

Iatrogenic Emphysema- A Rare Clinical Case Report

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Abstract: Subcutaneous emphysema is a rare complication related to dental treatment. The most common dental etiology of this complication is the introduction of air via the air-turbine handpiece during bone removal in surgical removal of impacted tooth, and is very rare during nonsurgical endodontic treatment. The use of three way air syringes and forceful irrigation of root canal can lead to surgical emphysema of subcutaneous tissue planes in and around the teeth which are involved. This case report presents a case of subcutaneous emphysema during a non-surgical endodontic treatment.

Keywords: Iatrogenic Emphysema, Air Turbine Handpiece, Endodontic treatment, Facial spaces

I. Introduction

Tissue emphysema is a condition occurring due to air entrapment in the tissue spaces which can be either iatrogenic or due to some pathological conditions. It is defined as an abnormal introduction of air in the subcutaneous tissues of the head and neck. Periorbital emphysema occurs when air is introduced into the periorbital tissues (1). In dental practice emphysema may occur due to the use of air driven handpiece used for surgical removal of partially erupted tooth, situations where deep periodontal pockets or gingival sulcus is present during Tooth preparation and when the three way syringe is used during root canal procedure and thus it can be projected as iatrogenic.(2) This subcutaneous emphysema is a potentially life-threatening condition, but the majority of cases are self-limiting and reduces with time (3). As a management of this condition, a strict observation of the vital signs of the patient, and prophylactic antibiotic therapy should be administered. Some complications such as pneumothorax and mediastinitis can develop associated to subcutaneous emphysema. Cases emphysema during root canal therapy resolves spontaneously after a few days (4). However, it can be a frightening and unpleasant experience for both patient and dentist. This is a case report on a iatrogenic tissue emphysema following a nonsurgical endodontic procedure.

II. Case Report

A patient was referred to Department of Conservative Dentistry and endodontics, Amrita School of dentistry from a private practice immediately after attempting an access opening in relation to upper right canine. During the procedure an extraoral swelling was encountered extending to the infra orbital region. Patient was immediately asked to report to a dental college facility for management. On examination the swelling was seen on the right side of the face extending superiorly in the infraorbital region, inferiorly to the lower border of the mandible, anteriorly to the ala of the nose and posteriorly 1cm from the tragus of the ears, with no noticeable pain with non-erythematous non tender swelling. On palpation cracking sound was observed and the patient was not able to open her right eye, Vital signs were normal and stabilized. After removal of the temporary restoration aspiration of the air was done by placing 2ml syringe with 30 gauge needle. The tooth was temporized to reduce the negative pressure. The patient was reassured and prescribed a course of amoxclav and a potent anti-inflammatory. The patient was monitored for 4- 5 hours to see any increase in swelling, reviewed every alternate day. After one week swelling had resolved with normal eye opening.

III. Discussion

Emphysema is derived from Greek word, 'whick', which means 'to blow in' (5). The use of air syringe for drying the canal during root canal procedure is common practice of most of the clinicians. Air/ gas can be introduced to soft tissue spaces through either root canal or dentoalveolar membrane (6). In endodontics the procedure that acts as a risk for this condition is, firstly, during canal preparation, a blast of air to dry the canal, and secondly during apical surgery, air from a high-speed drill, can lead to air emphysema. Air syringe operates at 20-25 PSI, this might result in air embolism during root canal therapy (7). Air can escape into many adjacent spaces which might lead to complications such as mediastinal emphysema. This results from the entry of a large quantity of air to the deepest planes of the neck, passing directly to the top part and then to the anterior of the mediastina (8,9). When air reaches the deeper soft tissue under pressure, as is the case when air-water cooled handpieces or air-water syringes are used, it will follow the path of least resistance through the connective tissue, along the facial planes, spreading to distant spaces (10). The presence of pain both in the

thorax and in the back, would suggest the presence of mediastinal emphysema (11), and a thorax X ray to confirm the diagnosis is mandatory. The characteristic signs and symptoms of subcutaneous emphysema included diffuse swelling and characteristic palpable crepitus. Hayduk et al., had reported that crepitus is a pathognomonic sign of tissue space emphysema. In order to perform a correct treatment, it is important to make differential diagnosis with complications that also produce swelling of the soft tissues, Anaphylactic reaction, Hematoma Angionedema (12). The complication can be immediate or delayed, Immediate swelling consisted of local swelling, crepitus and local discomfort. Delayed swelling is a diffuse swelling, erythema, Pyrexia and pain. In cases having deep periodontal pocket or when the gingival adhesion is minimum, it can act as thin path of entry for air while using air pressure instruments during tooth preparations or other treatments which can lead to similar conditions.(13,14)

Emphysema in this patient may be due to the use of high-speed airtor drill and the three-way air syringe. Since the use of high-speed airtor drill is inevitable for any endodontic treatment, but the use of three-way air syringe, especially for drying the canal is questionable. It should be avoided as there is a greater risk of inducing air into the canal and pushing the contents of the canal beyond the confines of the root canal into the periapex. It is recommended to use a pellet of cotton to accomplish the same; further drying of the root canal can be done with paper points. Situations with subcutaneous emphysema have shown to resolve in 2 to 3 days, and they are completely overcome in 5 to 10 days (15, 16). The patient should be advised to avoid increase the intraoral pressure, such as blowing the nose vigorously or playing musical instruments, which could introduce more air. Finally, the patient should be informed of this condition and the complete procedure should be registered

IV. Conclusion

According to Gutmann et al, majority of endodontic procedural problems can be prevented simply by carefully assessing the situation, correctly diagnosing the complaint and following accepted and proven principles of treatment and technique. Should always learn from one's mistake and try preventing the same thing from happening again.

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