



MAXILLARY TUBEROSITY FRACTURE AS A POST OPERATIVE COMPLICATION- A CASE REPORT

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ABSTRACT

Maxillary tuberosity sometimes lead fracture because of tooth fusion, prominent or curved roots, Root Ankylosis, chronic periapical infection, hypercementosis.

Fracture of the maxillary tuberosity sometimes can happen when pneumatization of the maxillary sinus extends between the roots of upper molars. Fracture of the maxillary tuberosity is a potential sequela of removal of maxillary posterior teeth. Often, a small fragment of bone is able to be carefully dissected from its periosteum and delivered with the tooth. However, in cases of a large bony fragment, tearing the fragment from its periosteum and delivery with the tooth can result in serious complications.

Such a complication may lead to oroantral fistula or serious infection, which may result in maxillary necrosis or deafness. Fracture of the maxillary tuberosity is not an uncommon complication of removal of maxillary molar teeth.

The incidence of fracture during third molar removal alone has been reported to be at around 0.6%.

Fragile vessels in the region of the posterior maxilla and tuberosity are easily ruptured when bone is fractured and separated from its periosteum. Deafness, the most frightening complication, may also occur because of tuberosity fracture. Cattlin (7) reported that, after maxillary tuberosity fracture, deafness occurred from the disruption of the pterygoidhamulus and the tensor veli palatine, in turn collapsing the opening of the eustachian tube. The patient also suffered permanent restricted mandibular movements. Deafness, the most frightening complication, may also occur because of tuberosity fracture. Cattlin (7) reported that, after maxillary tuberosity fracture, deafness occurred from the disruption of the pterygoidhamulus and the tensor veli palatine, in turn collapsing the opening of the eustachian tube. The patient also suffered permanent restricted mandibular movements. Deafness, the most frightening complication, may also occur because of tuberosity fracture. Cattlin (7) reported that, after maxillary tuberosity fracture, deafness occurred from the disruption of the pterygoidhamulus and the tensor veli palatine, in turn collapsing the opening of the eustachian tube.

The patient also suffered permanent restricted mandibular movements. Deafness, the most frightening complication, may also occur because of tuberosity fracture. Cattlin (7) reported that, after maxillary tuberosity fracture, deafness occurred from the disruption of the pterygoidhamulus and the tensor veli palatine, in turn collapsing the opening of the eustachian tube. The patient also suffered permanent restricted mandibular movements because of the disruption of the pterygoid muscles. Deafness, the most frightening complication, may also occur because of tuberosity fracture. Cattlin (7) reported that, after maxillary tuberosity fracture, deafness occurred from the disruption of the pterygoidhamulus and the tensor veli palatine, in turn collapsing the opening of the eustachian tube. The patient also suffered permanent restricted mandibular movements because of the disruption of the pterygoid muscles. In this case report we showcase fracture of maxillary tuberosity followed by extraction which lead to palatal defect and for the closure of defect palatal pedicled flap and buccal rotation flaps used. The procedures utilizing buccal mucoperiosteal flap for closure include straight-advancement flap, rotation-advancement flap, transverse flap and sliding flap techniques. Double-layer closure utilizing local tissues include the combination of inversion and rotational advancement flaps, double overlapping hinged flaps, double island flaps and superimposition of reverse palatal and buccal flaps. The most common methods used for closure of OAF are the buccal flap and the palatal pedicled flap technique

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INTRODUCTION

The maxillary sinus is the largest of the paranasal air sinuses and develops as an inward proliferation of the mucosa of the nasal fossa during the third and fourth months of fetal life.

Enlargement of the maxillary sinus into the alveolar process usually occurs after eruption of the permanent teeth, especially in the region of the upper first molar.

The sinus may extend into the trifurcation of the molar teeth, and it may approximate the alveolar crest.

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These extensions may weaken the posterior and lateral walls of the sinus.

Because of the close proximity of the roots of the teeth, to sinus is vulnerable during surgical procedures in this area, and this vulnerability may be increased by such dental anomalies as abnormal root configuration.

