Subcutaneous emphysema of the axilla, chest wall, mediastinum, retroperitoneum, and spinal canalin a patient with cannabis hyperemesis syndrome

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Abstract

Aim— We describe the clinical history of a young adult male who presented with repeated episodes of emesis and subcutaneous emphysema in the context of frequent cannabis use.

Case Presentation—A 20-year-old male presented with a ten-day history of vomiting of up to forty times per day. He had experienced frequent episodes in the past but had never sought medical care. His vomiting was accompanied by subjective fever, chills, and severe nausea limiting his ability to take in food and liquids. Several days prior to presentation, he noticed “rice crispy” crackling under the skin of his neck and chest. His social history was notable for daily marijuana use.

Laboratory tests were remarkable for low levels of sodium (129 meq/L; normal 135-145), potassium (2.5 meq/L; normal 3.5-5.0), and chloride (77 meq/L; normal 96-106) as well as elevated bicarbonate (CO_2)(40 meq/L; normal 20-24). Computed tomography (CT) with intravenous (IV) contrast of the neck, chest, abdomen and pelvis revealed extensive subcutaneous emphysema throughout the supraclavicular, axillary, and bilateral anterior/posterior chest walls which track down into the mediastinum, retroperitoneum, abdomen, lower back, and upper thoracic spinal canal (Figures 1-4). No significant pneumothorax was present. A barium swallow study yielded no evidence of an esophageal perforation.

Conclusion— We present a case of extensive subcutaneous emphysema secondary to rupture of a peripheral airway from forceful vomiting secondary to cannabis hyperemesis syndrome.

Keywords

Cannabis hyperemesis syndrome, cyclic vomiting syndrome, subcutaneous emphysema

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Case Presentation

A 20-year-old man with personal and family history of gastritis, presented to the Emergency Department complaining of frequent emesis for the previous 10 days. At its worst, he experienced between 30-40 episodes of emesis per day. He endorsed nausea associated with his vomiting as well as an inability to eat or drink. He recounted similar episodes of recurrent vomiting in the past, but none severe enough to cause him to seek medical attention. Several days prior to presentation, he noticed “rice crispy” crackling under the skin of his neck and chest. He reported fevers and chills over this course of persistent vomiting but denied hematemesis, headaches, myalgias, sore throat and melena. He admitted daily marijuana use.

The patient appeared hemodynamically stable and vital signs were within normal limits. On physical examination, crepitus was noted upon palpation of the anterior neck to the level of the mandible as well as in the bilateral axilla, anterior chest, and superior abdomen. There was mild epigastric tenderness, but otherwise, the abdominal examination was unremarkable. Laboratory tests revealed low levels of sodium (129 meq/L; normal 135-145), potassium (2.5 meq/L; normal 3.5-5.0), and chloride (77 meq/L; normal 96-106) as well as an elevated CO_2 (40 meq/L; normal 20-24), confirming a hyponatremic, hypokalemic, hypochloremic metabolic alkalosis. Computed tomography (CT) with IV contrast of the neck, chest, abdomen and pelvis revealed extensive subcutaneous emphysema throughout the supraclavicular, axillary, and bilateral anterior/posterior chest walls which track down into the mediastinum, retroperitoneum, abdomen, lower back, and upper thoracic spinal canal (Figures 1-4). No significant pneumothorax was present. A barium swallow study yielded no evidence of an esophageal perforation.

Esophageal perforation was ruled out as the cause of the subcutaneous emphysema based on CT imaging of the chest as well as barium swallow study. The subcutaneous emphysema was suspected to have resulted from the rupture of a peripheral airway. The diagnosis of cyclic vomiting syndrome (CVS) was considered given his recurrent episodes of vomiting and nausea. Ultimately, he did not meet the Rome IV Criteria for CVS.[1] Cannabis hyperemesis syndrome (CHS) was then entertained. Upon review of documented past medical encounters, it was discovered that the patient had a history of excessive bathing, to the magnitude of between two and four showers per day. When this behavior was discussed with the patient, he described feeling relief of his symptoms in the shower. This behavior, coupled with his excessive use of marijuana, was highly suggestive of cannabis hyperemesis syndrome.[3] Follow up would be required to assess whether his symptoms resolved with cessation of marijuana, thereby confirming the diagnosis of cannabis hyperemesis syndrome.

The patient received antiemetic therapy with Ondansetron as needed as well as electrolyte replenishment. He was given an anti-histamine to reduce gastric acidity. In addition, he was intervened with a substance abuse counselor at length about his marijuana use. He decided it was time for smoking cessation and agreed to pursue further counseling to help him in this process. While in the hospital, he received oxygen via nasal cannula to aid in the resorption of subcutaneous air. He was prescribed pantoprazole.

