Case Report
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Dynamic CT Features of a Hemangioma Originating from the Parietal Pleura: A Case Report[1]

벽측 흉막에서 기원한 혈관종의 역동적 CT 소견: 증례 보고[1]

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A pleural hemangioma is an extremely rare disease. Few studies have reported on the radiologic appearance of chest wall hemangioma, especially originating from the parietal pleura. We describe a 45-year-old female patient with a soft tissue mass in the parietal pleura showing centripetal enhancement on dynamic CT. The patient underwent surgery and the pathologic examination confirmed the presence of a capillary hemangioma.

Index terms
Hemangioma
Chest Wall Tumor
Pleura
Dynamic CT

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INTRODUCTION

Chest wall hemangiomas are very rare with most occurrences originating from the ribs, intercostal muscles or connective tissue outside the parietal pleura (1-4). To date, only one case has been reported to originate from the pleura (5).

We illustrated the chest radiograph, dynamic CT images, surgical findings, and pathologic findings of a extremely rare hemangioma originating from the parietal pleura.

CASE REPORT

A 45-year-old, non-smoking female with a history of a hysterectomy for treatment of cervical cancer was referred for evaluation due to an incidentally found mass on a chest radiograph. The mass was well-defined and located in the left lower hemithorax forming obtuse angles with the chest wall laterally and a sharply demarcated medial margin, suggesting an extrapulmonary location (Fig. 1A).

The patient had no history of trauma or operation on the chest wall and did not experience any respiratory symptoms such as chest pain, cough, dyspnea.

On a precontrast scan (Fig. 1B), an extrapulmonary soft tissue mass was detected adjacent to the posterolateral arc of left 9th rib without rib destruction or calcification. In the arterial phase (Fig. 1C), the mass showed peripheral, globular heterogenous enhancement. In the delayed phase (Fig. 1D), centripetal enhancement progressed to uniform filling with a low attenuation area in the central portion. The enhancement pattern was typical of a hemangioma. On the bone window setting (Fig. 1E), associated bony erosion was seen at the posterior arc of left 9th rib without definite destruction.

By video-assisted thoracic surgery (VATS), a well movable, vascular-rich soft tissue mass measuring about 2.0 cm (Fig. 1F) was identified at the parietal pleura near the left ninth intercostal space. The mass had no adhesion to the visceral pleura or

lung parenchyma.

Microscopically, the tumor was composed of capillary-sized vessels with a few dilated channels. The lining endothelial cells showed no significant atypia or mitosis, suggesting a benign vascular neoplasm. There was no tumor extension beyond the basement membrane of the parietal pleura (Fig. 1G). The findings confirmed the presence of a capillary hemangioma originating from the parietal pleura. At a 3-year follow-up following the surgery, the patient was healthy without any evidence of recurrence.

