Subcutaneous emphysema during restorative dentistry

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Background. Subcutaneous emphysema is a rare occurrence in the dental setting. When it does occur, the entity may be mistaken for an anaphylactic reaction to a local anaesthetic agent or other medications used in dental surgery.

Case Report. During restorative treatment of a left

Introduction

Subcutaneous emphysema, surgical emphysema, or tissue space emphysema are different names for a similar condition, namely, the abnormal presence of air in tissue spaces^{1–6}. Subcutaneous emphysema occurs rarely during dental procedures. When it does occur, it can be a frightening experience that often will be confused with an anaphylactic reaction. The distinction between the two conditions is important because treatment is vastly different. The following report describes a case of subcutaneous emphysema during restorative dental treatment, which was initially believed to be an anaphylactic reaction.

Case report

A 5-year-old female patient was undergoing restorative treatment for a carious mandibular left second primary molar. Rubber dam isolation was not utilized. An air driven hand-piece was used to restore occlusal caries without local anaesthesia. An immediate facial swelling occurred that involved the entire face and neck. No airway compromise occurred and no cyanosis was observed. She was transported to the emergency department. Initially, she was second primary molar air was introduced under an operculum. Communication with submandibular and sublingual spaces to the mediastinum was established.

Conclusion. Therapy for subcutaneous emphysema involves, correct diagnosis and antibiotic coverage. Subcutaneous air will resolve over time so observation is indicated.

believed to have had an allergic reaction to some unknown agent. She received Benadryl (Diphenhydramine), 12.5 mg and epinephrine 0.5 mL of a 1:10 000 solution intravenously without effect. Crepitus was noted upon palpation of the involved face and neck areas. Chest X-ray showed subcutaneous air in the right and left facial and neck areas as well and mediastinum (Fig. 1). She was haemodynamically stable throughout the emergency department evaluation and transported to the paediatric intensive care unit without incident. Prior to transport she was given clindamycin to cover anaerobes, Staphylococcus sp., and Streptococcus sp. from the oral cavity. She experienced only minor discomfort in the face and chest during her 1-day observation period in the unit. No respiratory or circulatory compromise was observed.

Discussion

Subcutaneous emphysema does not occur frequently in dentistry. However, there have been sporadic cases reported following dental treatment that included pulp therapy, extractions, and oral lacerations^{1–6}. The condition is most distressing to the dental surgeon because of the rapidity of accumulation and extent of the subcutaneous air. Some practitioners have mistakenly confused subcutaneous emphysema with an allergic, or anaphylactic, reaction^{1,4}. Differentiating the two conditions is not difficult. Palpation of the swollen head and neck areas

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Fig. 1. Chest radiograph showing presence of bilateral subcutaneous air involving the jaws, neck, shoulders, and mediastinum.

will elicit crepitus, or a 'Velcro' sensation, that is not present in anaphylaxis¹. Anaphylaxis occurs after exposure to an allergen that elicits an IgE-mediated hypersensitivity that leads to an abrupt onset of symptoms that may include pruritis of lips, tongue and palate; oedema of the lips; nausea; vomiting; dysponea; wheezing; rhinorrhoea; syncope and hypotension⁷. Anaphylaxis is a true medical emergency, whereas subcutaneous emphysema is generally not life-threatening⁴.

The patient presented in this case report had subcutaneous emphysema that not only involved the head and neck regions but also the mediastinum. During the attempted restorative of the mandibular left second primary molar, air was introduced under an operculum flap that was present on the distal aspect of a newly erupting mandibular left first permanent molar. A plausible explanation for the extension of air is communication with submandibular and sublingual spaces, which communicate with the pterygomandibular, parapharyngeal, and retropharyngeal spaces. The mediastinum communicates with the retropharyngeal space³.

Therapy for subcutaneous emphysema involves the following: (i) correct diagnosis and (ii) antibiotic therapy. Subcutaneous air will resolve over time; therefore, observation is indicated³. Complications may rarely include cardiac tempanade, airway compromise, or air embolism^{1,4,6}. Antibiotic administration is controversial, however, it seems prudent to give these patients an anti-infective agent that covers *Staphylococcus* sp., *Streptococcus* sp., and anaerobes that may be transmitted from the oral cavity^{2,3,6}.

What this paper adds

- This paper illustrates an uncommon complication that can occur during routine restorative and oral surgical procedures when compressed air is used to operate surgical handpieces.
- Simple palpation of the swollen facial areas is instrumental in making the correct diagnosis, relieving patient anxiety and avoiding unnecessary treatment for anaphylaxis.

Why this paper is important for paediatric dentists

• This paper highlights the merits of a simple physical examination in differentiating between a relatively benign condition versus a life-threatening entity.

Conclusion

Subcutaneous emphysema is a rare occurrence in dentistry. It is generally not life-threatening, resolves spontaneously, and leaves no permanent sequelae. Correct diagnosis is imperative and antibiotics are recommended. Additionally, correct rubber dam isolation of carious teeth may prevent some of these cases during routine restorative treatment.

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