



Case Report

**Surgical Management of Impacted Bilateral Mandibular
Molars Adjacent to Inferior Alveolar Nerve to Avoid
Paresthesia of Lower Lip**

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Abstract

The extraction of impacted 3rd molar is most frequently performed surgery now-a-days as it can lead to infections, cysts, tumors, neuralgiform pain, and disturbances of occlusion, masticatory dysfunctions and myoarthropathies. Damage to inferior alveolar nerve leads to impairment of sensation in the lower lip, which is most unpleasant postoperative complication. For surgical removal of impacted mandibular molars, relative position of inferior alveolar nerve with mandibular 3rd molar is of utmost importance. There are number of positions in which inferior alveolar nerve is located in relation to impacted 3rd molar which, either in a direct contact with the 3rd molar or has no contact at all. While performing surgical procedures in the vicinity of 3rd molar, Inferior Alveolar Nerve can be damaged but with high expertise and precision the operator can spare the nerve without any injury. In this case report, we discuss about the surgical management of a case with bilateral impacted 38, 47, near the Inferior alveolar nerve to avoid paraesthesia of lip.

Keywords: Paresthesia, Myoarthropathies, Mandibular, Alveolar, Neuralgiform.

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INTRODUCTION

The major basic cause of aberrant/impacted teeth in the adults of Western Europe, Great Britain and Ireland, U.S.A, and Canada is due to artificial feeding of babies, the habits developed during childhood, due to cross breeding, more consumption of sweet food by the children and youth which produces disproportion in the jaws and the teeth.¹

The extraction of impacted 3rd molar is most frequently performed surgery now-a-days as it can lead to infections, cysts, tumors, neuralgiform pain, and disturbances of occlusion, masticatory dysfunctions and myoarthropathies. However, it is associated with various complications especially in geriatric group. The most common complications include disturbances of sensation, infection of socket, residual root tips and fracture of jaw. Damage to IAN leads to impairment of sensation in the lower lip, which is most unpleasant postoperative complication.²

For surgical removal of impacted mandibular 3rd molar, relative position of inferior alveolar nerve with mandibular 3rd molar is of utmost importance. There are number of positions in which inferior alveolar nerve is located in relation to impacted 3rd molar which include inferior, buccal, lingual and inter-radicular. The nerve is either in a direct contact with the 3rd molar or has no contact at all. While performing surgical procedures in the vicinity of 3rd molar, IAN can be damaged but with high expertise and precision the operator can spare the nerve without any injury.

CASE REPORT

We present a case of 23-year-old female patient, who consults with the Maxillofacial surgery department due to pain in the back side of lower jaw bilaterally since a month. Patient was otherwise healthy with no past medical or dental history. On clinical examination, patient had pericoronitis in relation to 47 which was reddish in colour and tender on palpation. No restriction in the mouth opening was noticed. The orthopantomogram was revealed horizontally impacted mandibular 2nd molar on right and 3rd molar in left side.

Figure-1: OPG Showing Bilateral Impacted Molars (34 &47)



A Cone beam CT was also performed to check the relationship of impacted mandibular 2nd molar with inferior alveolar canal. CBCT showed the evidence of narrowing of the canal on right side with no gap between the inferior alveolar canal and roots of impacted 47 while on left side there was a distance of just 0.1mm between roots of 38 and inferior alveolar canal.



Figure-2: CBCT scan showing relation between roots of 46 with 47.



Figure 3: CBCT scan showing relation between IAN and 38,

Based on the reports of OPG and CBCT, patient was planned for surgical extraction of bilateral mandibular molars impactions. A complete Hemogram test of the patient was performed which turned out to be normal. Surgical extraction of 38 and 47 was performed by giving a Ward's one incision without injuring the inferior alveolar nerve. Closure of flaps was done using 3-0 RC silk suture. There was no sign of paresthesia on first post-operative day.



Figure 4: OPG showing post-operative healing of bone.

On 2nd and 3rd postoperative day, a mild swelling was seen on right side of the face. Patient had no complaint of pain or paresthesia. Neurosensory testing was done using both mechanceptive method (i.e. 2-point discrimination method) and nociceptive method (i.e. pinprick method). Patient was checked for paresthesia from 1st to 7th postoperative day and after 1 month, 3 months and 6 months interval.

