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Case report

Left-Sided Pericardial Cyst Mimicking Acute Coronary Syndrome

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Abstract

Pericardial cysts are rare clinical entities mostly asymptomatic and detected incidentally. Albeit rare, many complications are reported and extend from cough and dyspnea to sudden cardiac death. The case presented herein is the first large and localized hemorrhagic pericardial cyst mimicking an acute coronary syndrome (ACS) with intense chest pain, precordial ST-segment elevation, and elevated troponin.
Following thorough investigations, this cyst appeared to be associated with moderate pericardial effusion explaining myopericarditis as a cause of the findings listed. After surgical excision, the patient experienced relief of his symptoms, and Serial electrocardiograms (ECG) post-operative were normalized.

Keywords: ***hemorrhagic cyst, pericardial diseases, echocardiography, electrocardiogram, cardiac magnetic resonance, chest pain, acute coronary syndrome***

Introduction

A pericardial cyst is a rare non-neoplastic tumor developing in the pericardium. It is mainly considered a congenital anomaly but can be acquired. It is usually asymptomatic and incidentally discovered on routine chest imaging. In rare cases, it is symptomatic due to the subsequent risk of infection, compression of adjacent structures, or cyst rupture. Thereby, it can cause pneumonia, constrictive pericarditis, heart failure, arrhythmias, syncope, superior vena cava compression, cardiac tamponade, and sudden cardiac death [1].

The case presented below is the first case of a hemorrhagic cyst mimicking an acute coronary syndrome (ACS).

Case Presentation

A 71-year-old male farmer presented to the emergency department for atypical intense substernal chest pain radiating to the neck and interscapular area. The pain started several weeks prior to presentation and was associated with increasing frequency until occurring at rest. It was aggravated by inspiration, with partial alleviation when leaning forward.

A review of systems was significant for dry cough, mild exertional dyspnea, and palpitations. There was no history of chest trauma. The remaining systemic examination was unremarkable.

Past medical history included hypertension well controlled on Amlodipine, Ramipril, and Bisoprolol. He didn't undergo any previous surgeries and hadn't received any blood thinner. His medical family history is irrelevant for heart disease. He doesn't use tobacco, alcohol, or recreational drug.

Differential diagnosis included acute coronary syndrome, aortic dissection, pericarditis, pulmonary embolism, and gastrointestinal related diseases.

An Electrocardiogram (ECG) was done showing atrial tachycardia and Q-wave with a high take-off ST segment over V2-V3 precordial leads (**Figure 1**)

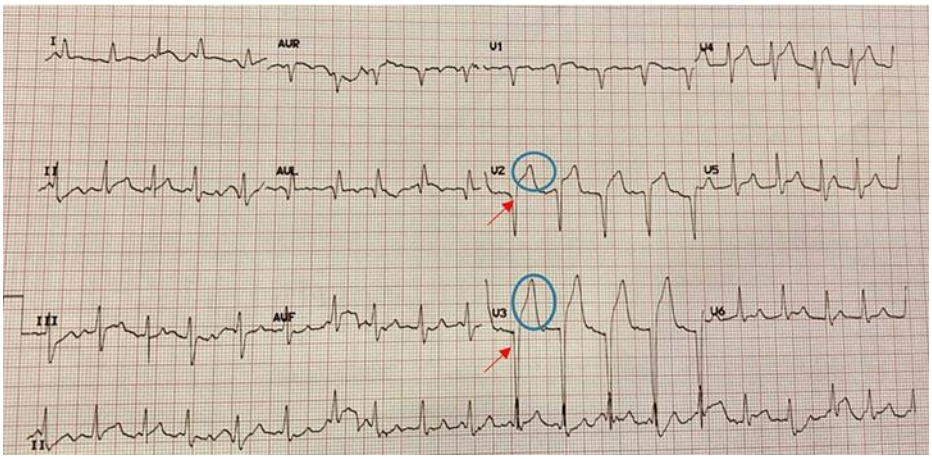
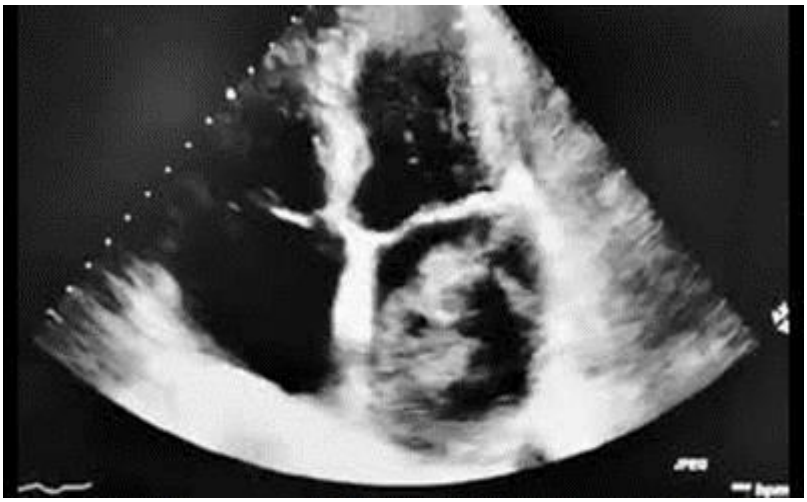


