



## Case Report

# Migrating Pericardial Cyst Mimicking a Pleural Pseudotumor

Christine J. Ha<sup>1</sup>, Pierre D. Maldjian<sup>1</sup>

<sup>1</sup>Department of Radiology, Rutgers New Jersey Medical School, Newark, New Jersey, United States.



### \*Corresponding author:

Christine J. Ha,  
Department of Radiology,  
Rutgers New Jersey  
Medical School, 185 South  
Orange Ave, MSB F-506,  
Newark-07101-1709, New  
Jersey, United States.

[cjh243@njms.rutgers.edu](mailto:cjh243@njms.rutgers.edu)

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## ABSTRACT

We discuss an atypical presentation of a pericardial cyst appearing as a mobile lesion extending into and out of the right pulmonary major fissure. With the patient in the supine position, the cyst mimicked a pleural pseudotumor along the right oblique fissure. In the left lateral decubitus position, the cyst migrated to the right cardiophrenic angle and assumed an appearance more characteristic of a pericardial cyst. At surgery, a stalk was discovered attaching the cyst to the pericardium explaining its migrating nature. We conclude that computed tomography scanning in the decubitus position is useful for differentiating a mobile pericardial cyst from a pleural pseudotumor.

**Keywords:** Pericardial cyst, Migrating, pseudotumor, Computed tomography

## INTRODUCTION

We report a rare case of a migrating pericardial cyst discovered in a patient presenting with chest pain and cough. While the wandering nature of some intrathoracic lesions such as fibrous pleural tumors has been well described, there are few prior reports of mobile pericardial cysts in the literature.<sup>[1-5]</sup> Furthermore, while cases of pericardial cysts have been reported, in which the cysts migrate for months to years, ours is the first description of migration of a pericardial cyst on computed tomography (CT) elicited by a change in position at a single point in time. We suggest that knowledge of this phenomenon would permit timely diagnosis of a migratory pericardial cyst after the use of provocative maneuvers during imaging.

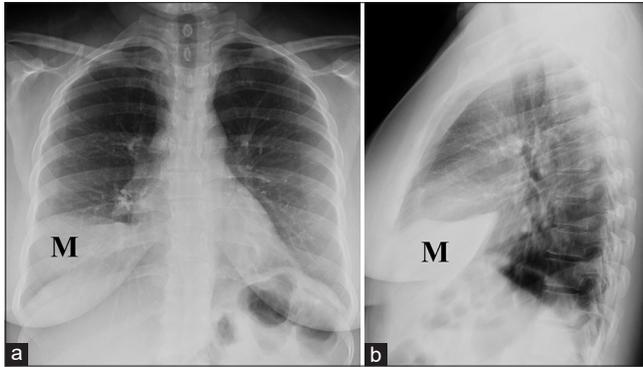
## CASE REPORT

A 40-year-old woman presented to our emergency department complaining of chest pain and cough of 3 weeks duration. The patient had no significant medical history. On physical examination, she had decreased breath sounds over the right lower lung. No pertinent abnormalities were found on laboratory examinations. The chest radiograph revealed a hazy opacity over the right lower thorax [Figure 1]. Contrast-enhanced CT scan of the chest showed a well-circumscribed homogeneous fluid attenuation collection within the right major fissure measuring 0 Hounsfield units (HU) [Figure 2 and Movie 1]. There was no wall thickening or nodularity along the margins of the collection. The abnormality was initially interpreted as a loculated collection of pleural fluid or pseudotumor within the right major fissure. Since the patient was symptomatic, CT-guided drainage of the collection was attempted, but was unsuccessful due to difficulty in obtaining an accessible window free of overlying lung tissue. The attenuation of the fluid collection remained

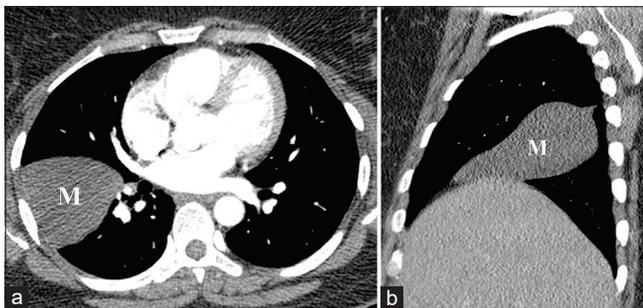
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0 HU on the unenhanced CT images obtained during localization for drainage. It was noted during the localization scan that images obtained with the patient supine showed the fluid collection to be in the right major fissure, abutting



**Figure 1:** A 40-year-old woman with a migrating pericardial cyst. Frontal and lateral chest radiographs show a mass (M) with smooth contours at the right lung base extending along the major fissure on the lateral view.



