

Removal of Displaced Maxillary Third Molar Using Modified Gillie's Temporal Approach

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Abstract

Tooth impaction is a pathological situation where a tooth is unable to achieve its normal functional position within the expected time span. The removal may be associated with intra-operative or post-operative complications. The Le Fort I osteotomy is a procedure used by maxillofacial surgeons to correct a wide range of dentofacial deformities. Due to its versatility and simplicity, it has gained popularity for a wide range of uses. This case report describes the location and surgical removal of a right maxillary third molar which was accidentally displaced into the infratemporal fossa in a 26-year-old female while performing Le Fort I osteotomy. The patient underwent a second surgery for the retrieval of tooth using modified Gillie's temporal approach. The important role of the cone beam computed tomography in determining the localization of the displaced tooth is demonstrated.

Keywords: Cone beam computed tomography, infra temporal fossa, Le Fort I osteotomy upper wisdom tooth displacement, modified Gillie's temporal approach

INTRODUCTION

Surgical extraction of maxillary third molars might be associated with displacement of the tooth into a variety of locations, including the buccal space, infratemporal fossa, temporal fossa maxillary sinus, lateral pharyngeal space or the pterygomandibular space, or other tissue planes. The versatility of the Le Fort I osteotomy to correct maxillary deformities is unquestioned. As a result, the osteotomy design has undergone modification to enhance the ability of the surgeon to accurately reposition the maxilla and to improve bony contact and logically the initial stability of the mobilized jaw. The accidental displacement of a maxillary third molar into the infratemporal fossa is a frequently mentioned but rarely reported complication associated with Le Fort I osteotomy. In the literature, there are a number of articles focusing on the retrieval of the upper third molars from the infratemporal fossa with various access options at different intervention times.^[1-4]

The aim of this case report is to present the modified Gillie's temporal approach used to remove a displaced maxillary third molar from infratemporal fossa.

CASE REPORT

A 26-year-old female patient came with a chief complaint of gummy smile, for which Le Fort I osteotomy with superior repositioning of the jaw was planned as a classical "surgery first" approach and carried out. Intraoperatively during the procedure after osteotomy, the upper right third molar got displaced into the soft tissue and was not palpable in the soft tissue, after which intraoral intervention was carried out for the retrieval of the tooth using the maxillary vestibular incision that was used for Le Fort I osteotomy which was unsuccessful. Postoperatively, the volumetric three-dimensional cone beam computed tomography [Figure 1] was done which showed the dislocated entire tooth in the infratemporal fossa. The patient had pain and swelling in the temporal region postoperatively

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which was an obvious indication to carry out the second surgical procedure for the retrieval of the tooth and the patient was informed about it. Modified Gillie's temporal approach was used [Figure 2], soft-tissue dissection carried out till infratemporal fossa and tooth was retrieved. Closure was done using 3-0 Ethilon. Postsurgically, the patient was prescribed an antibiotic and analgesic for 7 days. In the 1st week of postsurgical, there was swelling and reduced mouth opening and within 3 weeks, the patient recovered with normal mouth opening of about 40 mm without any postoperative sequelae. Postoperatively, lateral cephalogram and Paranasal sinus (PNS) view X-rays were taken [Figure 3].^[2-10]

DISCUSSION

The Le Fort I osteotomy is commonly used for the correction of malocclusion and maxilla-mandibular deformities. Because it allows for movement in all three planes, it is used to treat Class II and III malocclusions, as well dentofacial asymmetries.

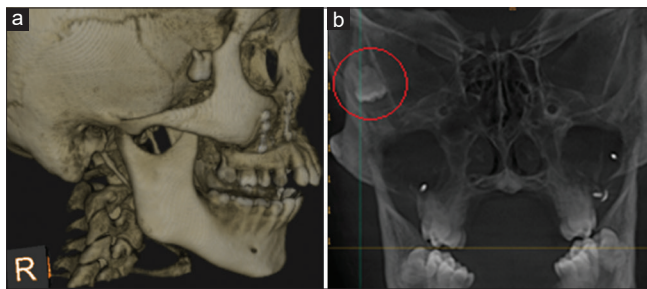


Figure 1: (a and b) Preoperative – cone beam computed tomography images showing location of the displaced right maxillary third molar

