Case Report

Acute subcutaneous laterocervical emphysema and pneumomediastinum secondary to inferior third molar extraction

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ABSTRACT

Subcutaneous laterocervical emphysema and pneumomediastinum are often due to head and neck surgery, but these are uncommon complications of dental procedures. The use of high-speed air-turbine headpieces during dental extractions is sometimes associated with this complication, making simple the spread of air under sublingual, submandibular, retropharyngeal, and parapharyngeal spaces, routes of communication to the mediastinum. Due to its rarity, it is not simple to recognize, often confused with other complications after oral surgery, such as allergic reaction, hematoma, and infections. We present a case of subcutaneous laterocervical emphysema and pneumomediastinum after inferior impacted third molar tooth extraction, self-limiting with a conservative therapy. We need to focus on this case because it is often misdiagnosed by physicians in emergency department as an allergic reaction. We also underline the importance of an empiric antibiotic therapy to prevent spreading of oral microorganism causing severe mediastinitis and sepsis. To avoid these complications, high-speed air-turbine headpieces should be used only when it is essential.

Key words: Dental impacted extraction, high-speed air-turbine headpieces, pneumomediastinum, subcutaneous laterocervical emphysema

Introduction

The occurrence of subcutaneous laterocervical emphysema and pneumomediastinum is often due to head and neck surgery, trauma or infections, caused by air passage through parapharyngeal and retropharyngeal spaces, routes of communication to the mediastinum.[1] Postoperative subcutaneous emphysema and pneumomediastinum after dental treatment are less common, especially due to dental extraction with the use of high-speed air-turbine headpieces.[2]

It is useful to know this complication, usually self-limiting, but potentially dangerous for the risk of mediastinitis.

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Differential diagnosis of acute complications after dental procedures includes allergic reaction, hematoma, and infections.

We present a case of subcutaneous laterocervical emphysema and pneumomediastinum after inferior impacted third molar tooth extraction with high-speed air-turbine headpieces.

Clinical Case

A 33-year-old man presented to our emergency department complaining right cheek swelling, without pain. He did not

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report any preexisting trauma or disease and he was in good health, except for marked prognathism.

He had undergone the day before extraction of the right inferior impacted third molar (i.e., 46), using a high-speed air-turbine headpiece to reduce operating time and to avoid complications such as lockjaw, considering his history of prognathism.

Physical examination showed right-sided cheek swelling and crepitus over his neck. His vital signs were normal.

A basal high-resolution multislice computed tomography (CT) scan of neck and thorax with multiplanar reconstructions showed the presence of air bilaterally in sublingual, submandibular, masticatory, and parapharyngeal spaces extended to laterocervical and retroclavicular regions, especially on the right side. The trachea was in site but surrounded by air, with the evidence of anterior and posterior pneumomediastinum extended to the hilum of each lung, with a small layer of anterior pneumopericardium [Figure 1a-c]. There were no images of pneumothorax.

A conservative approach was adopted with only an antibiotic (ceftriaxone 2 g/die for a week) and steroid therapy to avoid mediastinal infectious complications, with complete clinic resolution in 5 days, without a CT follow-up.

Discussion

Pneumomediastinum is a condition characterized by the presence of air in the mediastinum, also described as mediastinal emphysema.[3]

It is a rare complication following dental surgery, especially dental extraction using high-speed air-turbine headpieces,

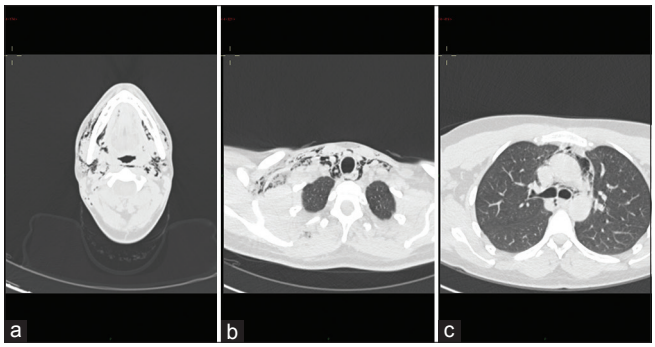

Figure 1: A basal high-resolution multislice computed tomography scan of neck and thorax showed the presence of air bilaterally in sublingual, submandibular, masticatory, and parapharyngeal spaces (a), extended to laterocervical and retroclavicular regions, especially on the right (b), with the evidence of anterior and posterior pneumomediastinum (c)

more common after inferior third molar impacted tooth extraction.[1] The roots of inferior molars communicate directly with the sublingual and submandibular spaces. The sublingual space is also in communication with the parapharyngeal and retropharyngeal spaces, direct routes of communication to the mediastinum.[4]

According to the etiology, pneumomediastinum is classified into different types: iatrogenic, usually due to head and neck surgery, life-saving procedures such as intubation or mechanical ventilation and dental surgery; traumatic, due to facial bone fracture, intraoral trauma, or trauma with disruption of the chest wall; infections, especially caused by gas-forming organism colonizing oral cavity; spontaneous, linked to pulmonary diseases with increased intra-alveolar pressure or weakened alveolar walls.[5]

The most common etiology is iatrogenic, even if it is a rare complication of dental surgery.

The use of high-speed air-turbine headpieces is performed to remove teeth and to discharge air or air and water to cool the friction-induced heat at the cutting interface and wash away debris. Using a large amount of air, it may penetrate into deeper structures, such as sublingual and submandibular spaces and then in the parapharyngeal and retropharyngeal spaces, direct routes of communication to the mediastinum causing pneumomediastinum.[1,2] In our case, the use of high-speed air-turbine headpiece was necessary to reduce the risk of lockjaw, increased by the marked prognathism of the patient.

Very frequently, it is not recognized immediately because it is confused with other oral surgery's complications, especially allergic reaction, hematoma, or cellulitis.[2,4,6] Between these, the most common is the allergic reaction.[4]

The presence of edema, swelling, and pain is common in all these conditions, but the evidence of crepitus on examination should suggest the presence of emphysema.

Even if it is a self-limiting condition, it is necessary starting an antibiotic and steroid therapy to avoid spreading in mediastinum of oral cavity microorganisms, causing infective mediastinitis and sepsis.

Rarely, it could be asymptomatic, found incidentally during a scheduled medical check-up on the day after tooth extraction.[1]

In our case, the absence of pain and other inflammatory signs such as rubor and calor let us exclude the possibilities

of cellulitis or other infectious processes. The presence of crepitus was suspected to emphysema, easily seen in a basal CT scan with an important pneumomediastinum. The condition was self-limiting with a conservative therapy, with the use of a prophylactic antibiotic (ceftriaxone 2 g/die for a week) and steroid therapy. CT is mandatory in the evolution of emphysema and pneumomediastinum considering the distribution of air, overimposed flogosis, and pneumothorax. It is useful in monitoring the evolution of complications.

Even if a case treated without antibiotics is reported in literature,[7] most of the authors agree on the necessity of a prophylactic and empiric antibiotic therapy to avoid the diffusion of oral microorganism with dangerous severe mediastinitis and sepsis.[8]

During extraction of impacted third molar with a high risk of complications, the use of high-speed air-turbine headpieces needs the right temporal limits.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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