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Displacement of a mandibular third molar into a submandibular space: A case report

Heo J, Choi H, De Silva HL

Abstract

As a general dentist, displacement of roots into the maxillary sinus is one of the complications that we think of while extracting upper molars. However, not many dentists are aware of the possibilities of displacing the lower third molar crown, roots, and fragments into the potential spaces around the mandible. Iatrogenic displacement of the mandibular third molar is a rare complication where the fragments can be accidentally displaced into the sublingual, submandibular, pterygomandibular or other deeper spaces of the neck. We report a case of submandibular displacement of a lower third molar and its investigation and surgical management. Predisposing factors and guidelines for practitioners are presented.

Introduction

Third molar extraction is a common surgical procedure performed by many dentists and oral and maxillofacial surgeons (OMS). There are multiple indications for wisdom teeth removal. NICE guidelines[1] recommend removal of wisdom teeth involved with pathology: such as unrestorable decay, non-treatable pulpal or periapical pathology, cellulitis, abscess, osteomyelitis, internal/external resorption of the tooth or adjacent teeth, fractured teeth, disease of the follicle including cysts/tumours or when deemed necessary to facilitate scheduled jaw surgery (eg. orthognathic surgery).

Surgical difficulty of third molar extraction varies considerably and needs careful case selection via pre-operative investigations and planning to ensure safe, successful surgical outcomes. Complications include pain, swelling, bleeding, alveolar osteitis (dry socket), wound infection, trismus and inadvertent injury to adjacent teeth (Osborn *et al.* 1985; Bui *et al.* 2003; Kim *et al.* 2006; Bouloux *et al.* 2007; Marciani 2007). The incidence of common complications following wisdom tooth surgery range from 4.6% to 30.9% (Osborn *et al.* 1985; Sisk *et al.* 1986; Bui *et al.* 2003; Kim *et al.* 2006).

Complications of a more serious nature like injury to the lingual nerve and/or inferior alveolar nerve, mandibular fracture, deep tissue-space infections, and iatrogenic displacement of tooth/roots into adjacent anatomical spaces are uncommon but continue to be reported (Kunkel *et al.* 2006; Bouloux *et al.* 2007).

[1] NICE guidance (2000). Guidance on the Extraction of Wisdom Teeth. https://www.nice.org.uk/guidance/ta1/chapter/1-Guidance

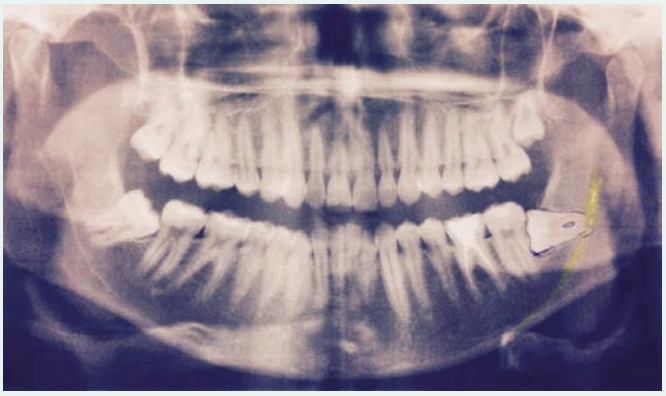


Figure 1. Pre-operation panoramic dental radiograph from the general dentist.

Case report

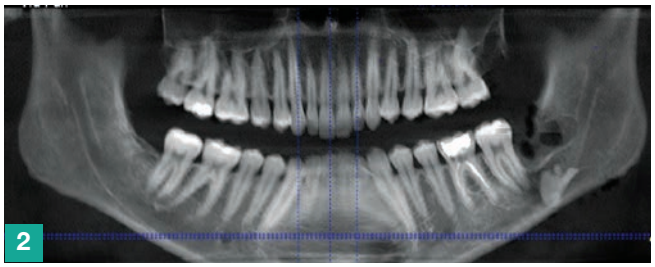
A 22-year-old male patient was referred by a general dentist to an oral and maxillofacial surgeon following a wisdom tooth extraction complication. The patient initially consulted the dentist for treatment of a partially erupted tooth 38 involved in repeated episodes of pericoronitis. He requested extending the treatment to remove non-functional teeth 28 and 48 at the same sitting as a preventive measure (Figure 1).