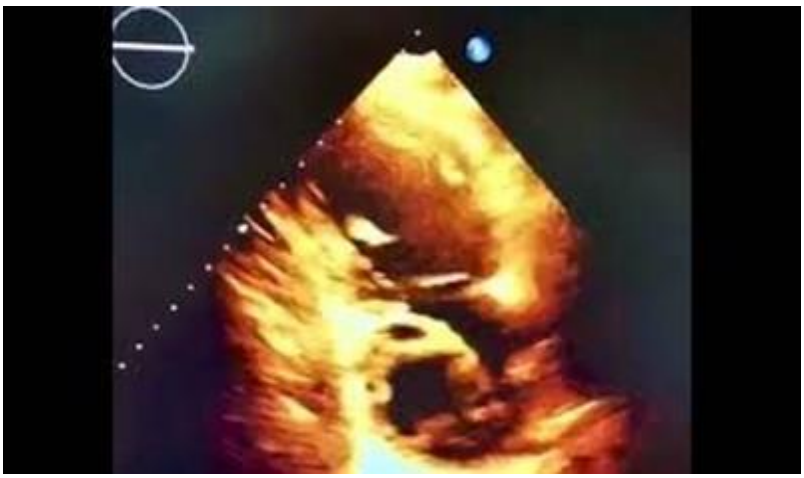
Figure 1: Electrocardiogram (ECG) showing atrial tachycardia and Q- wave with a high take-off ST segment over V2-V3 leads
Q-wave (red arrows)
High take-off ST segment (blue circles)

A fourth-generation troponin T assay was mildly elevated (0.05 ng/ml). A complete blood count showed mild normocytic normochromic anemia with leukocytosis. A drawn CRP was highly elevated (25 mg/dl).

Bedside chest X-ray showed splaying of the carina with bulging of left atrial appendage and no double density sign noticed. The abnormal troponin and the persistent ST-segment elevation raised concern about an ongoing ACS. Left heart cardiac catheterization was performed showing no coronary artery stenosis explaining an ischemic event. Transthoracic echocardiography (TTE) was performed showing preserved systolic function without regional wall motion abnormalities or evidence of aortic root dissection. A mild pericardial effusion was noted with elevated filling pressures. A septate echo-lucent, round, and cystic- appearing mass was seen overlying the left atrium (LA) that couldn't be well appreciated as interatrial or pericardial (**Video 1 to 2**).