At his two-week follow up, he reported that he had stopped using marijuana and that his nausea and vomiting had resolved. He continued to experience epigastric pain, but this was significantly improved when compared to his past symptoms. The subcutaneous emphysema had entirely resolved based on the absence of crepitus on physical examination. Five months later however, he was again admitted for continuous vomiting and abdominal pain. He had started using marijuana again and was not compliant in taking the proton pump inhibitor.

Discussion

CVS is characterized by intermittent episodes of repeated vomiting that occur between periods of normal health. Diagnosis is based on fulfillment of the Rome IV Criteria which requires that acute episodes of vomiting lasting less than one week occur at least three times in the prior year and twice in the previous six months. These episodes must be more than one week apart and in between them, vomiting must be absent.[1] A personal or family history of migraines is common in patients with CVS and psychological stressors may precipitate symptoms.[2]

CVS is most common in children, but can present in adults as well. Fitzpatrick et al. report an incidence of 3.15 per 100,000 amongst children 16 years old or younger in Ireland[3]while an accurate estimate of incidence in adults has not been achieved. Conflicting evidence exists regarding the comparison of children and adults with CVS. One study found that similar lengths of the intervals between vomiting episodes and similar rates of prodromal abdominal pain or headaches were seen in pediatric and adult patients.[4] Contrarily, another analysis found that adults experienced about four episodes of vomiting per year while children had closer to twelve.[5] Older patients were also shown to have longer episodes of vomiting and to be symptomatic for longer before they were diagnosed than children.[4]

CHS presents recurrent episodes of vomiting similar to those of CVS described above. CHS patients are likely to be under 50 years of age and will present with similar patterns of nausea and vomiting as those seen in CVS in addition to having a history of chronic cannabis use. It is believed that with this chronic cannabis use, the emetic effect of tetrahydrocannabinol (THC) at the gut is greater than its central antiemetic effect, causing this intermittent vomiting. Symptoms are often most prevalent in the morning. Laboratory testing and imaging are often negative in these patients and it is common to see weight loss of more than ten pounds in the setting of normal bowel habits.[2] Flushing and diaphoresis have also been reported in CHS.[6]

It can be quite difficult to differentiate CVS from CHS based on the fact that many CVS patients use marijuana to reduce their nausea.[7] One key difference between the two is the relief of symptoms seen with hot showers or baths in patients with CHS. One proposed mechanism for this phenomenon is that cannabis toxicity disrupts the body's ability to regulate temperature and causes a decrease in core body temperature. Bathing in hot water corrects this decrease in temperature and relieves symptoms as a result.[6]

Treatment and management of CVS and CHS are quite similar. Symptoms can be managed as inpatient with fluid administration, electrolyte imbalance correction and antiemetic therapy. There is no particular therapy that has been proven to be effective for CVS. In cases of CHS and patients with CVS who smoke marijuana, cessation should be encouraged to promote resolution of symptoms.

Conclusion

CHS may be debilitating and can lead to severe electrolyte disturbances which can be lifethreatening. CHS should be suspected in patients with recurrent episodes of vomiting in the setting of cannabis abuse. It is important to have a high level of suspicion in order to reach the diagnosis and to be able to offer prompt medical intervention. In this case, we present an interesting presentation associated with this condition.

Consent Disclaimer:

As per international standard or university standard patient's verbal consent has been taken.

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Figure 1.

