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Talc granulomatosis mimicking sarcoidosis

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ABSTRACT

Pulmonary disease due to talc, a group of hydrous magnesium silicates, is almost exclusively encountered secondary to occupational exposure or intravenous drug abuse. Talcosis or talc pneumoconiosis is one of the rarer forms of silicate-induced lung disease. It is seen in workers exposed during its production, and occasionally, in users of cosmetic talc and in intravenous drug addicts. Very often, the history of exposure is not recognised by the patient, and it is only the finding of granulomatous cellular interstitial lesions containing birefringent crystals which indicates considerable talc exposure. We report a 38-year-old woman who was initially diagnosed with sarcoidosis, until a bronchoscopic biopsy revealed the presence of numerous foreign body giant cells and birefringent particles forming non-caseating granulomas. There was no history of occupational exposure to talc or intravenous drug abuse. The patient responded to oral corticosteroid treatment. Talcosis is generally considered to be relatively benign.

Keywords: non-caseating granulomas, occupational lung disease, pulmonary granulomatosis, sarcoidosis, talc granulomatosis

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INTRODUCTION

Talc-induced pulmonary granulomatosis is associated with inhalational-occupational and intravenous exposure. Three forms of talc pneumoconiosis by inhalation are known, namely: talc asbestosis, talc silicosis and talcosis. The form of talc pneumoconiosis due to intravenous administration is manifested by consolidations, large nodules and masses.[1,2] This case illustrates that talc granulomatosis can mimic pulmonary sarcoidosis. The finding in the bronchoalveolar lavage (BAL) fluid of birefringent crystals is a simple laboratory method for confirming the diagnosis.

CASE REPORT

A 38-year-old woman, a nonsmoker, with a seven-month history of progressive dyspnoea, cough with expectoration, fever and weight loss of 15 kg in the previous seven months, was hospitalised. Physical examination revealed fine bilateral basal end-inspiratory crackles. Blood gas analysis revealed mild hypoxaemia. The forced expiratory volume in one second (FEV_1) was 35% of the predicted value and the forced vital capacity was 43% of the predicted value. The diffusion capacity for carbon monoxide was impaired, being 39% of the predicted value. The chest radiograph showed bilateral diffuse interstitial fibrosis (Fig. 1). Mantoux skin test was negative. High resolution computed tomography (HRCT) showed enlarged paratracheal, subcarinal, and hilar lymph nodes (Fig. 2a), bilateral interstitial fibrosis (Fig. 2b), multiple bilateral diffuse nodular opacities (Fig. 2c), and ground glass opacities with nodular lesions (Fig. 2d). The serum ACE (SACE) levels were markedly raised with the value being 175.70 U/L. The serum calcium and 24-hour urinary calcium were in the normal range. BAL revealed substantial lymphocytosis. Cultures of bronchial washings for bacteria, tuberculosis and fungi gave negative results.

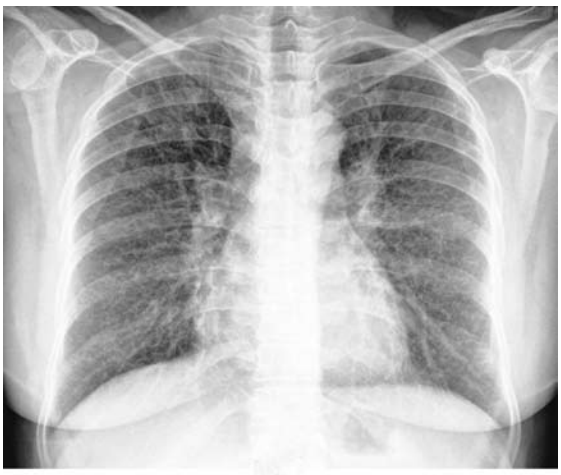

Fig. 1 Chest radiograph shows bilateral diffuse fibrosis with bilateral hilar enlargement.

The patient was diagnosed provisionally as a case of sarcoidosis, and bronchoscopy was done. Transbronchial biopsy revealed numerous foreign body giant cells with birefringent particles and non-caseating granulomas, with predominance of macrophages (Figs. 3a & b). The patient's symptoms recurred within one month of discontinuing prednisolone. The patient was