DISCUSSION

Impacted tooth is a tooth which is completely or partially unerupted and is positioned against another tooth, bone or soft tissue so that its further eruption is unlikely, described according to its anatomic position.³ Most of the researchers suggest that the females have a higher incidence of, mandibular third molar impaction when compared to males.⁴

Both clinical and radiographic evaluation is necessary for assessment of impacted tooth. For image accuracy, CBCT machines provide isotropic voxels i.e. equal in all three proportions as compared to anisotropic voxels found in conventional CT. Although CT voxel surfaces can be as small as 0.625 mm square, their depth is usually in the order of 1–2 mm where as CBCT produces sub-millimeter resolution ranging from 0.4 mm to as low as 0.09 mm. This sub-millimeter resolution of CBCT is precise enough for measurements in oral & maxillofacial applications fulfilling the need of exactness required for implant site assessment and orthodontic analysis.⁵

The clinical physical evaluation includes:-

- Movement of mandible
- Inspection and Palpation of TMJ
- Appearance of soft tissue overlying the impacted teeth

- Determination of mobility characteristics of cheeks and lips
- Size and contour of tongue

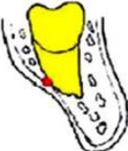
Radiographic evaluation includes:-

- Inferior alveolar nerve and vessels.
- Contact with second molar.
- Assessment of root morphology.
- Density of surrounding bone.
- Size of follicular sac.
- Nature of overlying tissues.
- Relationship with adjacent teeth.
- Relationship to body and ramus of mandible.⁶

Gradual evolutionary reduction in the size of the human mandible/maxilla has resulted in smaller arches that may accommodate the corresponding molars,⁷ since mandibular 3rd molars are last to erupt hence there are relatively higher chances of them to become impacted.⁶

Surgical extraction of impacted 3rd molars are also associated with some rare complications include severe trismus, oro-antral fistula, iatrogenic damage to adjacent tooth, buccal fat herniations, iatrogenic fracture of mandible.⁶

Assessment of position and relationship of 3rd molar with IAN should be done preoperatively to minimise the risk of nerve injury. Now-a-days various radiographic markers are used by the clinicians to indicate a relationship between inferior alveolar canal and mandibular 3rd molars. With the introduction of Cone beam CT there is a reduced radiation exposure to the patient as compared to conventional CT and it also gives a precise bucco-lingual position of 3rd molar in relation to inferior alveolar canal.

	Lingual	Interradicular	Buccal	Inferior
Contact: <u>NO</u> bone tissue between mandibular canal and third molar				
No Contact: bone tissue between mandibular canal and third molar				

1. Classification of the position and relationship of the third molar root to the mandibular canal, as seen on CBCT images.

The panoramic radiograph is the standard diagnostic tool in the preoperative assessment of mandibular third molars and their relationship with the mandibular canal. In cases having close relationship between the mandibular canal and the third molar, CBCT has a relatively low accuracy in predicting IAN exposure. However, CBCT is highly reliable in determining the bucco-lingual position of the inferior alveolar canal w.r.t third molar. In cases where IAN is placed lingually to the third molar root, patients develop a higher risk of IAN injury.⁷

Lower lip numbness is a common symptom that occurs due to damage, injury, or irritation of the inferior alveolar nerve or its mental branch. It is usually described by a patient as a unilateral loss of sensitivity of the lower lip and gums, numbness, a tingling sensation, and dryness of the affected mucosa. It is often preceded by intense pain and burning sensation in the affected area. Furthermore, most of reported cases were from lower molars or premolars. The implant endodontic causes extrusion of the materials used in treatment, irrigation liquids, over instrumentation, elevated temperatures proximal to the inferior alveolar nerve. Moreover, orthogenetic surgery, localized and metastatic neoplasms, malignant blood diseases, metastatic tumors in the mandible, and certain systemic disorders represent other reasons. In addition, acute or chronic periodontal infection can cause irritation or damage to the inferior alveolar nerve or its mental branch resulting in paresthesia or anesthesia of the lower lip. This can be occur even before or after endodontic therapy.⁸

Table 1 - Surgical Imaging protocols for CBCT examination⁹

Resolution	Voxel size mm ³	Field of View(α ,h,cm)	Examination
Fine	0.08-0.125	Small.eg 4X4	Endodontic, localised periodontal problems, short span implant related applications, complex extractions.
	0.125-0.25	Medium, eg 8X5	Multiple implants or impactions associated with vital anatomical structures generalised periodontal problems.
General	>0.3	Medium eg 10X5-10X10	3-D modelling, single or dual full arch implant assessment/bilateral TMJ assessment.
	>0.3	Large, eg>10X10cm	3-D modelling, cephalometric & metric & craniofacial applications, bilateral TMJ assessment.

Table 2 - The nerve injury or damage usually occurs in three forms¹⁰

Neuropraxia	Compression of the nerve with no structural damage.
Axonotmesis	Rupture of axons within an intact nerve sheath.
Neurotmesis	Complete severance of a peripheral nerve.

Table 3 - Sensory nerve disturbances¹⁰

Anaesthesia	Absence of all sensory modalities.
Paraesthesia	An abnormal sensation (tingling), whether spontaneous or evoked.
Dysaesthesia	An unpleasant abnormal sensation, whether spontaneous or evoked.
Hyperaesthesia	Increased sensitivity to stimulation, excluding special senses.
Hypoaesthesia	Diminished sensitivity to stimulation, excluding special senses.

CONCLUSION

In this case report, we discussed the surgical management of a case with bilateral impacted mandibular molars in vicinity of inferior alveolar nerve and avoided paraesthesia of lip.

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Conflicts of interest

There are no conflicts of interest

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