

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/308903541>

# Endoscopic assisted retrieval of lower third molars displaced into the pterygomandibular space

Article in *Dental Cadmos* · October 2016

DOI: 10.19256/d.cadmos.08.2016.09

CITATIONS

0

READS

38

5 authors, including:



**Mattia Berrone**

Università degli Studi di Torino

26 PUBLICATIONS 100 CITATIONS

SEE PROFILE



**Carola Aldiano**

Università degli Studi di Torino

6 PUBLICATIONS 0 CITATIONS

SEE PROFILE



**Monica Pentenero**

Università degli Studi di Torino

96 PUBLICATIONS 1,252 CITATIONS

SEE PROFILE

All content following this page was uploaded by [Mattia Berrone](#) on 10 October 2016.

The user has requested enhancement of the downloaded file. All in-text references [underlined in blue](#) are added to the original document and are linked to publications on ResearchGate, letting you access and read them immediately.

**Endoscopic assisted retrieval of lower third molars displaced towards the pterygomandibular space.**

**Recupero endoscopicamente assistito di terzi molari dislocati nello spazio pterigomandibolare**

**Mattia Berrone DDS\*, Carola Aldiano DDS§, Fulvio Gardetto DDS°, Vincenzo Carbone MD DDS^, Monica Pentenero DDS, Msc\$**

\*Resident, Phd program in Experimental Medicine and Therapy, Dept. of Oncology, University of Turin - San Luigi Gonzaga Hospital, Orbassano, Turin, Italy

§Resident, Dept. of Oncology, Oral Surgery Specialty School, University of Turin, Turin, Italy

^ Senior Consultant, Dept. of Oncology, Oral Surgery Unit, University of Turin - San Luigi Gonzaga Hospital, Orbassano, Turin, Italy

° Resident, Dept. of Oncology, Oral Surgery Specialty School, University of Turin, Turin, Italy

\$ Associate Professor, Dept. of Oncology, Oral Medicine and Oral Oncology Unit, University of Turin - San Luigi Gonzaga Hospital, Orbassano, Turin, Italy

“Nota: questa è la versione dell’autore di un lavoro che è stato accettato per la pubblicazione su *Dental Cadmos*. Eventuali cambiamenti, risultato del processo di peer-review, dell’editing, di eventuali correzioni, della formattazione strutturale dell’articolo e di altri meccanismi di controllo di qualità, potrebbero non essere contenuti in questo documento. Dal momento in cui è stato inviato per la pubblicazione potrebbero essere stati fatti alcuni cambiamenti. Una versione definitiva è stata successivamente pubblicata in *Dental Cadmos* (2016;84(8))”

## **Abstract**

**Objective:** The present report describes two cases of displacement of lower third molars. The teeth were displaced into the pterygomandibular space, close to the lower border of the mandible at the posterior margin of the mylohyoid muscle.

**Materials and methods:** In both cases, panoramic radiography (OPT) and computed tomography (CT) scans were used to identify the location of the displaced molars for subsequent surgical removal. The molars were successfully removed under general anesthesia by an intraoral lingual approach under endoscopic assistance.

Results and Conclusions: Displacement of a tooth or a tooth fragment into important adjacent anatomic sites is among the complications that can occur during third molar removal. Endoscopically assisted surgery represents an interesting aid to reduce surgical trauma on the lingual nerve and provide better intraoperative lighting for deeply displaced lower third molars.

**Key words:**

Third molar surgery; Displaced lower third molar; Endoscopy; Complications in third molar surgery; Endoscopic surgery

**Riassunto**

Obiettivi: il presente lavoro descrive due casi di dislocazione di terzi molari. I denti sono stati dislocati nello spazio pterigomandibolare, in vicinanza del bordo inferiore della mandibola e a livello del margine posteriore del muscolo miloioideo.

