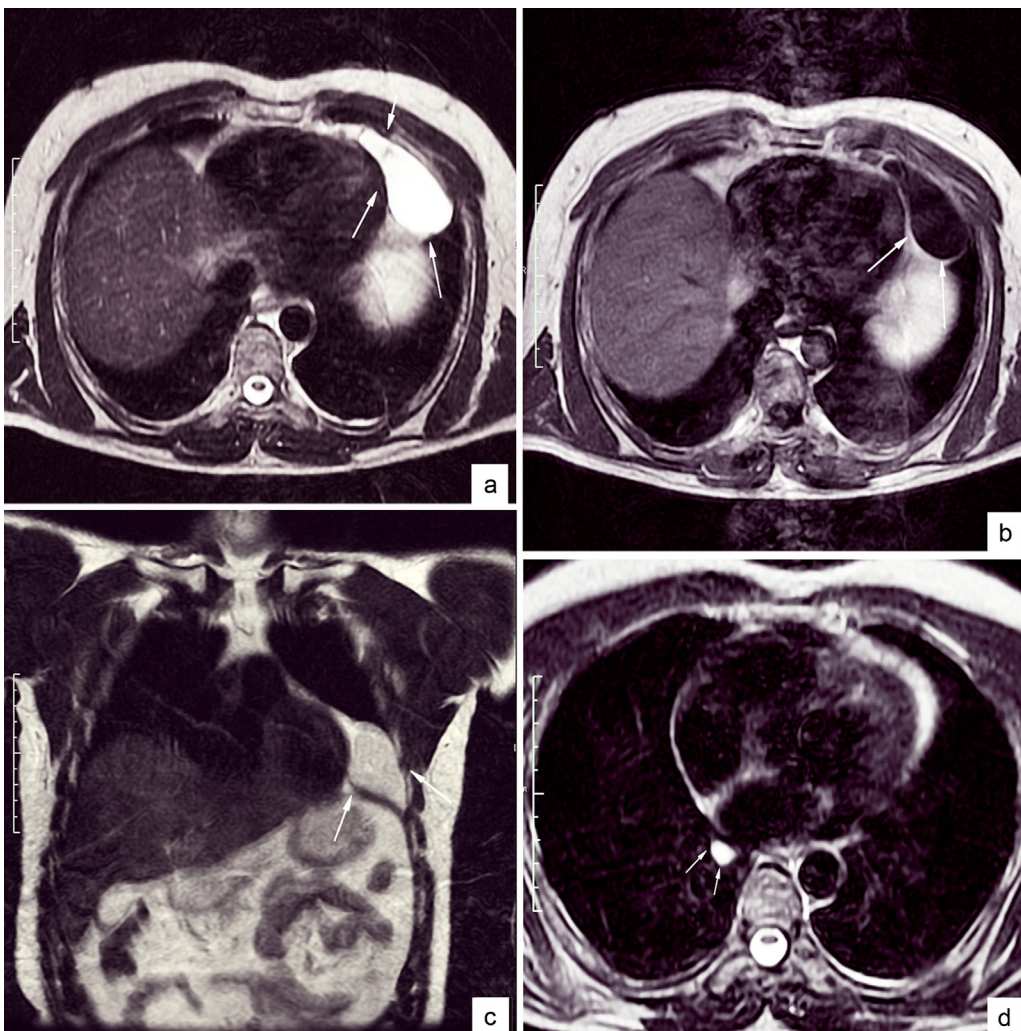


Fig. 2.

Chest magnetic resonance imaging. Axial T2 (a) and T1 (b) weighted images at the same level depict a water density structure with thin walls (arrows) located at the left cardiophrenic angle, establishing the diagnosis of pericardial cyst. Coronal T2 weighted images of the lesion located at the left cardiophrenic angle (c). Axial T2 weighted image depicts a smaller pericardial cyst located adjacent to the right posterolateral wall of the left atrium (d).

the cardiophrenic spaces with diameters ranging usually between 1 and 5 cm, although larger cysts have also been reported [1–3]. This patient had two cysts at unusual locations, causing symptoms. There were a large-sized cyst (maximum diameter of 10 cm) at the left cardiophrenic angle and a further smaller one near the left

atrium. To our knowledge, no symptomatic patient with more than one pericardial cyst has been reported till date.

Chest X-ray, echocardiography, and chest computed tomography or MRI are useful diagnostic tools. Echocardiography is indispensable for bedside evaluation of a patient presenting with

chest pain in the ED. Moreover, it helps in recognizing the location of the cyst and differentiating a cyst from other masses, as ventricular aneurysm, prominent fat pad, or solid tumor [4]. The appearance of a cyst on chest MRI is a non-enhanced, oval, homogenous paracardial structure, implanted on the pericardium [5]. In addition, there is no connection with pericardial space, opposed to pericardial diverticulae, where a complete wall cannot be identified in all parts of the lesion.

Most of the pericardial cysts are clinically silent and are usually detected by chance. Asymptomatic patients should be followed up to ensure a benign disease course and to monitor for possible symptom occurrence. Common symptoms are recurrent chest pain, shortness of breath or cough, dysphagia, albeit some cysts can also lead to rare complications, as cardiac compression, right ventricular outflow tract obstruction, rupture and tamponade, cyst infection, pneumothorax, atrial fibrillation, or even sudden death [3].

Pericardial cysts rarely require invasive management [1,2]. Treatment options include surgical removal, video-assisted thoracic surgery, or percutaneous echocardiography-guided aspiration and depend strongly on the characteristics and location of the cyst and the patient's surgical risk [1,2,6]. In experienced centers, endoscopic resection with video-assisted thoracoscopy, a minimally invasive approach, is the treatment of choice regarding classically located cysts. Complete excision should be performed to avoid recurrence. However, the best treatment appears not to be clearly defined and

the benefit of an invasive approach should always be individualized and weighed against the procedural risks regarding patients with symptoms attributed to relatively small- or medium-sized cysts. Surgical treatment should be reserved for patients with growing cysts, severe symptoms, and complications or when diagnosis is uncertain and malignancy is suspected.

#### Conflict of interest

None to declare.

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