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CASE FOR DIAGNOSIS

A 44-yr-old male with progressive dyspnoea and dry cough

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Case history

A 44-yr-old male carpenter presented to the outpatient clinic complaining of progressive dyspnoea and dry cough for the last 7 yrs. The patient's symptoms had worsened in the last 2 yrs and at the time of presentation he had dyspnoea at rest. He used intravenous amphetamine but stopped 12 yrs before presentation. The patient denied smoking or other previous illnesses.

Physical examination revealed an increased anteroposterior chest diameter. Auscultation disclosed diminished breath sounds and fine crackles at the lower lung fields. Respiratory rate was 24 beats per minute and pulse oximetry in room air and at rest was 90%.

A chest radiograph (fig. 1) and, later, a high-resolution computed tomography were performed (figs. 2a and b). Pulmonary function tests showed: forced vital capacity (FVC) 1.23 L (25%), forced expiratory volume in one second (FEV_1) 0.46 L (13%), FEV_1/FVC 0.37 (46%), total lung capacity 7.56 L (110%), functional residual capacity 6.31 L (166%), residual volume 6.03 L (298%), and carbon monoxide diffusing capacity of the lung 4.19 $mL \cdot min^{-1} \cdot mmHg^{-1}$ (14%). Seric alpha-1-antitrypsin was 1.19 $g \cdot L^{-1}$ (range 1.03–2.02 $g \cdot L^{-1}$). An open lung biopsy was performed (figs. 3a and b).

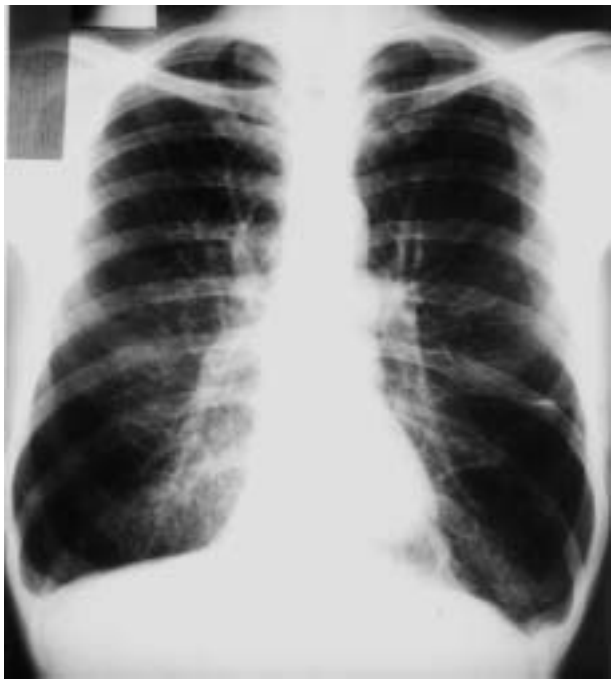

Fig. 1. – Posteroanterior chest radiograph.

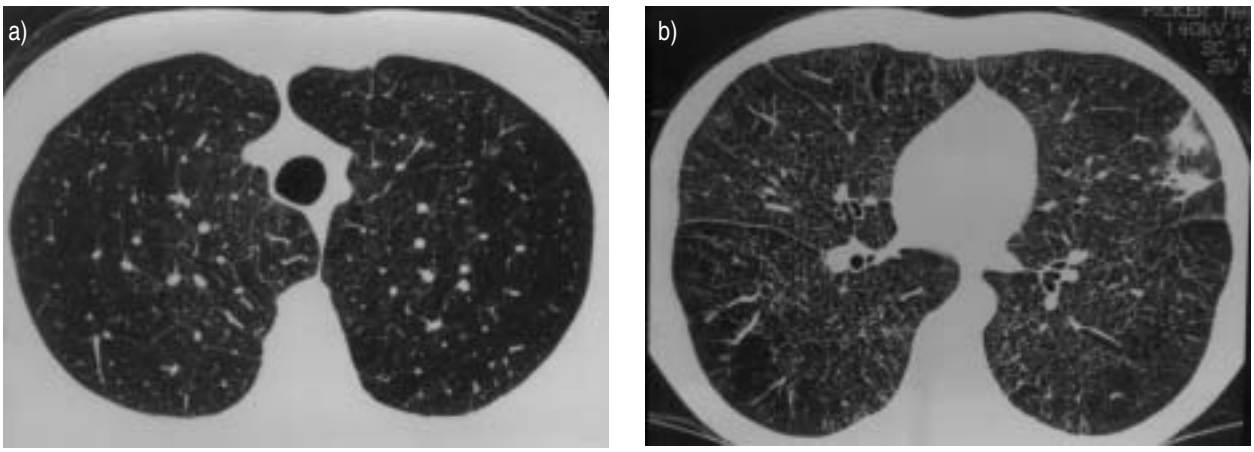

Fig. 2. – High-resolution computed tomography.