Materiali e metodi: In entrambe i casi sono state utilizzate una ortopantomografia (OPT) ed una Tomografia computerizzata (Tc) per valutare la posizione dei molari dislocati e per programmare la successiva rimozione chirurgica. Gli elementi dentari dislocati sono stati rimossi con successo in anestesia generale mediante un approccio linguale intraorale ed assistenza endoscopica.

Risultati e conclusioni: La dislocazione di un dente o di un frammento di esso in spazi anatomici adiacenti è annoverata tra le complicitanze possibili dell'intervento di estrazione dei terzi molari. Il recupero chirurgico endoscopicamente assistito rappresenta un valido aiuto che permette di ridurre il trauma a carico del nervo linguale ed una migliore illuminazione per la visualizzazione dei terzi molari inferiori dislocati in profondità.

## **Parole chiave:**

Chirurgia dei terzi molari; Dislocazione di terzi molari inferiori; Endoscopia; Complicanze nella chirurgia dei terzi molari; Chirurgia endoscopica.

## **Introduction**

The accidental displacement of a lower third molar during surgical removal is a rare but potentially serious complication.<sup>1</sup> In fact, this condition might cause tissue injuries, foreign body reaction, severe life-threatening sequelae, and medicolegal implications.<sup>2</sup> The submandibular space is the most common site of accidental displacement of lower third molars. We present two unusual cases of pterygomandibular displacement of lower third molars which were successfully retrieved with endoscopic assistance.

## **Materials and Methods**

### **Case reports**

#### *1st Case*

A 14-year-old male came to our clinic complaining of a foreign body sensation on the medial surface of the left mandibular ramus (angulus). Three years earlier, he had undergone surgical removal of the lower left third molar (3.8) by a general dentist, under local anesthesia. The procedure was described as being difficult and complicated, lasting for 1 hour. After this time, the tooth suddenly “disappeared” from the socket, so that, assuming that it had been swallowed, the dentist closed the wound and healing was uneventful. On both clinical intra- and extra-oral examinations, a hard palpable mass was found in the posterior part of the floor of the mouth. Both panoramic radiography (OPT) and a computed tomography (CT) scan revealed the presence of a radio-opaque mass resembling a third molar germ. CT images were reconstructed to form axial, sagittal and coronal sections and showed the displaced germ in the left

pterygomandibular space, close to the lower border of the mandible at the posterior margin of the mylohyoid muscle (Figs. 1,2).

### *2nd Case*

A 21-year-old male, in good general health, was referred to our department with an accidental displacement of a dental element in the right submandibular region which had occurred during attempted extraction a few months earlier. The tooth was not highlighted in the posterior part of the floor of the mouth during intra-oral palpation; extra-oral palpation showed a hard mass in the right submandibular region. Both the panoramic radiograph (Fig. 3) and the CT image revealed the presence of a dental element occupying the pterygomandibular space. The CT images reconstructed in axial, sagittal and coronal sections, showed the element in the right pterygomandibular space. In part positioned under the rear edge of the mylohyoid muscle, the roots were in contact with the lower-medial part of the mandible and with the crown jutting medial to the hyoglossus muscle.

### *Surgical procedure*

In the first case, management options for removal of the displaced tooth were discussed with the patient's parents, and with the patient himself in the second case, and surgical removal was attempted under general anesthesia with a lingual approach under endoscopic assistance. Informed consent was obtained in both cases; in the first case, it was obtained from the patient's parents. In both cases, an incision was made starting from the lingual sulcus of the mandibular first premolar towards the anterior border of the left ramus and a mucoperiosteal flap was carefully raised in the third molar region so as not to damage the lingual nerve. The teeth were impacted through the posterior margin of the mylohyoid muscle, in the first case in deep contact with the mandible (Figs. 1, 2), the second case with roots in contact with the mandible and crown jutting medial to the hyoglossus muscle. They were retrieved with blunt dissection (Fig.

4); afterwards, cortical osteotomy was performed under endoscopic control (4 mm, 30 degree angle; Karl Storz GmbH & Co KG, Tuttlingen, Germany) to mobilize and finally remove the displaced teeth (Fig. 5). The wounds were closed after irrigation with normal saline solution.

