Self-assessment corner

Thoracic pain and abnormal chest radiograph

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A 33-year-old man was admitted to hospital because of recent anterior thoracic pain. The history was unremarkable, except for itinerant thoracic itches of two years duration. Physical examination was unrevealing.

Laboratory values and an electrocardiogram were normal. His chest X-ray is shown in figure 1. Arterial blood gases on room air showed a pH of 7.38, pCO₂ 40 mmHg and pO₂ 86 mmHg. Tuberculin skin test, examination of stained sputum for acid-fast bacilli and serologic tests for *Legionella*, *Mycoplasma pneumoniae*, *Coxiella burnetii* and *Chlamydia psittaci* were negative. A nonenhanced chest computed tomography (CT) was performed (figure 2). Abdominal CT scan only showed fatty liver.

Figure 1 Chest X-rays

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Figure 2 Chest CT scan

Questions

- 1 What does the chest X-ray show?
- 2 What is the CT scan diagnosis?
- 3 How should this condition be managed?

Answers

QUESTION 1

The chest X-ray demonstrates a blurred and elevated left hemidiaphragm, with an increased distance to the gastric chamber. These findings are apparently consistent with an atypical pleural effusion, with a subpulmonary component.

QUESTION 2

Chest CT scan disclosed a left subpulmonary homogeneous low density mass (-86 Hounsfield units (HU)) containing fibrosepta. Enhanced CT scan showed no contrast enhancement. All these findings are diagnostic of a fatty mass. On contiguous scans, the soft tissue line of the diaphragmatic musculature adjacent to the mass remained intact. The lesion was, therefore, an intrathoracic subpleural subpulmonary lipoma.

QUESTION 3

When a fatty mass is around -55 HU, intervention is unnecessary. However, when the mass ranges from -11 to -20 HU, intervention is necessary since a malignancy cannot be excluded on the basis of the CT findings alone.¹ The very rare thoracic liposarcoma has a higher HU number than normal fat (-20 HU vs -55 HU for normal fat).¹ Our patient had an attenuation coefficient of -86 HU, indicating lipoma. The CT scan allowed us to limit our investigation to a brief non-invasive diagnostic work-up. During the admission the patient was asymptomatic. Without therapy, a radiographic examination showed no changes 15 months after discharge.

Discussion

Lipomas, common tumours of the subcutaneous tissue, are uncommon in the thoracic cavity.¹⁻³ In this position, they are usually related to the mediastinum. Subpleural lipomas (unconnected with the mediastinum) are even less common.² Subpleural lipomas may be located beneath the costal or diaphragmatic pleura, although they are extremely rare in the

latter location.² Most intrathoracic lipomas are discovered on routine chest X-ray in asymptomatic patients.² Symptoms arise when the mass exerts pressure on contiguous structures. In our patient, the tumour was an incidental radiologic finding. On chest X-ray, subpleural lipomas appear as well circumscribed areas of increased density, that indent the lung and possess contours characteristic of their extrapulmonary origin.^{2,3} The radiographic signs of thoracic lipomas, although helpful, are non-specific,¹ so that it may be difficult to distinguish lipomas from other conditions.

Leigh and Weens⁴ described three cases of mediastinal lipomas with the radiographic appearance of a mass which, when the patients were erect, rested on the right hemidiaphragm. This appearance, which may be mistaken for elevation of a hemidiaphragm, is caused by the effect of gravity on the soft, fatty tissue. Likewise, our case was missed on X-ray, and diagnosed as atypical pleural effusion, probably due to the left chest pressure over the fatty mass. This is, to our knowledge, the first subpulmonary lipoma with such a radiological appearance.

In the past, the diagnosis of thoracic lipomas in asymptomatic patients required surgical intervention. Nowadays the value of CT in the diagnosis of lipomas is well established.³ The CT finding of a homogeneous low density tumour with no contrast enhancement are considered diagnostic.⁵ Lipomas may be also identified with magnetic resonance imaging (MRI), giving high signal intensity on T1-weighted images and intermediate signal intensity on proton density and T2-weighted images, similar to normal fat. Compared with CT studies, MRI is more time consuming and costly. CT remains the modality of choice for the demonstration and characterisation of lipomatous tumours.⁵

Final diagnosis

Subpulmonary lipoma simulating atypical pleural effusion.

Keywords: subpulmonary lipoma, atypical pleural effusion.

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4 Leigh TF, Weens HS. Roentgen aspects of mediastinal lesions. *Semin Roentgenol* 1969; 4: 59-68.

5 Doores G, Hricak H, Sollitto R, Higgins CB. Lipomatous tumors with fatty component: MR imaging potential and comparison of MR and CT results. *Radiology* 1985; 157: 479-83.