An unusual right hilar 'mass' with enlarged mediastinal lymph nodes

Introduction

The imaging of lung cancer and pulmonary tuberculosis is extremely complex; an atypical radiological presentation can lead to diagnostic confusion when trying to distinguish between these two diseases.

This article reports the case of a 46-year-old woman who presented with a dry cough. Chest computed tomography scan showed a right hilar mass with adjacent bronchial stenosis and multiple enlarged mediastinal lymph nodes that was initially diagnosed as squamous cell carcinoma of the lung. Multiple bronchoscopy biopsies showed some atypical epithelial cells and granulomas without necrosis, leading to the consideration of pulmonary tuberculosis. Chest imaging significantly improved after 7 months of anti-tuberculosis treatment. To the authors' knowledge, this is the first reported case of lung consolidation caused by tuberculosis mimicking squamous cell carcinoma of the lung.

Discussion

Pulmonary tuberculosis is one of the most common infectious diseases in the world. Chest radiography is very important in diagnosing pulmonary tuberculosis, but the diagnosis can easily be confused by atypical imaging. This patient showed few respiratory symptoms and had no evidence of fever. Her original thoracic computed tomography scan showed a right hilar mass with adjacent bronchial stenosis and multiple enlarged mediastinal lymph nodes, and she was initially diagnosed with squamous cell carcinoma of the lung. However, contrast-enhanced chest computed tomography showed consolidation with both angiogram and air bronchogram signs surrounding the lesions, which raised suspicion of infectious causes, mucinous adenocarcinoma or lymphoma over other lung carcinomas (Shah and Friedman, 1998). The T-SPOT.TB assay was positive and multiple bronchoscopy biopsies showed granulomas and no tumour cells, so pulmonary tuberculosis was considered.

Parenchymal disease of pulmonary tuberculosis often manifests as dense, homogeneous consolidation of any lung lobe, but the middle and lower lung lobes are most commonly involved, especially in adults (Burrill et al, 2007). Lung consolidation as a result of tuberculosis can be easily misdiagnosed as bacterial pneumonia, but the lack of response to conventional antibiotics as well as the presence of lymphadenopathy differentiates this from bacterial pneumonia (Burrill et al, 2007). Resolution of lung consolidation caused by tuberculosis is generally slow and can take up to 2 years. Residual parenchymal scarring is seen in 15–18% of patients (Nachiappan et al, 2017).

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CASE REPORT

A 46-year-old woman, who had no history of smoking, presented with a dry cough of 6 months' duration. She reported no fever, chest pain, haemoptysis, night sweats or dyspnoea, and had no history of diabetes mellitus or other immunosuppressive diseases. Three months before admission, thoracic computed tomography showed a right hilar mass with adjacent bronchial stenosis, as well as multiple enlarged mediastinal lymph nodes. Bronchoscopy was performed and a transbronchial lung biopsy from the right upper lobe revealed chronic mucosal inflammation. Transbronchial needle aspiration from the subcarinal node showed some atypical epithelial cells. Conventional antibiotics were used, but her symptoms remained unchanged.

One month before admission, she was evaluated at another hospital: 18F-fluorodeoxyglucose positron emission tomography/computed tomography showed avidity of the lung lesions (maximum standardized uptake value = 4.5). A sputum acid-fast bacilli smear was negative and a T-SPOT.TB assay was weakly positive. Serum (1→3)-β-D-glucan and galactomannan were negative. Transbronchial lung biopsy from the right middle lobe demonstrated atypical epithelial cells surrounded by desmoplastic stroma. To confirm the diagnosis, a computed tomography-guided percutaneous needle lung biopsy was performed. The biopsy specimens showed granulomas without necrosis.

On physical examination, the patient's breath sounds were decreased in the right lung and no lymphadenopathy was found. The remainder of the physical examination was unremarkable.

The patient's white blood cell count and C-reactive protein levels were normal. Tumour marker and blood glucose levels were normal. HIV antibody testing was negative. A sputum acid-fast bacilli smear performed in triplicate was negative. Contrast-enhanced chest computed tomography scan showed a large area of consolidation with angiogram and air bronchogram signs in the right lung, as well as multiple enlarged homogeneously enhancing mediastinal lymph nodes (*Figures 1a* and *b*).

Endobronchial ultrasound-guided transbronchial lung biopsy of the right middle lobe showed granulomas with tiny areas of coagulative necrosis (*Figure 2*). Ziehl–Neelsen and Grocott methenamine silver staining were negative.

Further testing of the bronchoalveolar lavage fluid, including cytology and smear and culture for common bacteria and acid-fast bacilli, was negative. Pulmonary tuberculosis was considered as a differential diagnosis, along with sarcoidosis, non-tuberculous mycobacteria, histoplasmosis and lymphoma, so empirical therapy with isoniazid, rifampicin, pyrazinamide and ethambutol was administered. Chest imaging significantly improved after 7 months of this therapeutic regimen (*Figures 1c* and *d*) and a final diagnosis of pulmonary tuberculosis was made.

Figure 1. **a** and **b.** Contrast-enhanced computed tomography shows a large area of consolidation with angiogram and air bronchogram signs (arrow) in the right lung and multiple enlarged homogeneously enhancing mediastinal lymph nodes. **c.** After 3 months and **(d)** 7 months of anti-tuberculosis treatment.