Both patients were given oral antibiotics for 1 week (1 g of amoxicillin/clavulanic acid every 8 hours). The post-operative course was uneventful for both patients and they were already asymptomatic at the control visit 3 days later (Fig. 6).

## **Discussion**

Extraction of mandibular third molars is a common surgical procedure in dental clinics, and the various operative complications of this procedure have frequently been mentioned in textbooks and journals, such as alveolar osteitis, dysesthesia of the inferior alveolar and lingual nerve, trauma to adjacent tissues, hemorrhage, infection, etc.<sup>(2,3)</sup> The accidental displacement of a lower third molar or one of its roots is relatively rare, and only limited information about incidence and management can be found in the literature.<sup>(2,3)</sup> A review of the literature performed in 2007 found just 32 cases of mandibular third molar root/tooth displacement.<sup>(1)</sup> Displacement might cause tissue injuries, foreign body reaction and sometimes severe life-threatening sequelae. The risk of displacement can be related to anatomical issues such as a lingual location or the presence of dehiscence or fenestration of the lingual cortical plate with root exposure. In addition, other factors such as excessive or uncontrolled force, improper manipulation or inadequate clinical and radiographic examination might increase the risk. Lower third molars are usually displaced into the submandibular space.<sup>(1)</sup> Displacement into the pterygomandibular space is not a frequent complication but is possible in third molar surgery.

The timing of the retrieval attempt has been the subject of some debate. Some surgeons recommend retrieval as soon as possible<sup>(1,2,4,5)</sup> because, when there was a delay in referral of

more than 24 hours, the result was more pain, more swelling and trismus. Furthermore, some reports document infection and migration with severe life-threatening sequelae. Other surgeons prefer to postpone surgery for several weeks to allow fibrosis to occur, stabilizing the tooth or its fragment in a firm position.<sup>(6)</sup> The previous literature describes one case of symptomatic submandibular displacement retrieved after 3 years<sup>(6)</sup>, while most cases had been addressed within about 10 days.<sup>(1,7)</sup>

In our first case, the absence of any symptoms and the lack of a radiographic control supporting the hypothesis of a swallowed tooth, delayed the retrieval which was performed 3 years after the initial unsuccessful surgery. Fibrotic tissue was found all around the tooth, which also seemed to have been deeply impacted against the lingual cortical mandibular bone by the continued pushing action of the masticatory muscles. Whenever possible, in our opinion, the displaced tooth or root fragment should be retrieved during the first surgical procedure to avoid reintervention. Therefore, a complete preoperative radiographic evaluation is mandatory to help guide the surgeon to the location of the displaced tooth/root. Moreover, the present cases emphasize the importance of post-operative radiographic control when tooth extraction is uncertain.

Various surgical techniques for retrieval have been described in the literature. When the fragment is small and close to the socket, some authors suggest a “modified method” consisting of fracturing and retraction of the lingual plate to expose the fragment.<sup>(1)</sup> When the fragment or the tooth is large or palpable, the “conventional method” may be used with upward pressure from beneath the mandible if required.<sup>(1)</sup> Extra-oral or combined extra-/intra-oral approaches may be needed if the fragment or the tooth is large and distant from the socket.<sup>(8)</sup> Surgical access to the antero-inferior aspect of the pterygomandibular space can be achieved without much difficulty via an intra-oral approach. However, if the displacement is deeper into the substance of the medial pterygoid muscle or inferiorly into the submandibular space, an extra-oral

approach may provide better access. In the present cases, teeth were in an intermediate position, being “surrounded” by the posterior margin of the mylohyoid muscle.

