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 hystiocytic cells, epithelioid cells, lymphocytes and rare neutrophils. A diagnostic thoracotomy was performed. The histological section is shown in figure 3.

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. 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. Tuberculomas comprise 3–9% of all cases of pulmonary tuberculosis. Most patients are asymptomatic, 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. In these cases the diagnosis is made by thoracotomy and tumorectomy; 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, 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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