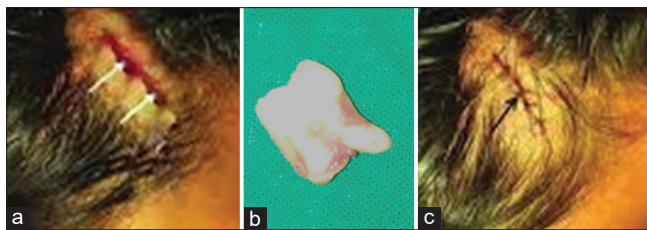


Figure 2: (a and b) Intraoperative – retrieval of tooth using modified Gillie's temporal approach. (c) Intraoperative – retrieval of tooth using modified Gillie's temporal approach

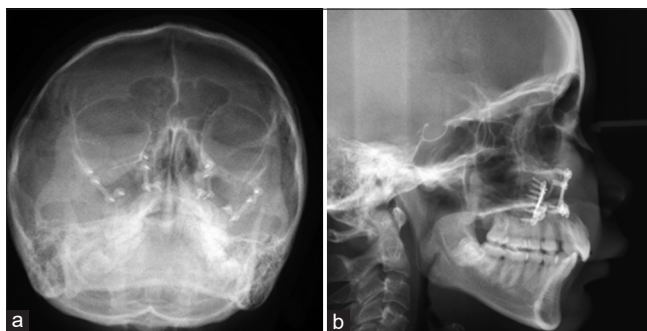


Figure 3: (a and b) Postoperative X-ray shows the removal of displaced maxillary third molar on the right side

Furthermore, it is commonly used to treat midface hypoplasia and vertical maxillary excess. There are certain complications associated during osteotomy, in which displacement of impacted maxillary third molar into infratemporal space which is rare.^[7,4,11,12]

Displacement of maxillary third molars into the neighboring anatomic spaces is associated with insufficient clinical and radiographic examination, and lack of basic principles of surgery such as poor anatomic knowledge, inadequate flap, decreased visibility, and excessive or uncontrolled force applied during extraction. Maxillary third molars uncommonly displaced through the periosteum into the infratemporal fossa. Excessive force application and incorrect use of elevator during the attempt to retrieve the tooth may further displace the tooth upward into the skull base carrying greater risks for morbidity. Removing a displaced tooth from the infratemporal fossa can entail serious hemorrhage of the maxillary artery blood vessel and neurologic injury of the maxillary nerve. Even more severe complications such as diplopia are reported.^[2,7,13,14]

The exact localization of the displaced tooth is impossible to determine clinically and radiographic examination is indicated. The superimposition of the anatomic structures located at the site of the infratemporal, temporal, and pterygopalatine fossa may disorient the diagnosis in the case, hence to determine the precise and detailed location of the dislodged tooth computed tomography examination is needed.^[15-17]

Many surgical approaches have been used for the retrieval surgery of displaced maxillary third molar into the infratemporal fossa area such as long incision in the buccal sulcus, the Caldwell-Luc approach through the maxillary sinus after removal of the whole posterior wall, and resection of the coronoid process.^[18,11,19,20]

In this case, the patient had pain and restricted mouth opening. The cone beam volumetric tomography scan showed clearly that the displaced tooth was in infra temporal fossa. A conservative method of surgery through modified Gillie's temporal approach was preferred due to the third molar location, being stuck in infratemporal fossa behind lateral wall of orbit, blunt dissection was carried until reaching the tooth. To prevent further dislocation of tooth, digital pressure was applied in orbital area and the tooth was retrieved.^[14,16,21]

Localization with images and proper surgical methods are the keys to retrieving the displaced fragment successfully. There are no certain treatment choices whether immediate or secondary surgery is advantageous for the retrieval of such displaced teeth. The oral and maxillofacial surgeon decides uniquely evaluating the time the patient was referred, location of the tooth, and the patient's psychological conditions all together for the most appropriate surgery approach.^[20,17]

CONCLUSION

Accidents and complications can be seen in any surgical procedure. Displacement of the upper third molar in Le Fort I

osteotomy is a rare but possible complication that has to be kept in mind before the planned procedure. This complication could have been prevented if the third molar were surgically extracted before the planned osteotomy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for images and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published, and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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