

Bilateral Cervicofacial, Axillary, and Anterior Mediastinal Emphysema: A Rare Complication of Third Molar Extraction

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The removal of third molars continues to be the most common surgical procedure performed by oral and maxillofacial surgeons on a daily basis. Despite great surgical skill and expertise, complications may arise. The complications seen from the removal of third molars include pain, swelling, bleeding, infection, sinus perforation, alveolar osteitis, and nerve damage. Fortunately, with proper treatment planning and good surgical technique, the incidence of such complications is quite low. Goldberg and colleagues reported on a statistical analysis of complications associated with 500 consecutive third molar extractions in which the overall complication rate was 7%.¹ Osborn and associates² reported an overall complication rate of 10.8% in the removal of 16,127 third molars in 9,574 patients.

Subcutaneous emphysema is an uncommon clinical complication of dental treatment caused by forceful injection of air into the loose connective tissue below the dermal layer.³ Once in this space, the air may remain locally at the surgical site or continue to spread along the loose connective tissue plane. The clinical results are local swelling, tenting of the skin, and crepitation on palpation. In extreme cases, air has been reported to pass through the masticatory space into the parapharyngeal and retropharyngeal spaces, and penetrate into the mediastinum.³ If the inflowing air contains bacteria, serious infection may ensue.⁴ Cases of fatal cervicofacial necrotizing fasciitis spreading to the mediastinum have been reported in the literature.⁵ When this complication arises, it is impor-

tant to rule out gas-forming organisms as the cause. Timely recognition of this could ultimately prevent a fatal outcome.

The following report describes a rare case of bilateral cervicofacial, axillary, and anterior mediastinal subcutaneous emphysema as a complication of third molar removal with the use of an air turbine dental handpiece. Although reported in the past as a unilateral presentation, this patient developed severe bilateral involvement of the cervical and axillary regions, with communication to the anterior mediastinal and suprasternal areas.

Report of Case

A 14-year-old white girl was seen by a private oral and maxillofacial surgeon for removal of mandibular third molars and uprighting of the mandibular second molars. The patient was in the process of completing orthodontic treatment and needed the second molars elevated into position to complete her case.

The patient's medical history was significant only for a kidney infection when she was 9 years old. Otherwise, there were no contraindications to surgery. Therefore, the patient underwent a general anesthetic for removal of both mandibular third molars and uprighting of the second molars (Fig 1). The third molars were removed in the following manner. An incision was made across the crest of the ridge with a #15 scalpel blade and the retromolar tissue was reflected only on the occlusal aspect. No attempt was made to develop the flaps in the buccal and lingual areas. Using a high-speed bur with irrigation, an occlusal window was created through the bone. Once the tooth was visualized, it was sectioned with the same high-speed bur under irrigation. The tooth was removed from its bony crypt, and the mandibular second molar was then elevated into position after removal of some bone distal to it. This bone removal was done with hand pressure using a chisel. Once the second molars were uprighted, the reflected tissue was allowed to return to place; no sutures were placed. The same procedure was then repeated on the other side. The patient was awakened from the general anesthesia and moved to the recovery room. At the time of discharge, the patient had no facial swelling. She was discharged with a prescription for pain medication and routine postoperative instructions (Fig 1).

The next morning the patient's mother called the office. She stated that her daughter awoke that morning with swelling involving the neck, face, and superior aspect of the

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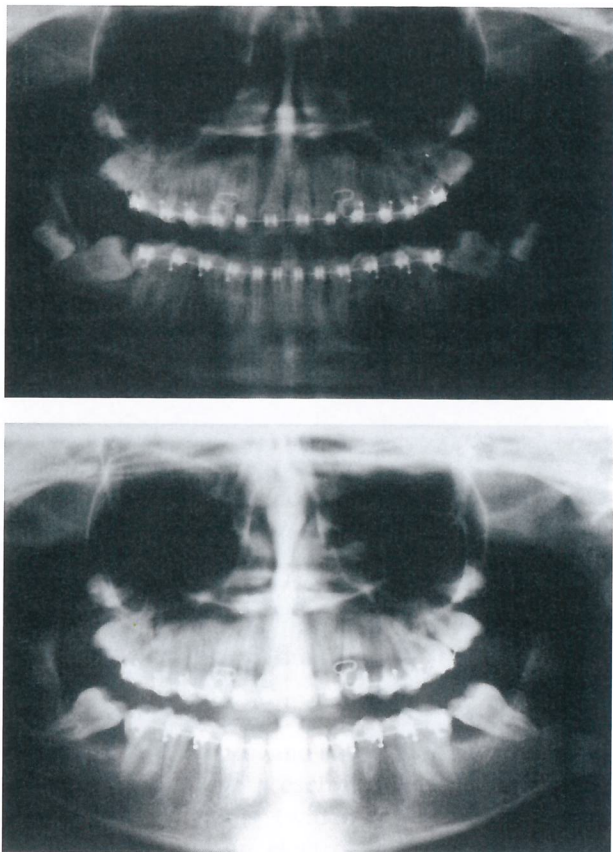


