

**Late removal of an upper third molar displaced into the infratemporal space using an intermaxillary fixation screw: a case report**

**Remoção de terceiro molar superior deslocado para espaço infratemporal utilizando um parafuso de bloqueio intermaxilar: relato de caso**

**Extracción del tercer molar superior desplazado hacia el espacio infratemporal utilizando uno tornillo de bloqueio intermaxilar: informe de caso**

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## **Abstract**

Teeth displacement during extractions even though rare are extremely unwanted, especially for infratemporal space. This accident generally necessitates additional treatment for their resolution, being either immediate or late. Several authors described surgical techniques for removal of displaced teeth into the infratemporal space, varying according to the degree of displacement, being that in some of these cases, it is necessary the utilization of complementary tools. This case describes the technique utilized for late removal of tooth 18 (upper right third molar) dislocated into the lower portion of the infratemporal space (confirmed by the Cone Beam Computer tomography Scan), exam was performed after the patient reported pain in the operated region and during mandibular movement too, with an interincisal opening maximum of 20 millimeters. The procedure was realized under local anesthesia by a conservative intraoral approach and aid of intermaxillary fixation screw to facilitate extraction. The patient recovered well, without complications, with remission of pain and restoration of mouth opening.

**Keywords:** Third molar; Oral surgery; Tooth extraction.

## **Resumo**

Deslocamentos dentais durante extrações, mesmo que raros, são extremamente indesejáveis, especialmente para o espaço infratemporal. Este acidente geralmente necessita de tratamento adicional para sua resolução, sendo ele imediato ou tardio. Muitos autores descrevem técnicas cirúrgicas para a remoção de dentes deslocados para o espaço infratemporal, variando de acordo com o grau de deslocamento, sendo que em muitos destes casos, há necessidade de utilização de ferramentas complementares. Este caso descreve a técnica utilizada para remoção tardia do elemento dental 18 (terceiro molar superior direito) deslocado para a porção inferior do espaço infratemporal (confirmado por tomografia Cone Beam), exame realizado após o paciente ter relatado dor na região operada e também durante movimentos mandibulares, apresentando uma abertura bucal máxima de 20 milímetros. O procedimento foi realizado, sob anestesia local, por meio de um acesso intrabucal (conservador) e auxílio de um parafuso de bloqueio intermaxilar, para facilitar a exodontia. O paciente se recuperou bem no pós-

operatório, sem complicações, evoluindo com remissão da dor e restabelecimento da abertura bucal.

**Palavras-chave:** Terceiro molar; Cirurgia oral; Extração dentária.

## Resumen

Los desplazamientos dentales durante las extracciones, aunque sean raros, son extremadamente indeseables, especialmente hacia el espacio infratemporal. Este accidente generalmente requiere tratamiento adicional para su resolución, ya sea inmediato o tardío. Muchos autores describen técnicas quirúrgicas para la eliminación de dientes desplazados al espacio infratemporal, variando de acuerdo con el grado de desplazamiento, siendo que en muchos de estos casos ha sido necesario utilizar herramientas complementarias. Este caso describe la técnica utilizada para la extracción tardía del elemento dental 18 (tercer molar superior derecho) desplazado a la porción inferior del espacio infratemporal (confirmado por tomografía Cone Beam), examen se llevó a cabo después de que el paciente ha reportado dolor en la región operada y además durante los movimientos mandibulares, con la apertura máxima de boca siendo 20 mm. El procedimiento se realizó debajo anestesia local por medio de un acceso intraoral conservador y auxilio de un tornillo de bloqueo intermaxilar, para facilitar la extracción. El paciente se recuperó bien, sin complicaciones, con remisión del dolor y restablecimiento de la abertura bucal.

**Palabras clave:** Tercer molar; Cirurgia oral; Extracción dental.

## 1. Introduction

Despite advances in surgical techniques and professional qualification, complications in dentoalveolar surgeries are possible in several stages of the procedure, especially in extraction of third molars. Accidents during third molar extraction and complications postoperative are unwanted events that may demand additional treatment for their resolution (Agarwal P et al., 2019). Among this events are, for example, bone fractures, alveolar osteitis, hemorrhage, infections, nerve injuries and not so common the dental dislocations (Nardo DD et al., 2019).

