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CASE FOR DIAGNOSIS

A 29-year-old male with malaise, chest pain and night sweats

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CASE HISTORY

A 29-yr-old male was seen in clinic for apparent mediastinal lymphadenopathy. While in the USA, 1 month previously, he became unwell, with night sweats, malaise, cough and pleuritic chest pain. He attended hospital, where the unusual appearance of his chest radiograph was noted. Subsequently, computed tomography (CT) of the thorax was undertaken and he was advised that he would need a mediastinoscopy. He declined the intervention and returned to the UK for continued management. No other information was available from the hospital in the USA. When reviewed in clinic, his constitutional symptoms had resolved, leaving only a complaint of ''clicking'' during inspiration.

The patient had previously enjoyed good health, apart from developing bilateral primary spontaneous pneumothoraces, followed soon after by a recurrent left pneumothorax, 7 yrs previously. The latter was successfully managed by thoracoscopic insufflation of 4.95 g of iodised asbestos-free talc. No further imaging of the chest was carried out until this presentation. He had a 15-pack-yr smoking history and drank 10 units of alcohol per week. On examination there were a few shotty axillary lymph nodes, the largest being 1.5 cm on the right medial wall. In the chest, dullness to percussion was noted over the left clavicle, where breath sounds were also diminished.

Laboratory studies demonstrated a normal full blood count, erythrocyte sedimentation rate (ESR) of 2 and C-reactive protein (CRP) of 5 $mg \cdot L^{-1}$ (0–9). Serum biochemistry, liver function tests and immunoglobulins were normal.

Chest radiography (fig. 1) and CT scans of the lungs and mediastinum (figs 2–4) were performed.

FIGURE 1. Chest radiograph.

FIGURE 2. Computed tomography chest scan cut through the superior mediastinum.

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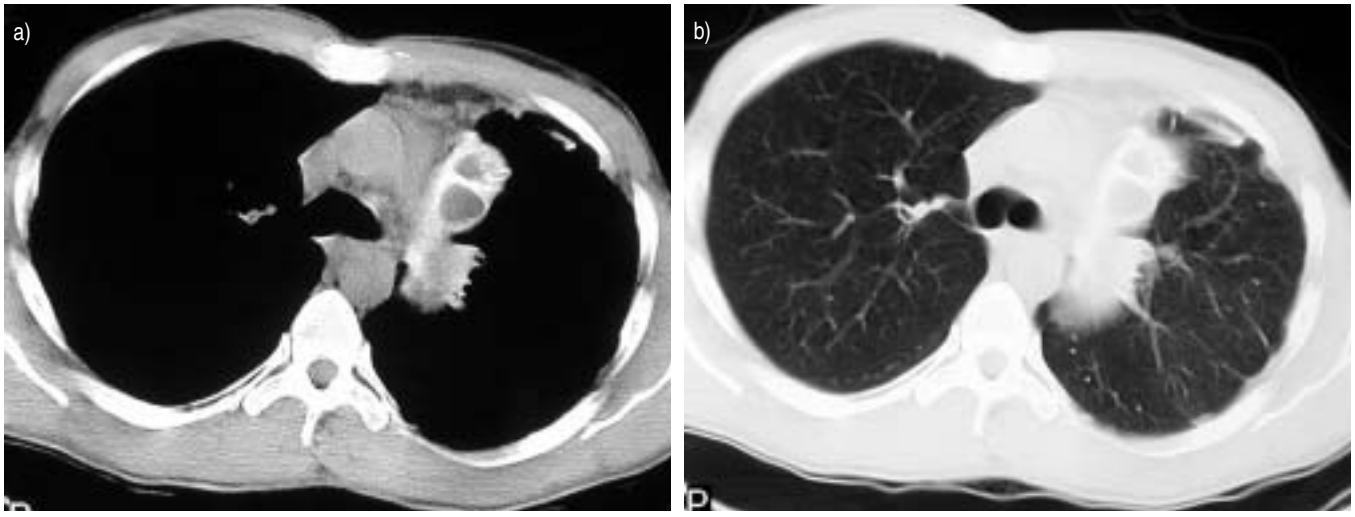

FIGURE 3. Computed tomography chest scan cut (mediastinal (a) and lung windows (b)) at the level of carina.