FIGURE 1. Preoperative (top) and postoperative (bottom) panoramic radiographs showing extraction of the lower third molars and uprighting of the second molars.

chest bilaterally. She also stated that the swelling felt "crunchy." The mother was instructed to bring the patient to the office immediately.

The patient appeared to be in no acute distress. Her only complaint was that it hurt to take a deep breath and that there was some pain in the surgical sites. On examination, she showed bilateral facial swelling extending from the masseteric region down to the superior aspect of the clavicles (Fig 2). These swollen areas showed crepitus on palpation. Intraorally the patient had minimal swelling and both extraction sites appeared to be healing normally. The patient was breathing without any difficulty. However, at this time it was decided that she required radiographic study to demonstrate that there was no mediastinal involvement by the emphysema. Therefore, the patient was referred to a local hospital.

On examination at the hospital, the patient was alert. She had a temperature of 36.7°C, a pulse rate of 76 beats/min, blood pressure of 112/60 mm Hg, respirations of 18 breaths/min, and oxygen saturation of 99% on room air. There was obvious fullness noted bilaterally in the neck. She had no fever, shortness of breath, dysphagia, or back pain. Oral examination showed no signs of bleeding or swelling in the extraction sites. Palpation of the neck showed fullness bilaterally, with crepitation throughout, but no signs of warmth or erythema. Palpation of both axillae and the anterior chest wall showed diffuse crepitus down to the sternum. Auscultation of the lung fields found breath sounds to be equal bilaterally, with a slight decrease at the bases,

and pain was reported on deep inspiration. The cardiovascular examination showed a regular rate and rhythm without the presence of a murmur or rub.

The anteroposterior and lateral neck radiographs showed diffuse subcutaneous emphysema bilaterally starting just inferior to the mandible and continuing down the neck (Fig 3). Posteroanterior and lateral chest radiographs showed bilateral subcutaneous air in the axillary region as well as in the anterior chest wall (Fig 4). A clear area of suprasternal air was seen tracking inferiorly, but there was no evidence of widening of the mediastinum or middle mediastinal involvement (Fig 4).

The patient was discharged from the emergency room on analgesics and instructed to follow-up with her private surgeon that afternoon. The patient continued weekly follow-up appointments, with complete resolution of the emphysema in approximately 10 days.

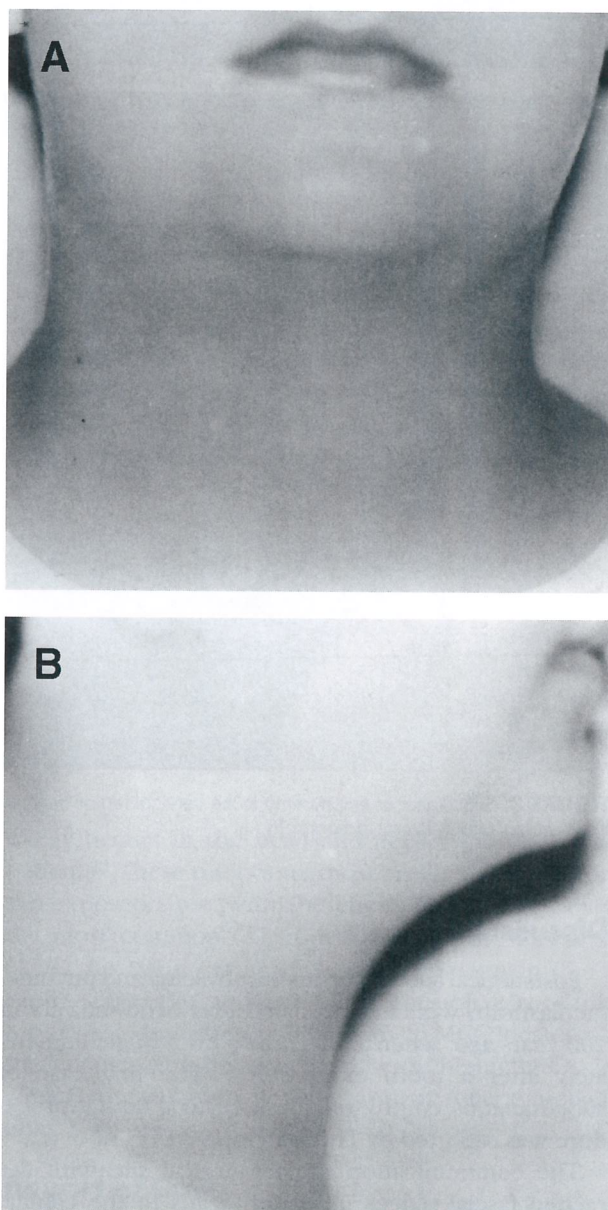


FIGURE 2. Postoperative photographs showing fullness of the neck in A, frontal and B, lateral views.

