

## Case report

# Bilateral pleural empyema following periodontal abscess

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## Introduction

Thoracic complications from dental procedures have been reported sporadically in the literature [1–5]. Pneumatic complications range in severity from benign, limited dissection of air between fascial planes to fatal haemodynamic compromise due to venous air embolism. The majority of complications that have been cited in the literature are in association with the use of air-driven dental drills. The case we present here is mediastinitis and rapid development of bilateral pleural empyema following periodontal abscess with no history of dental surgical intervention.

## Case report

A 14-year-old schoolgirl presented to the dentist and was admitted to Prince Hashim Ibn Al-Hussein Hospital (a district general hospital in Zarka, Jordan) with a periodontal abscess for parenteral antibiotics and drainage of the abscess. The patient started to complain of retrosternal chest pain and shortness of breath at rest 3 days after admission. Examination showed a temperature of 38.5 °C, a heart rate of 130 bpm with no other abnormal findings. Her investigations, which included a chest X-ray,

electrocardiograph, arterial blood gases, blood cultures and cardiac enzymes were all normal, and she had a white cell count of  $20 \times 10^3/\mu\text{L}$  (neutrophilic leukocytosis). At this point she was transferred to the intensive care unit under the care of physicians. She continued to be pyrexial and to deteriorate, despite broad-spectrum antibiotics. After 3 days she was found to have bilateral pleural empyema. At this time she had chest drains inserted and culture of the fluid grew *Pseudomonas aeruginosa* sensitive to piperacillin. After 10 days the drains continued to drain pus despite adequate drainage and appropriate antibiotics. At this time she was transferred to the care of chest surgeons, had thoracotomies and had to be ventilated for a short duration. She was eventually weaned off ventilation, and made a slow but progressive improvement. She was discharged 6 weeks after initial admission.

## Discussion

Complications following oropharyngeal and dental procedures are rarely addressed in the medical literature. Some of these complications can be fairly obvious, such as aspiration of gastric contents or of foreign bodies such as teeth, crowns, dentures, dental instruments, or dental

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materials; and local upper airway obstruction due to oedema, infection or haemorrhage. Bacterial endocarditis due to oropharyngeal flora is well known to both dentists and physicians and provides justification for the prophylactic antimicrobial therapy in patients predisposed to this disease by structural and cardiac or vascular disease. In all of these instances, the relationship to the dental procedure is usually clear to both the patient and the physician.

In other circumstances, however, less common intrathoracic problems may follow more insidiously. Many follow the use of air-driven dental drills. Thoracic infectious complications tend to be uniformly severe and potentially fatal. The most devastating of these are descending necrotizing mediastinitis and Lemierre syndrome (post-anginal sepsis) [6-8]. Subcutaneous emphysema and pneumomediastinum resulting from pressurized air release by dental hand-pieces occur more commonly than is realized, and may often go undiagnosed and unreported [1,9,10]. Fortunately, such problems most often represent a benign condition with gradual but complete symptomatic recovery within several days. However, depending upon the amount of air entrapped, its location and its contents (i.e. contamination with pathogenic bacteria or fungi), further complications may be extensive and serious. Temporary auditory abnormalities, orbital emphysema with retinal artery collapse and optic nerve damage (resulting in permanent visual field deficits), tension pneumothorax, pneumoperitoneum, and even death may occur [4,9,11].

Unfamiliarity with this problem on the part of dentists, dental surgeons and physicians may lead to erroneous initial diagnoses such as anaphylaxis, haematoma, oesophageal rupture, angioneurotic oedema, infection, or anaesthetic-related com-

plications. The patient may be subjected to inappropriate, invasive, inconclusive and costly diagnostic testing [12,13]. Not only may direct, contiguous spread of infection occur, but distant haematogenous spread can also develop. Pleural empyema is a rare complication of periodontal abscess, mainly following dental surgical procedures. Pleural empyema is usually the result of the development of mediastinitis, which may eventually spread to the pleural space to cause empyema. As a complication of periodontal abscess, it is devastating and can be life-threatening [14].

The clinical course of patients with the most common intrathoracic complication, pneumomediastinum, is usually benign, and can generally be managed as outpatient cases. Mediastinal air takes from 2 to 7 days to resolve completely [1]. Once signs and symptoms of mediastinitis develop, antibiotics should be started promptly and directed at the bacteria most likely to cause descending necrotizing mediastinitis — which may be due to aerobic, anaerobic and commonly polymicrobial infection. The mortality associated with this complication can reach up to 40% [6,15]. The involvement of an experienced chest surgeon is invaluable, as the majority of cases end up with thoracotomies.

## Conclusion

Complications following dental infection and dental work-up are many, but the majority are benign. Descending necrotizing mediastinitis and pleural empyema is one of the most devastating complications with a high mortality rate. Aggressive treatment with the use of antibiotics and the involvement of an experienced chest surgeon is mandatory.

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