Management of iatrogenic dislodgment of a mandibular third molar into the pterygomandibular space

Vikram Shetty, MDS, MBBS, BDS ■ Padmaraj Hegde, MDS, BDS ■ Sandesh Jain, MDS, BDS

Although the surgical extraction of the mandibular third molar is routinely performed in dental clinics, the precise management of complications associated with it requires thorough knowledge and experience in the field of oral and maxillofacial surgery. Iatrogenic dislodgment of a tooth or its fragment is a rare complication and usually occurs when excessive, uncontrolled forces are applied via elevators. It also is possible that this rare complication may be underreported. This case report describes the retrieval, under local anesthesia, of a mandibular left third molar crown from the posterosuperior region of the pterygomandibular space after iatrogenic dislodgment.

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Dislodgment of a tooth or a fragment of the tooth is a rare complication during surgical extraction of impacted molars. Nevertheless, dislodgment of third molars into various fascial spaces, including the buccal, lateral pharyngeal, and pterygomandibular spaces, as well as anatomic spaces such as the pterygopalatine fossa, has been reported.[1-9] Displaced tooth fragments of various sizes may migrate to different anatomical spaces.

There are different schools of thought about the delay between dislodgment and retrieval.[8,10,11] Some recommend that the delay in retrieval may favor stabilization of the fragment, whereas others argue that the retrieval attempt should be immediate to avoid risk of complications. This case report describes the immediate retrieval of a mandibular left third molar crown that was displaced posterosuperiorly into the pterygomandibular space.

Case report

A 26-year-old man reported to the Department of Oral and Maxillofacial Surgery, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore, India, complaining of pain, discomfort while chewing, and difficulty in mouth opening of 3 days' duration. A panoramic radiograph showed a distally impacted mandibular left third molar (Fig 1).

The treatment plan was to section the crown from the cervical region along the cementoenamel junction to clear the path of exit and then to remove the roots separately. After sectioning the tooth, a junior resident used a straight elevator to separate the coronal portion from the rest of the tooth. Due to complications from force displacement, the coronal fragment of the tooth was inadvertently displaced posteriorly and disappeared into the tissues.

Although the junior resident was able to remove the distal root, the displaced fragment could not be located. A panoramic radiograph was taken and showed the coronal fragment of the tooth dislodged into the posterosuperior area in the pterygomandibular space on the left side (Fig 2). The mesial root of the mandibular third molar was visible in the alveolar socket. Following this imaging, the mesial root was removed.

To retrieve the displaced fragment, the distal releasing incision was extended medially toward the palatoglossal arch (Fig 3). Blunt dissection was carried out to reach the medial pterygoid muscle. Careful dissection was carried out in the posterosuperior direction, between the muscle and the ramus, to locate the fragment. Once visualized, the fragment was removed from the pterygomandibular space with the help of a long-toothed forceps (Fig 4). The removal was confirmed with a postoperative panoramic radiograph (Fig 5). The incision was closed with resorbable sutures.

Fig 1. Preoperative panoramic radiograph showing a distally impacted mandibular left third molar.

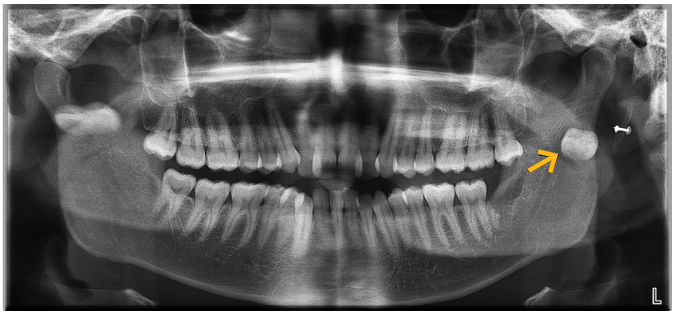

Fig 2. Panoramic radiograph showing the tooth fragment dislodged posterosuperiorly into the pterygomandibular space on the left side (arrow).

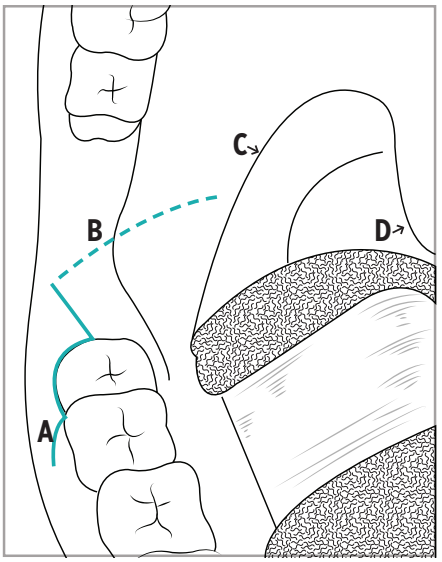

Fig 3. Modification of the incision to gain access to the pterygomandibular space. A, Ward's incision; B, medial extension of the incision; C, palatoglossal arch; D, uvula.

