

## Case Report

### Chest Pain Due to Pericardial Cyst

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## Introduction

Pericardial cysts are rare benign masses comprising approximately 7% of all mediastinal masses [1]. They most commonly are located at the cardiophrenic angle; less frequently, they are found in the posterior or anterior superior mediastinum. The majority are asymptomatic and found incidentally. Nearly one-third of patients, however, are symptomatic with chest pain, shortness of breath, or cough, usually at young age [2]. We present a unique case of an inferiorly located pericardial cyst causing atypical chest pain in an elderly woman.

## Case Presentation

A 69-year-old female with history of breast cancer treated with chemo-radiation and left mastectomy three months ago presented to our emergency department complaining of chest pain for four hours. She described the pain as a constant, dull band across her anterior chest that was non-pleuritic. It radiated to the epigastrium and was associated with dyspnea, palpitations, and abdominal bloating. She denied any fever, chills, cough, sore throat, dysphagia, heartburn, diaphoresis, or dizziness.

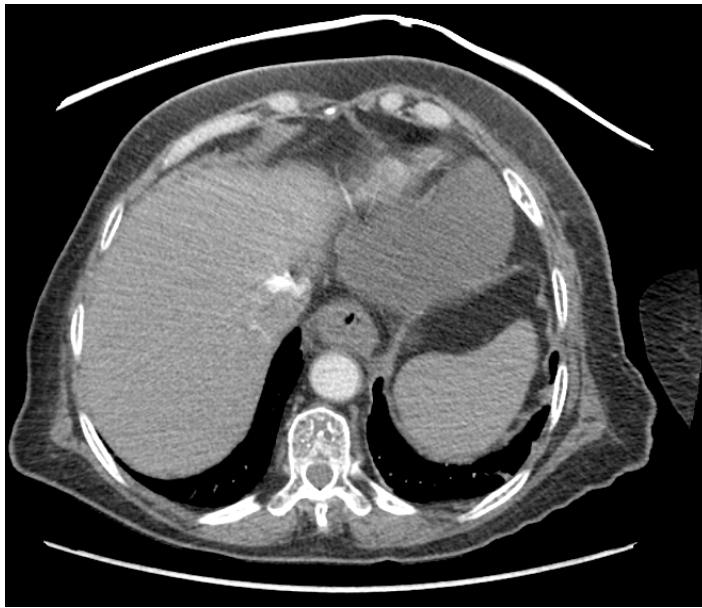
The patient had milder similar symptoms in the past nine months with occasional lower chest discomfort usually last between three to eight hours, non-exertional or positional, accompanied at times with non-exertional SOB and non-productive cough. These symptoms occurred approximately every other month. The patient presumed she had bronchitis and took a course of antibiotics.

The patient was then diagnosed with breast cancer few months later, which was treated with chemotherapy, radiation, and left mastectomy. She experienced an episode of musculoskeletal chest pain two weeks after the mastectomy relieved with narcotics. The patient has had previous chest imaging in the past six months. The records were unavailable as the patient recently moved from Mexico, however she remembers being told she had a "Benign cyst around the heart". Her vital signs were notable only for a re-

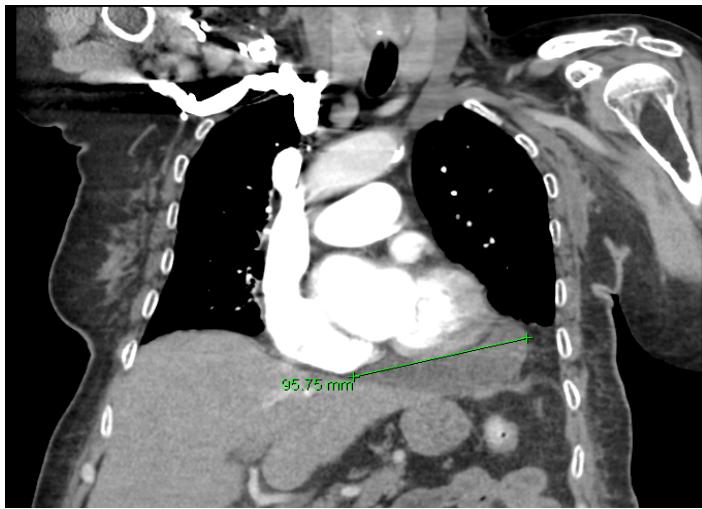
spiratory rate of 19 with an oxygen saturation of 94% on room air. Physical exam revealed a left post-mastectomy scar healing well with no point tenderness, normal heart sounds with regularly irregular rhythm, clear lung sounds, no jugular venous distention, and 1+ bilateral pitting pedal edema.

Initial laboratory workup revealed mild normocytic anemia and an elevated brain natriuretic peptide of 677 pg/mL. EKG showed atrial fibrillation with a rate of 95 bpm and no other changes. Chest x-ray demonstrated no acute cardiopulmonary processes. With concerns for possible pulmonary embolism, a CT of the chest with IV contrast was obtained. This did not show any emboli nor infiltrates; however, a 95 mm x 29 mm pericardial cyst was seen on the left side of the inferior portion of the pericardium abutting the diaphragm. Given risk factors, the patient was admitted to our inpatient service to rule out ischemic heart disease.

