



Cervicofacial subcutaneous emphysema and pneumomediastinum secondary to dental treatment in a young man

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ABSTRACT

The occurrence of cervicofacial subcutaneous emphysema and pneumomediastinum is very rare but can be potentially life-threatening.

These complications can happen during or after bronchoscopic or dental procedures, esophageal rupture or perforation, infections involving the head and neck and alveolar rupture in the setting of an inciting event such as asthma. The symptoms can appear promptly after the inciting event, but can also be delayed or do not reach maximal intensity for hours.

Cervicofacial subcutaneous emphysema usually occurs during or within minutes to hours after dental treatment and can be easily misdiagnosed as post-procedure swelling or an allergic reaction.

We report a 36-year-old male who underwent dental treatment for a fractured left lower molar tooth and subsequently developed extensive subcutaneous emphysema and pneumomediastinum. The purpose of this report is to bring attention to the fact that obtaining an accurate diagnosis for this condition is very important and management in a timely manner can prevent serious complications.

1. Introduction

Subcutaneous emphysema and pneumomediastinum are complications that can occur when air escapes into the mediastinum from the GI tract, for instance after esophageal rupture or perforation [1], and when air escapes from the respiratory tract following bronchoscopic procedures, such as transbronchial lung biopsy and transbronchial needle aspiration [2]. They can also occur following alveolar rupture in the setting of an inciting event such as underlying asthma. Other causes include dental procedures, mechanical ventilation, infections involving the head and neck and acute respiratory distress syndrome [1,3].

The occurrence of subcutaneous emphysema and pneumomediastinum following dental procedures is considered rare [3] but can lead to soft tissue infection [4], air embolism [5] and pneumothorax [6], which can be life-threatening if not diagnosed and treated early.

We report a case of cervicofacial subcutaneous emphysema and pneumomediastinum that presented to the Emergency Department (ED) shortly after dental treatment. Our goal is to highlight the importance of prompt diagnosis and prevent the misdiagnosis of these clinical manifestations.

2. Case presentation

A 36-year-old male presented to the ED with acute swelling of the left side of his face and neck. He had no preexisting disease and past medical history was only positive for childhood asthma. His symptoms began at the dentist's office where he was receiving treatment for a fractured left lower second Molar and air was insufflated during the procedure.

He was immediately brought to the ED from his dentist's office when the swelling which started in the left infraorbital region progressed to the left side of his face and neck. On arrival, the patient showed no signs of dyspnea or respiratory distress. The patient's blood pressure was 150/66 mm Hg; heart rate, 108 beats per minute; respiratory rate, 24 per minute; temperature, 36.2° C and oxygen saturation, 98%.

Physical examination showed significant soft tissue swelling from the left infraorbital region to the left side of the thorax (Fig. 1). The area was non-erythematous and non-tender. At presentation, there was no crepitus and allergic reactions and angioedema were considered as possible causes.

About 1 h after the patient's arrival, crepitus appeared on the left side of the neck extending to the inferior aspect of the sternum and the superior submental area of the jaw, indicative of air in soft tissues. The

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Fig. 1. Cervicofacial and palpebral emphysema can be seen in this photograph.

patient denied any tenderness with palpation of these areas. Oral inspection showed no wound or lacerations. The lungs were clear to auscultation with no stridor or wheezing. Heart sounds were normal, with no added sounds. The rest of physical examination was unremarkable.

Radiograph of the neck and chest showed the presence of subcutaneous emphysema and pneumomediastinum (Figs. 2–4). Electrocardiogram showed normal sinus rhythm at a rate of approximately 99 beats per minute, with no abnormalities. There were no abnormalities of the laboratory data.

A diagnosis of cervicofacial emphysema and pneumomediastinum

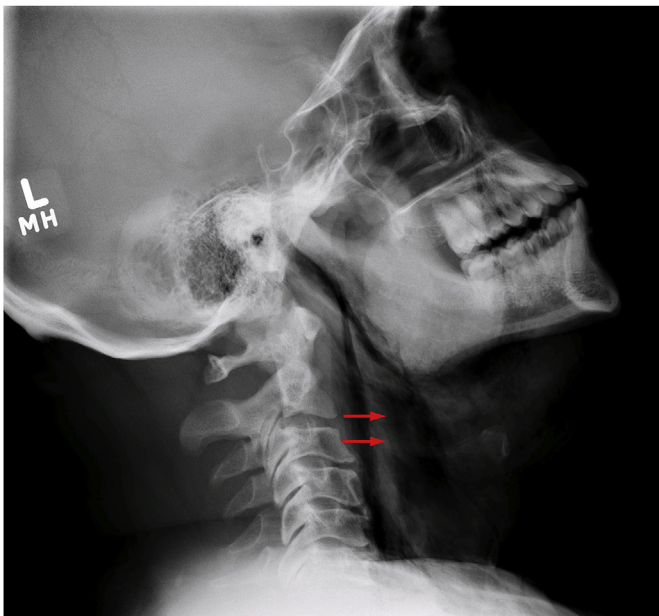


Fig. 2. Lateral neck radiograph showing subcutaneous emphysema.



