

Pericardial Diverticulum: A potential hidden diagnosis

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Abstract

Introduction:

Pericardial cysts are simple, serous fluid containing collections most frequently located near the right cardiophrenic angle. They are a rare entity constituting 7% of all mediastinal tumors occurring in 1/100,000 patients.² In 10% of pericardial cysts, a communication is present between the cyst and the pericardium called a pericardial diverticulum.^{1, 3} Histologically, the cysts are lined with a single layer of mesothelial cells surrounded by collagen and elastic fibers and contain a water-like fluid. They vary in size from 2-3cm to rarely as large as 28cm.

The cysts are most often congenital, although can be acquired most often through cardiothoracic surgery. A pericardial diverticulum usually results from the gradual stretching of a portion of the inner serous layer of the parietal pericardium herniating through the weakened outer fibrous layer of pericardium.

Pericardial cysts are most commonly found incidentally on chest imaging; although, they can cause symptoms mainly through pressure of the cysts on adjacent organs. Echocardiogram with color doppler can help further differentiate and delineate the exact positioning.

Complications of pericardial cysts include rupture, erosion into adjacent structures, including the right ventricular wall and superior vena cava, cardiac tamponade, mitral valve prolapse, obstruction of right mainstem bronchus and atrial fibrillation.

Treatment for pericardial cysts and diverticulum is not well-defined but usually is conservative unless the patient is symptomatic since these lesions are benign and often located next to the phrenic nerve which can make surgical excision difficult.^{1, 3}

Case Presentation:

A 44 year old female with a past medical history of type 1 diabetes, chronic kidney disease stage 3, hypertension, hyperlipidemia, hypothyroidism presented with shortness of breath at an outside facility where she was diagnosed with nephrotic syndrome with recurrent bilateral pleural effusions. She received 5 thoracentesis before being transferred for pleurodesis evaluation.

During the right-sided VATS, a pericardial cyst was noted to be protruding into the right hemithorax. The pericardial cyst was excised but then it was noted that a pericardial diverticulum was also present. A pericardial window was then performed followed by the planned pleurodesis. Pathology confirmed a benign mesothelial cyst but also reported focal chronic inflammation on the specimen; however, the patient has no known history of pericarditis, cardiothoracic surgery or rheumatologic disease.

While initially all of the patient's dyspnea was correlated with her bilateral pleural effusions, it is possible that part of her dyspnea was related in part to the pericardial diverticulum. Given her shortness of breath, multiple images of the chest were done prior including chest radiograph, transthoracic echo and chest CT but none revealed a pericardial cyst. This could be due to her large pleural effusions obscuring the imaging and the lack of IV contrast due to chronic kidney disease.

Final Diagnosis and Outcome:

Pericardial cysts are rare, benign, mostly congenital mesothelial cysts with pericardial diverticulum being even more rare. Patients are typically asymptomatic but can have vague symptoms including dyspnea and atypical chest pain making them difficult to distinguish when other heart and lung comorbidities are present. These other comorbidities can further complicate the diagnosis by obscuring imaging findings. In our case during VATS, a pericardial diverticulum was discovered incidentally. Development of the pericardial diverticulum could be either related to idiopathic pericarditis or congenital factors. While the best course of treatment is not well defined for these lesions, in our patient it was resected due for increased symptom management.

Learning Objectives

Describe common features, complications, outcomes and treatment for pericardial cysts and diverticulum

Diagnosis pericardial cysts and diverticulum

Identify obstacles to diagnosis of pericardial cysts and diverticulum