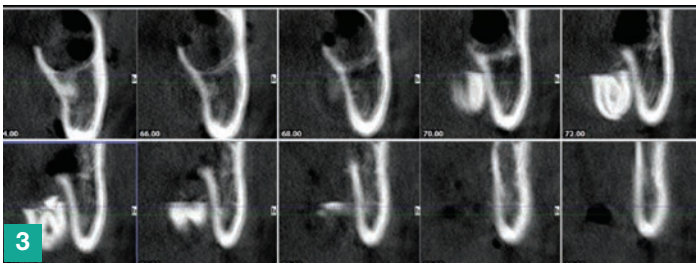
The dentist successfully completed the removal of teeth 28 and 48. Surgical difficulties were encountered while attempting to remove the horizontally impacted tooth 38. Only the coronal portion of the tooth could be removed, with the root fragment being inadvertently displaced into the deep lingual tissue space.

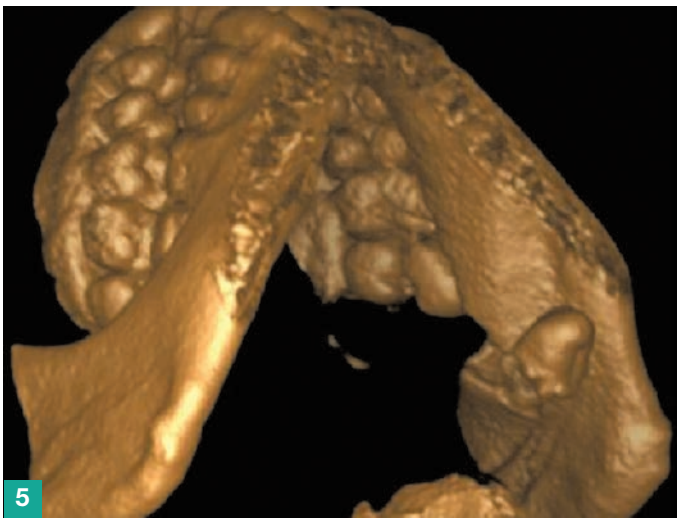
The dentist immediately referred the patient to an OMS. He was reviewed at a specialist clinic the following day and reported experiencing pain, swelling, and odynophagia. On clinical examination, he had mild trismus and an extra-oral swelling around the angle of the mandible. There was no swelling in the floor of the mouth, but he reported paraesthesia of the lateral tongue on the ipsilateral side.

Imaging was performed (Figures 2, 3 and 4) to determine the size and location of the displaced fragment. The series of coronal plane images and the 3D reconstructed image (Figure 5) revealed that the lingual plate had been perforated allowing the root fragment to slide into the submandibular space (i.e. inferior to the mylohyoid ridge). The displaced fragments comprised two roots remaining united at the furcation and another small fragment.

Removal of the displaced roots was performed under general anaesthesia. A standard three-sided buccal flap







was raised incorporating a distal relieving incision and a mesial relieving incision extending to the interproximal gingiva between teeth 36 and 37. A full thickness lingual mucoperiosteal flap was then raised continuing from the distal relieving incision and extending anteriorly as a lingual gingival crevicular incision around tooth 37.

The lingual nerve was identified and was protected with a Molt number 9 retractor while a blunt dissection proceeded subperiosteally into the floor of the mouth. Finger pressure applied (extra-orally) infero-medially at the gonial angle helped prevent further migration of the fragment into the deeper spaces. Once the fragment was clearly visible, it was pushed superiorly with digital pressure and was removed using a pair of mosquito artery forceps. The surgical site was irrigated with saline and the socket was curetted to induce bleeding from the walls and establish a blood clot prior to the flaps being re-approximated and primarily closed using resorbable sutures.

The patient was placed on a five-day course of oral Augmentin. He had an uneventful recovery and reported complete resolution of lingual paraesthesia at the one-week follow-up appointment.

Discussion

Iatrogenic displacement of lower third molars into deep tissue spaces during surgery is a rare complication and the literature is limited to few case reports.
A systematic review on this complication following third molar removal suggested an occurrence of less than 1%. However, this is difficult to assess due to the scarcity of publications (Bouloux et al 2007, Brauer 2009).

Figure 2. Image created by CBCT showing the displaced tooth 38 roots.
Figure 3. Coronal plane CBCT images showing the position of the displaced root on the lingual side of the mandible
Figure 4. Axial slice showing the position of the displaced root on the lingual side of the mandible.
Figure 5. 3D reconstructed view of the mandible with the displaced tooth 38 roots on the lingual side and compromised lingual plate of the left mandible.

