

Case Report

Resection of Intrathoracic Chest Wall Fat Necrosis with Video-assisted Thoracic Surgery

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ABSTRACT

A 63-year-old man was referred to our hospital with an abnormal shadow of the intrathoracic chest wall on X-ray examination. Computed tomography of the chest revealed a region of homogeneous density in the right chest wall smoothly outlined by extrapleural sign. Video-assisted thoracic surgery was performed, and a pedunculated, flat nodule was resected. The pathologic diagnosis was intrathoracic chest wall fat necrosis. To our knowledge, there have been no previous reported cases, although intrathoracic chest wall fat necrosis is an important disease entity that should be included in the differential diagnosis of an abnormal shadow of the intrathoracic chest wall.

(Jikeikai Med J 2007 ; 54 : 169-72)

Key words : fat necrosis, video-assisted thoracic surgery, thoracic wall, pleural neoplasms

INTRODUCTION

Various conditions are included in the differential diagnosis of an abnormal shadow of the intrathoracic chest wall on X-ray examination.

We report on a patient with intrathoracic chest wall fat necrosis that produced an abnormal shadow of the intrathoracic chest wall. To our knowledge, there have been no previous reports of this condition, although we believe intrathoracic chest wall fat necrosis should be included in the differential diagnosis of an abnormal shadow on X-ray examination.

CASE

A 63-year-old man with a 10-year history of angina pectoris and hypertension complained of dyspnea on exertion in February 2004. Chest roent-

genography revealed an abnormal shadow of the right lateral lung field (Fig. 1). The patient was referred to our hospital for further evaluation in September 2005. He had never smoked but worked in the office of a company that handled asbestos. Physical examination revealed no abnormal findings. The forced expiratory volume in 1 second was 66.04%, and the vital capacity was 3.87 L (113.2%). Laboratory studies revealed no inflammation, and carcinoembryonic antigen was not elevated. Computed tomography (CT) of the chest revealed an abnormal flat shadow on the lateral chest wall protruding into the lung with extrapleural signs (Fig. 2).

Three-port video-assisted thoracic surgery (VATS) with a double-lumen endotracheal tube was performed in November 2005, and a yellow, flat, round nodule with a stalk was resected from the chest wall (Fig. 3). On macroscopic examination, the

Received for publication, April 17, 2007

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tumor was a yellow, elastic-firm mass with a stalk (Fig. 4). Histopathological examination of the specimen revealed fat tissue with diffuse necrosis (Figs. 5, 6). No occlusion of blood vessels was observed.

The postoperative course was uneventful, and the patient was discharged on postoperative day 6 and has been well for the 5 subsequent months.

DISCUSSION

The differential diagnosis of an abnormal shadow of the intrathoracic chest wall includes various conditions, such as malignant mesothelioma of the pleura,

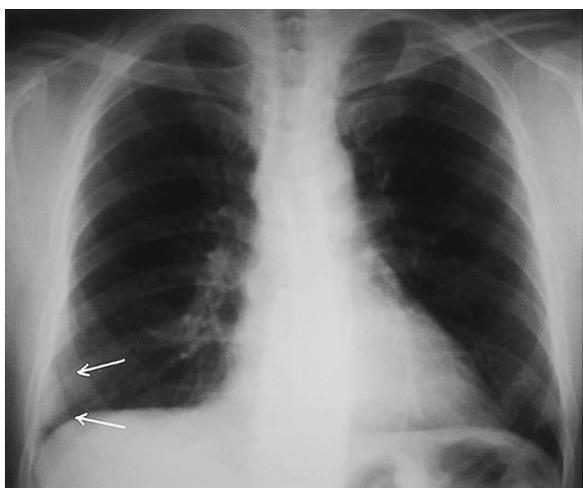


Fig. 1. Roentgenogram of the chest shows an abnormal shadow of the right lower lateral chest wall. No pleural effusion is seen.

solitary fibrous tumor, pleural thickening, lipoma, liposarcoma, and neurogenic tumor¹. The effectiveness of CT and magnetic resonance of the chest for diagnosing pleural lesions has been reported^{2,3}, and gadolinium scintigraphy and fluorodeoxyglucose positron emission tomography are useful for differentiating malignant and benign tumors. Some masses associated with such shadows have been diagnosed preoperatively with radiological examinations, although definitive diagnosis requires biopsy or excision.

