CASE REPORT

Pneumomediastinum following smoking crack cocaine

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Introduction

Pneumomediastinum is termed spontaneous when not associated with traumatic injury or other recognizable pathological process. Occurrence of the malady following cocaine abuse has rarely been reported. We herein describe a 22-year-old male who was a chronic user of large quantities of cocaine. Pneumomediastinum developed after smoking crack cocaine, and was diagnosed by chest radiograph and computed tomography (CT). The malady was not life-threatening and eventually resolved in the absence of sequelae.

Case report

A 22-year-old, previously healthy man presented to the emergency department with a sudden onset of retrosternal chest and neck pain. Vital signs were stable on arrival. Several hours later, he developed shortness of breath. He was afebrile, and the results of routine laboratory tests were also unremarkable, except for the room arterial blood gas, which displayed a pH of 7.5, pCO\textsubscript{2} of 30 mmHg and pO\textsubscript{2} of 88 mmHg (93% saturation). An endotracheal tube was inserted as a precaution against acute respiratory failure. A physical examination conducted upon admittance to the emergency room revealed a palpable crepitus over the neck and upper chest, and a mediastinal crunch (Hamman’s sign) on auscultation of the heart. No history of blunt or penetrating trauma was mentioned. The physical findings prompted an echocardiogram, which showed 2—3 mm ST-T wave elevation in leads V1 and V2.

A chest radiograph disclosed the presence of pneumomediastinum and subcutaneous emphysema in the neck and bilateral chest walls with no evidence of pneumothorax (Fig. 1). CT of the chest was subsequently done, which clearly demonstrated the pneumomediastinum and subcutaneous emphysema of the anterior chest wall (Fig. 2). Air along the course of oesophagus was easily visualised on the CT scan. However, visualisation of the oesophagus following swallowing of barium did not demonstrate contrast leakage into the mediastinum.

Obtaining the patient’s personal history revealed that he was a chronic and habitual user of cocaine,
including regular inhalation of crystal or vapour forms of the drug. Urine toxicology screening for cocaine proved positive.

The patient was admitted to the hospital, where he was observed for one week. Chest radiographs performed during this period revealed a slow regression of the subcutaneous emphysema and pneumomediastinum. After one week, the patient was discharged. Sequelae were absent upon discharge.

At a two-month follow-up examination, no similar episodes had occurred, despite the patient’s resumption of his former behaviour concerning cocaine consumption.

Discussion

Cocaine is a well-known addictive stimulant that directly affects the central nervous system. In general, there are three major routes of cocaine administration: snorting through the nose, injecting and smoking. Crack cocaine is nearly always smoked. This popular mode of cocaine use is less expensive and delivers large quantities of the drug to the lungs, producing an immediate and intense euphoria. Pneumomediastinum is an unusual complication of cocaine use. The development of mediastinal air is presumably related to positive pressure or prolonged Valsalva manoeuvres that induce microscopic oesophageal tears, eventually producing air leakage into the previously self-contained mediastinal space.

Clinical signs and symptoms resulting from cocaine-induced pneumomediastinum depend on the amount of mediastinal air present. Crack cocaine users may experience acute non-specific respiratory problems, including cough, shortness of breath, haemoptysis, and chest pain. When complicated by pneumomediastinum, a patient will typically present with neck, chest, or abdominal pain, or difficulty swallowing, although less often a patient can be asymptomatic, with the malady discovered upon routine radiographic procedures.

Diagnosis of pneumomediastinum can require further imaging. As exemplified by the chest radiograph presented here, there is a prominence of air in the soft tissues of the neck and chest. Diagnosis of pneumomediastinum is more easily made using CT, as the anatomic location of the air is self-evident on cross-sectional images.

Treatment varies with location of the air leak and size. It is important to remember that these events commonly occur as manifestations of trauma, which is often occult in cocaine abusers. A thorough medical and personal history is required in addition to the imaging procedures. Pneumothorax, pneumomediastinum, pneumopericardium, and even pneumoperitoneum have all been reported following cocaine abuse.

Surgical intervention is usually necessary in patients with pneumoperitoneum, while pneumomediastinum and pneumopericardium are typically treated more conservatively by observation. Small pneumothoraces can be left untreated with monitoring, while large pneumothoraces should prompt chest tube insertion to obviate the development of life-threatening tension.
In conclusion, pneumomediastinum caused by cocaine aspiration is usually a self-limited condition, and observation is recommended until the symptoms and radiographic changes subside. A careful drug use history should be obtained when "spontaneous" pneumomediastinum is encountered in an adolescent. Clinicians should be aware of this unusual complication of substance abuse especially in a young, healthy patient who has an unknown cause of pneumomediastinum.

References