Short Communication

Cervicofacial and Mediastinal Emphysema After Crown Preparation: A Rare Complication

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Cervicofacial emphysema is a well-known complication associated with the use of a high-speed air turbine. However, retropharyngeal emphysema or pneumomediastinum in the absence of severe trauma is rare. Immediate recognition of this phenomenon is essential to avoid life-threatening complications such as potential airway obstruction or venous air embolism. This article reports a case of gas diffusion into the mediastinum after dental preparatory treatment for a single-tooth crown. Pneumomediastinum should be considered whenever there are anamnestic data for retrosternal chest pain accompanied by dysphagia, dysphonia, or dyspnea caused by cervicofacial emphysema after dental treatment. *Int J Prosthodont 2007;20:143–144.*

The development of soft tissue cervicofacial emphysema after dental treatment is a well-known complication that has been reported after dental extractions, endodontic treatment, or restorative preparation using a high-speed handpiece.[1,2] Gaseous invasion is commonly restricted to the connective tissues immediately adjacent to the entry site. Retropharyngeal emphysema or pneumomediastinum, in the absence of severe trauma to the visceral organs, is uncommon. However, the use of compressed air- and water-cooled turbines may allow large amounts of air and water to be driven through the fascial planes into the mediastinum, pleural space, or even the retroperitoneum.[3] Air embolism and soft tissue infections through dissemination of oral flora microorganisms may cause life-threatening complications. In these cases, early recognition and medical surveillance are mandatory.

This article presents a case of airway compromise caused by severe subcutaneous emphysema extending to the retropharyngeal space and mediastinum following restorative treatment.

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Case Report

A 50-year-old woman was brought to the casualty department of the Medical University of Graz, Austria, by ambulance. The patient had undergone restorative treatment at her dental practitioner's office a few hours earlier. A single-tooth crown preparation was being performed at the mandibular left second molar using an air- and water-cooled high-speed air turbine when suddenly the patient developed breathing problems combined with thoracic pain and soft tissue swelling in the left facial region.

Clinical examination showed massive soft tissue swelling from the left periorbital region to the left thoracic wall. The patient complained about an oppressive feeling in the thoracic region and showed dyspnea. Palpation of the soft tissue swelling revealed crepitus at the cervical and left thoracic region. Apart from mild tachycardia, electrocardiography was uneventful. Arterial blood samples showed no signs of hypoxemia. Oxygen saturation was 99%.

Computerized tomography of the head, neck, and thorax region showed extensive emphysema at the left periorbital-temporal-infratemporal regions (Figs 1 and 2), as well as air along the retropharyngeal and parapharyngeal spaces tracking inferiorly through the tissue planes to the mediastinum and aortic arch (Fig 3).

The patient was managed conservatively with intravenous antibiotics and analgesics. Furthermore, 100% oxygen was supplied using a nonrebreathing facemask for the first 2 days. The cervicofacial swelling and crepitus subsided within the next 5 days, and the patient was discharged from the hospital in good condition.

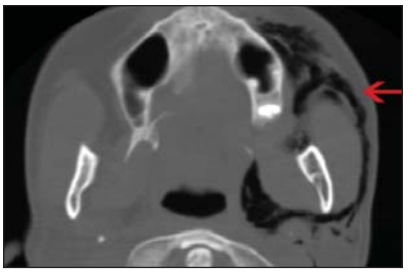

Fig 1 *(left)* At the time of referral, the patient showed extensive periorbital emphysema.

Fig 2 *(right)* Computerized tomogram of the maxillary region showing air in the perimandibular and retropharyngeal regions (*arrow*).

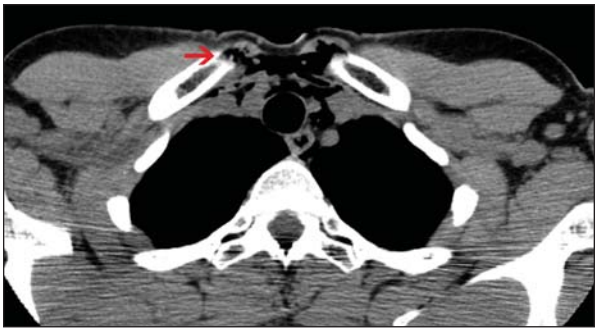

Fig 3 Axial computerized tomogram of the thoracic region showing air in the mediastinum (*arrow*).

Discussion

Cases of iatrogenic pneumatomediastinum after dentoalveolar treatment are rare and mostly follow the use of an air syringe or air- and water-cooled air turbine drills. Osseous or mucoperiosteal fenestration, such as in the surgical removal of a third molar, can lead to the entry of air into the wound region.[4] Air can diffuse into the pterygomaxillary region and lateral pharyngeal space from the molar-retromolar region and reach the mediastinum, dissecting the deep fascial planes of the neck.[5] Air can also reach the retroperitoneum, pleural cavity, or pericardium and may cause cardiac or pulmonary failure.[6] Secondary infections and mortality from sepsis and air embolism[1] and loss of vision[7] have been described.

The most important factor is early recognition and diagnosis. Physical examination mostly shows a skin-colored, poorly demarcated, soft tender swelling with clear crepitation. Generally, the area is not warm on palpation and does not show inflammatory redness. Further diagnostic tools include plain chest radiography, and in questionable cases, computerized tomographic scanning of the thorax. Because this patient complained about thoracalgia, echocardiography and arterial blood gas analysis were performed to rule out pulmonary and cardiac-related causes.

In most cases, only conservative treatment is required. In severe cases, however, immediate medical attention is mandatory and a tracheostomy may become necessary. In this case, treatment consisted of prophylactic intravenous administration of analgesics and antibiotics to prevent secondary infection. Further, the patient was provided with 100% oxygen via a nonrebreathing facemask for 2 days to accelerate gas resorption.

Oral surgeons and dental clinicians should be aware that even small interventions in the oral cavity may lead to life-threatening complications if compressed air invades the soft tissue through a disrupted intraoral barrier. In cases of severe emphysema, the authors recommend immediate referral of the patient to a hospital under medical surveillance.

Early diagnosis in this case was not difficult, since the patient developed the described symptoms while still receiving restorative treatment. However, diagnostic problems may arise in cases showing an initial absence of the typical features of subcutaneous emphysema. Such cases are frequently referred to departments unfamiliar with this phenomenon and therefore may go misdiagnosed as allergic reactions, angioedema, hematoma, infection, acute contact dermatitis, or Melkersson-Rosenthal syndrome.

References

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