A large alveolar or tuberosity extension of the maxillary sinus may exist, or early loss of a maxillary molar (frequently the first molar) may be followed. At the lower part of the infratemporal surface of the maxilla is a rounded eminence, the maxillary tuberosity, especially prominent after the growth of the wisdom tooth; it is rough on its lateral side for articulation with the pyramidal process of the palatine bone and in some cases articulates with the lateral pterygoid plate of the sphenoid. It gives origin to a few fibers of the Medial pterygoid muscle.

Extraction of the tooth requires that the surrounding alveolar bone be expanded to allow an unimpeded pathway for tooth removal. Upper third molar lies just in front and within the maxillary tuberosity. The fracture of a large portion of bone in the maxillary tuberosity area is a situation of special concern, which can result in torrential hemorrhage due to close proximity of significant vessels to the area. Maxillary tuberosity is especially important for the stability of upper denture and may cause oroantral communication if fractured.

Fracture of the maxillary tuberosity is a potential sequela of removal of maxillary posterior teeth. Often, a small fragment of bone is able to be carefully dissected from its periosteum and delivered with the tooth. However, in cases of a large bony fragment, tearing the fragment from its periosteum and delivery with the tooth can result in serious complications.

Fracture of the alveolar process can be seen during tooth extractions. These fractures occur most often in the anterior or premolar regions of jaws in young and adults. When maxillary sinus is enlarged between the roots of upper molars and the maxillary tuberosity, these types of fractures can be seen during extraction of upper molars. Some factors may predispose for this complication such as prominent or curved roots, chronic periapical infection, radicular cyst, hypercementosis, ankylosis and tooth fusion. The anatomy of the maxillary tuberosity faces the constant presence of root projections in the maxillary sinus and the constant extension of the maxillary sinus to the most posterior region of the maxilla, care for third molar extractions must be intensified so as to avoid tuberosity fracture.

Here in this case report we showcase fracture of maxillary tuberosity with complication associated and different approach of treatment that we have done. A case has been reported of a dental extraction complicated by a tuberosity fracture involving removal of parts of the pterygoid plate, the attachment of the lateral pterygoid and the lateral pterygoid artery. It should be noted that the vasculature is almost exclusively related intimately with the overlying periosteum. In cases where profuse bleeding emanates from the extraction site of an upper wisdom tooth, it is usually a branch of the posterior superior alveolar artery that is torn along with the tuberosity.

Case Report

A 42-year-old male patient was referred to our clinic after extraction of his upper right first molar because of chronic periapical infection by his dentist. While the dentist was extracting tooth, maxillary tuberosity fracture occurred. Although there was brisk haemorrhage and tenacious soft tissue tethering, maxillary tuberosity segment including all upper molars was not removed from this region by his dentist. After 4 days postoperatively patient was unable to swallow and developed severe pain after which he reported to our hospital, on examination intraorally an unhealed socket with 18 tooth region along with huge palatal defect (fig-1) and soft tissue injury around the socket noted.



Fig 1 Unhealed Socket



Fig 2 Unhealed Socket With large palatal defect

On the examination of the removed specimen, the fractured segment included all third upper molars and there was periapical lesion, which had weakened the maxillary tuberosity against extraction force. The patient requested surgical intervention to solve this problem. The segment was not repositioned because primary stabilization could not be achieved. An oro-antral communication was observed during intraoral examination. We have removed the maxillary tuberosity fractured piece, and closed the defect using palatal advancement flap and buccal rotation flap and sutured using 3-0 vicryl. The soft tissues were secured back with 3-0 vicryl sutures. Sutures were removed after ten days. Clindamycin, naproxen sodium and chlorhexidine mouthwash were prescribed postoperatively for a course of 5 days. The patient was advised to avoid blowing his nose to avoid development of an oro-antral fistula. The patient had an uneventful recovery.



Fig 3 Intraoperative Picture



Fig 4 Post-OP 4 Day



Fig 5 Post -OP 1 Week

DISCUSSION

When sensing any movement of maxillary during extraction of the upper molars, the procedure should be terminated immediately.

If only a small bony fragment is involved, the tooth and bone can be removed after dissection of the soft tissues. When a large bony fragment is present, it is recommended that the extraction should be abandoned and surgical removal of the tooth performed by using root sectioning. 1

The successful treatment of alveolar fractures is based on proper reduction, repositioning the fractured segment and its

satisfactory stabilization. Closed or open reduction techniques can be used.