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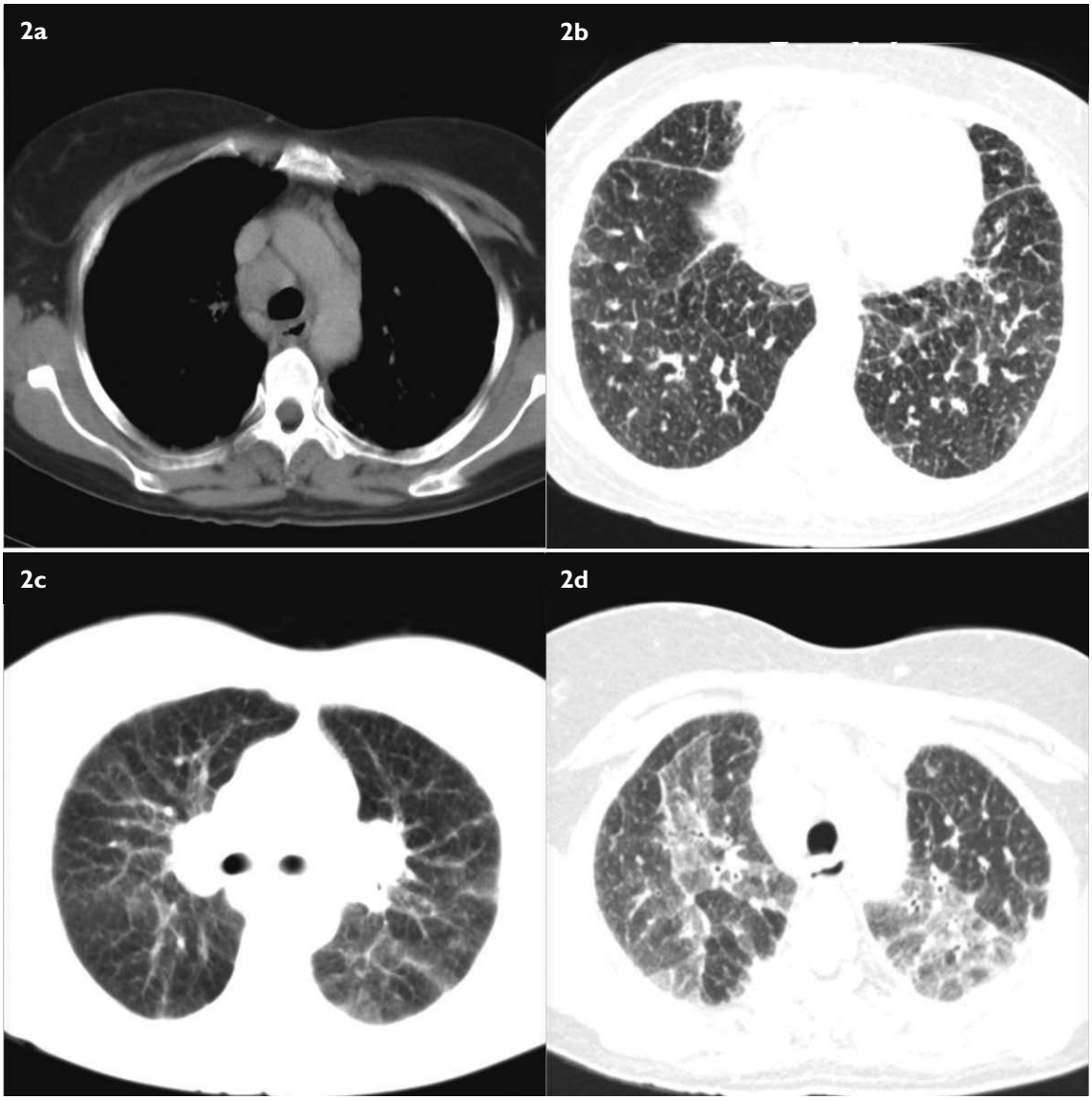

Fig. 2 Axial CT images of the chest show (a) enlarged paratracheal, subcarinal, and hilar lymph nodes; (b) bilateral interstitial fibrosis; (c) multiple bilateral diffuse nodular opacities; and (d) ground glass opacities with nodular lesion.

restarted on prednisolone and reported improvement in her symptoms. The patient was started on prednisone 0.5 mg/kg/day which was gradually tapered to 0.25 mg/kg/day. The patient is currently on low-dose alternate day prednisolone 5 mg and has remained symptom-free since then. Symptomatic improvement and spirometry were the objective parameters used for response in this case.