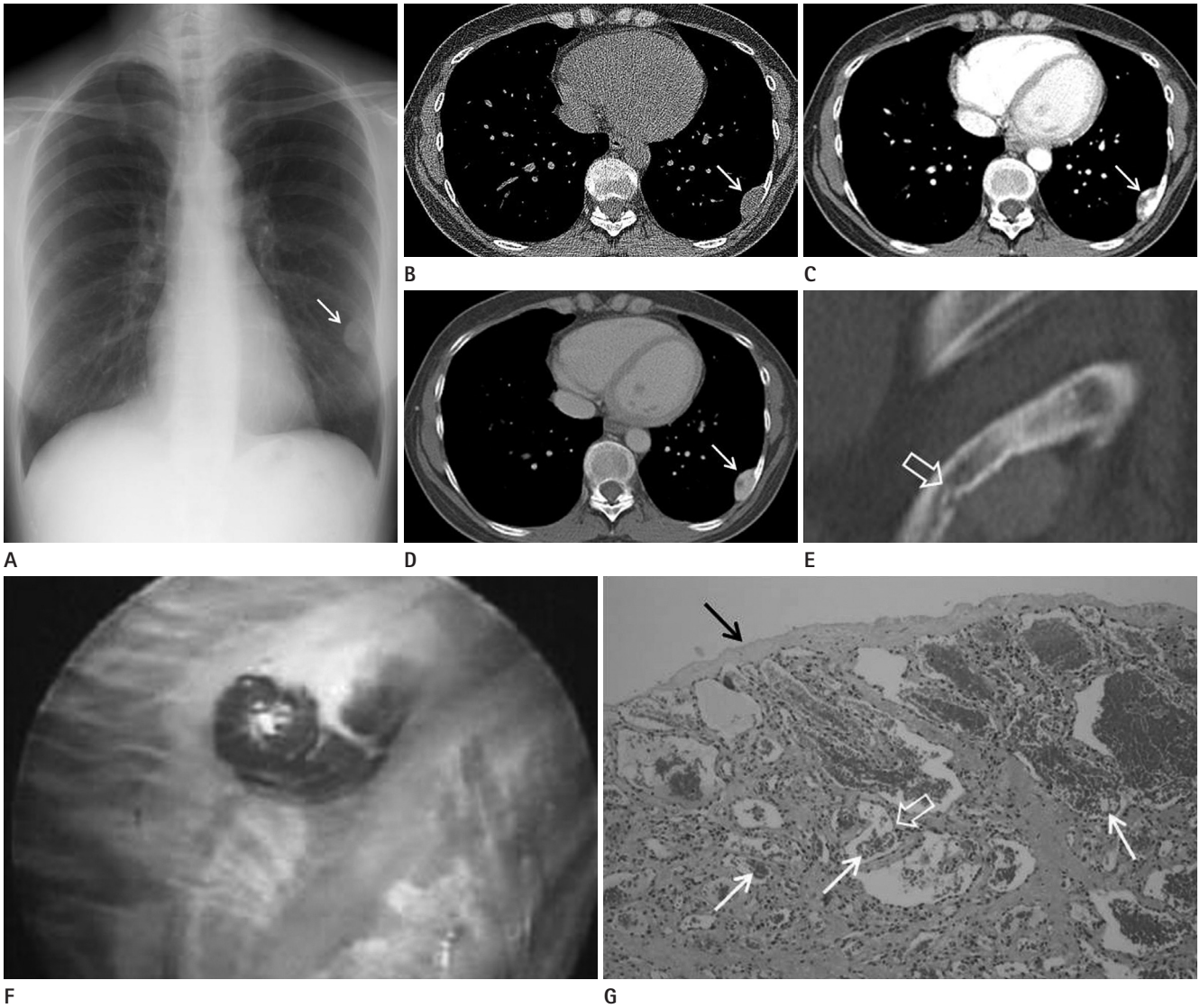

Fig. 1. A 45-year-old female patient with a capillary hemangioma in the parietal pleura of the left lower hemithorax.
A. Chest radiograph posteroanterior view shows a well-defined mass (arrow) in the left lower hemithorax forming an obtuse angle with the chest wall laterally and a sharply demarcated medial margin, suggesting an extrapulmonary location.
B–E. Precontrast chest CT scan **(B)** demonstrates a 2.6 × 1.0-cm extrapulmonary soft tissue attenuated mass (arrow) with no calcification. Contrast-enhanced arterial phase scan **(C)** shows a well-defined peripheral, globular heterogenous enhancing mass (arrow) attached to left posterolateral pleura adjacent to the posterolateral arc of the left 9th rib. In the delayed phase **(D)**, centripetal enhancement (arrow) progresses to uniform filling with a low attenuation region in the central region. On the bone window setting **(E)**, bony erosion is seen at the posterior arc of the left 9th rib (open arrow) without definite destruction.
F. VATS shows a well movable, vascular-rich soft tissue mass measuring about 2.0 cm and originating from the parietal pleura adjacent to the left ninth intercostal space without adhesion to the visceral pleura or lung parenchyma.
G. Microscopically, the tumor is composed of capillary-sized vessels (arrows). The lining endothelial cells (open arrow) show a single layer without atypia or mitosis. There is no tumor extension beyond the basement membrane of the parietal pleura (black arrow) (Hematoxylin-eosin stain, × 100).
Note.—VATS = video-assisted thoracic surgery

DISCUSSION

A hemangioma is a common benign vascular neoplasm that closely resembles normal vessels and can be found in all organs of human body (6). The hemangiomas are classified as capillary, strawberry, or cavernous hemangiomas by the diameter of involving vessels. Capillary hemangiomas are made up of capillary-sized vessels, while cavernous hemangiomas are composed of large dilated blood-filled vessels (7).