Fig. 3. Radiograph of patient's neck showing air in the subcutaneous tissue.

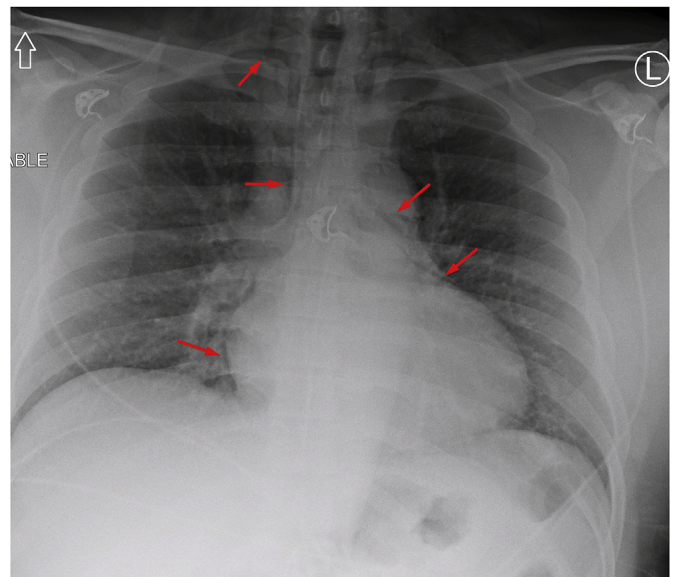


Fig. 4. Posteroanterior chest radiograph showing mediastinal air.

after the dental procedure was made. The patient was monitored in the ED for several hours after the diagnosis had been made. Once it was clear that the increase in cervicofacial emphysema had stopped, he was discharged with oral antibiotics and advice to stay off work until the cervicofacial emphysema had resolved.

He was advised to return to the ED, if he experienced any worsening of his condition.

The crepitus and swelling subsided after 6 days. The recovery was uneventful with complete resolution of symptoms after 2 weeks.

3. Discussion

Subcutaneous emphysema and pneumomediastinum are rare complications of dental treatment especially when the treatment is non-

surgical. Only a few cases have been reported and these indicate that they mostly occur after the introduction of air via the air turbine hand-piece [7–9].

Dental procedures that cause an interruption in the mucosa of the oral cavity and introduce air into the connective tissue spaces of the head and neck can lead to subcutaneous emphysema. Although this is mostly benign and self-limiting, there is a risk of progression to more serious consequences including pneumothorax, air embolism, mediastinitis, cranial nerves palsy, and cardiac tamponade [8,10].

The possibility of these life-threatening consequences indicates the necessity of diagnosis and effective management in a timely manner to decrease the chance of further complications.

It is crucial to consider subcutaneous emphysema among the other possibilities such as allergic reaction, hematoma, and angioedema. Crepitus on palpation is considered to be the pathognomonic sign of subcutaneous emphysema and may appear after a latency period of several hours following the inciting event. The neck has a complex fascial anatomy and communication between fascial spaces can lead to the introduction of the air into the mediastinum. Air can be introduced from the roots of teeth into the retropharynx and mediastinum through the fascial spaces of the neck. Infection can also be spread by the same route. Patients with pneumomediastinum can have a harsh voice and may experience dyspnea and respiratory distress. A friction rub during systole can be occasionally heard on cardiac auscultation (Hamman's sign) [8,11,12].

It is noteworthy to mention that the presentation of subcutaneous emphysema and pneumomediastinum can often be delayed following the procedures and clinical symptoms can sometimes take several hours to days to appear [2,10].

Treatment in mild to moderate cases should consist of observation and reassurance. Prophylactic antibiotic therapy reduces the risk of secondary infection and severe complications such as mediastinitis [8,12]. In severe cases, immediate medical attention is needed and securing the airway has the highest priority. Subcutaneous emphysema can sometimes lead to significant discomfort, disfigurement and anxiety. In these situations, micro-drainage could be considered. This is a simple, minimally invasive procedure accomplished by placing a subcutaneous fenestrated catheter into the area of subcutaneous emphysema and performing sequential massage. It is reported to improve

symptoms within hours and has a low chance of complications [13].

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Conflicts of interest and disclosure

None to declare.

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