



Iatrogenic Pneumomediastinum and Subcutaneous Emphysema after Mandibular Left First Molar Tooth Extraction

CASE REPORT

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ABSTRACT

Pneumomediastinum and subcutaneous emphysema occur due to the presence of free air in the mediastinum and subcutaneous tissue. Early diagnosis and therapy are crucial as the passage of huge amounts of air into the mediastinum may lead to lethal complications. We report a rare case of cervical subcutaneous emphysema and pneumomediastinum occurring after extraction of the mandibular left first molar using an air-turbine drill. A 54-year-old woman presented to the emergency service with the complaints of left cheek and neck swelling and dysphagia. Her symptoms began following a dental surgery—the extraction of the mandibular left first molar. Computed tomography showed subcutaneous emphysema, which extended bilaterally from the left cervico-facial region to the anterior and posterior mediastinum. She was admitted to our service for follow-up and antibiotic treatment with a diagnosis of subcutaneous emphysema and pneumomediastinum due to dental extraction. Five days later, she was discharged with normal physical and radiographic examinations. Dentists and oral surgeons should realize that using air injection equipment can cause life-threatening complications. They should give detailed information to patients about these possible complications and closely follow-up the patients.

Keywords: Emphysema, pneumomediastinum, tooth extraction

INTRODUCTION

Pneumomediastinum and subcutaneous emphysema occur due to the presence of free air in the mediastinum and subcutaneous tissue. The reason for pneumomediastinum is important because it can be caused by trauma, esophageal rupture, head and neck surgery, and infectious processes involving these areas, which are all potentially fatal and require surgical intervention and intensive care. The existence of subcutaneous emphysema after tooth extraction is rare, and the passage of air into the mediastinum is much rarer. The most common cause is the use of an air-turbine handpiece that may inject the air into the soft tissue (1). We report a rare case of cervical subcutaneous emphysema and pneumomediastinum that originated due to extraction of a mandibular left first molar using an air-turbine drill.

CASE REPORT

A 54-year-old woman visited our emergency department with the complaints of left cheek and neck swelling as well as dysphagia. Her symptoms were begun at a dental surgery following extraction of the left lower first molar. Compressed air had been used to dry the root canal. She reported no previously diagnosed disease and medication use. Physical examination showed mild cheek and neck swelling in the course of over an area ranging from the buccal region to the left cervical, supraclavicular and anterior thoracic regions. Subcutaneous crepitus was established by palpation. The vital signs were stable (blood pressure: 120/80 mm Hg, pulse rate: 90 beats/minute, temperature: 36.9°C, respiratory rate: 20/minute). The electrocardiogram and routine laboratory tests were all unremarkable. Then, chest computed tomography was done, which established subcutaneous emphysema extended bilaterally from the left cervicofacial region to spaces including the sternocleidomastoid muscles, parapharyngeal, suprasternal, retrosternal, anterior and posterior mediastinum (Figure 1). Endoscopic examination was done by an otolaryngology team and was found to be normal. She was admitted to the thoracic surgery department with a diagnosis of subcutaneous emphysema and pneumomediastinum as a complication of dental extraction. She was administered intravenous antibiotic therapy and monitored closely. After 5 days of clinical observation and treatment, she was discharged without any symptoms and signs. At a follow-up visit 10 days later, she was without symptoms and chest X-ray, lung function tests, and blood gas analysis were normal. At follow-up visits on 30 and 60 days, she remained without symptoms.

