



## Removal of Impacted Wisdom Tooth by Precise Surgical Procedure

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### Abstract

**Introduction:** Tooth extraction is a very common procedure in oral surgery. There are many complications in tooth extraction especially Inferior Alveolar Nerve (IAN) injury and Iatrogenic Fracture of Mandible (IFM). This case report describes third molar close to the IAN and the crown under first molar. So it is important to protect the INA and molar.

**Case Presentation:** A 22-year-old man was referred to the Department of Implantology, Stomatology Center, and Central South University Xiangya School of Medicine Affiliated Haikou Hospital with a chief complaint of the molar miss in the right side. He had no significant past medical history. A dental check revealed absence of right mandibular third molar, mesial impaction of right mandibular second molar with mesial II° caries. CBCT revealed that the tooth was found in the apex of first molar and near inferior alveolar nerve canal.

**Conclusion:** The impacted wisdom tooth described in this case report is close to the IAN. We evaluate relationship between tooth and IAN with CBCT. Then impacted teeth were safe to be removed by precise surgical procedure under CBCT guidance.

**Keywords:** CBCT; Impacted tooth; Extraction

### Abbreviations

CBCT: Cone Beam Computed Tomography; IAN: Inferior Alveolar Nerve; MC: Mandibular Canal; IFM: Iatrogenic Fracture of Mandible; CHX gel: Chlorhexidine gel; LA: Local Anesthesia

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### Background

According to the depth of the tooth in the bone, position of impacted wisdom tooth is divided into three categories. To extract deeply impacted wisdom tooth is one of the highest risks and it is easy to cause postoperative complications. It is highly demand for dentist to prevent these risks.

### Case Presentation

A 22-year-old man was referred to the Department of Implantology, Stomatology Center, and Central South University Xiangya School of Medicine Affiliated Haikou Hospital with a chief complaint of the molar miss in the right side. Intraoral examination revealed absence of right mandibular third molar, mesial impaction of right mandibular second molar with mesial II° caries. CBCT revealed that the tooth was found in the apex of first molar and near inferior alveolar nerve canal (Figure 1). The patient was admitted for surgery under Local Anesthesia (LA) after thorough physical examination and routine blood investigations. Prior to the surgery a duly signed written informed consent was obtained from the patient. A full thickness mucoperiosteal flap was reflected. The posterior part of the buccal wall of the #47 tooth was breached by rosette round bur over teeth #47 and #48, the lateral wall was also resected till the posterolateral wall was approached, guttering of the bone was done around the tooth, distal retractor was used and the #47 tooth was retrieved along with the help of a curette. The #48 tooth was found in the apex of first molar and near Inferior alveolar nerve canal, the vertical and buccal bone of the #48 tooth was to be removed with piezosurgery carefully, the #48 tooth was discovered, then it was split in the neck, but cementum of the #48 tooth close to the IAN was retained, remove the root of it, crown was divided into two pieces then extracted from beneath the #46 tooth, the socket was filled with Bio-OSS and PRF, the wound was sutured (Figure 2). Post-operative recovery was uneventful; the patient was prescribed analgesics and antibiotics. He was followed up for three months and found to have no complaint.



Figure 1: Preoperative.

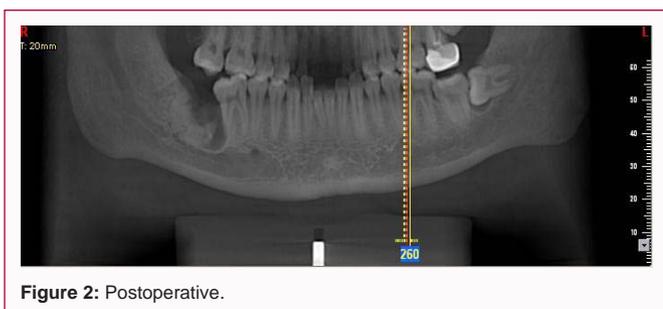


Figure 2: Postoperative.

## Discussion

Tooth extraction is a very common procedure in oral surgery [1]. The complications include Inferior Alveolar Nerve (IAN) injury, hemorrhage, surgical site infection [2,3] pain, dental fracture, the displacement of teeth or fragments, iatrogenic damage or luxation of the second molar [4], soft tissue damage, subcutaneous emphysema, trismus, swelling, and iatrogenic mandibular fracture. How to prevent these problems above all?

The incidence of IAN injury reported in the literature ranges from 1.3% to 5.3% which depend mainly on the position of the impacted tooth in relation to the inferior alveolar canal before surgery. If there is close proximity between the IAN and the roots, the incidence may be as high as 19% [5,6] and may be temporary or permanent injury [7], therefore proper presurgical planning is required to reduce the risk of injury to the IAN [8,9]. The minimally invasive extraction operation, originally described in the late 1900s, is an approach to the anterior wall of the maxillary sinus by making a full thickness flap, but in the present case we had to modify this approach as the tooth was located posteriorly in inferior alveolar nerve canal, Minimally invasive extraction [10] of mandibular impacted wisdom tooth is better than traditional method. So a vestibular incision was given starting from tooth #46 till distally to tooth #48. The use of a surgical navigation system [11] together with an interocclusal splint enabled the retrieval of a close proximity to the mandibular canal impacted wisdom tooth in a safe and minimally invasive manner without damaging the surrounding vital structures. Removal of deeply impacted tooth using the described techniques is safe with regard to mandibular nerve injury and neurologic damage [12].

Iatrogenic Fracture of Mandible (IFM) related to the removal of teeth is a rare complication [13]. Subcutaneous emphysema is not very common [14]. The use of piezosurgery can accurately remove the bone wall; effectively preserve the thickness of the mandible, thereby reducing iatrogenic fractures. And because the piezosurgery does not require high pressure gas as a driving force, it can also prevent the occurrence of emphysema. The antibiotic administration showed a decrease in pain suffered by patients but a higher incidence of gastro-

intestinal side effects. Chlorhexidine gel (CHX) is superior to a placebo in reducing the incidence of alveolar osteitis after mandibular third molar extraction. There were no significant differences in soft tissue closure at any time point and provide any additional benefit to enhance the soft tissue closure of extraction sockets [15].

In this case, the position of the Mandibular Canal (MC) in CBCT is close to the #48 tooth and absence of cortical bone between the root of the #48 tooth and MC; and the minimum distance between the MC and the third molar is 0 mm, the actual distance was <0.5 mm. The crown of the #48 tooth is proximity connects to the distal apex of first molar, the #47 tooth is upon it and there are caries in the mesio-crown. Under the guidance of CBCT, the resistance of bone tissue and adjacent tooth was removed with piezosurgery carefully, #47 and #48 were removed by precise surgical procedure. It is safe to extract teeth without any complications.

## Conclusion

With the development of high resolution imaging technology, we can clearly understand relationship between the impacted tooth and the surrounding tissue, the blindness of extraction can be reduced because of CBCT accurate guidance. The impacted wisdom teeth were removed safely by precise surgical procedure.

## Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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