

Is Maxillary Tuberosity Fracture Possible While Upper First Premolar Extraction?: Case Report

Üst Birinci Premolar Çekimi Esnasında Tüber Kırığı Oluşturmak Mümkün mü?

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ABSTRACT Maxillary tuberosity fracture is a rare complication and usually related with upper molar extraction. An upper first premolar extraction, which end up with tuberosity fracture is presented in this case report. A healthy fifty-two years old male patient was referred with a fracture on his right maxillary tuberosity. After his clinical and radiographical examination, the fracture was fixed. The molar teeth in the fragment were surgically extracted after four months from the first surgery. The patient healed without complication. As conclusion maxillary tuberosity fracture can occur even after a premolar tooth extraction, rigid fixation is the preferred treatment method.

Key Words: Maxillary fractures; maxilla; complications; surgical fixation devices; tooth extraction

ÖZET Maksiller tüber kırığı nadir görülen bir komplikasyondur ve genellikle üst molar diş çekimi ile ilişkilidir. Bu olgu sunumunda, üst premolar çekimi sonrası oluşan tüber kırığı sunulmaktadır. Sağlıklı 52 yaşındaki erkek hasta sağ maksiller tüber kırığı ile kliniğimize yönlendirildi. Klinik ve radyografik muayenesinin tamamlanmasından sonra kırık cerrahi olarak fiks edildi. Fragmandaki molar diş ilk cerrahiden dört ay sonra cerrahi olarak çekildi. Hasta komplikasyonsuz iyileşti. Sonuç olarak premolar diş çekiminden sonra bile tüber kırığı oluşabilir ve rijit fiksasyon tercih edilen bir tedavi yöntemidir.

Anahtar Kelimeler: Maksillar kırıklar; maksilla; komplikasyonlar; cerrahi fiksasyon araçları; diş çekimi

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Maxillary tuberosity fracture is a rare complication of upper molar tooth extraction and if not treated properly, it can cause serious problems.¹ Enlargement of maxillary sinus, prominent and curved roots, chronic periapical infection, radicular cyst, hypercementosis, ankylosis and tooth fusion increase the fracture risk.²⁻⁴ Large maxillary sinus with thin walls, alveolar process resorption following early loss of a maxillary tooth, fusion of maxillary third and second molar, isolated tooth, teeth with large divergent roots, teeth with an abnormal number of roots, teeth with prominent or curved roots, teeth with dental anomalies, tooth ankylosis, hypercementosis, radicular cysts, multiple extraction with incorrect order and malpractice by the dentist are etiological factors of maxillary tuberosity fractures listed in the literature.⁵

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Tuberosity fractures are usually seen during maxillary third molar extractions. Incidence of this complication decreases through first upper molar. Tuberosity fracture due to maxillary premolar extraction has not ever been reported in the English literature. The purposes of this case report are to present a tuber fracture occurred during maxillary first premolar extraction and emphasize the importance of proper force application for tooth extraction.

CASE REPORT

A medically healthy fifty-two years old male patient was referred to our department from another dental clinic with a maxillary fracture during extraction of his right upper first premolar because of persistent chronic periapical infection. On his clinical examination upper right posterior segment including the extraction socket of the first premolar was mobile in bucco-palatal direction. Hematoma was clearly seen on the posterior maxilla (Figure 1). The first and second molar teeth were left in the fractured segment. On the panoramic radiograph, fracture line, starting from apical of upper right premolar and extending to the posterior of the right maxillary tuberosity could be easily detected (Figure 2).

After clinical and radiological examination, the patient immediately prepared for internal fixation. After local anesthesia, triangular incision started from retromolar area extending to anterior region and completed with vertical incision on the anterior. Full thickness flap was elevated and all fracture line was clearly observed (Figure 3). Fracture was stabilized with a L type titanium plate and four titanium screws with 2 mm diameter and 5 or 7 mm length (Trimed, Ankara-Turkey) (Figure 4). After fixation, soft tissues were closed primarily with 3.0 silk sutures. Occlusal contacts of the upper first molar were removed. Clindamycine (600 mg, 2x1), paracetamol (500mg, 2x1) and clorhexidine mouthwash were prescribed for 6 days and the patient was advised about not to chew on the operation side. The patient recovered without any problem. After four months of healing, plate and



FIGURE 1: Extraction site. Hemorrhage on posterior maxilla can clearly be seen.



FIGURE 2: Preoperative panoramic radiograph. Fracture line on left maxillary posterior area started from extraction socket apex and ended on maxillary tuberosity.

