Spontaneous pneumomediastinum in a young man

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Introduction

Spontaneous pneumomediastinum is an uncommon condition that can easily be missed in patients presenting to hospital with dyspnoea and chest pain. Although most cases resolve with conservative management, severe complications may develop, including tension pneumomediastinum and acute mediastinitis. The condition is reported most frequently in young patients who may appear objectively well and stable on presentation. However, given the potential for acute deterioration, it is vital to ensure that the diagnosis of spontaneous pneumomediastinum is not missed. This article discusses the case of a 19-year-old man with spontaneous pneumomediastinum who developed type 2 respiratory failure.

Case report

A 19-year-old man with no significant past medical history presented to hospital with sudden onset shortness of breath and chest pain radiating to the neck, preceded by several days of persistent dry cough. The patient reported a ½ pack-year tobacco smoking history and a ¼ joint-year cannabis smoking history. He denied the use of any other inhalation drugs. On admission, the patient was tachycardic (heart rate of 121 beats/min), tachypnoeic (respiratory rate of 25 breaths/min), hypoxic (oxygen saturations of 92% on room air) and afebrile. Respiratory examination demonstrated reduced air entry bilaterally.

The accident and emergency team and the admitting medical team did not observe any significant abnormality on chest radiograph. An arterial blood gas on 4 litres/min oxygen demonstrated type 2 respiratory failure with a pH of 7.32, partial pressure of oxygen of 9.0 kPa and partial pressure of carbon dioxide of 6.4 kPa. Inflammatory markers were raised with a white cell count of 13.0x109/litre and a C-reactive protein of 61.2 mg/litre. As a result of his ongoing chest pain with tachypnoea and hypoxia, the patient underwent a computed tomography pulmonary angiogram (Figure 1) which revealed moderate volume pneumomediastinum and small foci of ground-glass opacification in the middle lobe and lingula.

In view of the ground-glass changes observed, COVID-19 infection was considered as a possible aetiology. However, two COVID-19 reverse transcription polymerase chain reaction swabs were negative and the patient did not exhibit any clinical signs suspicious of COVID-19 infection. The ground-glass changes were attributed to a concurrent viral infection, although no pathogen was identified on a respiratory virus polymerase chain reaction screen. A computed tomography oral contrast study demonstrated no oesophageal leak. Following discussion with cardiothoracic surgeons and respiratory physicians, spontaneous pneumomediastinum was diagnosed. The patient was transferred to intensive care for monitoring of his respiratory function. After 72 hours' monitoring, the patient's symptoms and respiratory failure resolved and he was discharged with respiratory follow up.

Discussion

Spontaneous pneumomediastinum is diagnosed when no obvious primary source for the pneumomediastinum is found. It is a rare but recognised cause of sudden onset chest pain with associated dyspnoea. Other common symptoms include neck pain and swelling, coughing and dysphagia (Sahni et al, 2013). The development of spontaneous pneumomediastinum is often preceded by coughing, vomiting or physical activity (Sahni et al, 2013). The proposed pathophysiology is that high intrapulmonary pressure causes alveoli to rupture, leading to the diffusion of free gas into the hilum and subsequently the mediastinum (Maunder et al, 1984). Predisposing factors that have been identified include smoking, pre-existing lung disease (particularly asthma and interstitial lung disease) and recent upper respiratory tract infection (Sahni et al, 2013). The reported incidence is less than 1 in 40 000 patients admitted to hospital (Macia et al, 2007). The condition is

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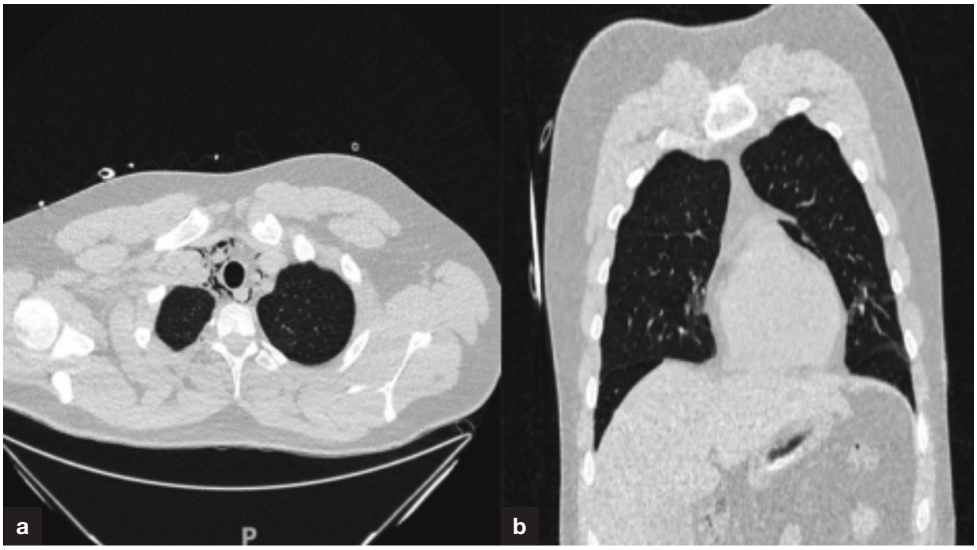

Figure 1. Pneumomediastinum visible on (a) axial and (b) coronal views from the patient's computed tomography pulmonary angiogram.

reported more frequently in young men (Sahni et al, 2013). The most common finding on examination is surgical emphysema, while Hamman's sign (crunching sound on auscultation synchronous with heart sounds) is less commonly seen (Macia et al, 2007). Spontaneous pneumomediastinum can be diagnosed on chest radiograph but if not visible on a plain film, it may subsequently be identified on computed tomography imaging of the chest. The majority of patients with spontaneous pneumomediastinum have an uneventful recovery but owing to the severity of potential complications, close observation in hospital is recommended.

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