The segments should be stabilized in place for 4 weeks. During this period, occlusal grinding should be done to prevent premature contacts. In our case, teeth and the attached bony fragment were completely separated without any notable attachment. The segment also included an infected lesion, which also had the possibility to complicate the bony fixation. Therefore, we would not want to reposition the bone fragment and the soft tissue was sutured. In our case, teeth and the attached bony fragment were completely separated without any notable attachment. The segment also included an infected lesion, which also had the possibility to complicate the bony fixation. Therefore, we would not want to reposition the bone fragment and the soft tissue was sutured. Prevention of this complication is the best option and should include a proper preoperative examination and right surgical plan. Especially, it has been known from the preoperative radiography that there was a close relationship between maxillary sinuses to the roots of the posterior teeth. In conclusion, adequate bone and ridge contour should ideally be preserved for later prosthetic rehabilitation. If not, it may present difficulties for the prosthetic treatment as in our case. Shah and Bridgman reported a case in which the extraction of an upper second molar had been complicated by a maxillary tuberosity fracture. They concluded that when a tethering of the lateral and medial pterygoid muscles to the fragment is recognized by a general dentist, the maxillary tuberosity should not be removed and referred to a specialist unit. When our patient was taken to operating room, the fractured segment had been already removed. Deafness which is the most frightening complication may occur because of tuber fracture. Cattlin reported that it had occurred from disruption the pterygoid hamulus and tensor veli palatini collapsing the opening of the eustachian tube, after maxillary tuberosity fracture. In conclusion, prevention against any complication is the best option including a careful preoperative examination and right surgery plan for extraction. The general dentists must refer to an oral surgeon, as soon as they encounter difficulties like the one we have described. This case highlights potential serious complications for practitioners in the management of simple dental extractions. Fracture of the maxillary tuberosity is not an uncommon complication of removal of maxillary molar teeth. The incidence of fracture during third molar removal alone has been reported to be at around 0.6%. Fragile vessels in the region of the posterior maxilla and tuberosity are easily ruptured when bone is fractured and separated from its periosteum. This can result in torrential bleeding and a life-threatening situation, as reported by this case. In certain instances of severe haemorrhage, management may necessitate ligation of the external carotid artery or arterial embolization proximal to the bleeding vessel. Serious complications of maxillary tuberosity fracture have however been previously recognised. In Coleman's book *Extraction of teeth* he quotes a paper by Cattlin in 1858, who reported a case in which a fracture of the maxillary tuberosity resulted in deafness thought to be from the disruption the pterygoid hamulus and tensor veli palatini collapsing the opening of the eustachian tube. The patient also suffered permanent restricted mandibular movements from the disruption of the pterygoid muscles and ligaments.

A maxillary tuberosity is thought to be more predisposed to fracture if the maxillary sinus has enlarged between the teeth

and into the tuberosity so creating thin bony walls. Dental anomalies of the maxillary molars may also be contributory including; tooth fusion, tooth isolation, over eruption, ankylosis, hypercementosis, chronic periapical infection and roots which are widely divergent. If it is thought that there is a high risk of a maxillary tuberosity fracture occurring then a surgical extraction of the molar is generally. Two philosophies of management of a fractured maxillary tuberosity are commonly put forward. If the bone fragment is large it may be attempted to be salvaged but immediate removal may be a better choice because of the difficulty in attempting to retain the bone. One reason that is frequently stated as an indication for conserving the fractured tuberosity is that removal makes later denture reconstruction difficult, although this is questioned. If the bone of the tuberosity is going to be attempted to be retained it is treated with the same surgical principles as other dentoalveolar fractures. The tooth can be dissected away from the bony fragment, and provided there is sufficient periosteal attachment, the segment can be held by appropriate suturing to allow bone union to take place. Alternatively, the tooth and bone complex segment can be immobilised, allowed to heal and the tooth or teeth extracted surgically at a later time. For this later technique the state of the tooth, its dental pulp and its place in occlusion also need to be managed. In all cases attention must be given to any communication established with the maxillary sinus. This complication occurred as a result of a routine dental procedure under local anaesthetic and was correctly referred to a specialist unit. Once the nature of the problem had been elucidated, the management of this case under general anaesthetic in the operating theatre setting was relatively straightforward. However, in the outpatient setting with the patient conscious, it would have been almost impossible and potentially dangerous.

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