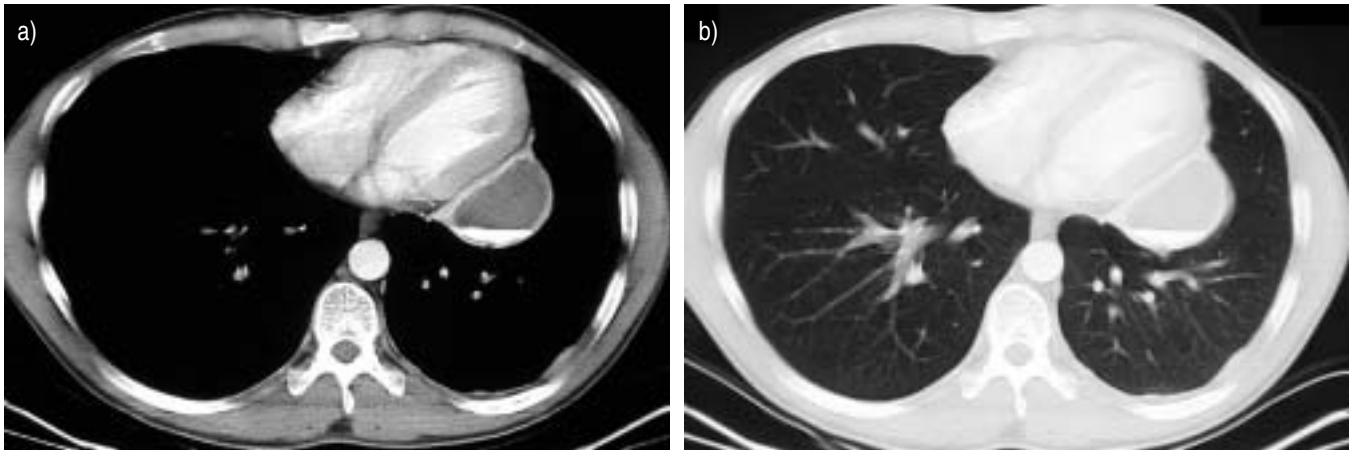

FIGURE 4. Computed tomography scan cut (mediastinal (a) and lung windows (b)) through the lower chest.

BEFORE TURNING THE PAGE, INTERPRET THE RADIOGRAPHS, SUGGEST A DIAGNOSIS AND A POSSIBLE CAUSE.

INTERPRETATIONS

Chest radiography

Multiple rounded lesions abutting the heart and a large loculated left mediastinal mass with loss of volume were observed on the left side of the chest radiograph (fig. 1). However, the right side was essentially normal.

CT

CT scans of the chest (figs 2–4) showed an extensive paramediastinal pleural collection, which extended from the lung apex almost down to the level of the hemi-diaphragm, with at least two large loculations. Figure 3 shows the lower part of upper locule and the upper part of lower locule. Both the loculated collections measured up to 6 cm in diameter in the transverse plane and were encased by rigid heavily calcified pleura throughout. Within the loculated pleural cavity the fluid had a variable attenuation value with a mean of 20 HU, suggesting the presence of protein/debris within. ''Milk of calcium'' was found within the lower collection, creating a fluid–fluid level with the rest of the locular contents (fig. 4). Most of the left-sided pleura showed irregular thickening, with heavy calcification in the upper zone. The underlying lung parenchyma appeared normal except for some minor bullous changes at the apices and slight loss of volume on the left side.

Diagnosis: Extensive left multi-loculated paramediastinal pleural collection secondary to previous talc pleurodesis.