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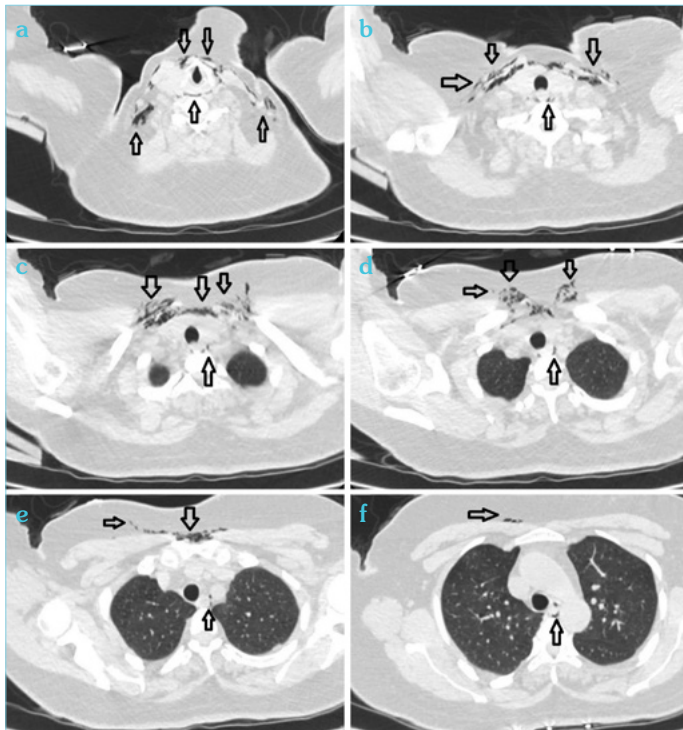


Figure 1. a-f. Computed tomography demonstrating subcutaneous emphysema extending bilaterally from the left cervicofacial region to spaces, including the sternocleidomastoid muscles, parapharyngeal, suprasternal, retrosternal, anterior, and posterior mediastinum (arrows)

DISCUSSION

Trauma-induced subcutaneous emphysema and pneumomediastinum are usually due to facial bone fracture, intraoral trauma, or trauma with disruption of the chest wall or aerodigestive tract. Infection of the head and neck with gas-forming organisms may also cause this complication. During dental treatment, the air from turbine drills can proceed into soft tissue via a minor damage of the mucosa. The roots of the first, second, and third molars are connected to the sublingual and submandibular areas. The sublingual area is also in connection with the pterygomandibular, parapharyngeal, and retropharyngeal areas. The retropharyngeal area is the main course of connection from the oral cavity to the mediastinum (1). The symptoms and signs of pneumomediastinum include facial and neck swelling, chest and back pain, dyspnea, dysphagia, brassy voice, Hamman's sign (crunching sound with each heartbeat), and widened mediastinum on chest X-ray. Nonspecific ST-T change may be seen on electrocardiography (2). In our case, the complaints were left cheek and neck swelling as well as dysphagia. We did not detect dyspnea or Hamman's sign, but pneumomediastinum was established on chest computed tomography. Electrocardiography was also normal. Generally, the symptoms and signs develop during the dental treatment, as in this case. However, they may also develop at home (3) or the day after treatment (4) or even 11 days after a dental procedure (5). Also, it is crucial to distinguish this complication from hematoma, cellulitis, allergic reaction, and angioedema (6, 7). Investigation of mediastinum is always necessary, even if subcutaneous emphysema is only located on the cervicofacial area because pneumomediastinum is frequently occurred with subcutaneous emphysema.

Furthermore, air in the mediastinum may cause bilateral pneumothorax by penetrating the mediastinal parietal pleura (8). This can lead to fatal consequences in patients with limited respiratory capacity. Chronic obstructive pulmonary disease or any other parenchymal lesions increase the risk of occurring spontaneous pneumomediastinum and pneumothorax. In our case, computed tomography showed no pulmonary disease or space-occupying lesion in the mediastinum. Early diagnosis and therapy are crucial because the accumulation of air in the mediastinum may cause lethal complications as respiratory distress, pneumothorax, optic nerve damage, and even death by air embolism (6, 8-10).

Therefore, the physician should not avoid the use of tracheotomy in cases of retropharyngeal space emphysema with progressive airway compromise. Most cases had a benign course, and symptoms usually subsided 2-7 days after conservative treatment. Prophylactic antibiotics are recommended to prevent secondary infections due to possible mediastinitis contaminated from the oral cavity (10). Our patient was administered intravenous antibiotic therapy and monitored for 5 days. Until then, the symptoms recovered overall, and the patient was discharged with a normal chest X-ray.

CONCLUSION

Dentists and oral surgeons should realize that using air injection equipment can cause life-threatening complications. They should give detailed information to patients about these possible complications and closely follow-up the patients.

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