Pneumomediastinum after dental treatment
Pneumomediastino secundário a tratamento dentário

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ABSTRACT
Pneumomediastinum is a rare and life-threatening complication that may occur following dental procedures. We report a case of acute subcutaneous emphysema that extended through the superior mediastinum, after a root canal treatment and air syringe use. Awareness of such complication and prompt prophylactic antibiotic therapy are extremely important and can save lives.

Keywords: Mediastinal emphysema/etiology; Root canal therapy/adverse effects; Root canal therapy/methods; Case reports

RESUMO
Pneumomediastino é uma complicaçao rara e potencialmente fatal, podendo ocorrer após a realização de procedimentos dentários. Relatamos um caso de enfisema subcutâneo agudo após tratamento de canal e uso de compressor de ar. O diagnóstico precoce dessa complicaçao e a administração imediata de antibióticos profiláticos sao de suma importância para reduzir a mortalidade associada a esse quadro.

Descritores: Enfisema mediastínico/etologia; Tratamento do canal radicular/efeitos adversos; Tratamento do canal radicular/métodos; Relatos de casos

INTRODUCTION
The development of soft tissue cervicofacial emphysema after dental treatment is a rare complication, occasionally reported in the literature, following oral surgical procedures. It is usually restricted to discrete local swelling and tenderness(1). However, spread of larger amounts of air may lead to serious consequences, including airway obstruction due to air accumulation in the retropharyngeal space, and dissection of deeper spaces reaching the mediastinum.

Pneumomediastinum is a life-threatening event that can be caused by any disruption in the dental alveolus membrane or root canal, during dental or oral surgical procedures, such as endodontic therapy, tooth extractions, restorative dentistry and dental implant surgery. The use of air syringe, high-speed handpieces or their combination, increases the risk of subcutaneous emphysema and its complications(2-4).

We describe a patient who presented pneumomediastinum secondary to root canal treatment using air-water-cooled high-speed dental device.

CASE REPORT
A 55-year-old white female was referred to the emergency department from a dental clinic with acute dyspnea, cervicofacial pain irradiated to the chest and sudden swelling of lips and cheeks. Two hours earlier, the patient had undergone partial root canal treatment in the second mandibular molar with use of air-compressed high speed dental handpiece. For local anesthesia, 2.0 ml of prilocaine - epinephrine hydrochloride 3.0% was administered.

The patient had no past cardiac or lung history, but referred one episode of anaphylaxis with skin rash following the use of codeine, two years before the present procedure. One day before the presentation she had been

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Pneumomediastinum and airway involvement, due to accumulation of air in the retropharyngeal “danger” space\(^1\). Therefore, early recognition by the dentist and emergency department attendants is thoroughly important and can be life-saving.

Diagnosis of severe subcutaneous emphysema can be misleading, when it occurs after a dental procedure. Angioedema is the main differential diagnosis, especially in patients with history of anaphylaxis, as in the present case\(^4\). Other confounders may be the diagnosis of hematoma, in patients taking anticoagulants or platelet inhibitors, who do not discontinue use for procedures and soft tissue infections. The physical examination with typical crepitation on palpation and chest radiographs exclude other presumptive diagnoses.

Severe subcutaneous emphysema with pneumomediastinum requires immediate medical care. Administration of high oxygen concentrations via masks should be considered, because oxygen is more readily absorbed than air mixture and can hasten the resolution process\(^2\). There is a potential risk for mediastinitis and sepsis, since oral bacterial flora can disseminate along the emphysematous tracts and reach the mediastinum. Similar report cases are unanimous recommending prophylactic antibiotic treatment. There is no consensus on which antibiotic should be administered. Most of the authors recommend the use of amoxicillin plus clavulanic acid; others prefer to use clindamycin associated with quinolone or an aminoglycosides, usually gentamicin\(^3,5\). The duration of antibiotic prophylaxis is also controversial.

DISCUSSION

Most patients who develop subcutaneous emphysema after a dental procedure have only mild to moderate local swelling and spontaneous resolution. However, serious and threatening complications of this iatrogenic event can occur in up to 35% of cases, including pneumomediastinum and airway involvement, due to accumulation of air in the retropharyngeal “danger” space\(^1\). Therefore, early recognition by the dentist and emergency department attendants is thoroughly important and can be life-saving.

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SUBMITTED TO FACIAL MICROINJECTIONS OF BOTULINIC TOXIN TYPE A. PHYSICAL EXAMINATION REVEALED MODERATE SWELLING AND DYSPHONIA WITH CREPITATION FOUND ON THE LEFT SIDE OF THE FACE NEAR THE LIPS, EXTENDING TO THE NECK AND ANTERIOR THORAX. THERE WAS NO EVIDENCE OF AIRWAY OBSTRUCTION OR PULMONARY IMPAIRMENT. HER VITAL SIGNS UPON ADMISSION AT HOSPITAL SHOWED A BLOOD PRESSURE OF 150/75 MMHG, HEART RATE OF 110 BEATS PER MINUTE, RESPIRATORY RATE OF 20 BREATH PER MINUTE AND TEMPERATURE OF 36.4 °C. SATURATION OF OXYHEMOGLOBIN ON ADMISSION WAS 99%. HER WHITE BLOOD CELL COUNT REVEALED LEUKOCYTOSIS AND NEUTROPHILIA (22,500 CELLS; IN WHICH, 88% WERE NEUTROPHILS). NECK AND CHEST COMPUTER TOMOGRAPHY SHOWED SUBCUTANEOUS EMPHYSEMA ON SOFT TISSUES INVADING SUBMANDIBULAR, PARAPHARYNGEAL, RETROPHARYNGEAL “DANGER”, CAROTID, ANTERIOR AND POSTERIOR LEFT SPACES AND THE SUPERIOR MEDIASTINUM (FIGURES 1 AND 2). A CONSERVATIVE APPROACH WAS ADOPTED WITH NO ORAL FEEDING AND INTRAVENOUS EMPIRICAL ANTIBIOTIC THERAPY WITH CLIAMDAMYCIN 600 MG, EVERY EIGHT HOURS, AND CIPROFLOXACIN 400 MG, EVERY 12 HOURS. OVER THE NEXT DAYS THE PATIENT REMAINED STABLE, SWELLING AND CREPITATION GRADUALLY WERE RESOLVED, WHITE BLOOD CELL COUNT RETURNED TO NORMAL VALUES AND AFTER THREE DAYS, SHE WAS DISCHARGED.
Although complete resolution of emphysema occurs within 14 days, in most cases reported the antibiotic was maintained only in the first week, when patients were at hospital.

**CONCLUSION**

Pneumomediastinum can be a serious complication associated to dental procedures and use of air syringe or high-speed handpieces. Early diagnosis by the dentist and prophylactic antibiotic prescription by emergency department attendants are of paramount importance and can be life-saving.

**REFERENCES**