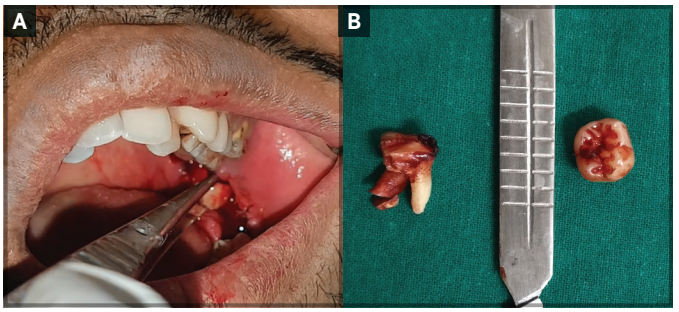

Fig 4. Fragment retrieval. A. Removal of the fragment with the help of a long-toothed forceps. B. Retrieved tooth fragment along with the mesial and distal roots.

The postoperative period was uneventful, and the patient remained asymptomatic during follow-up.

Discussion

A search in PubMed, *[(displacement of tooth) AND pterygomandibular space]*, returned 7 results.[4-9,12] In 3 of 7 cases, fragments were displaced into the pterygomandibular space, and in the other 4 cases, the fragments were displaced into the buccal space, pterygopalatine fossa, lateral pharyngeal space, or submandibular space.[4-9,12] In 4 of 7 reported cases, the displaced fragment was from the mandibular third molar.[4,5,9,12] In the other 3 cases, the displaced fragment was from the maxillary third molar.[6,7,8] In all 3 cases of displacement in the pterygomandibular space, the displaced fragment was from the mandibular third molar.[4,5,9]

Dislodgment of a third molar or its fragment during exodontia is rare.[1,2] However, once a tooth or its fragment is dislodged in any of the potential fascial spaces, it poses a great challenge to accurately locate and remove. Therefore, any patient with a third molar indicated for surgical extraction should be evaluated carefully. Any significant risks (such as distal version and curved or dilacerated roots) that might increase the risk of dislodgment of a tooth fragment or other potential complications should be discussed with the patient beforehand; written informed consent must be obtained.[13]

Surgical extraction of a tooth should always be performed with appropriate instruments under adequate visual access to the surgical area. Bone troughing and tooth sectioning should be performed when necessary, and use of excessive, uncontrolled forces should be avoided.[14] To avoid dislodgment of the third molar, use of the index finger as a guard is recommended while the clinician is using elevators. In addition, the distal releasing incision should always be made over the bone, that is, on the anterior border of the ascending ramus. If the incision is made more medially, the chances of dislodgment increase because the entrance to the pterygomandibular space is very close to the anterior border of the ascending ramus medially (Fig 6).[15]

When the operator discovers that a tooth or its fragments have been displaced during surgical extraction, he or she should refrain from blindly attempting a retrieval. To avoid further grave complications, the treating dentist should always consider referring the patient to an oral and maxillofacial surgeon or to a dental school for retrieval. This region has a complex anatomy, and retrieval of a displaced tooth or fragment is further complicated by the limited access. Any attempts by dentists with limited training may worsen the situation and push the fragment deeper.[13] Retrieval should only be attempted

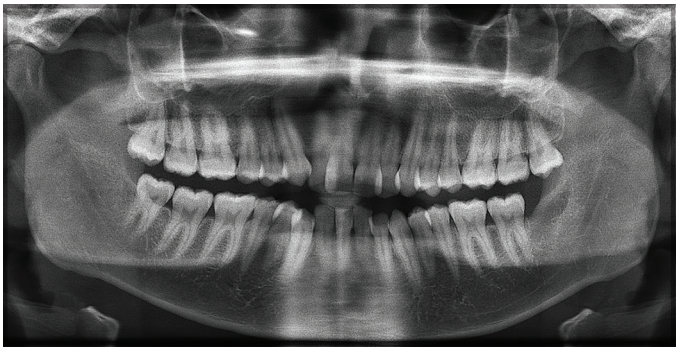

Fig 5. Postoperative panoramic radiograph confirming successful fragment retrieval.

Table. Cases of tooth fragment dislodgment and retrieval previously reported in the literature.