The use of endoscopic techniques in oral surgery is widely described for the recovery of teeth and implants in the maxillary sinus, a technique used routinely by the authors within the clinical environment, while it is less frequently described for dislocation in soft tissues. As reported by Huang et al., an extended lingual mucoperiosteal flap extending from the ramus to the premolar region may be regarded as the “conventional method” of retrieval.<sup>(5,9)</sup> This has been criticized as providing an operative field that is too narrow and where a prominent mylohyoid ridge may obscure the view.<sup>(1)</sup> Extra-oral and combined extra-/intra-oral approaches have been described.<sup>(6,8,10)</sup> This may be needed if the fragment is large and distant from the socket, as described by Yeh.<sup>(10)</sup>

Our approach has been reported because it involved full teeth displaced for some time in young patients with the aim of being as minimally invasive as possible. Endoscopic assistance has allowed us to avoid a traditional lingual approach and a possible extra-oral approach, significantly reducing the related issues of the lingual approach such as narrow operative field and mylohyoid ridge.

## **Conclusions**

Endoscopically assisted surgery is gaining popularity and is becoming a tool frequently used by surgeons to assist in and simplify some of the more difficult techniques that often require more extensive surgical exposure for visualization. In particular, oral and maxillofacial surgeons have applied this technique in trauma, orthognathic, sialoendoscopic, and temporomandibular joint surgery.<sup>(11)</sup> The usefulness of this technology in third molar surgery

has previously been reported for one case of an ectopic third molar at the level of the osteomeatal complex.<sup>(12)</sup>

To the best of our knowledge, these are the first cases in which patients were treated for a displaced mandibular third molar by endoscopic assisted surgery. Although it is not possible to compare more surgical methods, the use of our proposed technique allows surgical access to be limited, in turn limiting the trauma itself with a more rapid recovery of patients. The limits assessed by us are inherent in the sometimes difficult visualization related to this surgical site. It differs from the maxillary sinus, which is an anatomical structure that has a greater number of iatrogenically displaced dental elements and whose bony walls do not collapse<sup>(13,14,15)</sup>; the soft textured floor of the mouth must be constantly kept retracted for best viewing. The use of intraoperative endoscopic control avoided an extra-oral approach, allowed a reduced elevation of the mucoperiosteal lingual flap, reduced surgical trauma to the lingual nerve and improved intraoperative lighting (Fig. 7).

**Financial disclosure:** No sponsorships have been received for this article.

**Conflict of interest:** There are no competing interests for this article.

## References

1. [Huang IY, Wu CW, Worthington P. The displaced lower third molar: a literature review and suggestions for management. Journal of oral and maxillofacial surgery. 2007;65\(6\):1186-90.](#)
2. [Huang IY, Chen CM, Chang SW, Yang CF, Chen CH. Surgical management of accidentally displaced mandibular third molar into the pterygomandibular space: a case report. The Kaohsiung journal of medical sciences 2007;23\(7\):370-4.](#)
3. [Tumuluri V, Punnia-Moorthy A. Displacement of a mandibular third molar root fragment into the pterygomandibular space. Australian dental journal 2002;47\(1\):68-71.](#)
4. [Ertas U, Yaruz MS, Tozoglu S. Accidental third molar displacement into the lateral pharyngeal space. Journal of oral and maxillofacial surgery 2002;60\(10\):1217.](#)
5. [Grandini SA, Barros VM, Salata LA, Rosa AL, Soares UN. Complications in exodontia-accidental dislodgment to adjacent anatomical areas. Brazilian dental journal 1993;3\(2\):103-12.](#)
6. [De Biase A, Guerra F, Giordano G, et al: Surgical removal of a left lower third molar root after iatrogenic displacement in soft tissue. Case report. Minerva Stomatol 54:389, 2005](#)
7. [Pippi R, Perfetti G. Lingual displacement of an entire lower third molar. Report of a case with suggestions for prevention and management. Minerva stomatologica 2002;51\(6\):263-8.](#)
8. [Yeh CJ. A simple retrieval technique for accidentally displaced mandibular third molars. Journal of oral and maxillofacial surgery 2002;60\(7\):836-7.](#)
9. [Gay-Escoda C, Berini-Aytes L, Pinera-Penalva M: Accidental displacement of a lower third molar. Report of a case in the lateral cervical position. Oral Surg Oral Med Oral Pathol 76:159, 1993](#)
10. [Esen E, Aydogan LB, Akcali MC. Accidental displacement of an impacted mandibular third molar into the lateral pharyngeal space. Journal of oral and maxillofacial surgery 2000;58\(1\):96-7.](#)
11. [Pedroletti F, Johnson BS, McCain JP. Endoscopic techniques in oral and maxillofacial surgery. Oral and maxillofacial surgery clinics of North America 2010;22\(1\):169-82.](#)
12. [Hasbini AS, Hadi U, Ghafari J. Endoscopic removal of an ectopic third molar obstructing the osteomeatal complex. Ear, nose, & throat journal 2001;80\(9\):667-70](#)
13. [Giovannetti F., Priore P. Endoscopic Sinus Surgery in Sinus-Oral Pathology. J Craniofac Surg. 2016 Mar;27\(2\):532-3](#)
14. [Felisati G., Chiapasco M., Lozza P., Saibene A.M., Pipolo C., Zaniboni M., Biglioli F. Sinonasal complications resulting from dental treatment: Outcome-oriented proposal of classification and surgical protocol. Am J Rhinol Allergy 2013 Jul-Aug;27\(4\):e101-6](#)