According to dental dislocations, the literature show that the most ectopic position of third molar is the maxillary sinus or infratemporal fossa, pterygopalatine fossa, lateral pharyngeal space, ptergomandibular space, buccal space (Anand K et al., 2016; Lutz JC et al., 2019). In other words, dental dislocations are challenging, particularly the displacement of an

upper third molar into the infratemporal space, even though reported cases are rare (Orr DL II, 2019; Battisti A et al., 2019; Yucesoy T et al., 2018).

There are two main treatment approaches: (1) immediate removal of the tooth, in some cases requiring hospitalization and general anesthesia; or (2) expectant treatment in order to wait for fibrosis around the tooth, and subsequent removal. Pain, infection, limitation of mandibular movements and psychological discomfort of the patient represent the main indications for removal of the displaced tooth (Orr DL II, 2019; Roshanghias K et al., 2016).

In some cases, the tooth may migrate into a lower position after an expectant treatment has been instituted and may be removed by an extended third molar approach or by direct incision on the dislocated dental element (Sverzut CE et al., 2009). The use of image intensifiers, transantral approaches and an endoscope have also been reported as resources to remove displaced teeth. (Orr DL II, 2019; Battisti A et al., 2019; Sencimen M et al., 2017).

The purpose of this case report is to demonstrate the technique used for the late removal of a right upper third molar that was displaced into the lower portion of the infratemporal region.

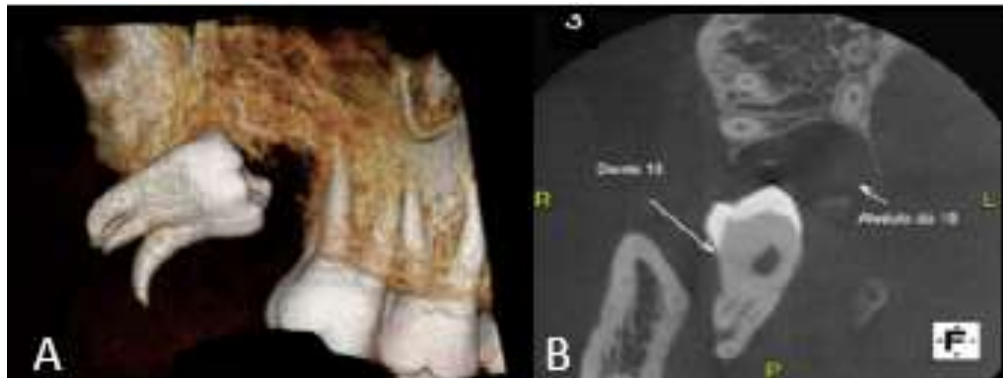
## **2. Methods**

This article consists of a descriptive case study. The work was not submitted to the ethics and research committee, as it is a case report, whose procedure to be performed was not experimental. The patient has a signature on the free and informed consent form about the surgical procedures performed during the treatment and regarding the use of images.

### **2.1 Case report**

A 21 year old male patient was admitted at Rolândia/PR - Brazil and evaluated after having undergone a surgical procedure for the extraction of the right upper third molar at a private dental office one month before. He reported pain in the operated region, especially when opening mouth and his interincisal opening was restricted. The patient and his parent, who was present at the time of surgery, reported that the procedure lasted two hours and that the dentist said he had removed the tooth, but the patient had to be hospitalized because of an infection at the surgical site and underwent antibiotic therapy. Due to the infection, a computed tomography (CT) scan was performed and showed the right upper third molar displaced posteriorly to the maxillary tuberosity into the infratemporal fossa (Figure 1):

**Figure 1.** Preoperative computed tomography (CT) images. (A) Three-dimensional reconstruction; (B) Axial view.



Source: The authors.

On physical examination, the patient had pain in the operated area and during mandibular movement, limited maximum mouth opening (20 millimeters) and the alveolar had a healed scar, with no signs of infection or bulging in the adjacent soft tissues.

Removal of the displaced tooth was planned under local anesthesia, after informing the patient that transference to the hospital might be necessary in case the tooth could not be located. After local anesthesia with 2% mepivacaine + 1: 100.000 epinephrine (DFL – Rio de Janeiro – RJ), the tooth was found by means of a 22G (0.70 X 25 mm; Injex – Ourinhos – SP) needle puncture in the posterior region of the maxillary tuberosity (Figure 2). On the puncture, an incision of approximately 1 cm was made (Figure 3). After divulsion, it was possible to observe the distal portion of the crown. However, apprehension of the tooth using tweezers was impossible due to its expulsive shape.

