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Hemorrhagic Pericardial Cyst Mimicking Pleural Effusion

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Abstract

This case report describes a rare hemorrhagic pericardial cyst in a 19-year-old male who presented with pleural effusion, chest pain, and dyspnea. Imaging studies, including echocardiography and chest computed tomography, revealed a pericardial cyst with significant effusion. The patient underwent thoracotomy for cyst removal and drainage, with histopathological analysis confirming the cyst's benign nature. Postoperative recovery was uneventful, with resolution of symptoms and no recurrence at three-month follow-up. This case underscores the importance of considering pericardial cysts in young patients with unexplained chest pain and dyspnea, demonstrating the effectiveness of surgical intervention.

Subject Areas

Cardiology

Keywords

Pericardial Cyst, Hemorrhagic Pericardial Cyst, Pleural Effusion, Thoracotomy

1. Introduction

Pericardial cysts are rare congenital anomalies caused by abnormal development of somatic cavities. They are most commonly located at the right anterior costophrenic angle but can also be found at the left anterior costophrenic angle or other areas within the mediastinum [1]. While most pericardial cysts are asymptomatic, larger cysts can cause symptoms such as chest pain, cough, dyspnea, and cardiac arrhythmias [2]. They occur in approximately 1 in 100,000 individuals and account for 7% of mediastinal masses, making them the third most common cystic

masses in the mediastinum. Most cases are discovered in the third or fourth decade of life [3]. Congenital factors are the primary cause, though pericardial cysts can also arise from inflammation, trauma, surgical complications, or chronic hemodialysis. We present a case of a 19-year-old man with a hemorrhagic pericardial cyst in an uncommon location, accompanied by recurrent pericardial effusion.

2. Case Presentation

A 19-year-old male was in his usual health until two weeks prior to admission, when he began experiencing symptoms of an upper respiratory tract infection and chest pain. He was initially treated elsewhere for a chest infection, but his condition did not improve by the time of admission. His chest pain was accompanied by significant exertional dyspnea, although he did not report nausea, vomiting, or abdominal pain.

Upon admission, the patient was hemodynamically stable. ECG results showed diffuse T-wave inversion and ST-segment depression with negative cardiac markers. Echocardiography indicated an ejection fraction of 60% with moderate to severe pericardial effusion, predominantly posterior, and moderate to severe circumferential effusion involving the right and left atria. A circular mass measuring 5.7 × 4.3 cm was observed without signs of invasion on the left side. Another circular mass measuring 0.7 × 1 cm was found posterior to the first mass. Chest CT with IV contrast confirmed a large pericardial effusion, with a maximum thickness of 4 cm at the left lateral wall, along with small bilateral pleural effusions (**Figure 1**). No evidence of pneumothorax, consolidations, lymphadenopathy, or nodules was found.

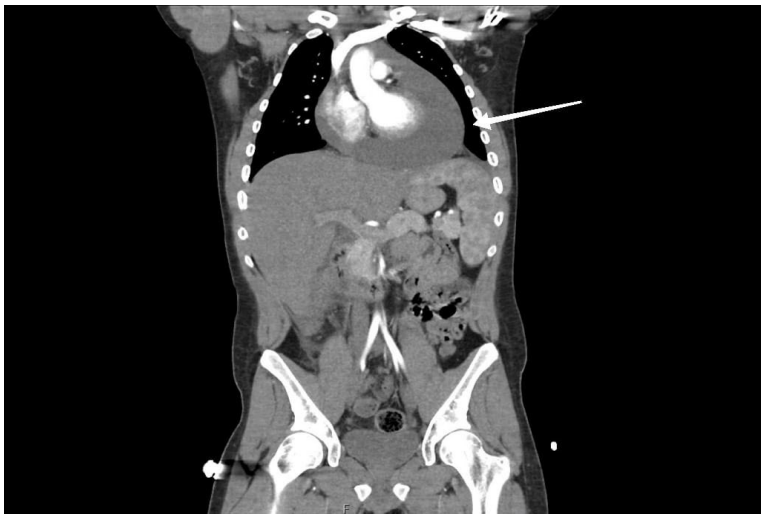

Figure 1. Axial CT imaging of left-sided thoracic masses and associated large pericardial effusion.

