

ACCIDENTAL DISPLACEMENT OF MANDIBULAR THIRD MOLAR ROOT: A RARE COMPLICATION

A K Choudhary^A, S K Roy Chowdhury^B, SudarshanBhat^C

^A - Gd Specialist, Oral and Maxillofacial surgery, New Delhi

^B - HOD & Prof. Department of Dental Surgery, Armed Forces Medical College, Pune, India

^C - Reader, Department of Dental Surgery, Army Dental Centre, R&R, Delhi, india

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Corresponding Author

AK Choudhary,
Gd Specialist, Oral and
Maxillofacial surgery
Postal Address: Lt Col AK
Choudhary
Room no 23, L BLOCK,
North Block, Church Lane
New Delhi, 110001
Tel No. +919971519782
Email: azad.tiger.khan9@gmail.
com

Abstract:

Purpose: To describe the clinical characteristics of patients who have had displacement of a mandibular third molar root while surgical removal of mandibular third molar, to identify potential risk factors, and to provide the clinician with information on how to prevent and treat this complication.

Patients and Methods: A retrospective analysis was performed of a series of 6 patients who underwent third molar removal with accidental displacement of a root. All patients were referred to the Oral surgeon for management from peripheral dental centers from 2012 to 2014.

Results: Three patients were male and three were females, and the mean age was 34 years. In 4 cases, the fragment was removed 2-3 days after the complication. In all 4 cases (66.7%) the patients were symptomatic (swelling and pain in the sublingual region) mouth opening was reduced. Two patients reported after at least 2 weeks after the complication and were asymptomatic. These two patients refused for surgery and were under regular follow up. A second surgical procedure using an intraoral approach was used to extract the displaced fragment in all 4 patients. All 4 cases presented transitory nerve impairment of the lingual nerve after surgery which resolved after 6 months.

Conclusion: When surgery is planned, a considerable incidence of complications can be expected. It is very important to recognize very early that such an incident has occurred and the patient should be explained and reassured about the complication and referred to oral surgeon for management.

Keywords: Accidental Displacement, Intraoral Approach, Lingual wall

Introduction

The removal of mandibular third molars is a common surgical procedure performed by oral surgeons and dentists alike. As expected with any surgical operation, there are a number of intra- and post-operative complications associated with this procedure. These include alveolar osteitis,

dysaesthesia of the inferior alveolar and lingual nerves, hemorrhage and infection. Other less common complications are damage to adjacent teeth, fracture of the mandible and periodontal pocket formation distal to the adjacent teeth.¹

Accidental displacement of fractured roots into the adjacent anatomical spaces and

the inferior alveolar canal is a rare occurrence. Some risk factors associated with this complication have been identified, such as the position of the third molar and lingual plate dehiscence or fracture. Other aspects, such as the use of excessive or uncontrolled forces or a poor clinical and/or radiologic assessment, appear to increase these accidental displacements.²

Some patients remain totally asymptomatic, whereas others present pain, swelling, and trismus, requiring removal of the displaced root. The success of treatment is closely related to the accuracy of locating the displaced fragment. Computed tomographic (CT) scanning is especially useful in such situations because it can precisely identify the 3-dimensional position of the tooth/fragment.³

The removal of a tooth fragment displaced into the adjacent space can be complex and postoperative complications are frequent. Thus, the present study was conducted to describe the clinical characteristics of patients having this complications and technique of retrieving the displaced root fragment.

A thorough understanding of this complication associated with this procedure will enable the practitioner to identify and counsel patients and appropriately manage the complication.

Patients and Methods

A retrospective analysis of a series of 6 patients who underwent lower third molar removal and who presented with accidental displacement of a root fragment into the adjacent anatomical space was carried out. All of the six patients were referred to the oral surgeon for further management from peripheral dental facilities from 2013 through 2017. All six patients were already informed about the complication. Extractions of third molars were performed under local anesthesia with lignocaine 2% and epinephrine 1:80000. 4 out of the six patients reported within 3 days of the complication while two reported for review after 7 days of surgical extraction. Four patients reported with pain, swelling and reduced mouth opening [Fig1].

In all patients, panoramic radiography (PR) and CT scanning were performed to precisely locate the displaced fragment [Fig 2]. Chest X-ray was advised to rule out

aspiration into the lungs.

Two patients refused for the second surgical procedure as they were asymptomatic. A second surgical procedure was performed on three patients under general anesthesia and 1 was operated under conscious sedation for the retrieval of the displaced root fragment. Pre anesthetic check up was done. Written informed consent was obtained from all patients. The patients were kept under antibiotic coverage till surgery.