However, the chest wall hemangioma is a very rare disease and most cases originate from the rib, intercostal muscles or connective tissue outside the parietal pleura (1-4). A hemangioma originating from the pleura is extremely rare, with one case reported to date (5).

The pathogenesis of a pleural hemangioma is not well known. It may be congenital or may be a part of Von-Hippel Lindau disease (capillary hemangiomatosis) (5). The other theory proposes that hemangiomas are of traumatic origin (3). Our patient did not have a history of trauma.

Patients are usually asymptomatic or present non-specific complaints like cough, chest pain, dyspnea or other constitutional symptoms. Therefore, for the majority of patients, hemangiomas are discovered incidentally. However, hemorrhagic pleural effusion was reported in one case, when the spontaneous rupture of a hemangioma occurred (5).

A chest radiograph can be useful for an initial evaluation of chest wall tumors, in order to determine the location, size, and growth rate of the mass. Hemagiomas may show a soft-tissue mass with phleboliths and bony erosion (8). However, calcification on plain radiograph is reported only in 10% of cases (5). CT enables accurate assessment of tumor morphology, location, extent, and pattern of enhancement and can be helpful in identifying tumor tissues and types (8). CT is more sensitive than a plain radiograph in detecting phleboliths, which are present in approximately 30% of cavernous hemangiomas (8). MRI enables the accurate characterization of tumor tissue and extent, including differentiation from adjacent areas of inflammation (8). T1- and T2-weighted images typically reveal high signal intensity in the mass. Dynamic MR images shows a similar appearance to hepatic hemangiomas; eccentric enhancement on early phase and filling-in on delayed phase scans (5).

Many hemangiomas require no therapy and even large lesions are treated conservatively. Radiologic findings indicative of a benign tumor and clinical features such as slow growth and lack of pain support a conservative management strategy (8). Although hemangiomas are typically benign, a percentage of them develop from complications and require a resection or embolization (5). Complete resection by means of VATS was performed in our patient to confirm the diagnosis.

Although it is a rare condition, the possibility of a pleural hemangioma should not be disregarded in the differential diagnoses of benign chest wall tumors. Benign chest wall tumors are uncommon lesions that originate from blood vessels, nerves, bone, cartilage, or fat. Although the imaging features of many of these lesions are nonspecific, the combination of imaging appearance, location, and clinical information may suggest a diagnosis. Such features include the presence of mature fatty tissue (lipoma), the presence of phleboliths and characteristic vascular enhancement (cavernous hemangioma), neural origin with a target-like appearance (neurofibroma), and a well circumscribed strong enhancing mass with cystic or necrotic change (Schwannoma) (8).

In summary, when a chest wall mass suggests an extrapulmonary location with a typical centripetal enhancement pattern and benign characterization, we should include a pleural hemangioma in the differential diagnoses, although it is rare in this location.

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벽측 흉막에서 기원한 혈관종의 역동적 CT 소견: 증례 보고[1]

김원경[1] · 박재성[1] · 백상현[1] · 차장규[1] · 신화균[2] · 고은석[3]

흉막의 혈관종은 매우 드문 질환이다. 흉벽의 혈관종, 그 중에서도 벽측 흉막에서 기원하는 혈관종의 영상소견에 관련된 보고는 매우 드물다. 저자들은 역동적 CT에서 바깥쪽에서부터 안쪽으로 점차 차들어가는 양상의 조영증강을 보인 벽측 흉막에 위치한 연조직 종양을 가진 45세 여자 환자의 증례를 보고한다. 환자는 수술적 치료를 시행하였으며, 병리적 소견상 모세혈관성 혈관종으로 확진되었다.

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