Authors (year)	Space involved	Retrieval	
		Delay	Anesthesia
Papadogeorgakis & Pigadas (1990)[4]	Pterygomandibular	NR	NR
Tumuluri & Punnia-Moorthy (2002)[5]	Pterygomandibular	9 d	Local
Kocaelli et al (2011)[6]	Buccal	1 wk	Local
Lee at al (2013)[7]	Lateral pharyngeal	2 y	General
Özer et al (2013)[8]	Pterygopalatine fossa	1 wk	General
Suer et al (2014)[9]	Pterygomandibular	2 y	Local
Jolly et al (2014)[12]	Submandibular	1 mo	Local

Abbreviation: NR, not reported.

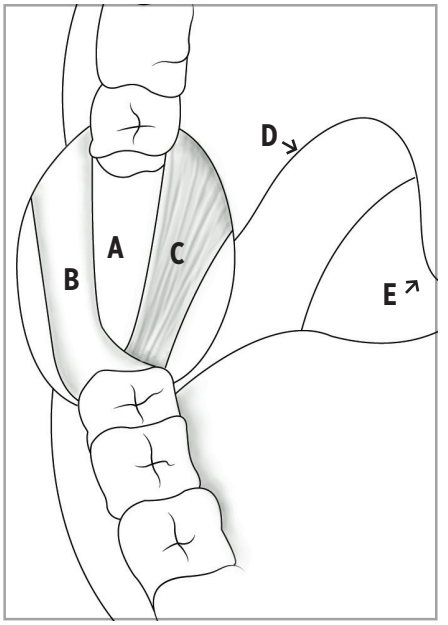

Fig 6. Pterygomandibular space (A), bounded laterally by the medial surface of ramus of the mandible (B) and medially by the medial pterygoid muscle (C); D, palatoglossal arch; E, uvula.

if the fragment is clearly visible and can be grasped easily. It is therefore recommended that the operator immediately halt the procedure; obtain intraoperative radiographs; gather all relevant information, including size, location, and type of fragment; assess the situation; and then decide whether to attempt a retrieval or to refer the patient to a person with the relevant training.[16]

The most appropriate timing for the retrieval attempt is a subject of controversy. Some believe that the delay in retrieval may favor stabilization of the fragment due to fibrosis, whereas others argue that the retrieval attempt should be made during the initial surgical procedure to avoid risks of infection, pain, and trismus and to spare the patient from being subjected to another procedure.[8,10,11] In the aforementioned 7 case reports, most of the authors preferred the option of not delaying the procedure, and the fragment was retrieved when the patient first presented to the maxillofacial surgeon (Table).[4-9,12] Any delay between the dislodgment and retrieval in these cases was solely due to the delay caused by the patient in reporting to the surgeon.

In 1 case, retrieval had to be delayed by 1 week as the patient was febrile at the time of presentation due to infection in the region of dislodgment.[6] The patient was prescribed an antibiotic course for 1 week.[6] This suggests that the risks of complications associated with delaying retrieval to facilitate fibrosis for ease of localization outweigh its advantages, and the authors therefore recommend that fragments be retrieved as early as possible after dislodgment. In the present case, the retrieval was performed immediately after the fragment was located on the radiograph, and the fragment was retrieved with relative ease. All the possible outcomes of delay, including the ease of retrieval due to fibrosis as well as the increased risk of infections, trismus, and patient discomfort, should be weighed when the clinician is making a decision about the management of a tooth displaced into a fascial space.

The pterygomandibular space is bound anteroposteriorly by the pterygomandibular raphe and the parotid gland with its capsule; lateromedially by the ascending ramus of the mandible and medial pterygoid muscle; and superoinferiorly by the lateral pterygoid muscle and pterygomassetric sling. Anteriorly, there is a small gap between the medial pterygoid muscle medially and deep tendon of temporalis muscle laterally, which provides the entrance to the pterygomandibular space.[15] Intraoral access to the pterygomandibular space can be achieved via an extended lingual mucoperiosteal flap from the ramus to the premolar region, but this approach has a risk of lingual nerve damage and provides a narrow field.[5,14,17] If the fragment is displaced posterosuperiorly in the pterygomandibular space, as in this case, the authors recommend extending the distal releasing incision in a medial direction toward the palatoglossal arch to reach the medial pterygoid muscle and then performing a blunt dissection to gain access to the tooth or its fragment. However, as each case is unique, no single technique of retrieval can be used in all circumstances. The surgeon must improvise

according to the situation, and a thorough knowledge of the regional anatomy is essential in attempting a retrieval.

Author information

Dr Shetty is a professor and the head, Dr Hegde is a reader, and Dr Jain is a resident, Department of Oral and Maxillofacial Surgery, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore, India.

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