General anesthesia was administered through nasal intubation. The surgical site was disinfected with a povidine iodine solution. 2ml of adrenaline (1:100000) was infiltrated in the incision line. Using an intraoral approach, an incision was made on the alveolar crest between the anterior edge of the ramus and the lingual gingival crevice of the first molar. Buccal and lingual mucoperiosteal flaps were raised. The granulation tissue was curetted from the socket. The lingual wall of the socket was sectioned with burs and removed. The medial pterygoid muscle was exposed following further removal of bone with burs. With blunt dissection using fine curved mosquito artery forceps the root fragment was retrieved [Fig-3]. During the surgical procedure utmost care is taken not to injure the lingual nerve.

Hemostasis was achieved and primary surgical closure done using 3-0 silk sutures. Patients were placed on a course of Injcefotaxime, Inj Metronidazole and Injvooveran for three days postoperatively. Post operative healing was uneventful. Patients were recalled for regular follow up.

Results

Six cases of sublingual root fragment displacements during third molar extraction were included in the study. A second surgical procedure was performed on four patients while two refused treatment. Two patients were male and two were females. The mean age of the patients was 34 years. In 1 case the fragment was removed under conscious sedation while the other cases were operated under general anesthesia. In all 4 patients the fragment was successfully removed.

However in 1 case it was very difficult to locate the fragment possibly because of its small size or because it had been displaced by the action of the muscles [Fig-4]. All

the 4 cases showed temporary lingual nerve impairment that spontaneously resolved between 4 to 6 months. Out of the two cases who refused treatment 1 reported with pain in the sublingual region and trismus. He was advised surgical treatment but he never reported for treatment.

Discussion

It is possible that any tooth fragment lost in the adjacent anatomical space could prove difficult to retrieve but it would seem that this is a very rare complication of extraction and cannot easily be anticipated. The majority of case reports are for the displacement of lower wisdom teeth.⁴

General dental practitioners extracting lower molar teeth should evaluate the degree of impaction, position of the roots, distal inclination, bone density and if appropriate surgical access should be planned. Adequate exposure of the surgical site in the form of a mucoperiosteal flap, proper instrumentation, delivering the appropriate amount and direction of force for elevation of lower molars is very important. If necessary a distal retractor or a finger can be placed lingually to prevent lingual displacement of the crowns or roots. The lingual plate is very thin in the region of the third molar and hence it is easy to perforate the lingual plate; this may lead to displacement of the teeth/roots into the sublingual space, submandibular space and pterygomandibular space.

An approach for the retrieval of lingually displaced teeth and apices is outlined in most oral surgery textbooks and in essence, involves extraoral pressure beneath the mandible in order to prevent displacement deeper into the tissue spaces of the neck and intraoral digital manipulation of the fragment back to the socket.⁵

If the lingual bony plate is damaged, displacement into the sublingual or parapharyngeal space is possible, and this can cause difficulty in retracting the fragment because of the large number of nerves and blood vessels; the lingual nerve in particular can be injured. It is essential that elevators are properly protected with finger rests and the force applied to elevators is not excessive. The flexible, wide metal spatula, which can be bent into any shape desired, can be used to protect the soft tissue that is reflected toward the lingual side and prevents the displacement of the tooth or its fragments.⁷ Efforts made to retrieve the tooth after its initial

dislodgement and blind probing appear to be the possible reasons for further displacement from the submandibular space.

The symptoms arising from a displaced root are variable. Several factors, such as fragment size, location, or the circumstances in which the complication occurred are important issues that should be taken into account.

In our study most cases, presented with symptoms (4 patients in the present sample). If pain, trismus, and swelling are present in the area, immediate root removal should be performed.⁸ Many authors believe that the symptoms like swelling, trismus and referred pain are closely related to the size of the fragment, especially when it exceeds 5 mm.⁹ In our study all the 4 patients had a root fragment size of more than 5mm.

For a correct diagnosis, it is always necessary to perform radiologic examination. CT scanning is the most appropriate examination, because it establishes 3D positioning of the tooth and allows locating fragments displaced into deeper spaces. Cone-beam CT scanning can be especially useful, because it offers good imaging of the region, an adequate assessment of the displaced tooth and surrounding anatomic structures and a lower dose of radiation.¹⁰

In all of our 4 cases computed tomography was utilized in terms of locating the displaced fragment, assessing the adjacent structures and perforations of the bone and guiding the surgical procedure. It is our belief that obtaining computed tomography scans before retrieval surgery of displaced tooth fragments would be useful. Intraoperatively the use of image intensifiers may also be very helpful to localize the fragment and theatre staff should be aware of such a possibility, so that appropriate arrangements can be made for the image intensifiers to be made available.