Video 1: A transthoracic echocardiography with apical 4-chamber view showing a large septate echo-lucent, round and cystic-appearing mass overlying the left atrium
View video here: https://youtu.be/ka8ZT_fc-b4



Video 2: A transthoracic echocardiography with apical 2-chamber view showing a large septate echo-lucent, round and cystic-appearing mass overlying the left atrium
View video here: https://youtu.be/FBz8EIl6mbg

An urgent chest computed tomography angiography (CTA) was ordered to rule out pulmonary embolism and further define this mass location. It showed a left bilocular cystic periatrial formation with a superior and inferior diameter of 47 mm and 67 mm respectively. This large cyst was compressing the LA and was associated with mild bilateral pleural effusion and moderate pericardial effusion. There was no evidence of pulmonary embolism. For further evaluation, Cardiac magnetic resonance (CMR) was done and showed a pericardial mass compressing the hypo-perfused LA compared to the myocardium with heterogeneous gadolinium enhancement. The ventricular myocardium showed normal perfusion at rest without hyperemia suggestive of inflammation. The atrial myocardium perfusion wasn't well appreciated. Moreover, there was no evidence of Late Gadolinium Enhancement (LGE) uptake in the myocardium signaling the absence of fibrosis and scarring (**Figure 2**).

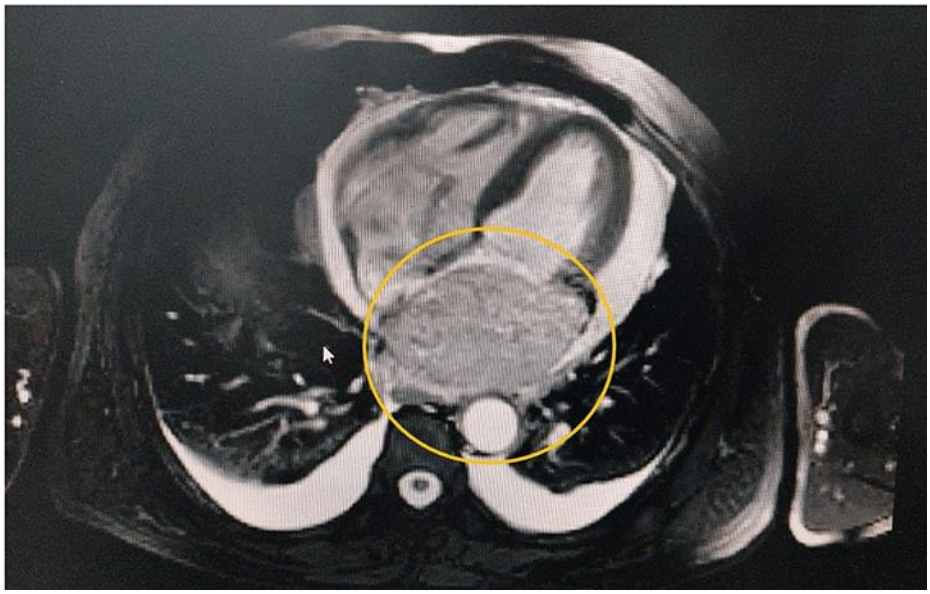


Figure 2: T2-weighted cardiac magnetic resonance imaging showing a pericardial mass compressing the left atrium
Pericardial mass (yellow circle)

The differential diagnosis of this pericardial cyst included hydatid cyst knowing that the patient's occupation places him at risk, but Echinococcus Granulosus serology was negative. The patient was referred to surgery. This cystic formation was evacuated and showed organizing hematomas with focal aggregates of inflammatory cells. No other type of tissue was identified, and cultures returned negative. ECGs normalized several days post-operative (**Figure 3**).

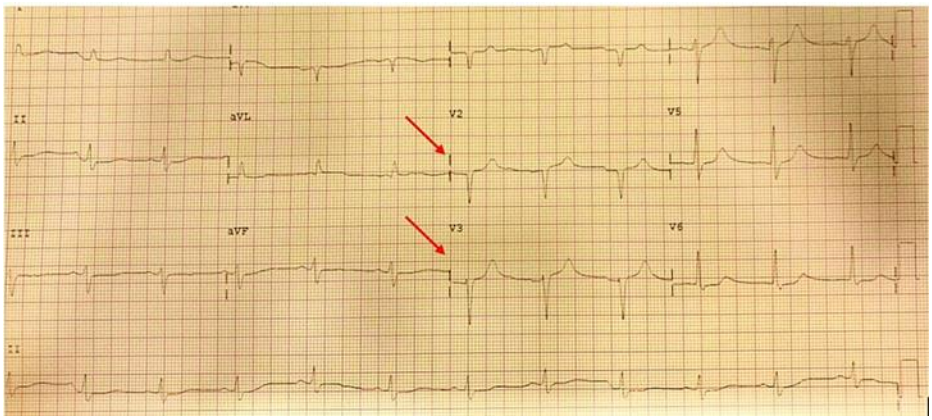


Figure 3: Post-operative electrocardiogram (ECG) showing normalization of V2-V3 leads