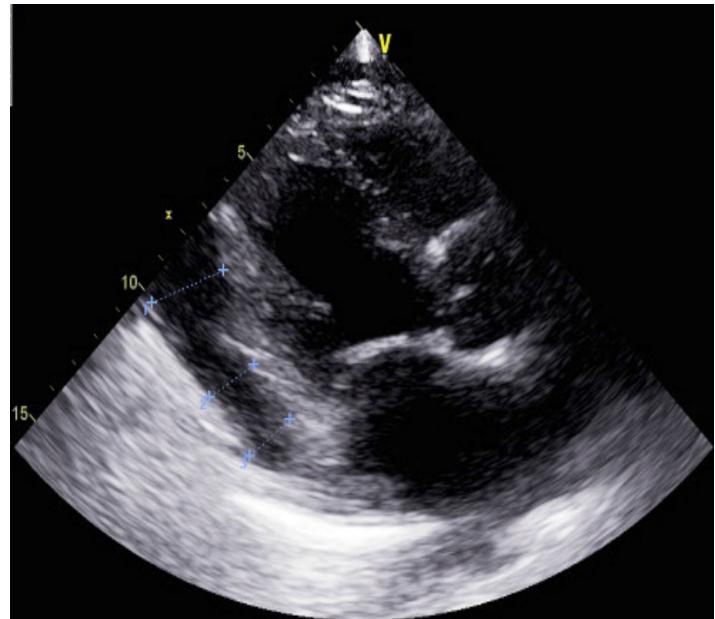
Three sets of cardiac enzymes were within normal limits. A repeated EKG thirty minutes later failed to show any new ischemic changes. Her lipid profile and hemoglobin A1c were unremarkable. A transthoracic echocardiogram showed an ejection fraction of 45% without wall motion abnormalities, a small pericardial effusion, and the inferior pericardial cyst. A pharmacological stress test showed no reversible ischemia. The patient continued to have paroxysms of the same chest pain that were ameliorated by opioids but not responsive to nitroglycerin or aspirin. Given her symptoms, a gastroenterology etiology was considered. She was started empirically on a proton pump inhibitor and endoscopy was promptly performed. No abnormalities were seen. It was concluded that the patient's chest pain originated from the mass effect of her pericardial cyst. The patient was transferred to a higher level of care, and underwent CT-guided cyst aspiration with 425 mL clear serous fluid removed. Her symptoms completely resolved after the aspiration, and was discharged home after two days. The patient remained asymptomatic in an outpatient follow up visit three months later. A repeat CT of the chest demonstrated no recurrence of the pericardial cyst (Figures 1-3).



**Figure 1:** CT chest showing the pericardial cyst. Notice the classic thin-walled, sharply defined, oval homogeneous mass without septation or solid component, with no enhancement from intravenous contrast.



**Figure 2:** CT chest showing inferior pericardial cyst compressing on the diaphragm.



**Figure 3:** Transthoracic echocardiogram showing inferior pericardial cyst with a clear separate line from the pericardial sac. Notice the homogeneous echoluent mass with minor attenuation.

## Discussion

Pericardial cysts are uncommon benign masses found in approximately 1 per 100,000 persons. They are usually congenital, arising from failure of fusion of one of the mesenchymal lacunae that form the pericardial sac [1]. The other cause is pericardial trauma, including cardiac surgery. These cysts are located most commonly at the cardiophrenic angle (92%); [right, 70%; left, 22%] and, rarely, in the posterior or anterior superior mediastinum (8%) [3]. The majority of these cysts are asymptomatic (60%-75%) and found incidentally on imaging studies. Approximately one-third of the patients may present with location-based symptoms such as chest pain, dyspnea, or cough. These patients generally report symptom development in their fourth and fifth decades of life [4].

Our patient is an elderly woman who had an inferior pericardial cyst abutting the diaphragm with subsequent chest pain, dyspnea, and bloating. Although pericardial cysts might be seen on chest x-ray, more advanced imaging (echocardiography, CT and

MRI) has higher diagnostic yield [5]. Asymptomatic cysts may require serial follow up imaging, though there are no guidelines on how often or for how long this should be done. Practitioners should keep in mind the possible complications of right ventricular outflow obstruction, cyst infection, cyst rupture leading to cardiac tamponade, and, rarely, death. Symptomatic pericardial cysts often require invasive intervention. The best initial treatment is percutaneous cyst aspiration with ethanol sclerosis. This can be done under CT or echo-guidance and usually is definitive therapy [3]. Other interventional options such as video-assisted thoracotomy or open surgical resection are usually indicated only in recurrent symptomatic pericardial cysts, notably growing cysts as to rule out underlying malignancy, and the previously mentioned complications.

It is important to differentiate pericardial cysts from pericardial diverticulae. The imaging characteristics may not provide a definitive distinction of pericardial cyst from a diverticulum (in which there is a communication with the pericardial space, identified by changes in size related to body position). Pericardial diverticulae usually require surgical removal. Our patient's symptoms had no significant changes with body positional changes, and her symptoms had completely resolved after aspiration with no recurrence on repeated follow up imaging. The two above mentioned facts further support the diagnosis of pericardial cyst [6].

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