Mucus plugging mimicking a left hilar mass

Introduction

Unexplained radiological new lobar collapse and apparent hilar mass especially in a smoker normally leads to rapid investigation for malignancy as an obstructive cause in most cases. However, the differential diagnosis should include alternative causes of obstruction including foreign body aspiration or mucus plugging.

This article describes a case of significant new lobar collapse and an apparent left hilar mass in a heavy smoker with asthma, which was initially attributed to probable cancer by the admitting team. This resolved completely following conservative treatment for mucus plugging by the specialist team obviating the need for further investigation, further patient radiation exposure and allaying patient anxiety about a more serious underlying diagnosis. In patients with airways disease, especially asthma with an infective history, mucus plugging needs to be high up on the differential diagnosis of unexplained lobar collapse and apparent mass lesions even in smokers.

Discussion

Atelectasis is defined as collapsed lung as a result of reduced aeration and is one of the most common chest radiograph abnormalities (Woodring and Reed, 1996a). Manifestations of atelectasis on the chest radiograph are secondary to volume loss and may be divided into direct and indirect signs. Direct signs of atelectasis include crowded pulmonary vasculature and air bronchograms, in addition to displaced interlobar fissures (Woodring and Reed, 1996a). Indirect signs include pulmonary opacification, ipsilateral hemidiaphragm elevation, tenting of the hemidiaphragm (juxtaphrenic peak sign), mediastinal and tracheal shift, and expansion of the surrounding lung (Woodring and Reed, 1996a).

The left upper lobe collapses anteriorly and medially. *Figure 1* demonstrates some of the classical signs of left upper lobe collapse including opacification of the upper left hemithorax with obscuration of the left cardiac and upper mediastinal borders, elevation of the left hemidiaphragm and the Luftsichel sign (Webber and Davies, 1981). This sign describes the crescentic area of hyperlucency around the aortic knuckle and represents the hyperinflated superior portion of the left lower lobe with the collapsed left upper lobe laterally (Webber and Davies, 1981). A lateral chest radiograph may display anterior displacement of the left upper lobe with bowing of the interlobar fissure (Woodring and Reed, 1996a).

Obstructive causes of atelectasis are most common and include tumour, foreign bodies and mucus plugging (Woodring and Reed, 1996b). The communication between the trachea and the alveoli is disrupted, leading to resorption of gases within the alveoli and subsequent segmental or lobar atelectasis (Woodring and Reed, 1996b). Tumours are the most important obstructive cause to exclude in patients with lobar atelectasis.

An increasingly litiginous health-care system has perhaps heightened the use of early cross-sectional imaging in unexplained lobar collapse for fear of delayed or missed diagnosis of intrathoracic malignancy. In a case series of 50 patients with atelectasis, Woodring (1988) identified tumour as the underlying aetiology in only 27 patients, and 24 of those tumours were visible on chest radiograph.

Conclusions

In patients with primary airways disease (especially asthma and bronchiectasis) with compatible symptoms, a repeat chest radiograph after appropriate treatment with bronchodilators, antibiotics, steroids, mucolytics and physiotherapy should be undertaken before proceeding to cross-sectional imaging as the latter may not be

Case Report

A 57-year-old social worker presented to the acute medical unit with a 1-week history of breathlessness, cough productive of viscous purulent sputum and fever. He had a 20-pack-year smoking history with a history of asthma and frequent lower respiratory tract infections. On examination he was pyrexial and tachypnoeic, resting saturations 93% on air, reduced breath sounds and crackles were noted in the left upper zone. White cell count was 10 x 10^9/litre with normal eosinophils, C-reactive protein was elevated (117 mg/litre) and aspergillus screen was negative. A chest radiograph confirmed left upper lobe collapse with the suggestion of a left hilar mass with indentation of the left upper lobe bronchus (*Figure 1a*). Given the apparent mass and smoking history, a computed tomography scan was requested by the admitting team to evaluate a suspected lung cancer.

The patient was then transferred to the respiratory ward. His symptoms were noted to have resolved having expectorated copious volumes of viscous sputum following treatment with antibiotics, nebulized salbutamol, systemic steroid, mucolytics and chest physiotherapy. Clinical examination revealed an entirely normal respiratory examination. A repeat chest radiograph 2 days later confirmed that the left lung had completely re-expanded (*Figure 1b*). The computed tomography scan was cancelled, the patient having been reassured. He was followed up in the asthma clinic and remained well at follow up with no recurrence of the collapse.

LEARNING POINTS

- Consider mucus plugging as a possible cause of lobar collapse, especially in patients with underlying airways disease and viscous sputum production.
- Computed tomography and bronchoscopy are not always necessary following lobar collapse on the chest radiograph. Investigations should be tailored to the clinical case.
- Mucus plugging often responds to chest physiotherapy, bronchodilators and mucolytics without the need for bronchoscopic intervention.

