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Subcutaneous Emphysema and Pneumomediastinum

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Abstract

Presentation

A 23-year-old male self-presented to the emergency department with complaints of dyspnoea, chest pain, neck swelling and forceful vomiting following alcohol consumption and intranasal cocaine insufflation.

Diagnosis

Chest x-ray and computed tomography of the thorax showed extensive subcutaneous emphysema and a pneumomediastinum.

Treatment

The patient was treated with nasal oxygen therapy and analgesia.

Conclusion

With the rise of cocaine abuse in Ireland, this rare complication should be considered in patients who present with chest pain following cocaine inhalation.

Introduction

The latest drug treatment figures from the Health Research Board (HRB) show a 50% increase in the number of cases presenting for cocaine treatment between 2017 and 2018. The number of cases treated for cocaine abuse has increased year-on-year from 2013 (708 cases) to 2018 (2,254 cases).[1] Unusual sequelae of cocaine abuse that must be recognised early include pneumomediastinum, pneumorrhachis and subcutaneous emphysema. We present a unique case of cocaine abuse that posed a diagnostic and therapeutic challenge.

Case Report

A 23-year-old male self-presented to the emergency department with complaints of dyspnoea, chest pain, neck swelling and forceful vomiting following alcohol consumption and intranasal cocaine insufflation. He was haemodynamically stable at presentation. He had no past medical history, no recent travel, trauma or surgery. He smoked cannabis regularly and had a history of occasional cocaine use prior to this presentation.

On physical examination, subcutaneous emphysema was palpable in the neck and chest. He was Hamman's sign positive. Examination of his throat revealed no evidence of airway obstruction, and he was conversing normally throughout the physical examination.

Electrocardiogram demonstrated sinus tachycardia. Chest x-ray (Image 1) showed extensive subcutaneous emphysema and a pneumomediastinum. Computed tomography (CT) of the thorax with oral contrast administration, (Image 2) confirmed the X-ray findings.

He was admitted under the surgical team for further investigations. He was managed conservatively and kept overnight for observations. He was treated with nasal oxygen therapy and analgesia. Subsequent gastrografin swallow revealed no evidence of oesophageal rupture or perforation. An oesophago-gastroduodenoscopy was not performed given the findings from the CT and gastrografin swallow. The patient's condition remained stable and he tolerated oral intake. The patient declined addiction psychiatry review. He was discharged the following day with lifestyle advice and education. The radiology department recommended a repeat chest X-ray 6 weeks post-discharge, which demonstrated resolution of the pneumomediastinum and subcutaneous emphysema.

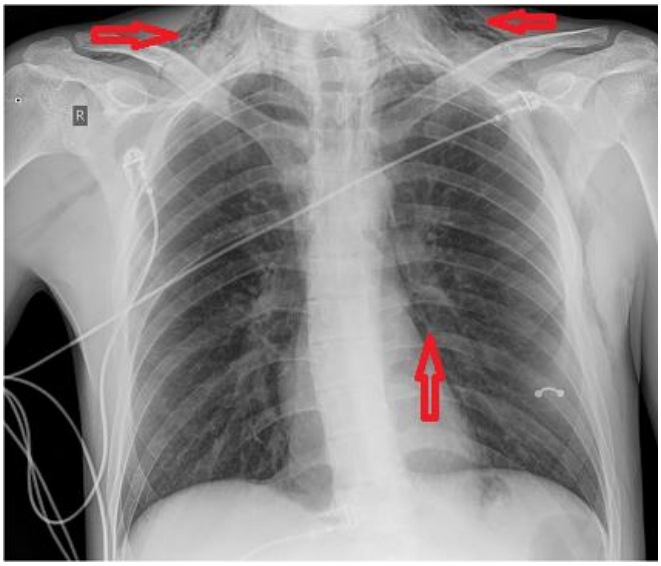

Image 1: Chest X-Ray – extensive subcutaneous emphysema and pneumomediastinum. No pneumothorax.

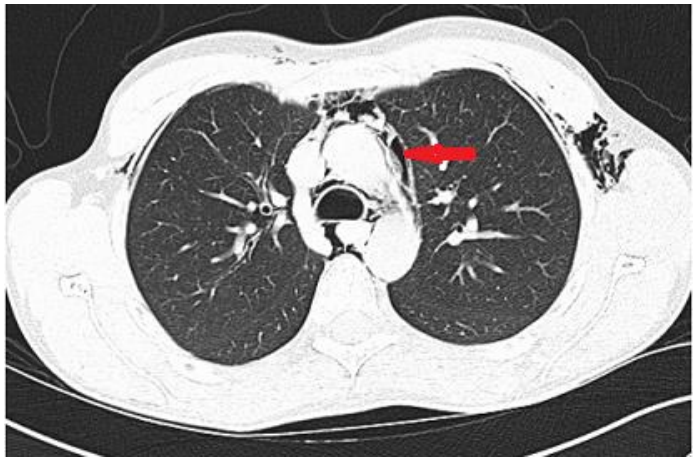

Image 2: Computed tomography of the thorax showing subcutaneous emphysema and pneumomediastinum (red arrow).

Discussion

Spontaneous pneumomediastinum is uncommon and has traditionally been considered a benign, self-limiting entity that can occur in young adults without any pre-existing medical conditions.[2] Subcutaneous emphysema and pneumomediastinum are usually caused by oesophageal or chest trauma. Iatrogenic aetiology has been reported in cases of assisted ventilation and medical or dental procedures. Spontaneous aetiology can occur with emesis, coughing, forceful straining, such as childbirth or exercise.[3]

Widespread abuse of cocaine has led to an increase in the frequency of ED visits worldwide. The most common complaint voiced by patients is chest pain.[4] Recent literature has reported that frequent consumption of cocaine is considered to be a pre-disposing factor for the development of spontaneous pneumomediastinum due to its toxic effect on the alveolar membranes.[5]

There are several possible mechanisms hypothesised behind the development of subcutaneous emphysema and pneumomediastinum, however alveolar rupture secondary to an abrupt increase in alveolar pressure due to bronchoconstriction combined with the Valsalva manoeuvre is most commonly implicated.[6] The sudden increase in the intra-alveolar pressure leads to dissection of air along the bronchovascular planes, subsequently leading to air in the pulmonary interstitium and the mediastinal and pericardial cavity.[7]

The majority of cases reported in the literature have been reported to resolve spontaneously with conservative management, consistent with our case above.[8-10] However, each case should be managed with guidance from the history, physical examination, vital signs, investigations and clinical judgement from the treating physician. It is important for physicians working in the acute setting to be aware of this phenomenon and to consider it during initial assessment and investigation to ensure appropriate management, in a timely manner. With the rise of cocaine abuse in Ireland, this rare complication should be considered in patients who present with chest pain following cocaine inhalation.

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The authors have no conflicts of interest to declare.

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