

## Removal of Mandibular Third Molar Accidentally displaced into the Parapharyngeal Space aided by Cone-Beam Computed Tomography: A Case Report

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### Abstract

A right impacted mandibular third molar (IMTM) accidentally displaced into the parapharyngeal space was dislodged successfully in only 5 minutes, with no sequel. Cone-beam computed tomography (CBCT) images were used to direct the removal. Five minutes is the shortest time having been reported. Considering that the event happens rarely, this report could add another case, and provide further reference to the dentists.

**Keywords:** Cone-beam computed tomography; Impacted mandibular third molar; Parapharyngeal space

### Introduction

Extraction of impacted mandibular third molars (IMTM) is a routine outpatient oral surgery, but is the most difficult among the teeth extraction operations. That is because the IMTM may be in different variants and different impacted position, its surrounding structure is complicated and the operation view is narrow. As a result, IMTM extractions are more likely to induce some complications such as roots fracture, pain, swelling, bleeding, paresthesia, etc [1-4]. It is a rare complication that the IMTM accidentally break through the thin lingual bone walls and enter the parapharyngeal space during the extraction. Once the IMTM displaced into the parapharyngeal space, it is important to promptly manage the situation by using appropriate measures. Considering that some blood vessels and nerves, such as the carotid artery and its branches, the cranial nerves IX through XII run through the parapharyngeal space, it is not appropriate to search the displaced IMTM blindly with the forceps because that may push it to a deeper position and injure the local blood vessels and nerves.

Based above, before dislodging the displaced IMTM, accurately locating its position and its adjacent structures by using advanced imaging techniques is necessary for its successful removal. Cone-beam computed tomography (CBCT) is a relatively new imaging modality. Compared with the conventional panoramic radiography (PAN), CBCT can reconstruct the three-dimensional images, provides better image of the teeth and their surrounding structures and thus gives the doctors a more detailed insight into the local anatomy of the teeth [5,6]. As a result, assisted with the CBCT images, the displaced IMTM could be located more accurately, and the removal will be expected to reduce the likely injury to the local structures. At present, cases of removal of IMTM accidentally displaced into the parapharyngeal space with the aid of CBCT images have rarely been reported. This report describes a case of right IMTM that was displaced into the lateral pharyngeal space during its extraction. After being accurately located by CBCT (3D Accuitomo, XYZ Slice View Tomograph, J.MORITA MFG.CORP., Kyoto, Japan), the displaced tooth was removed in only 5 minutes without any sequel.

### Case Report

A 71-year-old man was referred to the Department of Stomatology of the Beijing Chao-Yang Hospital with a complaint of pain and swelling in the region of the right IMTM for about 2 months. He was admitted by a young dentist. His right mandibular third molar was impacted in horizontal position with pericoronitis, the distal surface of the crown

had erupted out the gingival. After a period time of antibiotic therapy, the IMTM was planned to be extracted. The PAN was performed routinely before the operation (Figure 1). The extraction was performed by using normal procedures under local anaesthesia. During the operation, the dentist found that the tooth disappeared. She was puzzled about that and further searched the tooth in the socket with a curette but still could not find the tooth. Finally, the dentist referred the patient to a senior oral and maxillofacial surgeon for the proper management. Firstly, the PAN was requested by the surgeon and the PAN images showed that the tooth was displaced out of the socket (Figure 2), but the exact location could not be determined because the tooth and the



**Figure 1:** After a period time of antibiotic therapy, the IMTM was planned to be extracted. The PAN was performed routinely before the operation.

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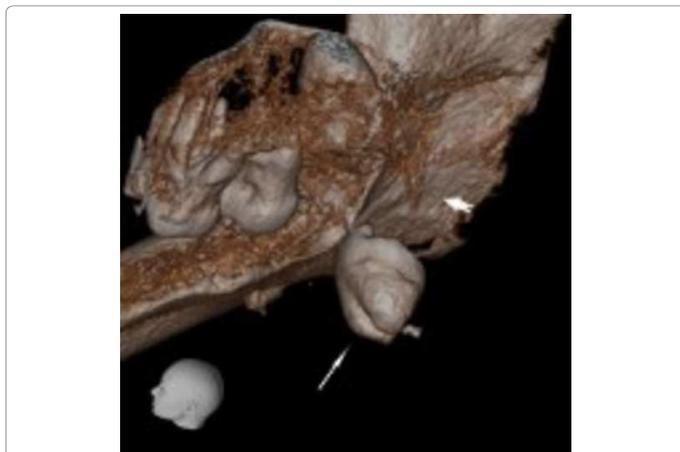
mandibular was overlapped in the PNA images. Then the CBCT scan (3D Accuitomo, XYZ Slice View Tomograph, J.MORITA MFG.CORP., Kyoto, Japan) was requested for accurately locating the tooth. The CBCT three-dimensional (3-D) reconstruction images showed that the tooth



**Figure 2:** Firstly, the PAN was requested by the surgeon and the PAN images showed that the tooth was displaced out of the socket.