Subcutaneous emphysema in the neck

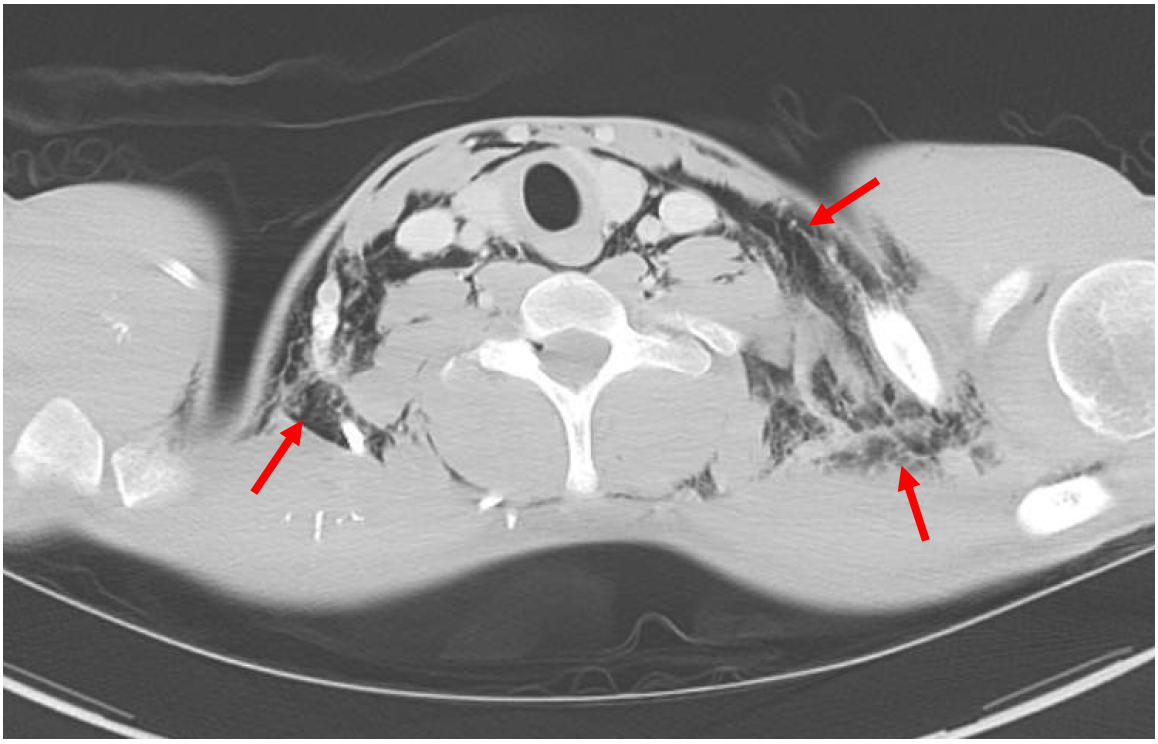

Figure 2

Subcutaneous emphysema in the thorax

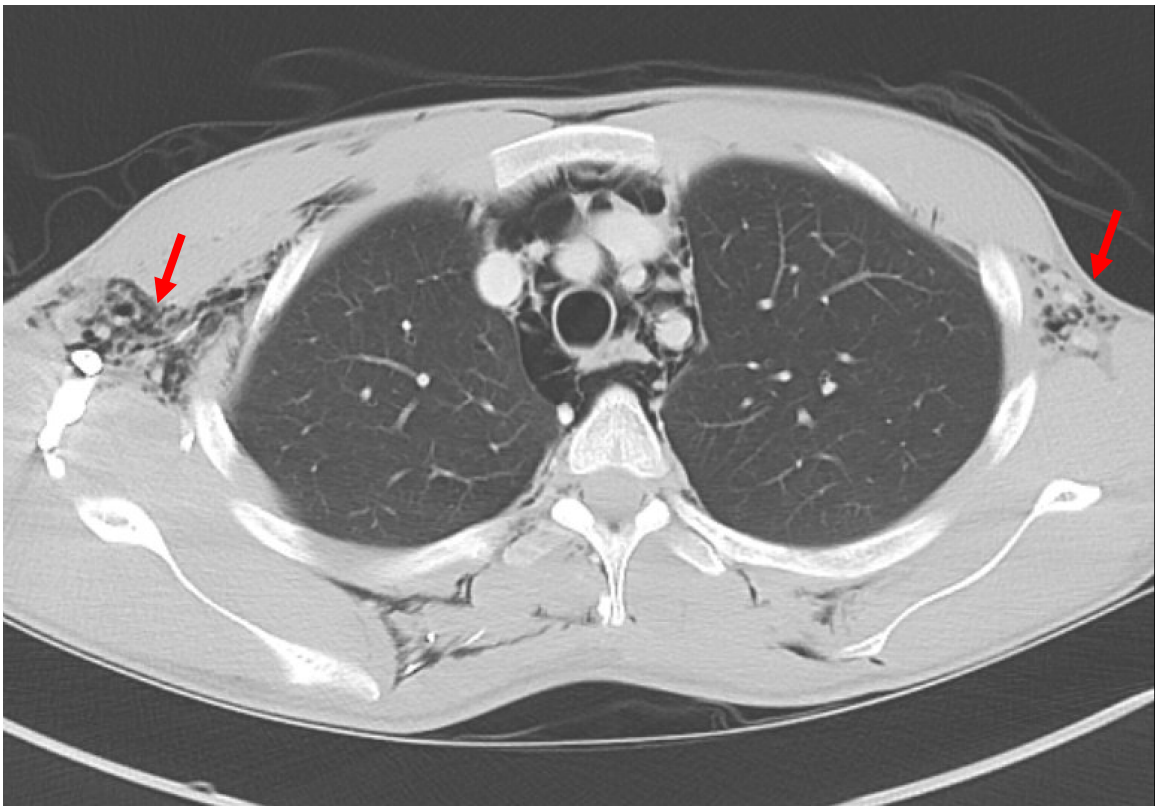

Figure 3

Subcutaneous emphysema in the axilla

Figure 4

Subcutaneous emphysema in the abdominal wall