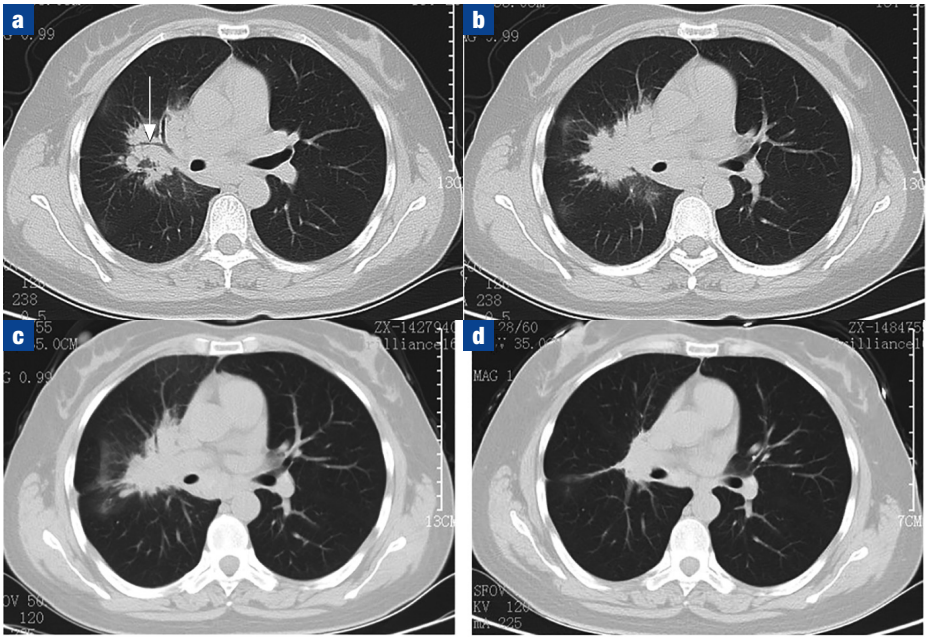
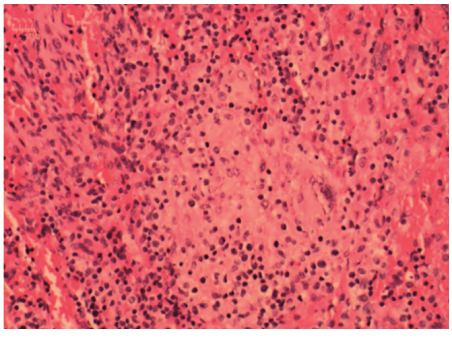


Figure 2. Endobronchial ultrasound-guided transbronchial lung biopsy shows granulomas with tiny areas of coagulative necrosis on haematoxylin-eosin staining ×40.



Extensive parenchymal lung consolidation as a result of tuberculosis is usually associated with lymphadenopathy, and typically involves the right paratracheal and hilar lymph nodes on contrast-enhanced computed tomography (Leung, 1999). On computed tomography mediastinal tuberculous lymphadenitis is seen as nodes with low central attenuation (the caseous necrosis at the core) and peripheral rim enhancement as a result of peripheral granulomatous inflammatory tissue (Curvo-Semedo et al, 2005). Nodes over 2 cm diameter with irregular wall thickness and low central density strongly suggest active mediastinal lymphadenopathy (Im et al, 1987).

Tuberculosis granulomas are typically necrotizing, but may be non-necrotizing or a combination of both. However, non-tuberculous mycobacterial lung disease and histoplasmosis can also form granulomas with caseous necrosis (Mukhopadhyay and Gal, 2010), so the presence or absence of caseating granulomas can not rule in or rule out a diagnosis of tuberculosis.

Although lung biopsy in this case identified some atypical epithelial cells, this is insufficient for a final diagnosis of lung cancer. Tuberculosis, bronchiectasis, lung abscesses, organized pneumonia, trauma and infarctions can also present with atypical epithelial cells (Yokoo and Suckow, 1961). Chronic inflammatory diseases, such as tuberculosis, play an important role in the development of scar carcinoma of the lung. Chronic inflammation produces inflammatory mediators which increase fibrosis and DNA damage. This may cause formation of dysplastic cells that may undergo malignant transformation (Bobba et al, 2011), so long-term follow up of patients with chest computed tomography is important.

Conclusions

This article describes an unusual case of pulmonary tuberculosis presenting as extensive consolidation of the right hilar region, which was initially diagnosed as squamous cell carcinoma of the lung. This article highlights the importance of distinguishing between consolidation and mass on chest imaging. Clinicians should suspect pulmonary tuberculosis when chest imaging shows extensive parenchymal consolidation associated with lymphadenopathy, or when lung biopsy shows granulomas without necrosis. **BJHM**

LEARNING POINTS

- Lung consolidation secondary to tuberculosis can rarely masquerade as squamous cell carcinoma of the lung.
- Angiogram and air bronchogram signs on chest computed tomography can help to distinguish between lung consolidation and mass.
- Chest imaging showing extensive parenchymal consolidation associated with lymphadenopathy should raise the suspicion of pulmonary tuberculosis.
- Although lung biopsy may show granulomas without necrosis, pulmonary tuberculosis cannot be excluded as a major differential diagnosis.
- Atypical radiological presentation of pulmonary tuberculosis can cause diagnostic confusion when trying to differentiate this from primary lung cancer.

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