

SUBCUTANEOUS EMPHYSEMA AND MANDIBULAR THIRD MOLAR: A CASE REPORT AND REVIEW

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Abstract

Mandible third molar removal is the commonest surgery performed by oral and maxillofacial surgeons in routine practice. Surgical removal requires great expertise as it is associated with vital structures. Patients undergoing removal of impacted third molar usually experience significant postoperative pain, swelling and trismus. Subcutaneous emphysema defines to collection of air beneath subcutaneous tissue. Emphysema is more commonly seen in cases of facial bone fracture, infection by gas producing organisms, tracheotomies and anterior neck dissections. Subcutaneous emphysema due to dental treatment is an uncommon clinical complication. The purpose of this case report is to discuss the complication induced during mandibular third molar removal and to discuss the cause and treatment for same.

Keywords: third molar, subcutaneous emphysema, surgical removal, complication.

Introduction

The surgical removal of impacted third molars is one of the most frequent procedures performed by oral and maxillofacial surgeons. Patients undergoing the surgical removal of impacted third molar teeth usually experience significant postoperative pain, swelling and trismus [1]. Pain, swelling and trismus after the surgery of impacted third molars are related to, in addition to other factors, the angulations and depth of the impacted tooth, the type of

suture technique and length of the surgical intervention. In clinical practice, various measures are required to be taken to reduce the unwanted effects of post surgical problems. Despite various measures and surgical expertise, complications may occur. Subcutaneous emphysema is an uncommon clinical complication of dental related treatment. Subcutaneous emphysema refers to collection of air beneath subcutaneous tissue. This condition is more commonly seen in cases of facial bone fracture,

infection by gas producing organisms, tracheotomies and anterior neck dissections [2]. Usually this is caused by the use of air driven surgical instruments such as high-speed surgical drills and compressed air syringes. High speed air turbine drills are used to section the tooth to perform extraction. These high speed air turbine drills are driven by compressed air at 3.5-4.0 kgf/cm², rotating at 450,000 rpm [3]. These tools can push the compressed air into the space between tissues especially if there is a break in the mucosa. One of the earliest complication dates back to 1900 when an infantry bugler developed facial swelling while blowing his bugle after getting a tooth removed [4]. Under dermal layer, the air may remain present locally at surgical site or continue to spread along the loose connective tissue plane. The clinical results are swelling at local area, skin tenting and crepitation on palpation [5]. In extreme cases, air may pass through masticatory space into parapahryngeal and retropharyngeal areas penetrating into mediastinum [6].

Mandibular third molar and subcutaneous emphysema

Mandibular third molar removal is the most common procedure performed by oral surgeons in day to day practice. Surgical removal of such tooth requires great expertise as it's associated with vital structures. Untoward techniques or lack of expertise leads to various types of complications. One of most uncommon complication is subcutaneous emphysema. Inclination of air turbine handpiece towards buccal side of tooth is usually done to avoid the damage to lingual nerve. If the air turbine handpiece get immersed within the elevated flap for mandibular third molar removal, the air produced by turbine may follow the free way constituted by the partially disinserted fibers of the masseter muscle. As a result, that side of patient may get swollen from inferior border of the mandible to attachment of the temporalis muscle. The swelling immediately closes the patients same side eye [Figure 1]. The patient may not have pain, tenderness to palation or difficulty breathing as result of swelling. The subcutaneous emphysema generally gets located in latero cervical, cheek and orbital region causing immediate closure of eyelids.



Figure 1: Clinical feature of subcutaneous emphysema immediately after its occurrence.

Discussion

Subcutaneous emphysema in relation to oral surgery is caused by entrapment of air into fascial spaces of face and neck leading to the distention of overlying skin or mucosa. Differential diagnosis of hemi-facial swelling with periorbital edema includes allergic reaction precipitated by either local anesthesia or latex in dentist's gloves, facial hematoma, angioedema, cellulitis or surgical emphysema secondary to fracture of facial sinuses or following mandibular third molar removal [7]. The first four differentials do not produce classical cracking sounds or crepitus of subcutaneous emphysema when pressure is applied to that area. Palpation of swollen head and neck areas will elicit crepitus or Velcro sensation in emphysema cases that is not present in other conditions. Mostly this sign is detected immediately but sometimes it may appear subsequently making diagnosis difficult [8]. Subcutaneous emphysema may also be associated with restorative procedures, crown preparation and endodontic therapy and oral laser surgery procedures [9, 10]. Air usually enters into soft tissues through dentoalveolar membrane or root canal [11]. Elevated flap for mandibular third molar surgery can provoke emphysema. Air entered provokes valve effect. Air entered can diffuse into pterygomaxillary region and into lateral pharyngeal space from molar retromolar region and reach mediastinum by dissecting visceral space. Air can penetrate cervical fascial planes and extend to mediastinum leading to life threatening consequences [12]. The presence of pain both in thorax and in back would suggest presence of mediastinic emphysema and there is requirement of chest film for diagnosis [8]. Dual antibiotic treatment (e.g. penicillin and metronidazole) course should be preferred to prevent odontogenic infections as there are elevated risk of bacterial transfer into surrounding bone and tissue due to extensive

surgical manipulation and prolonged operation time. Other possible complications include transient hearing disturbances and retinal artery and optic nerve damage [13]. Though subcutaneous emphysema is usually clinical diagnosis, imaging can help in determining the extent of air tracking and aid in management. Plain antero-posterior and lateral neck films will show lucency where air is present. Chest radiograph helps to rule possible complications such as pneumothorax, pneumomediastinum or pneumopericardium. Computed tomography (CT) of face and neck help to emphysema from fluid collections or masses. Generally subcutaneous emphysema starts resolving after 3 to 5 days and completely resolves after 7 to 10 days (9). Patient should avoid blowing the nose vigorously or avoid playing musical instrument as these lead to increase in intraoral pressure and this can cause introduction of more air [14]. To prevent emphysema, mucoperiosteal flap elevation should be done minimal and muscle attachment preserved whenever possible with gentle retraction of mucoperiosteal flap.

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