Extensive Pneumomediastinum, Subcutaneous Emphysema, and Pneumorrhachis Following Retching: A Case Report of Cannabinoid Hyperemesis Syndrome

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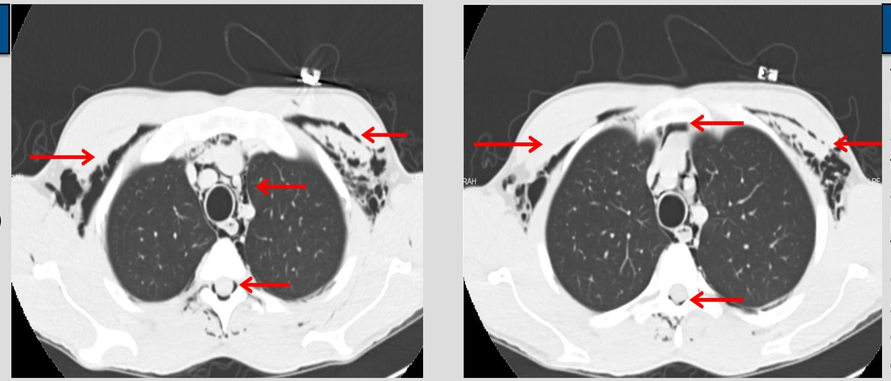
Introduction

Spontaneous pneumomediastinum (SPM) is a rare condition characterized by the presence of free air in the mediastinum, typically resulting from alveolar rupture due to increased intra-alveolar pressure. This phenomenon, known as the Macklin effect, can be triggered by forceful coughing, vomiting, or Valsalva maneuvers. Although esophageal rupture (Boerhaave syndrome) is a major concern, SPM can occur independently. Pneumorrhachis, the presence of air in the spinal canal is an even rarer occurrence and is usually benign. Marijuana use has been implicated in SPM through mechanisms involving barotrauma, though exact pathophysiology is not clear. This abstract discusses a patient with extensive pneumomediastinum, subcutaneous emphysema, and pneumorrhachis following forceful retching.

Case Presentation

A 32-year-old male with no significant past medical history presented to urgent care with 4-day history of nausea, vomiting, diarrhea, decreased oral intake, and reduced urine output. He had recently relocated from Portland, Oregon, and reported occasional marijuana use and social alcohol consumption. He denied toxic alcohol ingestion, over-the counter medications, herbal products, NSAIDs, or recent antibiotic use. The patient admitted to excessive consumption of marijuana gummies in the days leading up to his presentation.



CT images showing pneumomediastinum, subcutaneous emphysema and pneumorrhachis

Hospital Course

Initial laboratory findings included hyponatremia (122mEq/L), acute kidney injury and elevated creatine phosphokinase (CPK 17,000), consistent with rhabdomyolysis. Imaging revealed extensive pneumomediastinum, subcutaneous emphysema, and pneumorrhachis. An esophagogram ruled out esophageal perforation.

Patient was admitted to the ICU for aggressive medical management, including intravenous fluid resuscitation for rhabdomyolysis. Cardiothoracic surgery and neurosurgery consultation deemed no surgical intervention necessary.

Discussion

This case presents a unique constellation of findings, including extensive pneumomediastinum, subcutaneous emphysema, and pneumorrhachis, likely secondary to retching. While Baerhaave syndrome was a primary concern, the negative esophagram made this diagnosis less likely. Macklin effect, or alveolar rupture due to increased intra-alveolar pressure, provides a more plausible explanation.

The patient's history of excessive marijuana gummy use may have contributed to his presentation. Cannabinoid hyperemesis syndrome (CHS) is a condition characterized by chronic nausea and vomiting in chronic cannabis users. While typically associated with long term use, the possibility of acute exacerbation of vomiting with high-dose edibles cannot be excluded. The forceful retching associated with CHSW could have increased intra-thoracic pressure, leading to alveolar rupture and subsequent air dissection. Pneumorrhachis, while rare, has been reported in association with pneumomediastinum. The exact mechanism is not fully understood but is thought to involve the tracking of air along fascial planes into the spinal canal. Then management of SPM is typically conservation, focusing on supportive care and addressing any underlying causes. In this case, the patient's acute kidney injury, electrolyte imbalances and rhabdomyolysis required aggressive medical management. The fact that the patient improved without surgical intervention highlights the importance of a conservative management in absence of esophageal perforation or other surgical emergencies.

Conclusion

This case represents that extensive pneumomediastinum, subcutaneous emphysema can occur 2/2 forceful retching, even in absence of esophageal rupture.