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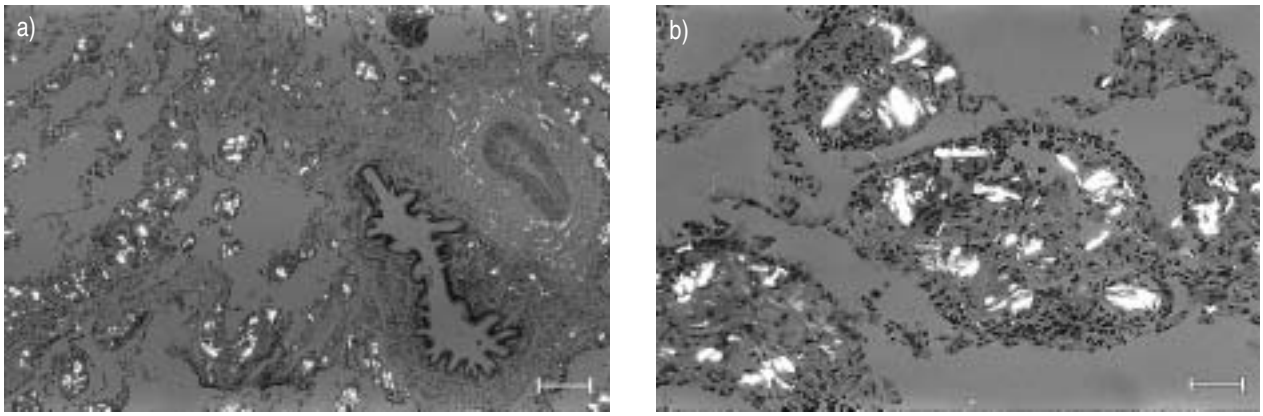

Fig. 3. – a) Photomicrograph of a histology slide from the lung biopsy (haematoxylin and eosin stain under polarised light, internal scale bar=100 μm). b) Magnified view (haematoxylin and eosin stain under polarised light, internal scale bar=500 μm).

BEFORE TURNING THE PAGE, INTERPRET THE RADIOGRAPHIC EXAMS AND HISTORY AND SUGGEST A DIAGNOSIS.

Interpretation

The chest radiograph reveals hyperinflation and a micronodular pattern more prominent in the middle and lower lung fields. High-resolution computed tomography shows diffuse micronodules, areas of conglomerate nodules and regions of decreased attenuation consistent with emphysema.

The pulmonary function tests reveal a severe obstructive pattern, air trapping, hyperinflation, and reduced diffusion of carbon monoxide.

Histological examination revealed emphysema and multiple granulomas, which contained plate-like crystals that were birefringent under polarised light.

Diagnosis: "Pulmonary emphysema associated with intravenous talc granulomatosis"

Treatment and clinical course

The patient later gave a more detailed history of drug abuse that consisted of intravenous injection of dissolved pills of phenmetrazine, methamphetamine and pentobarbital. The patient used these drugs between the ages of 19–32-yrs-old.

After diagnosis, the patient was referred to the lung transplantation programme of the authors′ institution. Hepatitis C was then diagnosed and interferon alfa-2b and ribavirin were initiated. The patient′s dyspnoea worsened after the administration of interferon, but improved before the next dose. Use of bronchodilators continued but response has been poor. After hepatitis treatment, the patient will be re-evaluated for lung transplantation.

Discussion

Histologically, multiple granulomas are present in the perivascular and parenchymal interstitium. Talc can be identified within the giant cells under polarisation microscopy. It forms irregular birefringent aggregates of plate-like crystals ranging from 5–15 μm. Panacinar emphysema is often evident [1–3].

The earliest radiological manifestation is widespread micronodules, which may enlarge and coalesce to form opacities with air bronchograms. In later stages, emphysema and bullae can also be observed. Pneumothorax and mediastinal lymph node enlargement have been described [1–3]. High-resolution computed tomography may reveal ground-glass attenuation, diffuse micronodules, conglomerate masses, and lower lobe panacinar emphysema [4].

Panlobular emphysema is an uncommon but well described complication of intravenous injection of oral medications [1–6]. Methylphenidate and methadone are the most common drugs used but several others have been reported [1, 2, 5]. Methamphetamine and pentobarbital have never been associated with this disease. All of the drugs have talc as a filler. Following intravenous injection, talc emboli reach pulmonary vessels and then migrate to the adjacent perivascular and parenchymal interstitial tissue where they promote a foreign body giant-cell reaction [1]. It is not clear why panlobular emphysema develop in these patients. Cigarette smoking is present in virtually all cases reported but usually leads to centrilobular emphysema [1, 2, 5]. The drugs could be responsible, but several different substances have been associated with this disease and, when used as oral medications, they do not promote emphysema [2, 4].

Most patients are young and have symptoms of slowly progressive dyspnoea and cough, which may progress despite cessation of drug abuse. Heavy use seems to be necessary before development of symptoms [3]. Fundoscopy reveals birefringent particles, principally surrounding the foveal area [3]. Pulmonary function tests can reveal both restrictive and obstructive features but, as disease progresses, severe obstruction and hyperinflation with air trapping usually predominate. Decreased diffusing capacity is also common [1, 2, 5].

Treatment consists of smoking and drug abuse cessation and supportive care. Lung transplantation can be an alternative in some patients but recurrence has been reported in one patient [6].

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