In the present case, the preoperative diagnosis of the shadow was pleural thickening or mesothelioma. Surgery was performed because the shadow was increasing in size, as would a malignant tumor. Furthermore, malignant mesothelioma was a concern, because the patient had worked in an asbestos-related company. VATS was performed to minimize invasiveness and allowed the nodule to be observed frontally with a 30-degree oblique camera.

To our knowledge, there have been no previous reports of intrathoracic chest wall fat necrosis, although a similar condition, pericardial fat necrosis, has been reported⁴. Fat related tumors of the chest wall have also been reported^{5,6}. Pericardial fat necrosis causes sudden lower anterior chest pain, and usually arises in obese persons; CT and magnetic resonance of the chest in such cases show a soft-tissue mass with a clear margin and density compatible with fat tissue. In the present case, preoperative CT of

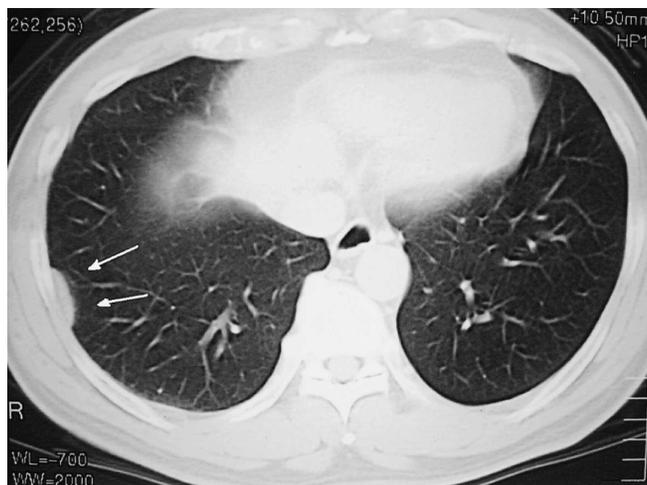


Fig. 2. Chest CT scan showing a region of homogeneous density in the right chest wall smoothly outlined by extrapleural signs.

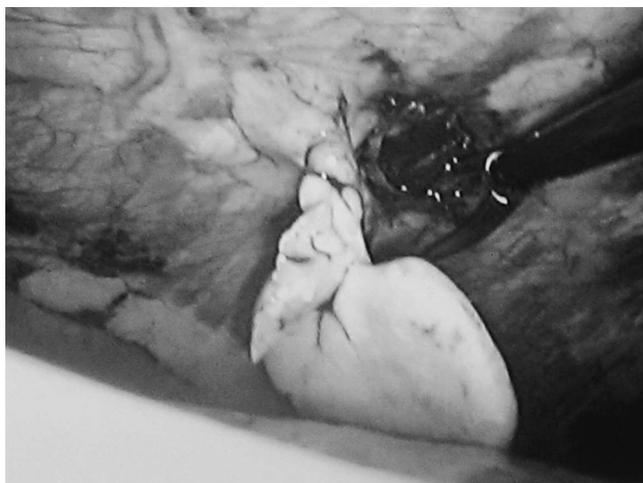


Fig. 3. Appearance of the tumor at VATS. A yellow, pedunculated, flat, round nodule was observed on the lateral chest wall.