DISCUSSION

Thorel reported the first case of talc pneumoconiosis in 1896.[3] Talc is pure hydrous magnesium silicate with 63.5% SiO_2, 31.7% MgO and 4.8% H_2O, but in practice, substitutions of ions occur in the mineral lattice.[4] Four distinct forms of pulmonary disease caused by talc have been defined. Three forms due to inhalation include: talc asbestosis produced by inhalation of talc with asbestiform fibres, talc silicosis caused by talc mined with high silica content mineral, and talcosis due to pure talc inhalation. The fourth form, due to intravenous administration of talc, is manifested by consolidation, large nodules and masses.[1,2]

Delayed hypersensitivity is the likely hypothesis for the physiological and pathological mechanism of talc-induced pulmonary granulomatosis. Pulmonary parenchymal lesions in the case of talc-induced granulomatosis may be classified into three groups including: diffuse interstitial fibrosis with collagen deposition in the alveolar walls and dust-laden macrophages; widespread, poorly-defined nodules with stellate collections of macrophages and fibroblasts; and foreign body granulomas consisting of epitheloid cells and foreign body giant cells.[5] Gysbrechts et al emphasised the importance of a thorough, detailed

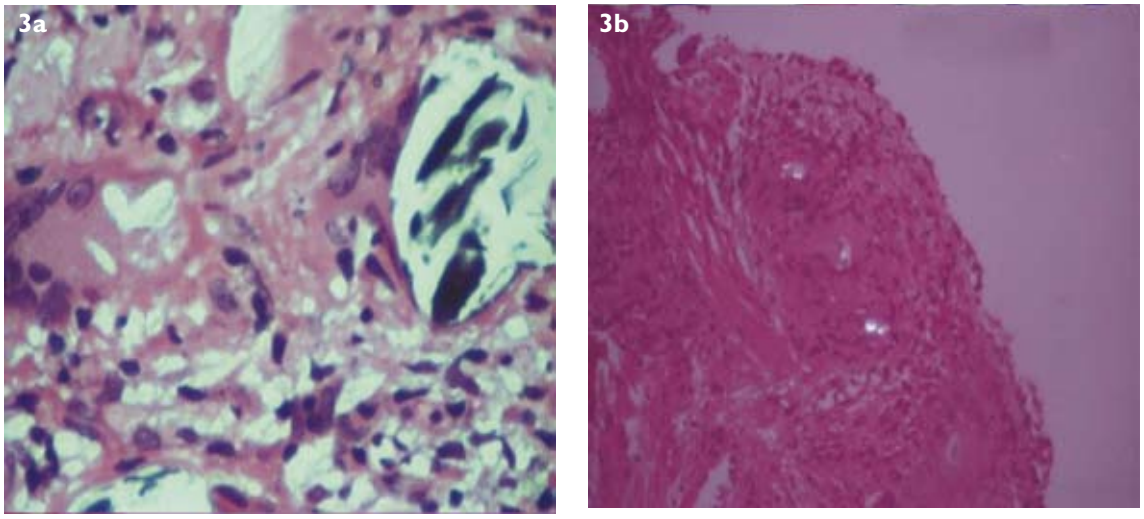

Fig. 3 (a) Photomicrograph shows foreign body giant cells with engulfed crystals (Haematoxylin & eosin, × 40). (b) Polarising micrograph shows birefringent crystals (× 40).

occupational history, which may be helpful in revealing a remote and forgotten exposure leading to talc granulomatosis.[6] Our patient did not give any history of occupational exposure or intravenous drug abuse. There is considerable overlap in the clinical features and laboratory findings of patients with talc-induced pulmonary granulomatosis and sarcoidosis as is evident in this case.

Occupational exposure to talc dust occurs during mining, crushing, separating, bagging, loading and in end-use facilities, such as rubber dusting and addition of talc to ceramic clays and glazes. Manufacturing of ceramic, plastic, rubber and cosmetics account for the majority of talc consumption worldwide, but paint and confectionery industries use talc as well. Consumer applications of talc include pharmaceutical tablet production, confectionery manufacturing, and cosmetic applications such as antiperspirant sticks or body powder. High concentrations of SACE and increased number of lymphocytes in BAL in patients with talc granulomatosis suggest a pulmonary cellular response to talc that is similar to the cellular response in patients with sarcoidosis.[7] Thus, the possibility of exposure to talc (as well as to beryllium and other dusts) must be investigated in any case of sarcoidosis.[8] Findings from chest radiographs and HRCT range from diffuse micronodular patterns to major loss of structure of the pulmonary parenchyma due to massive fibrosis.[9]

Although no proof of a cause and effect relationship for the development of progressive interstitial lung disease was found in this patient, talc-induced pulmonary granulomatosis was diagnosed by the demonstration of birefringent particles in BAL fluid by polarised microscopy. A definitive diagnosis is obtained by transbronchial or open lung biopsy specimens, which show macrophages with intracellular talc crystals. In these cases, an early bronchoscopy along with a biopsy should be considered, as the identification of talc-induced granulomatosis would avoid diagnostic errors and consequently, unnecessary treatment. Treatment with corticosteroids has been attempted, with improvement of clinical and respiratory functions, although there is a risk of relapse after cessation.[10]

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