

Cervicofacial subcutaneous and mediastinal emphysema caused by air cooling spray of dental laser

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Cervicofacial subcutaneous emphysema is a rare complication of dental procedures with an air turbine or syringe, and dentists and oral surgeons sometimes encounter mediastinal emphysema following the presentation of extensive subcutaneous emphysema. Most emphysema occurs incidentally during tooth extraction, restorative treatment, or endodontic treatment, with only a few cases reported of cervicofacial subcutaneous emphysema associated with dental laser treatment. We report a case of cervicofacial subcutaneous and mediastinal emphysema caused by the air cooling spray of dental laser during dental treatment in a 76-year-old woman. After she underwent dental laser treatment, cervicofacial swelling was noted and she was referred to our department. Computed tomography showed both cervicofacial subcutaneous emphysema and mediastinal emphysema. Antibiotics were administered prophylactically and the emphysema disappeared 5 days after the dental laser treatment, without any complications. (*Oral Surg Oral Med Oral Pathol Oral Radiol* 2013;115:e13-e16)

Cervicofacial subcutaneous emphysema is a rare complication of dental procedures with an air turbine¹⁻³ or syringe,^{1,4,5} and dentists and oral surgeons sometimes encounter mediastinal emphysema following the presentation of extensive subcutaneous emphysema.²⁻⁴ Most cases of emphysema occur incidentally during tooth extraction,¹⁻³ restorative treatment,¹ or endodontic treatment.^{1,6} However, only a few reports have described cervicofacial subcutaneous emphysema associated with dental laser treatment.⁷⁻⁹ We report here a case of cervicofacial subcutaneous and mediastinal emphysema caused by air cooling spray of dental laser during dental treatment.

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CASE REPORT

A 76-year-old woman presented to a family dental clinic with left upper gingival swelling and pain. Dental examination revealed acute periodontitis of the left upper first molar. Under local anesthesia, the patient underwent calculus removal and Er:YAG laser irradiation to the gingival pocket. Immediately after the dental laser treatment, she felt discomfort in the left cheek and subsequently developed bilateral cervicofacial swelling. As a result, the patient was referred by her dentist to our department with bilateral cervicofacial swelling (Figure 1).

Vital signs were normal, and oxygen saturation was 97% on room air. Although physical examination revealed diffuse swelling with crepitus from the bilateral temporal region to the supraclavicular fossa, no Hamman sign, dyspnea, or dysphagia were present. Intraoral examination showed swelling of the buccal gingiva of the left upper first molar and the buccal mucosa (Figure 2). We diagnosed this clinically as cervicofacial subcutaneous emphysema caused by air cooling spray of dental laser. Computed tomography (CT) of the thoracocervicofacial region revealed widespread emphysema from the cervicofacial space, including the buccal, masticator, submandibular, parapharyngeal, and retropharyngeal spaces, to the mediastinum and precordium (Figure 3). We admitted the patient for airway monitoring, bed rest, and prophylactic intravenous antibiotic therapy. The cervicofacial swelling disappeared and the subcutaneous crepitus was almost undetectable 5 days after the dental laser treatment. The patient was then discharged without any complications. Two weeks after the dental laser irradiation, CT showed no cervicofacial subcutaneous or mediastinal emphysema.

DISCUSSION

Cervicofacial subcutaneous emphysema is an uncommon complication caused by dental treatment and oral surgery.^{2,3,7-9} Subcutaneous emphysema is typically in-



Fig. 1. The patient's face shows bilateral cervicofacial swelling.



Fig. 2. Intraoral photographs show swelling of the buccal gingiva of the left upper first molar and buccal mucosa.

duced by tooth extraction,¹⁻³ but it can also occur as a result of various dental treatments, such as restoration and endodontic treatment.^{1,6} Heyman and Babayof¹⁰ reviewed 75 cases reported from 1960 to 1993 of subcutaneous emphysema and pneumomediastinum after dental treatment. Emphysematous complications were

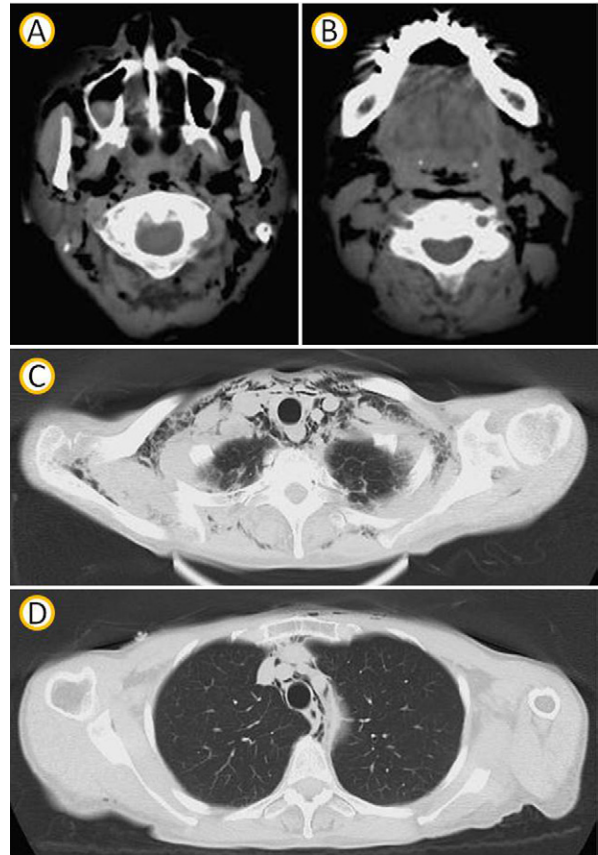


Fig. 3. Computed tomography scan of the thoracocervicofacial region shows widespread emphysema from the cervicofacial space, including the buccal, masticator, submandibular, parapharyngeal, and retropharyngeal spaces (A, B), to the mediastinum (C) and precordium (D).

caused by the use of only a high-speed handpiece in 27 cases (36%) and with the use of both a high-speed handpiece and air syringes in 42 patients (56%). On the other hand, a review by McKenzie and Rosenberg,¹ covering cases reported from 1993 to 2008, showed that 16 of 32 cases (50%) of iatrogenic subcutaneous emphysema were linked to the use of air-driven handpieces. Arai et al.² also reviewed 47 CT-documented cases reported from 1994 to 2008 of subcutaneous emphysema and pneumomediastinum following dental treatment and found the cause was use of a high-speed air turbine handpiece in 31 patients (66%). According to these reviews, the incidence of emphysema caused by high-speed air-driven handpieces during surgical or nonsurgical dental procedures has increased.^{1,2,10}

Because subcutaneous and mediastinal emphysema can occur during nonsurgical dental procedures, such as restorations and extractions, this suggests that air from the air turbine may enter the tissue even via a minor break in the mucosa.² In addition, rare cases have been reported following nonsurgical procedures where an air

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