Persistent chest pain in the vomiting patient secondary to an incidental spontaneous pneumomediastinum

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DESCRIPTION

A 23-year-old woman with a history of cannabinoid hyperemesis syndrome (CHS) presented with multiple episodes of non-bilious, non-bloody vomiting. She reported a 3-year history of daily marijuana use. Unlike her prior presentations characterised by nausea and vomiting, the patient endorsed ongoing cramping chest pain with difficulty breathing.

The patient continued to endorse chest pain with epigastric discomfort non-responsive to analgesia and antiemetics, despite resolution of vomiting. ECG revealed sinus tachycardia of 108 bpm, which resolved with intravenous fluid volume repletion. The chest X-ray was initially interpreted as within normal limits. With concern of her persisting epigastric discomfort a CT abdomen/pelvis was obtained to exclude an acute abdomen. Findings revealed a partially visualised trace pneumomediastinum. This prompted a second-look of the initial chest X-ray, which in retrospect had trace evidence of a pneumomediastinum (figure 1).

Subsequent CT chest revealed an extensive pneumomediastinum with air tracking along the left hilum/bronchovascular sheath of an unclear source with no radiographic evidence of chest trauma (figure 2). A water-soluble contrast oesophagram had no evidence of oesophageal perforation, hence

Boerhaave's syndrome (spontaneous rupture of the oesophagus) was excluded (figure 3).

Given her recurring cyclic vomiting in the setting of cannabis use, the patient was diagnosed with CHS with spontaneous pneumomediastinum (SPM). The patient was managed conservatively, with complete recovery.

SPM or spontaneous mediastinal emphysema is a rare condition characterised by free air in the mediastinum not preceded by thoracic trauma, surgery or any other medical procedure.¹ A classic clinical triad described consists of thoracic pain (usually retrosternal and pleuritic in nature), subcutaneous emphysema and dyspnoea.

Inhaled marijuana use has been infrequently identified as a potential risk factor for the development of SPM. Weiss *et al* reported 14 cases of marijuana use associated with pneumomediastinum in a retrospective review.² It is a self-limiting condition resulting from alveolar rupture secondary to an acute increase in intrathoracic pressure subsequently leading to dissection of air along the bronchovascular sheath towards the mediastinum.³ The hypothesised pathophysiology of marijuana-related pneumomediastinum is barotrauma occurring during the breathing movements. An increase alveolar pressure gradient results in rupture of alveolar septa with air dissecting around the peribronchial and perivascular sheaths.²

Figure 1 Chest X-ray with trace evidence (red arrows) of pneumomediastinum.

Figure 2 Air within the mediastinal structures (red arrows) with no evidence of oesophageal perforation.

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Figure 3 Water-soluble contrast oesophagram with no evidence of contrast extravasation into the mediastinum.

Our patient presented with classic symptoms of CHS and on this occasion reported persistent, vague chest and epigastric discomfort that led to abdominal and subsequent chest CT imaging which revealed an SPM. Vomiting-induced pneumomediastinum requires a thorough assessment and evaluation to exclude Boerhaave's syndrome which is characterised by oesophageal rupture leading to extravasation of air/gastric content into the mediastinum resulting in mediastinitis.⁴ Water-soluble oesophagram can be used to exclude oesophageal perforation.

Patient's perspective

'I've been here before with the vomiting; I just didn't think my chest would keep hurting so much this time and I kept feeling like I couldn't breathe'.

Learning points

- ▶ There should be a low threshold for chest imaging in the vomiting patient with persisting chest pain in order to exclude an underlying sinister pathology.
- ▶ Diagnosis of spontaneous pneumomediastinum is often delayed, missed or misdiagnosed due to a general lack of awareness and should be on the differential of patients presenting with chest pain and dyspnoea.

Anecdotal evidence of both marijuana and vomiting is reported risk factors for the development of an SPM. SPM can have an ambiguous presentation due to a general lack of awareness. The diagnosis is often delayed, missed or misdiagnosed and should be on the differential diagnosis in patients with risk factors presenting with unexplained dyspnoea and chest pain.^{5,6} Thus, we believe that there should be a low threshold for chest imaging in patients presenting with classic CHS and persisting chest discomfort in order to exclude an underlying acute chest pathology such as hollow organ rupture.⁷

Correction notice This article has been corrected since it was published online. The second author's last name has been corrected from "Sottlie" to "Sottile".

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