Pericardiocentesis was performed, draining approximately 2800 cc of fluid. A 10 cc sample of bloody fluid sent for analysis revealed mixed inflammatory cells and clusters of reactive mesothelial cells. No malignant cells were detected, sug-

gesting a benign etiology. Serial echocardiographic evaluations indicated recurrent pericardial effusion with fibrin tissue and a pericardial cyst. A pericardial-pleural window procedure was performed, draining pleural fluid and excising the pericardial cyst along with multiple biopsies. The pathology report indicated that the pericardial cyst exhibited features of a mesothelial cyst (Figure 2) with prominent hemorrhagic changes (Figure 3) and no evidence of malignancy. The left lung cystic lesion showed a dense histiocytic infiltrate, mostly reactive, with a single non-caseating granuloma. Immunostaining was positive for CD68 in histiocytes but negative for S100 and CD1a. Additional immunostains were negative, as were PAS, Giemsa, and ZN special stains. The pericardium exhibited fibrofatty tissue with mild chronic inflammation and prominent hemorrhagic changes, without evidence of malignancy.

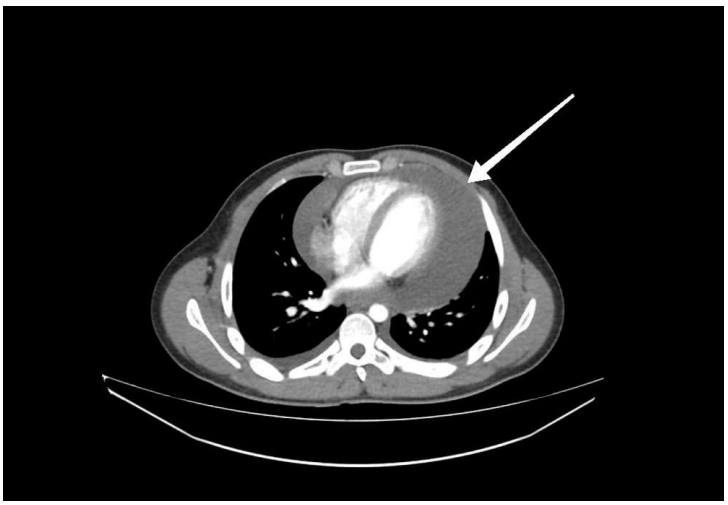

Figure 2. Histopathological findings of pericardial cyst with mesothelial lining cells.

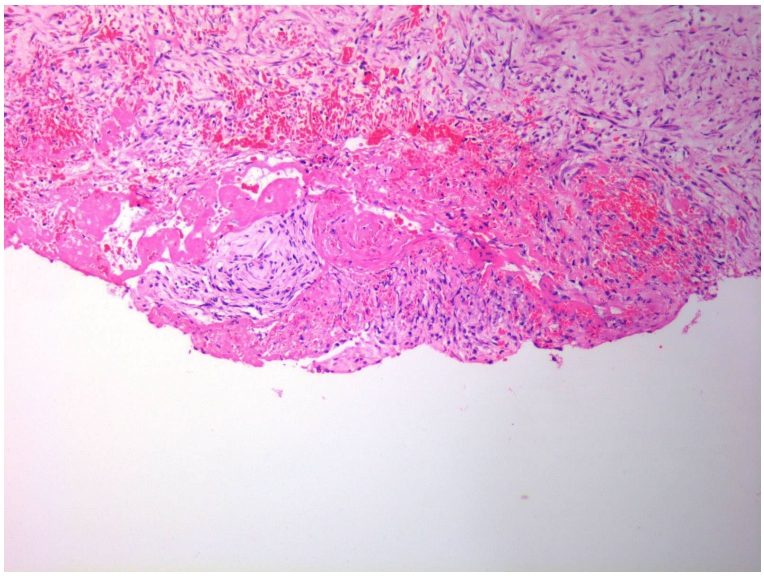

Figure 3. Histopathological image showing prominent hemorrhagic changes with hemosiderin pigment deposition.

