An unusual pulmonary mass

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A 23-year-old woman smoker complained of right-sided chest pain. The patient had no significant personal or family history. She was asymptomatic, and physical examination was unremarkable.

Her chest X-ray and thoracic computed tomography (CT) scan are shown in figures 1 and 2. Blood biochemical and haematological examinations were normal, as was abdominal ultrasonography. A tuberculin purified protein derivative (5 IU) skin test was 10 mm in diameter. Several sputum samples were negative for malignant cells and for *Mycobacteria*.

Appropriate microbiological and cytological examinations of a bronchoalveolar aspirate obtained by fiber-optic bronchoscopy were non-diagnostic. A transthoracic fine-needle aspiration of the pulmonary mass yielded abundant necrotic material with clumped histiocytic cells, epithelioid cells, lymphocytes and rare neutrophils. A diagnostic thoracotomy was performed. The histological section is shown in figure 3.

Figure 1 Chest X-ray

Figure 2 Thoracic CT scan

Figure 3 Microphotography of the lung (H&E, original $\times 200$)

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Questions

- 1 What is the radiological differential diagnosis in this patient?
- 2 What is the most likely diagnosis?

Answers

QUESTION 1

Radiological differential diagnosis of a pulmonary mass in a young patient includes many lesions and diseases, summarised in the box.

QUESTION 2

Microscopic examination of the surgical specimen revealed necrotizing epithelioid granulomas with multinucleated giant cells (arrow) and abundant acid-fast bacilli surrounded by normal lung parenchyma. *Mycobacterium tuberculosis* grew in Löwenstein's culture. Antituberculous drugs were begun.

Discussion

Pulmonary infection by *Mycobacterium tuberculosis* is still a widespread clinical problem. Its radiological manifestations are very diverse, although usually its diagnosis can be clinically and/or radiologically suspected. Unusual forms of pulmonary tuberculosis include pleural effusions, mediastinal or hilar lymphadenopathies and pulmonary nodules; the presence of a large mass is an extremely rare form of presentation.

Tuberculomas are defined as solitary, round or oval pulmonary nodules which are surrounded by normal lung parenchyma, and are caused by *M. tuberculosis*. They usually range from 0.5 to 4 cm in diameter.¹ Radiologically they show calcifications in 50%, satellite lesions in 80%, and cavitation in one-third of cases. They are preferentially found in upper lobes and in the right lung, and are most frequently seen in women.² Tuberculomas comprise 3–9% of all cases of pulmonary tuberculosis.^{3,4} Most patients are asymptomatic,² and the diagnosis is difficult to establish unless X-ray findings are suggestive of pulmonary tuberculosis (cavitation, calcification, satellite lesions), since sputum samples and bronchoalveolar aspiration fluid are usually negative for acid-fast bacilli.^{2,4} In these cases the diagnosis is made by thoracotomy and

Radiological differential diagnosis of a pulmonary mass

- structural abnormalities: bronchopulmonary sequestration, bronchial cyst
- infectious diseases: pulmonary abscess, tuberculoma, cryptococcosis, nocardiosis, actinomycosis, echinococcosis
- immunological diseases: Wegener's granulomatosis
- neoplasia: lung carcinoma, metastases, Hodgkin disease, non-Hodgkin lymphoma, plasmocytoma, hamartoma, carcinoid tumour
- inhalation diseases: lipoid pneumonia

tumorectomy^{1,2,5}; conventional antituberculous treatment is still necessary.

The case described herein is interesting for several reasons. First of all the patient presented with a large lesion consistent with a pulmonary mass, which is an extremely rare form of pulmonary tuberculosis. Secondly, the absence of clinical manifestations, the non-specific thoracic X-ray and CT scan findings and the left lower lobe location of the mass were not suggestive of pulmonary tuberculosis. It was necessary to perform a thoracotomy and tumorectomy to make the diagnosis. Although the fine-needle aspiration could have suggested the diagnosis of an infectious necrotizing lesion, the absence of infecting organisms made it necessary to rule out a necrotic neoplastic lesion. Magnetic resonance imaging with gadolinium-DTPA might help in the diagnosis of pulmonary tuberculomas by showing the epithelioid granulomas as a reinforced peripheral halo,⁶ but the validity of this technique needs to be confirmed.

Final diagnosis

Pulmonary tuberculosis presenting as a large mass.

Keywords: tuberculosis, pulmonary mass, tuberculoma, *Mycobacterium tuberculosis*

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