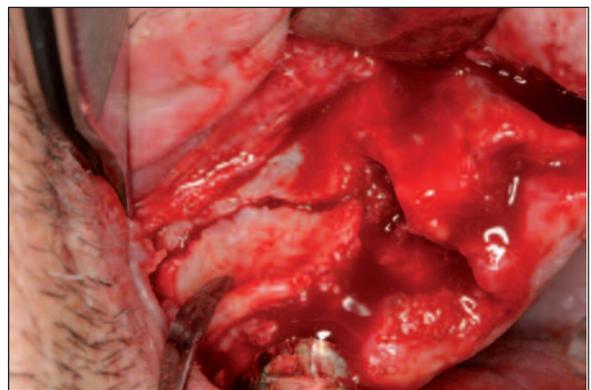


FIGURE 3: Intraoperative view of the fracture. Sinus mucosa can be observed while fracture segment was moving.

screws were removed and his molar teeth were extracted surgically (Figure 5, 6).

The patient is still under follow up and his prosthetic treatment has been started.

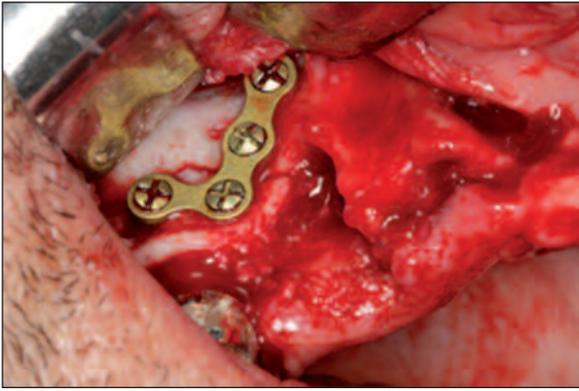


FIGURE 4: Fracture segment was fixed with a L-shape titanium plate and four titanium screws.



FIGURE 5: Postoperative clinical view.



FIGURE 6: Postoperative panoramic graphy.

DISCUSSION

The fracture of maxillary tuberosity is a rare complication during maxillary posterior tooth extraction. Baniwal et al. published the prevalence of tuber fracture as 0.15% of 8455 simple tooth extractions.⁶ In another similar study, Arrigoni et al.

reported this incidence as 0.08%.⁷ Tuberosity fractures often occur during 3rd molar extractions. Although tuberosity fractures due to maxillary molar teeth extraction have been published in the English literature, not any case due to premolar extraction has ever been published.

Although enlargement of the maxillary sinus, angled and extra roots of maxillary molar tooth, abnormal physiology of the tooth, excessive resorption of maxillary alveolar bone due to various reason such as trauma, tumor, cyst, early tooth extraction etc., ankylosis, hypersementosis, pathology in related area, chronic periapical lesions and malpractices are the ethological factors of the maxillary tuberosity fractures malpractice comes into prominence as a factor in the presented case.^{3,4,8} Disproportionate and careless force application during extraction was lead to the occurrence of this rare complication. We considered that, weakening of the posterior maxillary area due to existence of the first and second maxillary molar teeth and close proximity of the roots of these teeth with the maxillary sinus and extraction without supporting the alveolus were the main reasons of the tuberosity fracture in our patient.

Conventional radiographs and computerized tomography are used for diagnosis of tuberosity fractures. Even though panoramic radiographs have limitations, on the clinical application it is the most convenient imaging way. In our case, fracture was diagnosed with panoramic radiograph as well as clinical examination.

Hadziablic et al. distinguished tuberosity fractures to three degrees as mild, moderate and severe fractures with regard to the size.⁹ Mild is described as a small fracture and small bone fragment of the tuberosity adjacent to the root is attached, moderate as a medium fracture and along the extracted molar a greater part of the adherent tuberosity is attached, covering the area of the adjacent the root, but also could be wider and severe fracture is described as a catastrophic fracture when the fracture line includes greater part of tuberosity and additionally pterygoid plate fracture and/or blood vessel and muscle injuries could be involved.

The presented case was a severe fracture as it covered greater part of the maxillary posterior and alveolar area. However no additional complications have been observed. Deafness and serious bleeding are the most feared complications of maxillary tuber fractures.^{2,10} In our case, immediate referral of the patient after the fracture prevented more complex complications.

After the occurrence of the maxillary tuberosity fracture, the main aim is immediate fixation since it can lead to oro-antral communication, hemorrhage, serious infection or deficiency in prosthetic stabilization due to maxillary defect if not treated properly.

As it has been stated that maxillary premolar area is the strongest part of maxilla for the buccal

cortical bone density when compared to the other sites, it has been suggested that the tuber fracture occurred as a result of careless and excessive extraction force application of the dentist.¹¹ However it has also been considered that maxillary molar teeth in close relation with maxillary sinus might be a reason for progression of the fracture to the maxillary posterior region and tuberosity by weakening the bone.

In conclusion, careful preoperative examination, right surgical movement and appropriate force application are the best precautionary measures to prevent any complications while tooth extraction. In our case, it is obviously shown that lack of attention to these issues make maxillary tuberosity fracture possible even in a premolar extraction.

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