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Thoracic Duct Cyst of the Anterior Mediastinum

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Abstract

Mediastinal thoracic duct cyst is a rare benign cystic disease. The lesion is generally in the posterior or superior mediastinum, where the thoracic duct passes. We herein report an extremely rare case of surgically resected anterior mediastinal thoracic duct cyst. A thoracic duct cyst should be considered as an uncommon differential diagnosis of an anterior mediastinal lesion.

Keywords

Thoracic Duct, Cyst, Anterior Mediastinum, Chylothorax

1. Introduction

A mediastinal mass is often incidentally discovered when patients undergo evaluation for an unrelated condition or symptom. The location of the lesion is important to differential diagnoses. Anterior mediastinum is the most common location of mediastinal lesions in adults and thymoma is the most common in the anterior mediastinum tumors followed by germ cell tumors, lymphoma and thyroid tumor. Thoracic duct cyst is a rare mediastinal disease, which is generally located in the posterior or superior mediastinum where the thoracic duct passes and the presence of thoracic duct cysts at other sites is extremely rare.

2. Case Report

A 65-year-old asymptomatic woman was admitted to our hospital with an enlarged anterior mediastinal tumor. She had a medical history of cryptogenic organizing pneumonia. A computed tomography (CT) revealed a round 2-cm-diameter lesion in the left-sided lower anterior mediastinum which was retrospectively detected as a 1-cm-diameter lesion on CT taken three years ago. Magnetic resonance imaging revealed an oval lesion with low signal intensity on T1-weighted images and high signal intensity on T2-weighted images, which was sus-

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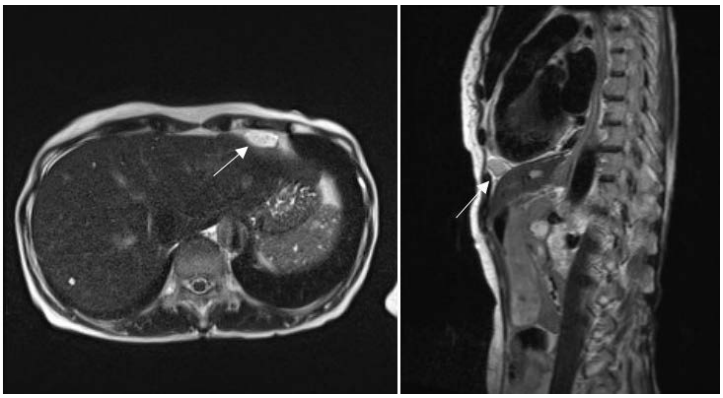
pected of a cystic lesion (**Figure 1**). Video-assisted thoracic surgery was performed to obtain a definitive diagnosis and radical cure. The lesion was enclosed with pericardial fat (**Figure 2**) and was resected with a tissue-sealing device (ENSEAL; Ethicon Endo-Surgery Inc., Cincinnati, OH). There was no visible connection to the adjacent tissue. Histological diagnosis was a benign cyst and the origin was highly suspected of thoracic duct with immunochemical staining (**Figure 3**).

The patient developed chylothorax after surgery. However, pleural effusion was well controlled with fat-restricted diet and the chest tube was removed without chemical pleulodesis. There were no other complications and she was discharged from the hospital on 9 postoperative days.



(a) (b)

Figure 1. Magnetic resonance imaging showed a 26 × 10 mm mass with high signal intensity on T2-weighted images. The mass was located on the pericardium of the cardiac apex (white arrows).