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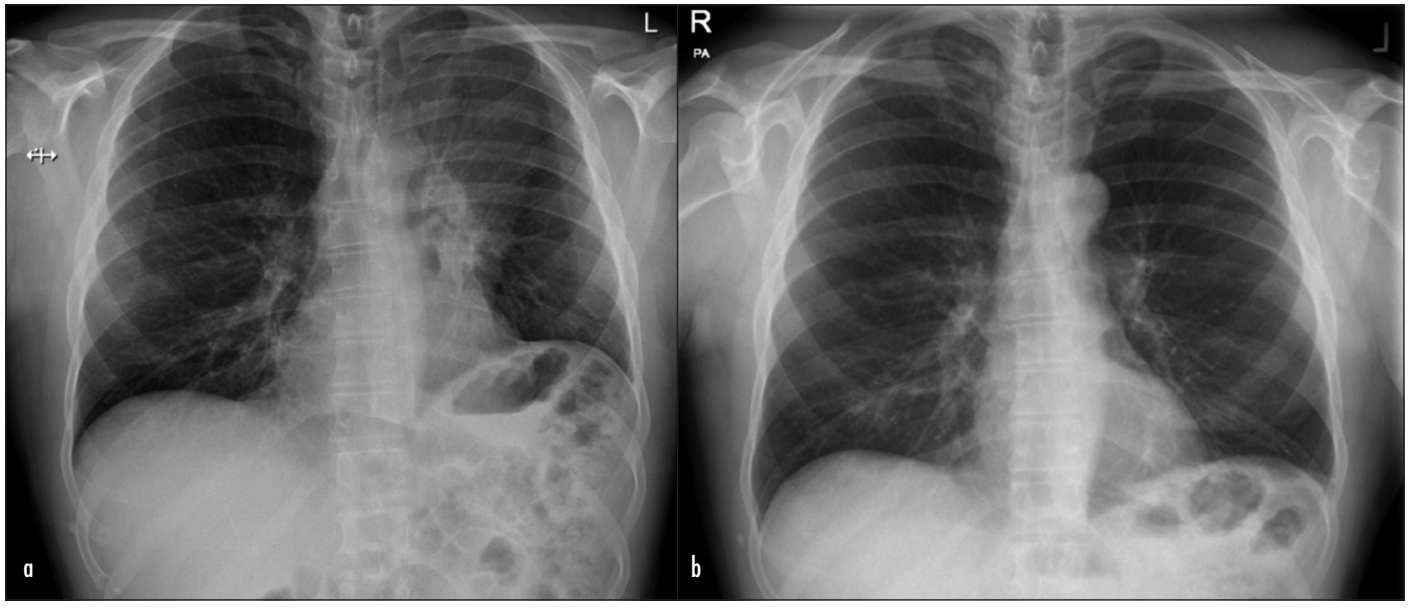

Figure 1. a. Chest radiograph on admission demonstrating the signs of left upper lobe collapse with an apparent left hilar mass and volume loss. b. Normal chest radiograph following treatment.

necessary. This potentially reduces patient anxiety, unnecessary radiation exposure and risk of contrast allergy, improves radiology service capacity and reduces unnecessary health-care costs. BJHM

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Hydrofluoric acid burn

A 40-year-old glass etching worker presented to the emergency department with a hydrofluoric acid burn. The patient was complaining of increasing pain in the affected fingers. His physical examination showed blisters on the right first, second and third fingertips in addition to mild staining with dye which had transferred from a towel (*Figure 1*).

The blisters were washed with plenty of water, deroofed, and a 2.5% calcium-gluconate gel was prepared (by mixing 25 ml of 10% calcium-gluconate solution with 75 ml of water-soluble lubricant) and applied by the patient wearing a surgical glove filled with the gel. After a few minutes, the pain was dramatically relieved. Electrocardiogram, serum electrolytes, and radiographic imaging was normal.

Figure 1. Blisters on the three fingertips on the right hand caused by a hydrofluoric acid burn in addition to mild dye staining.

Although hydrofluoric acid is a weak acid, the free fluoride ion results in calcium chelation which leads to cellular death. Patients can have a tremendous amount of pain with seemingly benign wounds. Severe injuries may result in severe systemic hypocalcaemia, hypomagnesaemia, hyperkalaemia, acidosis and ventricular dysrhythmias. Treatment options include calcium gel (in minor burns), intradermal calcium (5%) injection up to 0.5 ml/cm^2 (for larger burns), Bier block, and intra-arterial 2% calcium-gluconate for distal refractory burns (Ryan et al, 1997). BJHM

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