Periorbital emphysema during dental treatment: a case report

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Periorbital emphysema is a rare complication of dental treatment. To date, there is only 1 case of periorbital emphysema during dental treatment reported in the literature. Etiologies and guidelines for the prevention of this complication during dental treatment were outlined and a rare case was presented. **(Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;112:e94-e96)**

Subcutaneous emphysema is defined as the abnormal introduction of air in the subcutaneous tissues. It is mainly caused by trauma, head and neck surgery, general anesthesia, and coughing or habitual performance of the Valsalva maneuver.[1] Subcutaneous emphysema has been reported to occur after dental and oral surgical procedures, but it remains a rare complication.[2] There is only 1 report in the literature linking periorbital emphysema with dental treatment.[2]

CASE REPORT

A 23-year-old female patient without any preexisting disease was referred to the department of Oral and Maxillofacial Surgery with an acute swelling of the left periorbital area (Figs. 1 and 2). She was getting her root canal treatment done for tooth #23 in the endodontics clinic and suddenly developed a swelling in the fossa canina which advanced over the periorbital area. The endodontist noted that the swelling started just after the last endodontic file inserted to the apex. Immediately temporary filling had been applied and the patient was referred to the surgery clinic.

Physical examination revealed a significant soft tissue swelling around the right eye and crepitus on palpation, which is a sign of air collection within soft tissues. She was unable to open her right eye owing to severe swelling. The diagnosis was periorbital emphysema. No other clinical findings or visual problems were observed. Her vital signs were stable.

She was admitted for prophylactic antibiotic therapy (amoxicillin). She showed signs of satisfactory recovery and partial opening of her eye after 2 days. The fifth day she showed significant recovery with decreased periorbital emphysema, and she recovered completely in ~10 days.

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DISCUSSION

Emphysema is defined as a condition created by the introduction of air or other gases into the soft tissues resulting in distension of the overlying skin or mucosa. The first report of subcutaneous emphysema related to a dental procedure (a premolar extraction) was published by Turnbull in 1900. In 1995, Heyman and Babayof reviewed the literature from 1960 to 1993 on emphysematous complications in dental treatment.[3] In summary of the cases reported up to 1957, soft tissue emphysema usually followed tooth extraction as a result of several actions done by the patient leading to raised intraoral pressure.[1] Since that series was reported, the widespread use of advanced air-driven handpieces has increased the risk of iatrogenic emphysematous complications in both surgical and nonsurgical treatment.[1,4] Tooth extraction, especially the mandibular third molar, is the most commonly reported cause of subcutaneous emphysema.[1,5,6] Less commonly, it also results from restorative treatment,[7,8] root canal treatment,[9,10] preparation and placement of crown,[11] periodontal surgery,[12] scaling,[13] and laser irradiation.[14] The underlying mechanism in all of these procedures is a disruption of the intraoral barrier, allowing air under pressure to tract subcutaneously.[1]

Subcutaneous emphysema is a known complication of root canal treatment. The condition is usually a result of treatment with high-speed air-driven surgical drills and compressed air syringes during restoration and endodontic procedures.[15] However, in the present case, periorbital edema was observed during a dental treatment while using hand instruments (endodontic files), which makes this case report interesting.

Clinical presentation of subcutaneous emphysema is usually a soft skin-colored swelling without redness and may occur during or shortly after dental treatment. Early recognition and adequate treatment are very important because the spread of larger amounts of air into the deeper spaces may sometimes cause serious com-

Fig. 1. ●●●

Fig. 2. ●●●

plications, although most patients who develop subcutaneous emphysema after a dental procedure have only mild to moderate local swelling. Air can enter the parapharyngeal and retropharyngeal spaces, where accumulation of air can lead to airway compromise, air embolism, and soft tissue infection. Pneumothorax, optic nerve damage, and even death by air embolism has been reported.[1]

If emphysema does occur, differential diagnosis from angioedema, hematoma or infection should be made first, which should be followed by observation to detect the spread of the gas. The patient must be told how to watch for the extension of the emphysema and be advised to go to the emergency department if such extension occurs.[3] In the present case, the patient was under supervision when the symptoms began. Therefore, we reached the diagnosis easily and informed the patient about its prognosis.

Subcutaneous emphysema is usually absorbed spontaneously without complications, which explains why the treatment of subcutaneous emphysema is usually symptomatic. Prophylactic antibiotics, close observation of the airway, and monitoring the extension of the gas are recommended.[3] Prophylactic administration of antibiotics is recommended to prevent secondary infections.[1] Analgesics are prescribed as necessary but are rarely required, because discomfort is often minimal.[15] In this case, the patient was prescribed only prophylactic antibiotic and observed. No other complications occurred. Even though the situation in this case is not related with the suggestions mentioned below, it is still important to keep in mind that endodontic complications can be prevented by: 1) using a rubber dam; 2) using remote exhaust handpieces or electric motor-driven handpieces; 3) avoiding the use of the compressed air syringe during irrigation; and (4) avoiding the use of hydrogen peroxide while irrigating canals.[1]

CONCLUSION

The purpose of this case report was to remind dentists, oral surgeons, and emergency physicians to be alert to the signs of subcutaneous emphysema resulting from dental procedures, so that early and accurate diagnosis can be made and appropriate treatment applied.

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