Spontaneous pneumomediastinum complicating asthma exacerbation

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DESCRIPTION

Pneumomediastinum is an uncommon condition characterised by the accumulation of air in the mediastinum. Pneumomediastinum is frequently associated with other forms of extra-alveolar air, including pulmonary interstitial emphysema, pneumopericardium, pneumothorax, subcutaneous emphysema, pneumoretroperitoneum and pneumoperitoneum.¹ The majority of patients with spontaneous pneumomediastinum have predisposing factors that cause increase in airway pressure, which leads to alveolar rupture. Most commonly, this results from straining against a closed glottis (Valsalva manoeuvre) as during vomiting, coughing, or exercising.² Oesophageal perforation (OE) is another important cause of spontaneous pneumomediastinum. However, these individuals are more likely to present with history of multiple or severe episodes of emesis and retching along with features of shock such as hypotension and tachycardia.³ OE are often complicated by mediastinitis and sepsis, early diagnostic imaging is the goal in order to improve survival.^{4,5} The incidence of pneumomediastinum in adult patients with asthma exacerbations is unknown.^{6,7} Vianello *et al* published a study of 45 patients with severe acute asthma exacerbations who underwent radiologic imaging on admission and found that 11% had pneumomediastinum.⁸

A 22-year-old man with asthma who presented to the emergency department with complaints of breathlessness, pleuritic chest pain that was non-radiating and cough associated with post-tussive emesis for 1 day. He had no history of intubations and was not on maintenance asthma therapy. On admission, his vitals were blood pressure 122/58 mm Hg, heart rate 160/min and respiratory rate 40/min, saturating 87% on room air and

Figure 2 CT chest sagittal showing prominent pneumomediastinum extending throughout the middle mediastinum and superior mediastinum well into the soft tissues of the neck.

temperature 37°C. Physical examination was significant for respiratory distress with use of his accessory muscles for respiration, widespread rhonchi bilaterally and prolonged expiratory phase but no stridor. On palpation subcutaneous emphysema extended from the anterior neck down to the infra-clavicular regions into his bilateral axilla.

Blood work-up showed elevated white cell count $20 \times 10^9/L$, lactate 6.6 mmol/L and anion gap of 13 mEq/L. Blood cultures and influenza/respiratory syncytial virus (RSV) PCR were unremarkable. Chest X-ray showed linear lucencies traversing the mediastinum and low neck consistent with pneumomediastinum. CT chest showed a very large pneumomediastinum throughout the chest extending well into the neck (figures 1 and 2). There was

Figure 1 CT chest axial showing large pneumomediastinum in the pericardial region.

Learning points

- ▶ Spontaneous mediastinum occurs as a result of sudden rise in the intra-alveolar pressure resulting in rupture of alveoli.
- ▶ Management is conservative, however high flow oxygen might enhance the reabsorption of air from the mediastinum.
- ▶ CT chest imaging is an important initial diagnostic tool if spontaneous pneumomediastinum secondary to oesophageal perforation is suspected.

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air surrounding the oesophagus although no focal oesophageal abnormality was noted effectively ruling out OE in absence of features of shock. There was prominent pneumopericardium and air extending into the spinal canal at the level of the thoracic and cervical spine. Repeat chest X-rays showed persistent subcutaneous emphysema with pneumomediastinum but no evidence of pneumothorax.

He was managed with high-flow oxygen, nebulised bronchodilators, intravenous steroids, fluids and morphine for pain and was subsequently discharged on day three of admission.

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