A 21-year-old male with right chest pain, dyspnoea on exertion and bloody pleural effusion

CLINICAL PRESENTATION
A 21-year-old man was admitted to our hospital due to right chest pain and shortness of breath on exertion for 2 months; the symptoms had been exacerbated for 4 days. He denied having cough, sputum production, chill, fever, night sweats or a history of surgery or trauma. His past history was unremarkable. On physical examination the right lung was dull on percussion and the respiratory sounds from the right inferior lung disappeared on auscultation.

A chest CT scan revealed moderate right pleural effusion; no solid lesion was identified in the lung and there were no enlarged lymph nodes in the mediastinum (figure 1); 3-D reconstruction revealed destruction of the first to fourth ribs, as well as the middle lower part of the right scapula (figure 2).

Ultrasound-guided thoracentesis yielded 500ml of bloody effusion. Routine biochemical tests of the pleural effusion showed that it was exudative. Pleural fluid tests included carcinoembryonic antigen (CEA), lactate dehydrogenase (LDH) and adenosine deaminase (ADA) which were all normal; haematocrit 9.20% and haemoglobin 29g/l. Cytology was negative for malignant cells.

QUESTION
What is your diagnosis?
See page 836 for the answer

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Figure 1 Chest CT scan revealed moderate right pleural effusion. No solid lesion was identified in the lung and there were no enlarged lymph nodes in the mediastinum.

Figure 2 Chest CT 3-D reconstruction revealed destruction of the bone of the middle lower part of the right scapula (A) and the right first to fourth ribs (B) (arrowed).
Thoracoscopy revealed a normal right lung with a blood-oozing lesion measuring 6 cm² on the right lateral chest wall. The biopsy of the blood-oozing lesion revealed chronic inflammation. A pathological examination of the right scapula lesion revealed an intramuscular haemangioma in the right chest wall (figure 1).

**DISCUSSION**

The usual reasons for bloody pleural effusion include tumours, sarcomas, pulmonary embolism, trauma to the chest wall/diaphragm/lung/mediaestinum, bleeding disorder and hereditary haemorrhagic telangiectasia, osteochondroma of the ribs, etc. Bloody pleural effusion caused by an intramuscular haemangioma has not been reported previously.

Haemangioma is a rare congenital benign lesion and is thought to be associated with an imbalance of proangiogenic factors and angiogenesis inhibitors. Approximately 80–90% of haemangiomas develop before the age of 30 and the disease occurs in both sexes. Chest wall haemangioma is rare and can be classified as chest intramuscular haemangioma. It can be easily misdiagnosed, and differential diagnoses include lipoma, vascular lipoma, abscess, haematoma and malignant tumours.

Diagnosis of haemangioma depends primarily on imaging and pathological examinations. The most widely used imaging studies include CT and MRI; angiography and MRI are the most important modalities for diagnosis of haemangioma. The MRI image may reveal an intramuscular irregular mass with T1-weighted image intensity equal to or slightly higher than that of the skeletal muscle.

The complications of intramuscular haemangioma depend on its size, growth location and growth rate. Complications include ulceration (skin breakdown), which can bleed or become infected; obstruction of vital functions such as vision, hearing or breathing; and, very rarely, internal bleeding or high output cardiac (heart) failure resulting from a haemangioma in an internal organ. Intramuscular haemangioma of the head and neck can induce distortion of facial features, which will lead to psychosocial complications.

The treatment of haemangioma should be individualised, depending on the location of the tumour mass, the depth of its infiltration, and the age and cosmetic requirements of the patient. Comprehensive treatment strategies are recommended, including dry ice cryotherapy, radiotherapy, steroid treatment, sclerosing agent injection, vascular ligation, vascular embolism and surgical excision.

Degeneration of an intramuscular haemangioma does not tend to occur and the local recurrence rate is high; therefore, the optimal treatment is to excise the tumour mass extensively to ensure there is no residual tumour tissue.

Our patient had an intramuscular haemangioma in the right chest wall which destroyed the middle lower part of the right scapula and the right first to fourth ribs. While chest wall intramuscular haemangiomas often cause chest pain and chest mass, they do not typically cause a bloody pleural effusion as seen in this case. To our knowledge, this is the first case of an intramuscular haemangioma-associated bloody pleural effusion.

**Figure 1** (A) Thin-walled capillary-like structure clusters with the typical pathological features of a capillary haemangioma. (B) Different sizes and an irregular vessel-like structure comprise the cavernous haemangioma. H&E×100.
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