Discussion

Pericardial cysts are uncommon abnormal growth. They are estimated as 6% of mediastinal masses and 33% of mediastinal cysts. They are mainly asymptomatic and not discovered until a routine chest imaging is performed [2].

Pericardial cysts can be congenital or acquired post cardiothoracic surgery, trauma, infection, or chronic inflammation [2]. The main infection that can cause a pericardial cyst is the Echinococcus Granulosus, especially in endemic regions. A literature review has shown that the hydatid cyst can imitate ACS without an artery stenosis on cardiac catheterization [3,4]. Otherwise, it can be hemorrhagic as per our case. To our knowledge, there have only been around 6 reports of hemorrhagic pericardial cysts [5]. The reason behind hemorrhagic cysts remains not fully identified. Reported cases suggest risk factors for pericardial hematoma. Patients are more susceptible after open cardiac surgery if there's abnormal bleeding or coagulopathy, early use of anticoagulants, re-do surgery, valve replacement, or aortic surgery [6]. However, we didn't find any of those in our patient.

Albeit around 70% of pericardial cysts are silent, large cysts can cause a compression of adjacent structures resulting in various symptoms, such as chest discomfort, dyspnea, and cough [2]. These cysts can in dramatic cases lead to life-threatening conditions, such as cardiac tamponade. In our case, the patient was in severe recurrent chest pain with ST elevation on ECG and positive troponin.

The differential diagnosis of pericardial mass lesions includes benign, malignant primary, secondary metastatic pericardiac tumor, or nonneoplastic mass [7].

TTE is considered the first-line imaging in the assessment of pericardial disease [7]. Echo-lucent mass will probably represent

fluid-filled consistencies, while echo-dense mass is predilected for solid lesions [8].

Furthermore, a blood-filled cyst is more echo-lucent in the acute phase while in the chronic phase it becomes denser, which makes it tougher to differentiate from a solid mass [6]. In this case, the cyst was echo-lucent.

For further assessment, CT or CMR is recommended to raffinate the diagnosis with morphologic and physiologic features. CT is more accurate in evaluating calcified masses. Invasive modalities such as cardiac catheterization are reserved only for hemodynamic assessment and depending on the patient's presentation [8]. In our case the CTA showed a moderate pericardial effusion and the CMR and cardiac catheterization eliminated any coronary artery compression. These findings raised the suspicion of myopericarditis along with elevated CRP.

Treatment of hemorrhagic cysts in asymptomatic patients is usually conservative with a regular follow-up by performing serial TTE. In symptomatic patients or patients experiencing enlarging of the growth, surgery may be needed, urgently sometimes, due to a life-threatening condition [1]. Since our patient was symptomatic with presumptive myopericarditis, surgical cystic resection via sternotomy was performed.

Oguri et al. [5] underscore the possibility of having a hemorrhagic cyst with an underlying inflammatory process. In our case, the pathology showed inflammatory cells and the TTE revealed an echo-lucent cyst apparently in the acute phase. However, we cannot decide whether the myopericarditis led to the hemorrhagic cyst or vice versa.

This report is significant because of the rare presentation as chest pain, the ECG findings mimicking ACS and found to be due to myopericarditis, and the presence of hemorrhagic cyst without any coagulation- related risk factors Post-operative ECGs were normalized few days later. The patient was discharged with an uneventful recovery.

Conclusions

Physicians should be aware that pericardial cysts may manifest clinically as acute coronary syndrome. The pericardial cyst should be considered in the differential diagnosis of acute chest pain. The case also emphasizes the possibility of having a hemorrhagic pericardial cyst in a patient that has never been on blood thinners and has never undergone any surgical intervention

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