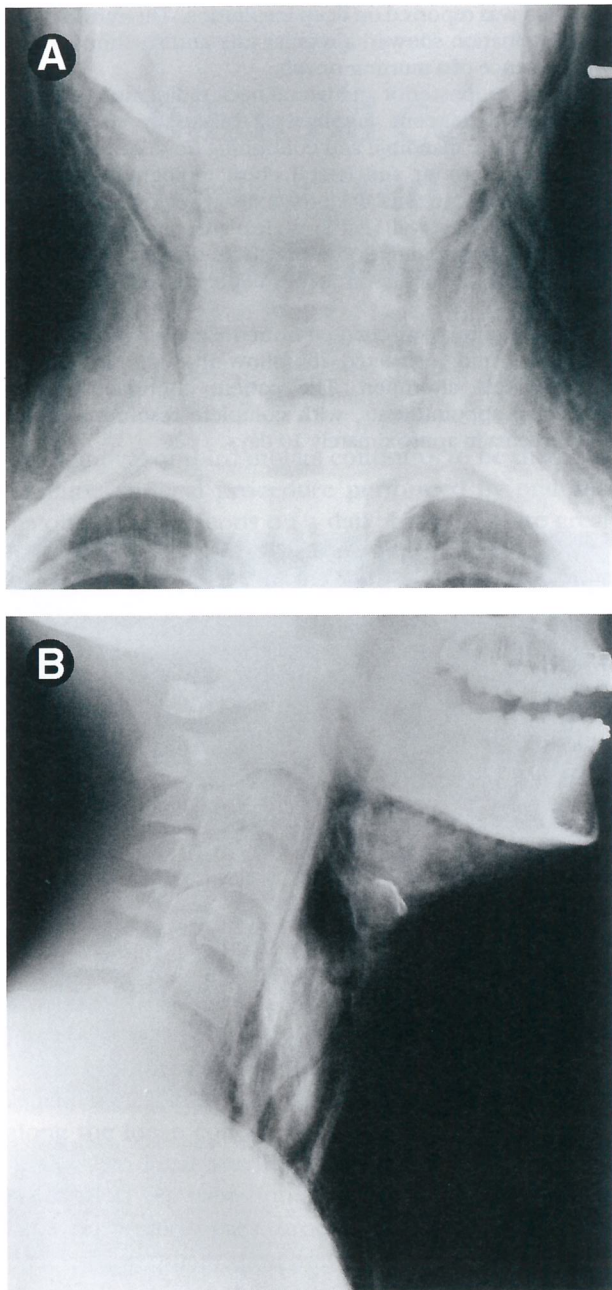


FIGURE 3. Subcutaneous emphysema in the cervical region seen on the A, frontal and B, lateral radiographs.

Discussion

Postsurgical subcutaneous emphysema and pneumomediastinitis were first reported after exodontia about 100 years ago, when a musician blew a bugle immediately after a tooth extraction.^{6,7} The first case of subcutaneous emphysema related to a dental procedure was reported by Turnbull in 1900.⁷

The communication of the surgical site with the related fascial spaces ultimately leads to the clinical presentation. The fascial spaces of the muscles of mastication and the parapharyngeal space continue

laterally into the perivisceral spaces. These spaces in the neck, as well as the retropharyngeal, vascular, and pretracheal spaces, are in direct communication with the mediastinal spaces of the thorax.^{8,9} Therefore, air under either positive or negative pressure may find its way from the face down to the neck and mediastinum.¹⁰

