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.\(^1\text{-}^4\)

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 1 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 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 sequela. Postoperatively, lateral cephalogram and Paranasal sinus (PNS) view X-rays were taken [Figure 3].

**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. 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 peristomeu 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.

**References**

1. Dawson K, MacMillan A, Wiesenfeld D. Removal of a maxillary third molar from the infratemporal fossa by a temporal approach and the aid of image-intensifying cineradiography. J Oral Maxillofac Surg 1993;51:1395-7.
2. Roshanghias K, Peisker A, Zieron JO. Maxillary tooth displacement in the infratemporal fossa. Dent Res J (Isfahan) 2016;13:373-5.
3. Ogden GR. The Gillies method for fractured zygomas: An analysis of 105 cases. J Oral Maxillofac Surg 1991;49:23-5.
4. Buchanan EP, Hyman CH. Le Fort I Osteotomy. Semin Plast Surg 2013;27:149-54.
5. Durmus E, Dolanmaz D, Kucukkolbsi H, Mutlu N. Accidental displacement of impacted maxillary and mandibular third molars. Quintessence Int 2004;35:375-7.
6. Patel M, Down K. Accidental displacement of impacted maxillary third molars. Br Dent J 1994;177:57-9.
7. Sverzut CE, Trivelato AE, Sverzut AT, de Matos FP, Kato RB. Removal of a maxillary third molar accidentally displaced into the infratemporal fossa via intraoral approach under local anesthesia: Report of a case. J Oral Maxillofac Surg 2009;67:1316-20.
8. Dimitrakopoulos I, Papadaki M. Displacement of a maxillary third molar into the infratemporal fossa: Case report. Quintessence Int 2007;38:607-10.
9. Gulbrandsen SR, Jackson IT, Turlington EG. Recovery of a maxillary third molar from the infratemporal space via a hemi-coronal approach. J Oral Maxillofac Surg 1987;45:279-82.
10. Liang X, Jacobs R, Hassan B, Li L, Pauwels R, Corpas L, et al. A comparative evaluation of Cone Beam Computed Tomography (CBCT) and Multi-Slice CT (MSCT) Part I. On subjective image quality. Eur J Radiol. 2010;75:265-9.
11. Ozer N, Uçem F, Saruhanoğlu A, Yılmaz S, Tanyeri H. Removal of a maxillary third molar displaced into pterygopalatine fossa via intraoral approach. Case Rep Dent 2013;2013:392148.
12. Kim HJ, Paik DJ, Choi BY, Sohn HJ, Chung RH and Koh KS, et al. Measurements of the zygomatic bones and morphology of the zygomaticofacial and zygomaticotemporal foramina in Korean. Korean J Phys Anthropol 1997;10:225-34.
13. Baig MH, Punjabi S, Khan M. Displacement of maxillary third molar in the infratemporal fossa. Pak Oral Dent J 2012;32:39-41.
14. Markose G, Graham RM. Gillies temporal incision: An alternate approach to superficial temporal artery biopsy. Br J Oral Maxillofac Surg 2017;55:719-21.
15. Hoyt CJ. The simple treatment of zygomatic fractures: The Gillies approach after fifty years. Br J Plast Surg 1979;32:329-30.
16. Prakash M, Dolas RS, Managutti A, Deepashi K. A modified temporal incision: An alternative approach to the zygomatic arch. J Maxillofac Oral Surg 2010;9:428-33.
17. Kramer FJ, Baethge C, Swennen G, Teltzrow T, Schulze A, Berten I, et al. Intra- and perioperative complications of the Le Fort I osteotomy: A prospective evaluation of 1000 patients. J Craniofac Surg 2004;15:971-7.
18. Kajla P, Lata J, Sharma BS, Verma K. Delayed removal of displaced maxillary third Molar from the infra-temporal fossa by intra oral approach. J Adv Med Dent Sci Res 2016;4:142-5.
19. Lee D, Ishii S, Yakushiji N. Displacement of maxillary third molar into the lateral pharyngeal space. J Oral Maxillofac Surg 2013;71:1653-7.
20. Mumtaz M, Kazmi F, Alsuwailk AA. Displacement of impacted third molar into maxillary sinus and its removal through Caldwell-Luc approach - A case report. Int J Med Dent Case Rep 2018;5:1-4.
21. Song WC, Choi HG, Kim SH, Kim SH, Hu KS, Kim HJ, et al. Topographic anatomy of the zygomatic arch and temporal fossa: A cadaveric study. J Plast Reconstr Aesthet Surg 2009;62:1375-8.