



CASE REPORT

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Subcutaneous Emphysema and Pneumomediastinum Following a Dental Filling Procedure

ABSTRACT

We report a patient who underwent a routine dental procedure and developed subcutaneous emphysema (SCE) and pneumomediastinum (PM). Clinical management included oxygen therapy, pain control, rest and supportive therapy as needed. Our patient clinically improved with this treatment, and was discharged home two days later. It is important to be aware that even minimally invasive dental procedures can lead to SCE and PM.

KEY WORDS

Dental procedure, subcutaneous emphysema, pneumomediastinum.

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A 38-year-old female presented to the Emergency Department (ED) with shortness of breath, left-sided facial swelling, and pain on the left side of her neck and face. She was unable to fully open her mouth. She also had blurring of vision in her left eye, and decreased hearing in her left ear. One day prior to her arrival at the ED, she underwent a dental filling procedure on a left maxillary molar. She denied undergoing an endodontic treatment or extraction. She reported some swelling in her face immediately after the procedure. At the dentist's office, the swelling was attributed to an allergic reaction to the injected local anesthetic. However, she reported no known allergies. She was prescribed oral penicillin, and she returned home. Later that night, the swelling worsened, and the patient experienced shortness of breath along with increasing pain in her face and neck. She was subsequently taken to the ED for further evaluation.

Physical examination revealed an alert, afebrile, normotensive patient, who saturated well with a non-rebreather mask. She was noted to have left periorbital, facial, submandibular and anterior cervical edema, with mild crepitus and tenderness over the left temporal bone and cheek. Examination of her ears revealed clear external canals and gray tympanic membranes bilaterally. She had minimally decreased hearing on her left side compared with the right. Her oropharynx was non-erythematous, without signs of infection or gingival complications; however, she was unable to fully open her mouth because of the pain. She

was tender to palpation over the left upper chest, and the same painful sensation was elicited by left upper extremity movement. Also, her lungs were grossly clear on bilateral auscultation.

Laboratory studies showed a white blood cell count of 9,900/mm³, with a normal differential. An EKG showed normal sinus rhythm. The troponin levels were also within normal limits. A chest X-ray revealed a normal cardiac silhouette with clear lung fields. The head and chest computed tomography (CT) revealed gas in left temporal, preorbital and perimandibular areas, which extended down the left neck to the upper mediastinum (Fig. 1-3).



Figure 1. CT scan of the head, showing perimandibular subcutaneous emphysema (arrows).

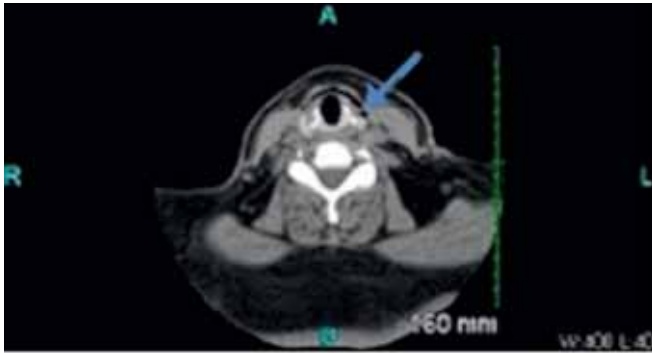


Figure 2. CT scan of the neck, showing peritracheal subcutaneous emphysema (arrow).



Figure 3. CT scan, showing pneumomediastinum (arrow).

The patient was started on prophylactic ampicillin/sulbactam, and remained on a 100% non-rebreather mask for the next day; she was then slowly weaned off the oxygen. She received acetaminophen/hydrocodone for pain relief. Because the patient complained of difficulty swallowing solid foods as her diet was advanced, a gastrografin swallow study was performed but showed no esophageal perforation. The facial swelling and breathing difficulty improved over the hospital course, and the patient was discharged home on oral antibiotics two days after admission.

Discussion

Spontaneous pneumomediastinum (PM) classically occurs in the setting of increased intra-alveolar pressure, leading to alveolar rupture and diffusion of air into the mediastinum via vascular sheaths.¹ Common triggers include asthma attacks or prolonged Valsalva. Less commonly, invasive dental procedures such as dental extractions or endodontic treatments can trigger PM. Numerous case reports describe subcutaneous emphysema (SCE) and PM after dental extractions of mandibular molars.²⁻⁴ Molars are in close proximity to the submandibular, sublingual, pterygomandibular and retropharyngeal spaces. The proposed mechanism is the introduction of air into these spaces via pressure appliances such as commonly used air-turbine drills – causing PM via diffusion.

We have described a case in which SCE and PM developed from a dental filling procedure of a maxillary molar. Although air-turbine drills are frequently used in both procedures; routine dental fillings typically involve only the enamel and dentin layers of the teeth, whereas endodontic treatments include the deeper pulp. This case emphasizes the propensity of dental procedures to cause SCE and PM, regardless of the type of procedure or the location of the affected tooth. One should consider SCE and PM in patients with a similar presentation following any dental procedure, irrespective of its invasiveness. The treatment for PM includes initial oxygen therapy, analgesia, and rest.⁵ Prophylactic antibiotics can also be added to prevent mediastinitis. This treatment, in our patient, contributed to a satisfactory outcome.

Authorship statement

DV gathered patient history and participated in the writing and organization of the case report. AR gathered patient history and treated the patient during hospitalization. SJ contributed to the writing of the manuscript. ST participated in the design, supervision and final approval of the submitted manuscript. DV, AR, SJ and ST all contributed to the final critical revision of this manuscript.

Financial disclosure

The authors declare no conflict of interest involved with this case study.

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