**Figure 2:** Images from contrast-enhanced computed tomography scan on the same patient. (a) Axial image shows round fluid collection (M) along the right major fissure. (b) Sagittal reformatted image shows fluid collection (M) extending along the right major fissure.

**Movie 1:** Series of axial images from contrast-enhanced computed tomography scan on the same patient. Video is accessible from the portal.

the lateral chest wall, while images with the patient in the left lateral decubitus position demonstrated the migration of the collection to the right cardiophrenic angle [Figure 3]. Subsequent video-assisted thoracoscopic surgery revealed a large cystic mass with a thin wall attached by a stalk to the pericardium. After complete resection of the mass, pathologic examination revealed a benign mesothelial-lined cyst with minute foci of papillary hyperplasia consistent with a pericardial cyst. After surgery, the patient's symptoms resolved and her recovery was uneventful.

## DISCUSSION

Pericardial cysts are of mesothelial origin, representing uncommon benign aberrations in the formation of coelomic cavities. The cysts usually contain clear fluid with cyst walls composed of connective tissue lined by a single layer of mesothelial cells.<sup>[6]</sup> While pericardial cysts are often incidental findings on radiological studies, patients with larger lesions may present with chest pain, dyspnea, and persistent cough.<sup>[7]</sup> On imaging, pericardial cysts appear as well-defined unilocular masses containing simple fluid typically arising in the right anterior cardiophrenic angle.<sup>[4]</sup> However, they may also occur in the left cardiophrenic angle or in the upper mediastinum as high as the pericardial recesses at the level of the proximal aorta and pulmonary arteries.<sup>[6]</sup> On CT scan, pericardial cysts are usually of fluid attenuation and do not enhance after administration of intravenous contrast material. On magnetic resonance imaging (MRI), these lesions demonstrate intermediate to low-signal intensity on T1-weighted sequences and high-signal intensity on T2-weighted sequences with no enhancement after administration of intravenous contrast.<sup>[8]</sup> MRI can be useful for differentiating simple cystic lesions from cystic neoplasms if findings are indeterminate on CT.

Rarely, a pericardial cyst can be pedunculated, attached to the pericardial sac by a thin stalk.<sup>[3]</sup> The stalk permits mobility of the cyst allowing it to be situated away from the pericardium. The previous reports of the wandering nature of pericardial cysts



**Figure 3:** Images from computed tomography (CT) scan performed for localization and attempted aspiration of fluid collection. (a) Axial image performed with the patient in the supine position shows fluid collection (M) in the right major fissure. (b) CT image with the patient in the left lateral decubitus position shows that fluid collection (M) has migrated to the right cardiophrenic angle. (c) The coronal reformatted image obtained from CT with the patient in the left lateral decubitus position shows the typical appearance of a pericardial cyst with fluid attenuation mass (M) in the right cardiophrenic angle.

describe migration on CT for months to years.<sup>[2-4]</sup> Our report is the first to depict the migration of a pericardial cyst on CT at a single point in time provoked by changes in patient position. When the patient was in the supine position, the fluid-filled mass was situated in the right major fissure. With the patient in the left lateral decubitus position, the cyst migrated to the right cardiophrenic angle, the more typical location for such lesions. Because the pericardial cyst was attached to the pericardium by a pedicle, cyst migration was due to the effects of gravity. Even in retrospect, the stalk was not readily apparent on CT.