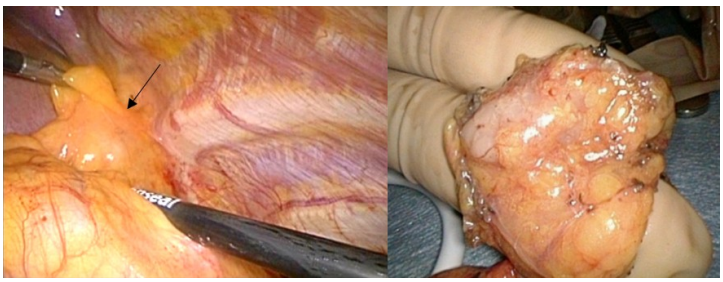
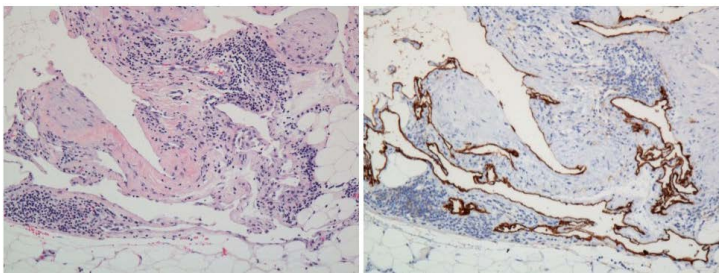


Figure 2. Thoracoscopic findings. The cyst was located in the anterior mediastinum (black arrow) and adherent to the diaphragm and pericardium. The cyst contained milky liquid.



(a) (b)

Figure 3. Pathologic findings. (a) The cyst wall was composed of fibrous tissue and smooth muscle. Lymphoid aggregates were seen on the outer surface (hematoxylin-eosin staining, ×40); (b) The luminal surface was lined by a single layer of endothelial cells with immunohistochemical expression of D2-40 (×40).

3. Discussion

Mediastinal thoracic duct cyst is a rare disease. They are thought to develop from congenital or degenerative weakening in the thoracic duct wall [1]. Usually, the thoracic duct ascends on the right side of the vertebral column and on the anterior surface of the aorta and azygos vein. However, there is a wide variety of anatomical location of thoracic duct. Phang *et al*. reported that the thoracic duct ascend between the azygos vein and vertebral bodies in about 11% of cases and the duct does not cross to the left but remains on the right in 1% - 6% of cases [2]. To our knowledge, there are no reports of the thoracic duct running through the anterior mediastinum. The location of the thoracic duct cysts are generally posterior or superior mediastinum where the thoracic duct generally runs in the thoracic cavity. However, cases of uncommon origins such as middle mediastinum or pericardium have been reported [3]. Because the anatomy of the thoracic duct is varied and thoracic duct cysts can occur anywhere along the thoracic duct, the location of the cysts may be also varied. In addition, connection with the thoracic duct, which is a key to diagnose the disease, may not be obvious in certain cases as the present case. Yun *et al*. also reported a thoracic duct cyst adjacent to the left pericardium without apparent connection to the adjacent tissue [3], which may be originated from a small branch of the thoracic duct. In the present case, the tumor had no apparent connection to the adjacent tissue, but chylothorax was occurred. It was evidence of connection with the thoracic duct.

Diagnosis of the thoracic duct cysts during surgery is very difficult when a cyst is located in other than posterior or superior mediastinum and has no apparent connection to the adjacent tissue. In these uncommon cases, chylothorax after resection may be complicated because adequate surgical procedures such as ligation or clipping are usually omitted. The present case had a thoracic duct cyst in the lower anterior mediastinum adjacent to apex of pericardium, which is extremely rare and hardly suspected of the relation to the thoracic duct.

Pathologically, the thoracic duct cyst is composed of fibrous wall without elastic fiber, and the luminal surface is lined by a single layer of endothelial cells. Immunohistochemical positive staining with D2-40 as the present case is important to identify the lymphatic nature of the cystic lesion [4].

Surgical resection of thoracic duct cysts is usually recommended [5]-[8]. The most common postoperative complication is chylothorax. To avoid chylothorax after resection, it is critical to ligate both the afferent and efferent limbs of the thoracic duct. Despite this double ligation, however, chylothorax may still occur [5]. In the present case, chylothorax developed despite the use of a tissue-sealing device for resection.

4. Conclusion

In conclusion, we experienced a rare case of anterior mediastinal thoracic duct cyst. Although it is an extremely rare clinical entity, we should remind the disease as an anterior mediastinal cyst.

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