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A rare case of subcutaneous emphysema following routine dental care in a dental school setting

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CASE REPORT

A healthy 55-year-old Hispanic male presented to the Rutgers School of Dental Medicine community dental clinic in southern New Jersey for treatment planned restorative care (buccal amalgam on tooth number 17) to be completed by the assigned fourth year dental student. The patient's medical and dental histories were unremarkable, and had no contraindications for the planned treatment. The patient also had no significant findings in his family or social history.

Treatment was initiated with administration of the inferior alveolar nerve block using one cartridge (1.7 mL) 2% lidocaine with 1:100,000 epinephrine via a 30-gauge dental needle/syringe, with negative aspiration. Difficult access precluded the stable placement of rubber dam isolation. The preparation was completed using an air driven, high-speed handpiece.

During caries removal and preparation, a 4mm long, by three millimeter wide, by 3 mm deep laceration from a 556-carbide bur occurred on the buccal mucosa, approximating the lower left third molar. Appearing minor in nature, the preparation was completed and restored with amalgam. Nearly one hour into the procedure, while carving the amalgam restoration, the dental student and auxiliary staff observed swelling in the periorbital area of the ipsilateral side. Shortly thereafter, swelling of the left cheek also occurred, which extended to the lateral border of the nose. Involvement included the upper and lower eyelid causing partial closure of the left eye (Figure 1).

Upon palpation of the periorbital area, crepitus was noted. The area was erythematous and warm to the touch. The patient reported neither discomfort nor difficulties with swallowing, breathing, or vision. No radiographs were taken as the airway was not compromised at any point. The patient did not complain of any discomfort or constriction in the area of the throat and vital signs remained normal. The patient was referred to an oral maxillofacial surgeon to corroborate the definitive diagnosis. It was agreed that subcutaneous emphysema was the diagnosis and the route of air entry into the fascial plane was via the laceration in the buccal mucosa, an iatrogenic occurrence. The patient was prescribed a ten-day course of oral Penicillin V Potassium 500 mg four times a day.

Figure 1: The patient immediately after placement of the amalgam restoration showing evidence of swelling.

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The patient was re-evaluated in the dental clinic three days after appearance of swelling. Swelling had diminished decidedly, but crepitus was still significant (Figure 2). Simple observation was the only treatment necessary. One week later, the patient was contacted for further follow-up and stated that his swelling had completely resolved. Crepitus had subsided completely and he had no residual difficulty with swallowing, breathing, or movement of his head or neck.

DISCUSSION

Subcutaneous emphysema can occur in a number of dental procedures even when no laceration takes place iatrogenically, including endodontics, oral surgery, and restorative procedures [1–3]. The air may travel through the path of least resistance from a high-speed handpiece or air/water syringe through the gingival sulcus into a fascial plane of connective tissue [4].

A rubber dam should be used when possible to form a tight seal around the tooth or teeth being operated on to reduce the likelihood of subcutaneous emphysema. If a rubber dam is not in place during a procedure, compressed air "from either an air-driven handpiece or an air-water syringe could dissect through gingival and loose connective tissues to the fascial planes of the face via the gingival crevice" [5]. In addition, if nitrous oxide is being used and a subcutaneous emphysema is suspected, nitrous oxide should be terminated immediately, and the patient should be started on 95% oxygen to prevent the swelling from enlarging [6].

In general, the clinical presentation of subcutaneous emphysema is characterized by a sudden onset of facial swelling with the sensation of fullness of the face. Differential diagnosis of this complication may include hematoma, allergic reaction, or angioedema. Crepitus, which is virtually pathognomonic for subcutaneous emphysema, will be noted on palpation allowing the practitioner to make a more definitive diagnosis of the condition.

While the trapped air is often limited to the subcutaneous space of the head and neck and absorbed back into the body, it may disperse deeply into the fascial planes of the neck and result in para- and retropharyngeal emphysema. The trapped air has the potential to extend into the thorax and mediastinum, causing potentially life-threating complications.

There have been a few reported cases of subcutaneous emphysema documented in literature. Each newly reported case provides a unique learning opportunity. Subcutaneous emphysema should be considered as part of the differential diagnosis for patients that exhibit rapid facial swelling during a dental procedure. The patient may be prescribed an antibiotic regimen, because infection could potentially occur as a sequelae to subcutaneous emphysema. The patient should be closely evaluated because of the potential for the infection to extend to the cavernous sinuses [7]. While rare in the dental setting, the use of high pressure instrumentation and air/water syringes suggests that this phenomenon will continue to be encountered.

CONCLUSION

The purpose of presenting a rare case of subcutaneous emphysema from a simple buccal laceration is to encourage dental students to include subcutaneous emphysema as a possible differential diagnosis when faced with a rapid facial swelling in a clinical setting.

Figure 2: The patient 72 hours after termination of the precipitating dental procedure.

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Authors declare no conflict of interest.

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