A pericardial diverticulum might also be considered in the differential diagnosis for our case. Both pericardial cysts and diverticula result from the same developmental process, in which there is incomplete fusion of one or several lacunae that create the pericardial cavity. A weakness in the defective region causes it to protrude into the pericardium, producing either a cyst or diverticulum. A pericardial cyst forms when the lumen of the neck of the outpouching obliterates creating a stalk, while the neck of a pericardial diverticulum maintains communication with the pericardial space. This communication allows for the movement of fluid between the diverticulum and pericardial cavity, which can result in the diverticulum changing in size with position and respiration. However, in our case, alteration of patient position did not result in fluid draining into the pericardial space. Furthermore, at surgery, no communication with the pericardial cavity through the stalk was demonstrated as manipulation of the fluid collection did not cause the collection to shrink from movement of fluid to the pericardial space.<sup>[9]</sup>

In our case, the lesion initially resembled a pleural pseudotumor (a loculated collection of pleural fluid). However, we were uncomfortable with that diagnosis as the patient had no underlying medical conditions that would predispose to the formation of loculated pleural fluid, and there was no evidence of fluid elsewhere in the pleural space. Furthermore, the loculated pleural fluid should not move or alter its shape with changes in the patient position. This particular lesion acted like a mobile bag of fluid assuming an ellipsoid shape in the fissure with the patient supine and a more spherical shape in the right cardiophrenic angle with the patient positioned left side down. Thus, if an apparent unexplained pseudotumor is encountered on CT in the right major fissure, a radiologist might consider obtaining additional CT images with the patient in the left lateral decubitus position to explore the possibility of a migratory pericardial cyst.

Curiously, pericardial cyst migration has only been reported with right-sided cysts. While pericardial cysts are more common on the right, they can also occur in the left cardiophrenic angle. The right major fissure inserts more anteriorly than the left onto the diaphragm and is, therefore, located closer to the pericardium. It is common for extrapleural fat near the pericardium to extend into the

inferior margin of the right major fissure.<sup>[10]</sup> We speculate that the proximity of the right major fissure to the pericardium makes it more accessible than the left major fissure to potentially migratory pericardial cysts.

## CONCLUSION

In this report, we have illustrated the positionally dependent migration of a pericardial cyst into and out of the right major fissure on CT. We conclude that knowledge of this phenomenon might permit timely diagnosis of these rare lesions and help differentiate them from pleural pseudotumors.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Karabulut N, Goodman LR. Pedunculated solitary fibrous tumor of the interlobar fissure: A wandering chest mass. *AJR Am J Roentgenol* 1999;173:476-7.
2. Agarwal PP, Seely JM, Matzinger FR. Wandering pleuropericardial cyst. *J Comput Assist Tomogr* 2006;30:276-8.
3. Cramer JA, Mann H, Layfield LJ. AIRP best cases in radiologic-pathologic correlation: Migrating pericardial cyst. *RadioGraphics* 2014;34:373-6.
4. Walker MJ, Sieber SC, Boorboor S. Migrating pleural mesothelial cyst. *Ann Thorac Surg* 2004;77:701-2.
5. Shin MS, Tyndall EC, Ronderos AD. Pedunculated pericardial coelomic cyst manifesting as a rolling intrapleural mass. *Chest* 1973;63:123-4.
6. Jeung MY, Gasser B, Gangi A, Bogorin A, Charneau D, Wihlm JM, *et al.* Imaging of cystic masses of the mediastinum. *Radiographics* 2002;22 Spec No: S79-93.
7. Feigin DS, Fenoglio JJ, McAllister HA, Madewell JE. Pericardial cysts. A radiologic-pathologic correlation and review. *Radiology* 1977;125:15-20.
8. Kar SK, Ganguly T. Current concepts of diagnosis and management of pericardial cysts. *Indian Heart J* 2017;69:364-70.
9. Parmar YJ, Shah AB, Poon M, Kronzon I. Congenital abnormalities of the pericardium. *Cardiol Clin* 2017;35:601-14.
10. Hayashi K, Aziz A, Ashizawa K, Hayashi H, Nagaoki K, Otsuji H. Radiographic and CT appearances of the major fissures. *Radiographics* 2001;21:861-74.

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