15. [Saibene A.M., Pipolo G.C., Lozza P., Maccari A., Portaleone S.M., Scotti A., Borloni R., Messina F., Di Pasquale D., Felisati G. Redefining boundaries in odontogenic sinusitis: a retrospective evaluation of extramaxillary involvement in 315 patients. Int Forum Allergy Rhinol. 2014 Dec;4\(12\):1020-3](#)

## Figure captions

Fig. 1 CT reconstruction showing the displaced tooth (case 1)

Fig. 2 CT reconstruction, coronal view, showing the displaced tooth (case 1)

Fig. 3 Panoramic radiograph showing the displaced tooth (case 2)

Fig. 4 Endoscopic view of muscle blunt dissection (case 2)

Fig. 5 Endoscopic view during tooth retrieval (case 2)

Fig. 6 Wound appearance on the third day (case 1)

Fig. 7 Virtual presentation of the surgical technique – lingual flap approach with endoscope (case 1)

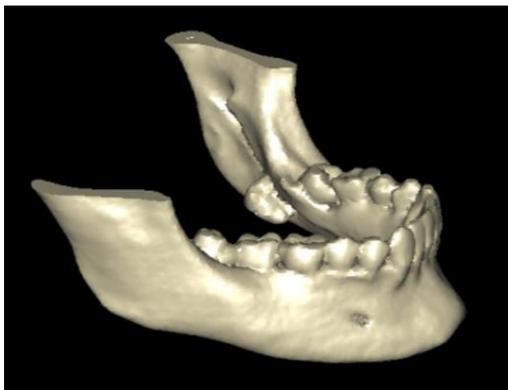


Fig.1



Fig.2



Fig.3



Fig. 4



Fig.5



Fig.6

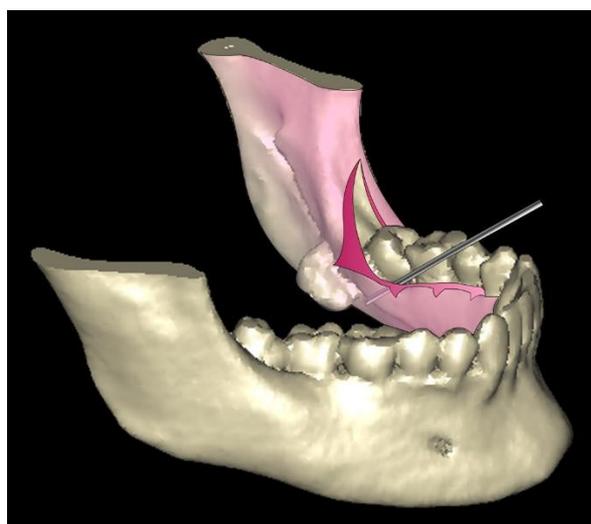


Fig.7