**Figure 3:** reconstruction images showed that the tooth was medial to the right mandibular angle, displaced from the socket 1cm inward and 2cm downward.



**Figure 4:** A position of the parapharyngeal space region. Had confirmed the location, the surgeon immediately began to dislodge the displaced tooth.



**Figure 5:** The tooth was touched at a position anterior medially to the medial pterygoid muscle (i.e. the anterior compartment of the parapharyngeal space) and then was removed immediately using a hemostat.

was medial to the right mandibular angle, displaced from the socket 1 cm inward and 2 cm downward (Figures 3 and 4), a position of the parapharyngeal space region. Had confirmed the location, the surgeon immediately began to dislodge the displaced tooth. The operation procedures were simply as the followings: A triangular incision was made by extending the original wound, 1cm backward to the retromolar pad and 1 cm forward to the alveolar ridge crest of the second molar from where turn downward 0.5 cm along the lingual mucoperiosteal, with a number 11 blade (Jinhuan, Shanghai, China). Then the lingual mucoperiosteal flap was raised. The tooth was searched by searching the dropping passage of the tooth, using a hemostat under the lingual mucoperiosteum directly toward the direction of the position of the displaced tooth as the CBCT 3D images indicated. The tooth was touched at a position anterior medially to the medial pterygoid muscle (i.e. the anterior compartment of the parapharyngeal space) and then was removed immediately using a hemostat (Figure 5). It took only 5 minutes from making incision to finally removing the tooth. Then the wound incision was irrigated sufficiently with normal saline and the socket was cleaned by using a curette. After two pieces of fibrin sponge (Stypro, curasan AG, Germany) were placed into, the wound incision was closed using 3-0 silk sutures. The patient was given oral cefixime (XIANQIANGYANLING, Guangdong, China), 200 mg every 12 hour for 3 days to prevent local inflammation that may occur. Seven days later, the sutures was removed, the patient recovered without any sequel.

## Discussion

During extracting the IMTM, the tooth is accidentally displaced into the parapharyngeal space is a rarely occurred complication. The incident usually happens by inappropriate and unskilled operation of young doctors. The displaced IMTM should be managed appropriately, or the patient may be dissatisfied and even resort to legal. Firstly, the displaced tooth should be removed as soon as possible. Delayed intervention may increase the risk of infection, injury to the vital carotid sheath and cranial nerves in the posterior compartment of the parapharyngeal space, migration of the tooth to deeper spaces and inducing infection of the adjacent fascial spaces even the deep cervical spaces [7,8]. The importance of prompt and appropriate management of the displaced tooth has also been emphasized in the reported cases [7-10].

Secondly, the displaced tooth should be removed safely. For safely removing the displaced tooth, accurately locating its position is important. For this case, the tooth and the mandibular was overlapped in the PNA images, while the reconstructed CBCT 3D images had accurately indicated the location of the displaced tooth, which was used to direct the dislodging. The surgeon emphasizes that using CBCT to locate the tooth is necessary for the quick and successful dislodging. Conventional PAN radiographs could not determine the precise location of the displaced tooth and the relation between the tooth and the adjacent anatomical structures, whereas computed tomography (CT) scans could, especially the CBCT that could reconstruct the 3D images with lower x-ray dose than the conventional CT [6]. The necessity of using advanced imaging techniques to locate a displaced tooth and its relation to the adjacent anatomic structures has also been particularly pointed out, but the CBCT has not been used in the few reported cases [7-10].

Finally, dislodging the displaced IMTM should be performed by experienced oral and maxillofacial surgeon for the least invasive, the least sequel and the most safe result. For this case, it is appropriate that the young doctor timely refer the patient to a senior doctor. The quick and safe dislodging of the displaced tooth could partly ascribe to the surgeon's experiences.

In summary, an IMTM accidentally displaced into the parapharyngeal space was dislodged successfully in only 5 minutes, with no sequel. CBCT images were used to direct the removal. 5 minutes is the shortest time having been reported. Considering that the event happens rarely, this report could add another case and provide further reference to the dentists.

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