**Figure 2.** Transoperative photographs. Location of the tooth using a 22G needle.



Source: The authors.

**Figure 3.** Transoperative photographs. Intraoral approach distal to the maxillary tuberosity.



Source: The authors.

Upon failure of apprehending the tooth with instruments, and in view of the need for an increased surgical approach or even a reintervention under general anesthesia if removal was not possible, the surgeon decided to attempt to drill the crown. It was possible to stabilize the tooth in position, through the distal positioning of a Freer periosteal elevator (Quinelato – Rio Claro – SP), preventing its posterior displacement. The dental crown was drilled with a 2.0mm drill bit and a 2.0mm intermaxillary fixation screw (Orthoface – Curitiba – PR) associated to a steel wire aciflex number 1 (Johnson & Johnson – Sao Paulo – SP Brazil) was installed. It was then possible to remove the tooth through this conservative approach (Figure 4). The patient recovered uneventfully, with remission of pain and recovery of mouth opening range.

**Figure 4.** Removal of the tooth using a intermaxillary fixation screw.



Source: The authors.

### 3. Discussion

The first reported attempts to recover teeth displaced into the infratemporal fossa show the importance of adequate preoperative imaging for tooth location. Oberman et al. (1986) pointed out the difficulty of locating the tooth with the resources available at the time (occlusal radiography, panoramic and Waters incidence). The authors reported that, even performing an extensive incision under general anesthesia, with removal of the upper and lateral wall of the sinus, the tooth was not reached. Battisti, et al (2017) emphasize the importance of imaging to accurately evaluate the position of the tooth. Currently, cone beam CT, due to its low radiation dose, is the gold standard to determine the exact position of the tooth and to plan the most conservative approach (Sverzut CE et al., 2009; Sencimen M et al., 2017).

In most of the cases reported in the literature, tooth removal is attempted late, usually because the extraction/displacement was done by other dentists (Oberman et al., 1986; Sverzut CE et al., 2009; Polo TOB et al., 2017). The immediate recovery of the third molar displaced to the infratemporal fossa was described by Orr II (1999), inserting a needle in the extraoral region, superior to the zygoma and posterior to the orbital border, in order to exert pressure on the tooth while a contralateral digital pressure was exerted on the tooth in the intraoral region.

The surgical technique described in the literature varies according to the degree of displacement. The intraoral approach by means of a sulcular incision is the most frequently used, but in some cases, it needs the aid of complementary techniques, such as the use of Gilles's temporal incision (Dalson K et al., 1993; Patel M et al., 1994). In the article by Oberman et al (1986), even using an extensive incision, removal of the superior and lateral wall of the maxillary sinus, the authors were not successful in recovering the displaced tooth. Some authors describe even more aggressive techniques, such as the use of a hemicoronal approach. (Gulbrandsen SR et al., 1987) In contrast, Sverzut et al. (2009) were successful using a conservative approach through the fibers of the buccinator muscle, without the need for osteotomy. The recovery of the displaced tooth by a conservative approach has also been described by Polo et al. (2017).

The technique described in the present article has not been published previously. It is important to emphasize that stabilization of the tooth is crucial, because the pressure exerted by the drill and screw may displace it further posteriorly and superiorly into the fossa. Considering the challenge that these cases represent, this technique may be an alternative when tooth apprehension is not possible with the use of conventional instruments.



#### 4. Conclusion

In conclusion, displacement of upper third molars may lead to major complications and in most circumstances will require surgical reintervention to resolve the patient's complaints. The type of surgical approach should be individualized according to the degree of dental displacement. Approaches under local anesthesia are possible for small displacements, however, good planning is required, especially the use of cone beam CT scan. It is also important that the patient is aware that hospital intervention may be necessary, and also that the attempt to remove the tooth may be unsuccessful. The conservative intraoral incision and division with the use of an intermaxillary fixation screw was a resolute technique in this case.

However, it should be noted that the choice for this type of treatment requires, in addition to a good technical skill from the surgeon, satisfactory dental locking (in order not to dislocate) for the manipulation of the screw and, finally, an excellent anatomical notion of region in question, since one of the limiting factors of this technique is precisely the difficulty of visualizing the operative field.

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