The indication and the time to extract the displaced fragment have been a source of debate. A review by Huang et al¹¹ stated that delayed removal (<24 hrs) of the displaced fragment results in an inflammatory response (more pain, swelling, and/or trismus). However in our study all the patients reported after 24 hrs. Some investigators have recommended postponing surgery a few weeks to promote fibrosis in the area to stabilize the displaced fragment. This last option can trigger infections, foreign body reactions, or migration of the root into deeper spaces.^{4,12} However in our study two patients reported after 7 days and were

asymptomatic and refused surgery and were under regular follow up for one year. The authors believe that a conservative approach (clinical and radiological follow-ups) could also be a valid treatment option if the patient is asymptomatic.

In our opinion, the use of local anesthesia is insufficient to perform this surgical procedure especially because involuntary patient movements, lack of access to the surgical site and poor visibility can interfere with the treatment outcome. General anesthesia or local anesthesia with conscious intravenous sedation is preferred. We recommend performing this surgical procedure either in general anesthesia or conscious sedation.

Several approaches have been described in the literature (intraoral and/or extraoral), but the most widely used technique consists of raising a lingual mucoperiosteal flap from ramus of the mandible to the premolar region.¹³ This technique offers limited access and poor visibility of the area, owing to the presence of the mylohyoid muscle. Thus some changes have been proposed, such as lingual plate fracture to allow access through the socket.¹¹ In our study we have used the same technique. Ozalp *et al* in a recent study have recommended conservative management with regular clinical and radiologic follow-ups in a case where the fragment has moved into deeper spaces such as lateral pharyngeal space.

The intra operative complications associated with the removal of a sublingual displaced root fragment are common because of the proximity of important structures such as the lingual and inferior alveolar nerves. Nerve damage with temporary or permanent impairment and vascular lesions might be present in these surgical procedures. All of the 4 cases surgically managed in our study had temporary lingual nerve impairment. The surgical technique for removing root fragments is complex and involves a considerable incidence of complications if the fragment has moved into deeper spaces.

In conclusion, when a tooth or root does get displaced, it is very important to recognize very early that such an incident has occurred and the patient should be explained and reassured about the complication. Whereas surgical retrieval could sometimes result in complications such as nerve damage and even further displacement into deeper tissues. These possible outcomes should be taken into consideration when making a decision about the

management of a displaced root into an adjacent tissue or anatomical space.



Fig-1. Patients with swelling of face



Fig-2. CT Scans depicting displaced root fragments

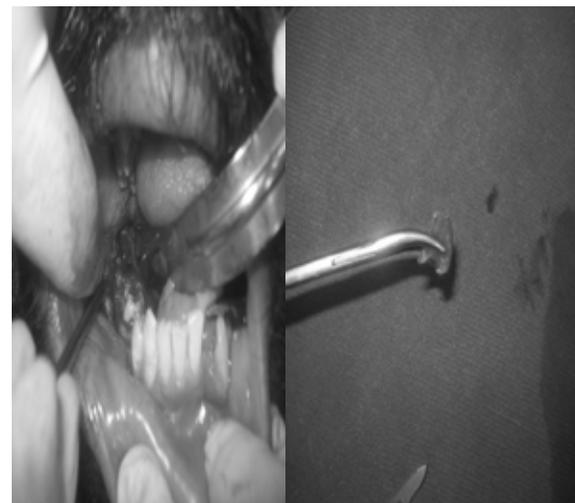


Fig-3. Exposure and retrieval of root fragment

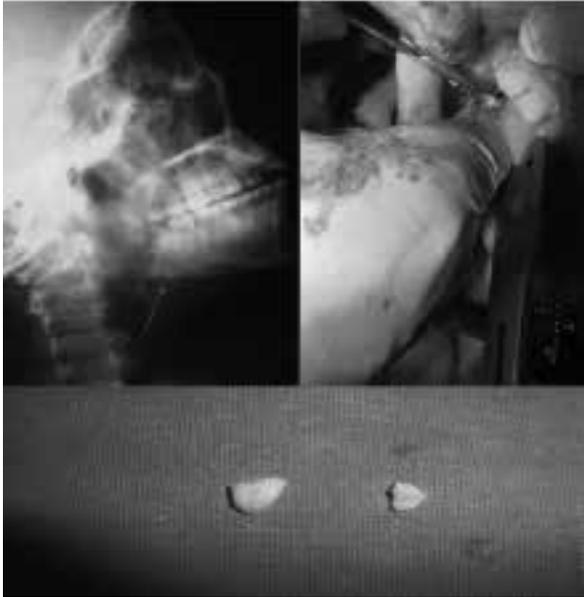


Fig-4. Displacement of root fragment into deeper spaces and its retrieval

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