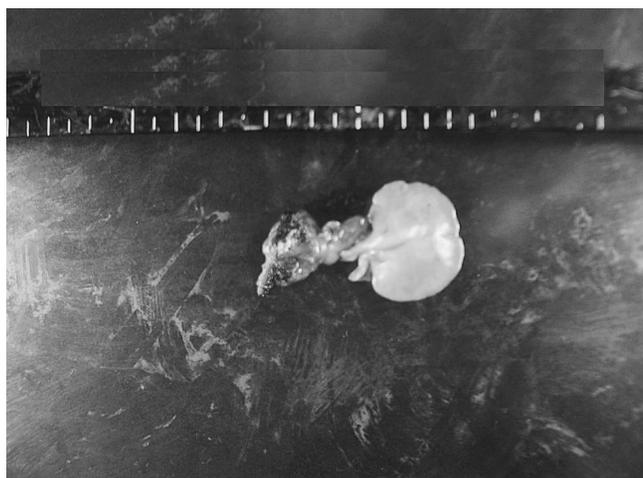


Fig. 4. Macroscopic appearance of the specimen, which measured $3.0 \times 3.0 \times 0.7$ cm and had a stalk.

the mass did not exhibit fat density and caused us to rule out a fat-related tumor.

The present case suggests that when an abnormal shadow of the intrathoracic chest wall is observed, intrathoracic chest wall fat necrosis should be included in the differential diagnosis.

Possible causes of pericardial fat necrosis and of intrathoracic chest wall fat necrosis include torsion and Valsalva breathing. In the present case, no arterial thrombus or arteriosclerosis was observed, but congestion was noted in the specimen, suggesting the possibility of torsion of the stalk of the mass.

Many surgeons now perform VATS^{7,8} to treat chest tumors. We also recommend VATS for chest

wall nodules that much be differentiated from malignant tumors, such as malignant mesothelioma. We performed VATS because it is less invasive and because the entire chest wall can be accessed with appropriate port placement and maneuvers.

CONCLUSIONS

We have reported an intrathoracic chest wall tumor that was resected with VATS and was diagnosed as intrathoracic chest wall fat necrosis. This condition does not exhibit fat density on radiological examination and was thus difficult to diagnose preoperatively. Intrathoracic chest wall fat

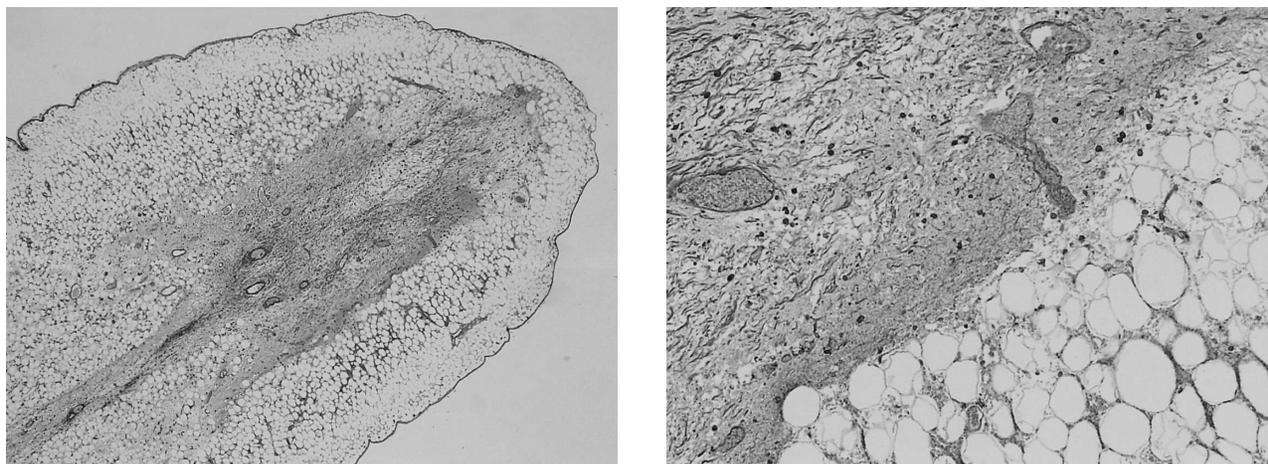


Fig. 5, 6. Microscopic views of the specimen, showing nontumorous fat tissue, most of which is necrotic.

necrosis is a rare but important disease entity in the differential diagnosis of intrathoracic chest wall tumor.

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