

### **Unusual Case of Inferior Alveolar Nerve Relationship with Third Molar and It's Treatment**

<sup>1</sup>Pratap Movaniya, Post Graduate Student, Department of Oral And Maxillofacial Surgery, Karnavati Scholl of Dentistry, Uvarsad.

<sup>2</sup>Hirakben Patel, Post Graduate Student, Department of Oral And Maxillofacial Surgery, Karnavati Scholl of Dentistry, Uvarsad.

<sup>3</sup>Kalpesh Makwana, Assistant Professor, Department of Oral And Maxillofacial Surgery, Karnavati Scholl of Dentistry, Uvarsad

<sup>4</sup>Nimisha Desai, Professor and Head, Department of Oral And Maxillofacial Surgery, Karnavati Scholl of Dentistry, Uvarsad

<sup>5</sup>Ridhi Matariya, Assistant Professor, Department of Oral And Maxillofacial Surgery, Karnavati Scholl of Dentistry, Uvarsad

**Corresponding Author:** Pratap Movaniya, Post Graduate Student, Department of Oral and Maxillofacial Surgery, Karnavati Scholl of Dentistry, Uvarsad.

**Citation of this Article:** Pratap Movaniya, Hirakben Patel, Kalpesh Makwana, Nimisha Desai, Ridhi Matariya, “Unusual Case of Inferior Alveolar Nerve Relationship with Third Molar and It's Treatment”, IJDSIR- March - 2020, Vol. – 3, Issue -2, P. No. 246 – 250.

**Copyright:** © 2020, Pratap Movaniya, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

#### **Abstract**

Perforation of the lower third molar roots by the inferior alveolar nerve is uncommon and can be difficult to determine by conventional radiographic methods. Presented is a case of perforation that was treated by root sectioning and treatment modality discussed for the same

**Keyword:** Third molar, inferior alveolar nerve, Root Perforation by nerve

#### **Introduction**

Removal of impacted or unerupted mandibular third molar is one of the most frequently performed dentoalveolar surgical procedures<sup>1</sup>. The third molar is close to important

structures such as the Inferior Alveolar Nerve (IAN), lingual nerve, and adjacent second molar<sup>2-3</sup>. The risk of IAN injury (IANI) complication depends mainly on the position of the impacted tooth in relation to the mandibular canal (MC) before surgery. The IAN travels within the MC in the mandible, and is thus supported by the alveolus and the neurovascular bundle<sup>4-5</sup>. Inferior alveolar nerve injury is one of the most feared complications of mandibular third molar surgery. A careful preoperative radiographic evaluation is mandatory to precisely define the relation between third molar roots and the inferior alveolar nerve.

The aim of the paper is to report and discuss a case in which the inferior alveolar nerve was entrapped between the roots of a partially erupted mandibular third molar.

### Case Report

A 36-year-old woman was referred to the Department of Oral and Maxillofacial Surgery by her general dental practitioner for the removal of her lower right third molar (Figure 1).



Figure 1: impacted third molar relation with IAN

Review of the preoperative panoramic radiograph showed a mesioangularly impacted lower-right third molar with a radiolucent band across the roots (Figure 1).

Third molar was removed with the patient under local anesthesia, and during operation the IAN was found to be perforating the root (Figure 2).



Figure 2: IAN perforating the root of third molar



Figure 3: root was sectioned to free it from inferior dental bundle

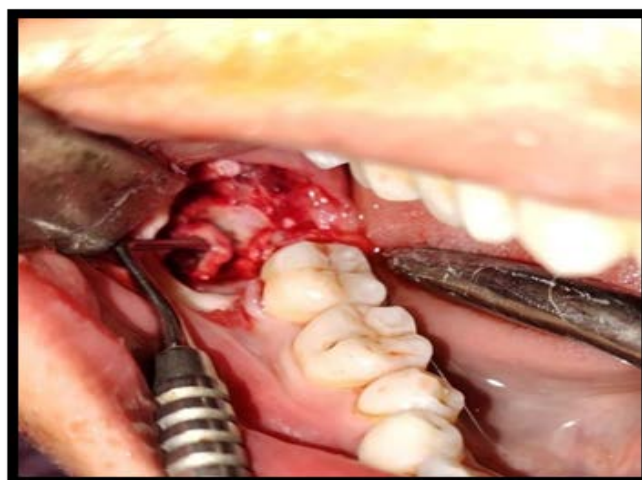


Figure 4: IAN reposing in socket



Figure 5: Suturing done with 3-0 silk suture material



Figure 6: Sectioned root

There was no bony canal surrounding the bundle. The root was sectioned to free it from inferior dental bundle (Figure 3). The nerve was undamaged macroscopically by this procedure and was later repositioned in socket (Figure 4) and suture was taken with 3-0 silk (Figure 5).

### Discussion

An intimate relationship exists between the inferior alveolar canal and the roots of the mandibular third molar. The root apices of deeply impacted teeth may show a definite grooving or they may be bent due to pressure of the contents of the mandibular canal, and in extreme cases the roots may form around the neurovascular bundle leading to its entrapment.<sup>6</sup>

A careful pre-operative radiological examination will help to determine the exact position of the impacted tooth and its relationship to the inferior alveolar canal.