The use of the air turbine dental handpiece at high

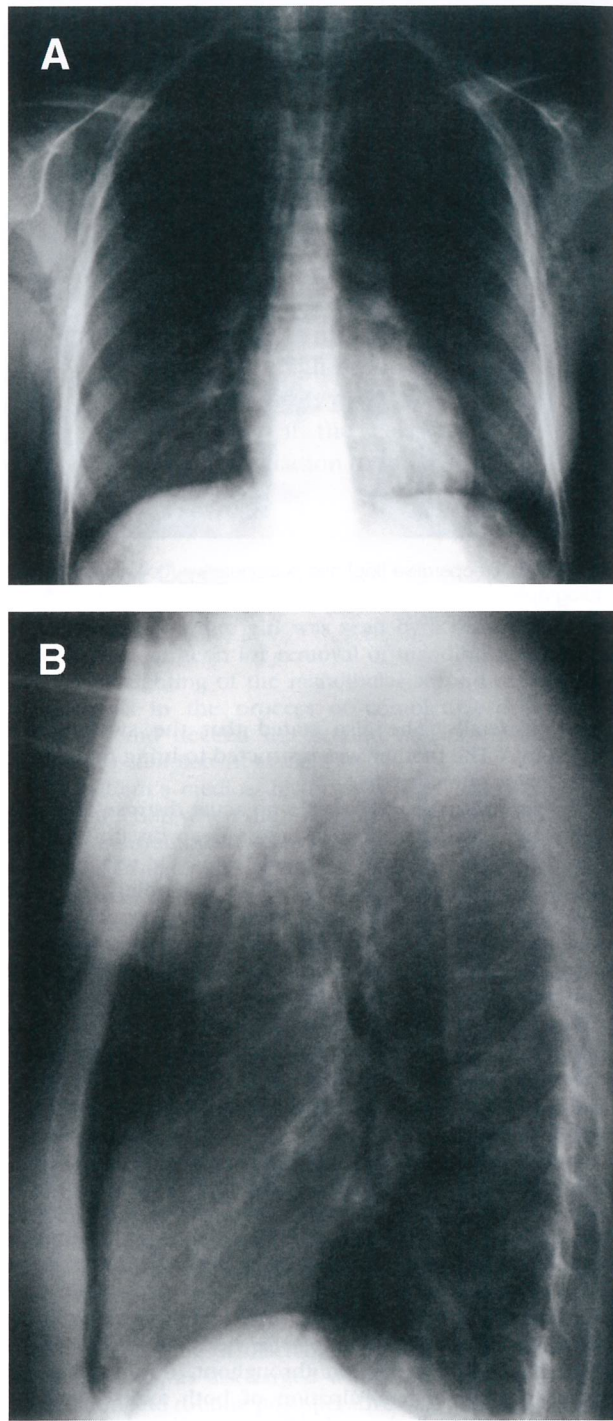


FIGURE 4. A, PA and B, lateral chest radiographs showing bilateral axillary and anterior chest wall emphysema.

speeds (100,000 rpm), with 30 psi of compressed air directed at the bur tip, may introduce air into the fascial spaces. Negative pressure may be created at the same time by the intrathoracic effect of inspiration. However, only with violation of the periosteum of the reflected flap can air be introduced into the loose connective tissues. Care in raising the full-thickness flap can help prevent this complication from occurring.

The most common clinical signs correlate with the extent of dissection of the subcutaneous air. With local involvement at the surgical site, one will see only mild facial swelling. As the air continues inferiorly into the neck, retropharyngeal, and axillary regions, new symptoms arise. One must always be concerned about respiratory distress due to retropharyngeal air constricting the upper airway. Patients are generally uncomfortable, and palpable crepitus is present along the extent of the subcutaneous air. Signs of an infectious origin should always be considered, including fever/chills, erythema, warmth, and drainage.

It is very important to exclude a diagnosis of mediastinal emphysema. Clinical signs and symptoms include dyspnea, chest and back pain, Hamman's sign (crunching sound with each heartbeat), and positive radiographic findings (widened mediastinum).³ In 25% of cases, there are electrocardiogram changes.¹¹

The treatment of subcutaneous emphysema is mainly supportive in nature. The patient should have close follow-up in the resolution phase to allow for the timely diagnosis of any further complications (mediastinal involvement/necrotizing fasciitis).¹² Resolution is

the usual postoperative course, occurring in approximately 1 to 3 weeks.

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Merkel Cell Carcinoma of the Cheek: A Case Report

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Merkel cell carcinoma (MCC) is an uncommon, aggressive, cutaneous neuroendocrine tumor that predomi-

nately occurs in the head and neck region of older patients.¹ These tumors are most predictably found on sun-exposed sites, with the cheek and eyelids being the most common (47%), followed by the forehead (17%), lip (9%), ear (7%), nose and neck skin (5.4% each), scalp (4%), and chin (2%).² The objective of this report is to describe a patient with an MCC located on the cutaneous aspect of the cheek, highlighting its clinical presentation, course, and treatment modalities.

Report of Case

A 70-year-old white woman presented to her primary care physician complaining of a left cheek swelling, as well as a

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