The patient was discharged and managed with colchicine, indomethacin, and esomeprazole to prevent complications. Colchicine was administered to reduce the risk of recurrent pericardial effusion and inflammation, while indomethacin provided anti-inflammatory and analgesic effects. Esomeprazole was added to mitigate potential gastrointestinal side effects associated with NSAID use, ensuring a safe and effective recovery. At a 3-month postoperative follow-up, he was in good health with no recurrence of pericardial effusion.

3. Discussion

General pericardial cysts are benign, fluid-filled congenital anomalies, often asymptomatic and discovered incidentally. They occur in approximately 1 in 100,000 individuals, accounting for about 7% of mediastinal masses, and are typically unilocular, filled with clear fluid, and located at the right cardiophrenic angle [3]. General pericardial cysts are benign, fluid-filled congenital anomalies, often asymptomatic and discovered incidentally. They occur in approximately 1 in 100,000 individuals, accounting for about 7% of mediastinal masses, and are typically unilocular, filled with clear fluid, and located at the right cardiophrenic angle. [3]-[5]

Pericardial cysts vary in size, ranging from 2 to 28 cm in diameter, and larger cysts may compress adjacent structures, leading to symptoms. Approximately 70% of these occurrences are located at the right cardiophrenic angle. [6]. The most common etiology is primarily congenital, arising from the failed fusion of mesenchymal lacunae during embryonic development. Other causes include inflammation (e.g., rheumatic pericarditis, tuberculosis, echinococcosis), trauma, surgical complications, and chronic hemodialysis. [7]

While more than 50% of patients with pericardial cysts are asymptomatic, symptomatic cases may present with chest pain, cough, or dyspnea due to compression of adjacent structures. Approximately 30% of patients develop pronounced symptoms, such as chest pain and shortness of breath. [3]

This article presents a case of symptomatic pericardial cysts associated with pericardial effusion, characterized by the presence of hemorrhagic fluid in a 19-year-old male patient. This case is significant due to its atypical location and recurrent episodes of pericardial effusion. Imaging revealed benign cystic characteristics with no evidence of malignancy. Cytological analysis confirmed the benign nature of the cyst, consistent with findings that benign cysts typically show non-malignant cytological profiles.

CT scans and echocardiography are essential non-invasive modalities for accurately delineating the cyst's location and differentiating it from other diagnoses, such as prominent fat pads or left ventricular aneurysms. [2]

The management of pericardial cysts is guided by symptoms. For asymptomatic cases, conservative monitoring with transthoracic echocardiography is recommended. Symptomatic cysts may be treated with percutaneous aspiration and ethanol sclerosis, as suggested by the European Society of Cardiology [8]. However,

aspiration alone carries a high recurrence rate. Video-assisted thoracoscopy is preferred for symptomatic cysts causing compression, offering reduced invasiveness, shorter hospital stays, and faster recovery. In complex cases involving large, hemorrhagic, or recurrent cysts, a thoracotomy or median sternotomy may be necessary for complete removal and histopathological examination. Stereotactic radiotherapy may be considered in rare cases where surgery is not feasible [9] [10]. In this case, a pericardial window via thoracotomy was performed to ensure continuous drainage and prevent fluid re-accumulation.

4. Conclusion

While most pericardial cysts follow a benign course, they can occasionally lead to serious complications such as cyst rupture, cardiac tamponade, and right ventricular outflow obstruction. Timely diagnosis and intervention are crucial to prevent these adverse outcomes. This case highlights the importance of considering benign etiologies like pericardial cysts in young patients presenting with pericardial effusion and underscores the effectiveness of a multidisciplinary approach in management. To optimize patient outcomes, regular echocardiographic follow-up is recommended, particularly for those with a history of hemorrhagic or symptomatic presentations. A collaborative approach involving cardiologists, radiologists, and thoracic surgeons is essential for comprehensive care. Patients should be educated to recognize symptoms of recurrence, such as chest pain or dyspnea, and adhere to scheduled follow-up visits to ensure early detection and intervention if complications arise. These strategies aim to enhance long-term care, improve diagnostic and therapeutic approaches, and ultimately improve patient outcomes.

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Conflicts of Interest

The authors declare no conflicts of interest.

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