Clinical course

After discussion with cardiothoracic surgeons, a conservative policy was followed, given that the loculated fluid was in direct contact with major mediastinal structures, including the heart, and any surgery would have carried a high risk of complications for what was essentially a benign condition.

Clinical evaluation, interval chest radiography and a repeat CT after 10 months were all stable. The patient continues to be well to the present day, except for intermittent clicking in the chest brought on by bending or twisting. This is probably secondary to the mechanical effect of the heavily calcified pleural locules.

DISCUSSION

The unusual aspect of this case is the presence of multiple rounded lesions mimicking a mediastinal mass on the chest radiograph. CT chest scans showed at least two large loculations and the lower of these contained ''milk of calcium'' creating a fluid–fluid level with the rest of the locular contents (fig. 4). The presence of milk of calcium (calcium carbonate crystals) is most often seen in gall bladder disease, and is thought to represent sequelae of cholestasis [1]. Milk of calcium pleural collections have previously been reported following pleural tuberculosis and pleuropulmonary paragonimiasis, as well as in a bronchogenic cyst [2, 3], chemical analysis showing a colloidal suspension of calcium crystals. The locular contents in this case were radiologically similar to other milk of calcium collections, but the possibility of the collection being free talc cannot entirely be discounted. However this could not be verified, as surgery was not indicated in this patient.

The safety and efficacy of talc pleurodesis has been well documented for >50 yrs [4], leading to its widespread use throughout the world for the treatment of recurrent pneumothorax [5], especially when used through a thoracoscopic procedure [6]. However, there have been reports of deaths due to acute respiratory distress syndrome (ARDS) following talc poudrage, and, hence, its use in young people is considered unacceptable by some authorities [7]. Other complications include pain, fever, empyema, benign cardiac arrhythmias and fibrothorax [8].

A few studies have examined radiographical changes following chemical pleurodesis. McLoud *et al.* [9] reviewed the repeat chest radiographs of 57 patients after chemical pleurodesis. This was a disparate group, as agents other than talc were used, and only six patients had pneumothorax, the remainder having pleural effusions due to a variety of causes [9]. The most striking radiological changes were identified within the 1st week of instillation, with the most common finding (56%) being the development of multiple loculations in the pleural space. Resolution of these changes occurred within 1–3 weeks. No patient had evidence of pleural calcification, though a late fibrothorax occurred in six patients. Murray *et al.* [10] retrospectively reviewed chest CT scans of seven patients, six pleural effusions and one pneumothorax, after talc pleurodesis. The most distinctive finding in all cases was focal areas of high attenuation within the pleural space, which were presumed to be deposits of talc. Clusters of high-attenuation material were seen on the pleura of the patients treated with talc slurry *via* an intercostal drain, whereas fine linear deposits were seen on the pleura of the patient treated with talc poudrage at thoracoscopy. The focal high-attenuation areas seen appear to be distinctive for talc and are not apparent with other agents. In all cases, talc was predominantly seen in the posterior, caudal aspect of the pleural space.

Kwek *et al.* [11] examined CT scans of nine patients following talc pleurodesis for malignant effusions (three patients) and persistent air leak following thoracic surgery (six patients). They noted high-density areas of pleural thickening (average thickness of 1.2 cm), as well as rounded pleural nodules, but no loculated pleural fluid collections were seen in any of the patients. The changes remained stable on serial imaging.

Viskum *et al.* [12] examined the chest radiographs of 50 patients at least 22 yrs after thoracoscopic talc poudrage for spontaneous pneumothorax. In 37 of these patients, either obliterated costophrenic angle or small partially calcified pleural patches were seen. Only two patients had pronounced pleural thickening with calcification. Again, no loculated pleural collections were seen.

Current experience would suggest the reaction described is unusual. The procedure undertaken in this patient was no different to any other talc poudrage and the unusual appearances that have not progressed over time cannot be explained. It is important to recognise that instillation of talc can lead to extensive pleural loculations and a conservative approach is the best management plan for such pleural collections.

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