Application of excessive, uncontrolled force on the tooth during attempted removal leading to fracture or perforation of the lingual cortical plate is considered to be the primary reason for this complication (Bouloux et al 2007, Kose *et al.* 2014). However, it is difficult to determine what level of force should be considered excessive, as many anatomical factors may confound the clinical situation. Sometimes a pre-existing lingual plate dehiscence/perforation or the fracture of an excessively thin lingual plate (even when using minimal force) could result in inadvertent displacement of the tooth or a fragment. Careful case selection, using pre-operative imaging to meticulously plan surgery using judicious bone removal and tooth sectioning to facilitate luxation would help minimize the risk of tooth displacement in an adverse direction (Huang *et al.* 2007a).

Despite being rare, clinicians should be aware of the possibility of iatrogenic displacement of lower third molars and be able to recognize the complication immediately if it happens. No attempt should be made to retrieve it unless the fragment is clearly visible,

accessible and is easily retrievable. Unplanned attempts risks further displacement into deeper tissue planes and could also cause damage to vital structures in the vicinity (Grandini *et al.* 1993, Kose *et al.* 2014). Once the complication is recognized, the general recommendation is to refer the patient to an OMS as soon as possible. The surgical site should be cleaned and closed with the sutures and a course of antibiotics considered. The patient should be referred with all the relevant information such as the size of the fragment, the circumstances of the extraction and the pre-operative radiograph (Huang *et al.* 2007a). There have been some case reports of delayed presentation as late as two years. These showed that the displaced fragment caused recurrent inflammation and infection requiring multiple courses of antibiotics. (Gay-Escoda *et al.* 1993; Esen *et al.* 2000; Suer *et al.* 2014).

A patient with this complication will often develop swelling, trismus, pain and infection (Huang *et al.* 2007a, Silveira 2014). Trismus can be an issue as it may interfere with obtaining adequate intraoral access into the surgical site. The case reported by Suer *et al.* (2014) showed that a trismus of 16 mm improved to 37 mm within five days of antibiotics and jaw physiotherapy. If access is limited by trismus or infection, starting a short course of antibiotics could be beneficial prior to referral.

The key to managing this complication is to identify the exact location, size, and number of displaced fragments. Some older case reports used conventional radiographic techniques (PA, panoramic, occlusal radiographs) to identify the location of fragments (Gay Escoda *et al.* 1993, Grandini *et al.* 1993). In contemporary practice, computerized tomography or CBCT play an important role in locating the displaced fragments and their relationship to adjacent anatomical structures. This imaging can help with surgical planning and minimize the potential damage to the nerves and blood vessels during the operation (Tumuluri *et al.* 2002; Huang *et al.* 2007b; Medeiros and Gaffree 2008; Silveira 2014; Suer *et al.* 2014).

The surgical approach will vary depending on the exact location of the displaced fragment. Reviews show that most displaced teeth/fragments were retrieved via an intraoral approach, while a few required an extra-oral approach or even a combined technique, particularly when the displaced fragment has migrated into the lateral pharyngeal space or into other tissue spaces of the neck (Tumuluri *et al.* 2002; Yeh 2002; Huang *et al.* 2007a).

The intraoral approach carries the risk of injury to the lingual nerve. Fortunately, lingual nerve injury is relatively rare, but it is recommended to identify and protect the nerve as there have been reports of lingual nerve paraesthesia lasting up to 1 month (Tumuluri *et al.* 2002, Huang *et al.* 2007a, Kose *et al.* 2014).

An extra-oral submandibular approach provides improved access but may produce an unsightly scar and risks damage to the mandibular branch of the facial nerve. An intraoral access complemented by a meticulously planned small skin incision in the submandibular region allowing the placement of a haemostat to stabilize and push the displaced fragment towards the oral cavity can be of value (Yeh 2002).

We used an intraoral approach by raising a standard three-sided buccal mucoperiosteal flap and an envelope lingual mucoperiosteal flap from the ramus forward to the premolar region. Digital pressure at the inferior border of the mandible (in the submandibular region) helped direct the tooth fragment towards the socket (Grandini *et al.* 1993; Bouloux *et al.* 2007).

Conclusion

In contemporary practice, the primary clinician should evaluate the need for further imaging (e.g., CBCT) and consider referral for specialist help when potential difficulties are suspected. Unforeseen complications occur rarely in spite of good clinical assessment and it is important to be alert to such possibilities, recognize any inadvertent iatrogenic displacement of a lower third molar fragment and institute appropriate immediate management.

Author information

Jaewon Heo BDS(Otago) MBChB (Otago)
Waikato Hospital Maxillofacial Department

Han Choi BDS MBChB MDS Otago
North Shore Oral and Maxillofacial Surgeons

Harsha L. De Silva BDS(Peradeniya) MS(Colombo) FDSRCS(England) FFDRCS(Ireland)
Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago

Corresponding author: **Jaewon Heo** jaewon727@gmail.com

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