Pericardial Cyst: Case Reports and a Literature Review

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Pericardial cysts are rare mediastinal abnormalities, which are usually congenital but may also be acquired after cardiothoracic surgery. Cysts frequently occur in the right cardiophrenic angle and their diagnosis is usually suspected after an abnormal chest X ray is obtained. The presence of a pericardial cyst in this typical location or, less frequently, in unusual locations, poses a diagnostic challenge in distinguishing it from other intracardiac or mediastinal abnormalities. Two-dimensional echocardiography and transesophageal echocardiography are extremely valuable in diagnosing the presence of a pericardial cyst. Although most pericardial cysts are asymptomatic, patients may present with chest pain and dyspnea. In addition, life-threatening complications such as pericardial tamponade have been reported in association with pericardial cysts. The following cases illustrate the usefulness of two-dimensional echocardiography in making an accurate diagnosis of a pericardial cyst, as well as in follow-up of these patients for the development of possible complications. (ECHOCARDIOGRAPHY, Volume 21, April 2004)

Case Report 1

An 18-year-old female was referred to the electrophysiology lab in our institution for an ablation of atrioventricular reentrant tachycardia, which was successfully ablated. A routine echocardiogram performed post ablation to exclude the presence of effusions, showed a 3 × 2 cm round echo lucent structure within the pericardial space, which was minimally compressing the right atrium. The inferior vena cava was mildly dilated, and exhibited only partial inspiratory collapse (25%). There was no evidence of pericardial fluid and both left and right ventricular systolic Patel, page-3 function were normal without any regional variability. (Fig. 1). Since she was asymptomatic the decision was to manage her conservatively. Follow-up echocardiogram was done 11 months later. The cyst was still present, and had grown in size measuring 3.4 × 2.7 cm, however, there was no evidence of increased compression of the right heart. A subsequent echocardiogram done 17 months after the initial echocardiogram showed further enlargement of the cyst measuring 3.6 × 2.7 cm with no evidence of right heart compression. (Fig. 2). The patient remained asymptomatic.

Case Report 2

A 48-year-old Asian American female with no significant medical history had a two-year history of vague abdominal discomfort. She was initially evaluated with a chest x-ray and an abdominal film, which showed an abnormality adjacent to the cardiac border. She subsequently underwent a transthoracic echocardiogram, which suggested a cyst-like structure adherent to the right atrium. She was then referred for a transesophageal echocardiogram to better delineate the anomalous structure. The TEE showed a 3 × 3 cm cyst (Fig. 3).

Discussion

Pericardial cysts are benign intrathoracic lesions that occur in 1 person per 100,000 and constitute 7% of all mediastinal tumors.1 Pericardial cysts are typically located at the right cardiophrenic angle (51–70%), or left cardiophrenic angle (28–38%) and rarely in other mediastinal locations not adjacent to the diaphragm (8–11%).2 Histologically these cysts are lined with a single layer of mesothelial cells, with the remainder of the wall composed of connective tissue with collagen and elastic fibers.
Figure 1. Transthoracic four chamber view demonstrating pericardial cyst measuring $3 \text{ cm} \times 2 \text{ cm}$ within pericardial space near the right atrium with minimal right atrial compression (for patient in case 1).

Figure 2. Transthoracic four chamber view demonstrating pericardial cyst measuring $3.6 \times 2.7 \text{ cm}$ near the right atrium (17 month follow-up echocardiogram for patient in case 1).
They contain a clear water-like fluid and thus referred to as "spring water cysts." The size of these cysts varies from 2 to 3 cm to as large as 28 cm as reported by Braude et al. Pericardial cysts are usually discovered as an incidental finding on a chest X-ray obtained in an asymptomatic patient. When symptoms occur, they are due to the pressure of the cysts on adjacent organs. Feigh et al. reported symptoms of atypical chest pain, dyspnea, and persistent cough in about one-third of patients. Once suspected on the chest X-ray, thoracic CT scan with IV contrast has been a commonly used modality to confirm the diagnosis in the past. However, the diagnosis of a pericardial cyst by a CT scan can be challenging and the exact location cannot always be ascertained. In these situations, cyst puncture followed by injection of a contrast material to make the definitive diagnosis as well as to cure in some cases, has been used by many.

Two-dimensional echocardiography was first used by Hynes et al. to diagnose pericardial cyst. We believe that echocardiography is a superior noninvasive modality to delineate the exact location of a pericardial cyst and to differentiate a cyst from other potential diagnoses such as a prominent fat pad, left ventricular aneurysm, prominent left atrial appendage, aortic aneurysm, and solid tumors. Color and spectral Doppler can help in differentiating a pericardial cyst from other vascular structures such as a coronary aneurysm.

Transesophageal echocardiography can be useful if transthoracic echocardiography is inadequate in delineating the diagnosis and can help identifying a pericardial cyst in atypical locations and distinguishing it from other posteriorly located lesions.

Pericardial cysts usually follow a benign course in the majority of cases, although complications have been reported and include cyst rupture, erosion of the cyst into adjacent structures, such as the right ventricular wall or the superior vena cava, cardiac tamponade, mitral valve prolapse, obstruction of right mainstem bronchus, atrial fibrillation, and even sudden death.

Surgical excision of pericardial cysts is recommended by most authorities only in symptomatic patients while asymptomatic cases are managed conservatively with a close follow-up. Minimally invasive thoracoscopic resection of a pericardial cyst is a good alternative option to open surgical resection because it minimizes surgical trauma and postoperative pain, has a shorter recovery period and a better cosmetic outcome. Percutaneous aspiration of cyst contents is another attractive alternative.
to surgical resection in symptomatic patients. A three-year follow-up study of post percutaneous resection showed no recurrence in four out of six patients.\textsuperscript{2} Spontaneous resolution of a pericardial cyst has been reported in few cases managed conservatively, the probable mechanism being cyst rupture.\textsuperscript{12,17}

In conclusion, transthoracic and in some circumstances, transesophageal echocardiography is an excellent modality for making a definitive diagnosis of pericardial cyst, as well as a great tool in follow-up of patients with documented pericardial cyst for development of potential complications.

References
