

An unusual cause of difficult asthma: talc granulomatous disease

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Abstract

A 44-year-old woman presented with poorly controlled asthma and nodular radiological changes. A VATS lung biopsy confirmed talc granulomatous disease possibly related to her previous work as a dental technician. A detailed occupational history is mandatory. Talc granulomatous disease is one important alternative diagnosis in poorly controlled asthma.

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Keywords

Talc granulomatous disease; asthma; occupational history.

Case history

A 44-year-old asthmatic presented with symptoms suggestive of an infective exacerbation. On examination, she was tachycardic and tachypnoeic with widespread polyphonic wheeze but nil else. She had been asthmatic since birth and had been ventilated twice in the last 3 years becoming colonised with methicillin-resistant staphylococcus aureus. She had never smoked. Her only occupational history was being a dental technician for 10 years having stopped 15 years ago.

A chest radiograph revealed diffuse micronodular shadowing throughout the right lung with a lesser degree of nodular shadowing in the left mid and lower zones. A high resolution computed tomography (CT) scan during this admission revealed a 'tree in bud' pattern, more marked on the right, suggestive of a bronchiolitis but nil else (see Fig. 1). Investigations revealed no evidence of vasculitis, cystic fibrosis, hypogammaglobulinaemia, neutrophil dysfunction or α_1 -antitrypsin deficiency, allergic bronchopulmonary aspergillosis or mycobacterial infection.

She failed to respond to treatment and was referred to a tertiary centre for a further opinion. A repeat high resolution CT scan confirmed features of bronchiolitis with no other findings. Echocardiography was normal and lung function tests revealed a restrictive ventilatory defect with significantly reduced gas exchange: FEV₁ 1.1 L, FVC 1.27 L (FEV₁/FVC ratio 87%), DL_{CO} 2.27 mmol min⁻¹ kPa⁻¹ (27% predicted), K_{CO} 0.8 (45% predicted) mmol min⁻¹ kPa⁻¹ L. A VATS lung biopsy revealed a giant cell reaction with nodular granulomatous infiltrates and surrounding fibrosis (Fig. 2(a)) with positively birefringent crystals on polarisation (Fig. 2(b)). The birefringent material containing silica and magnesium consistent with talc. There was no evidence of malignancy or eosinophilia.

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Discussion

Pure talc is a hydrated magnesium silicate. The most common occupational factors for talc inhalation are in cosmetics and mining^[1]. It is also used in ceramics, roofing products, textiles, water filtration, insecticides and as a lubricating agent in the production of methadone and hydromorphone. Therefore, intravenous drug abusers are at risk and talc-induced lung disease is well described in this group. The patient's exposure is most likely to have occurred during her time as a dental technician. Talc-induced lung disease in dental technicians has not been well described. However, French talc was used to produce a high lustre on plaster models of teeth in the past.

Talc granulomatous disease was originally described in 1896. It usually presents insidiously with symptoms of cough, dyspnoea and sputum related to the underlying histological bronchiolitis^[2,3]. The most consistent physiological abnormality is a reduced DL_{CO}. Radiologically, there are typically bilateral reticulonodular infiltrates in the lower lung fields. Pleural abnormalities occur especially in intravenous drug users^[3].

Histological diagnosis usually requires surgical lung biopsy. This typically reveals peribronchial and perivascular interstitial fibrosis and talc granulomas containing positively birefringent nodules under polarised light microscopy^[2,3]. Lower lobe emphysema can occur secondary to alveolar wall necrosis in intravenous talc-induced disease. The main complications are pulmonary fibrosis and pulmonary hypertension, and there is no definite causal association with lung cancer^[2,3].

Steroids have been tried and can improve lung function but relapse is common^[4]. They can be more effective in those with less vascular pathology. There is a lack of information regarding duration therapy, tapering and durability of response. Isolated occurrences of dramatic response to steroids in intravenous talc-induced lung disease have been reported. Lung transplantation has been performed in such patients with secondary pulmonary hypertension^[5]. In isolated occurrences, lung function may improve after cessation of exposure but progressive disease is the norm. There is no clear correlation between inhaled or intravenous exposure and pathology.

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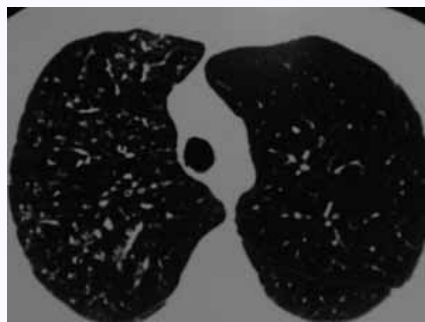


Fig. 1. HRCT showing centrilobular nodular process with 'tree in bud' appearance more marked on the right.

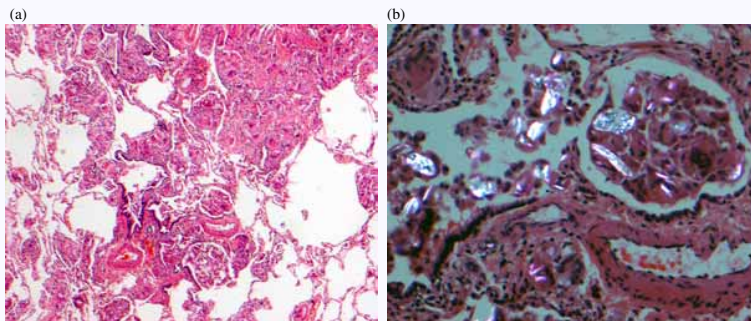


Fig. 2. (a) Nodular granulomatous infiltrate centred on bronchiole with surrounding fibrosis (magnification $\times 40$). (b) Smaller peribronchiolar nodule at higher power showing positively birefringent material within foreign body type giant cells (magnification $\times 100$).

Learning points

This case illustrates some of the typical clinical, radiological and histological features of talc granulomatous disease and one of the occupational risk factors. It emphasises the particular importance of a detailed occupational history especially in poorly controlled asthma failing to respond to appropriate therapy. In these circumstances, it is mandatory to consider alternative diagnoses to avoid potentially unnecessary investigations, treatment and morbidity.

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