Orthopantomography (panoramic radiography) is the radiologic investigation of choice before third molar surgery. The criteria for injury are identifiable on this radiograph, but like other conventional radiographs, it is unable to give complete information in three dimensions.<sup>7</sup> Cone beam computed tomography (CBCT) provides three dimensional relationships between inferior alveolar nerve and tooth root compared with conventional Orthopantomography.<sup>8</sup> some modifications of the routine

surgical procedure have been proposed for performing the extraction when the inferior alveolar nerve passes through root of third molar. Walker<sup>9</sup> reported a case in which a thin lingual root was first amputated and then definitively separated from the greater buccal root before complete tooth extraction.

Howe and Poyton<sup>10</sup> suggested widely exposing the tooth by buccal bone removal and sectioning it at the level of the nerve trunk. Mishra<sup>11</sup> proposed creating a window on the buccal aspect of the root above the level of the nerve, through which the nerve is gently lifted out.

Hosein Kalantar Motamedi<sup>12</sup> suggested first separating and extracting the tooth crown from an oval window created on the buccal aspect of the alveolar process and then sectioning the root trunk mesiodistally so the 2 fragments can be carefully removed.

Coronectomy, in other words, intentional tooth root retention, has been alternatively proposed to completely avoid the surgical risk of nerve injury, although complications can subsequently occur and, if removal is then necessary, the surgical dilemma remains.<sup>13,14,15</sup>

The orthodontic extraction technique is recommended to the patients to reduce the postoperative complications. This technique needs an orthodontist to design and put a special bar on the tooth to control the direction of traction. It also needs a long time of traction from 6 to 12 months, especially for medially inclined and horizontal teeth to be away from the IAN. Patients also need frequent follow-ups to unite, reshape, and reactivate the cantilever every 4 to 6 weeks before the tooth is ready to be extracted.<sup>16</sup>

In the present case simple root separation was first carried out and a careful delivery of the mesial root, distal root with crown, without nerve damage.

### Conclusion

Nerve injury is a common and debilitating complication of third molar extractions. The surgical procedure to extract

impacted mandibular third molars can be associated with the risk of nerve injuries, and adequate pre-operative assessment is required to identify such cases. In order to reduce the neurological risks, alternative strategies might be used like some modifications of the routine surgical procedure, coronectomy and orthodontic extraction techniques.

### Reference

1. Grossi GB, Maiorana C, Garramone RA, Borgonovo A, Creminelli L, Santoro F. Assessing postoperative discomfort after third molar surgery: a prospective study. *J Oral Maxillofac Surg.* 2007 May;65(5):901-17.
2. Alessandri Bonetti G, Bendandi M, Laino L, Checchi V, Checchi L. Orthodontic extraction: riskless extraction of impacted lower third molars close to the mandibular canal. *J Oral Maxillofac Surg.* 2007 Dec;65(12):2580-6.
3. Susarla SM, Blaeser BF, Magalnick D. Third molar surgery and associated complications. *Oral Maxillofac Surg Clin North Am.* 2003 May;15(2):177-86.
4. Kipp DP, Goldstein BH, Weiss WW Jr. Dysesthesia after mandibular third molar surgery: a retrospective study and analysis of 1,377 surgical procedures. *J Am Dent Assoc.*
5. Rood JP, Shehab BA. The radiological prediction of inferior alveolar nerve injury during third molar surgery. *Br J Oral Maxillofac Surg.* 1990 Feb;28
6. Austin, L. T. Perforation of roots of impacted lower third molar by contents of mandibular canal. Report of a case. *American Journal of Orthodontics and Oral Surgery* 1947,
7. Jhamb A, Dolas RS, Pandilwar PK, Mohanty S. Comparative efficacy of spiral computed tomography and orthopantomography in preoperative detection of relation of inferior alveolar neurovascular bundle to the impacted mandibular third molar. *J Oral Maxillofac Surg.* 2009 Jan;67(1):58-66.
8. Hashimoto K, Kawashima S, Kameoka S, Akiyama Y, Honjaya T, Ejima K, Sawada K. Comparison of image validity between cone beam computed tomography for dental use and multidetector row helical computed tomography. *Dentomaxillofac Radiol.* 2007 Dec;36(8):465-71.
9. Walker JEG: Inferior dental nerve perforating root. A case report. *Br Dent J* 124:467, 1968
10. Howe GL, Poyton HG: Prevention of damage to the inferior dental nerve during the extraction of mandibular third molars. *Br Dent J* 109:355, 1960
11. Mishra YC: Entrapment of the neurovascular bundle by the roots of an impacted mandibular third molar. A case report. *Br J Oral Maxillofac Surg* 25:261, 1987
12. Hosein Kalantar Motamedi M: Impacted lower third molar and the inferior alveolar nerve. *Oral Surg Oral Med Oral Pathol* 87:3, 1999
13. Pogrel MA, Lee JS, Muff DF. Coronectomy: a technique to protect the inferior alveolar nerve. *J Oral Maxillofac Surg.* 2004 Dec;62(12):1447-52
14. O'Riordan BC: Coronectomy (intentional partial odontectomy of lower third molars). *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 98:274, 2004
15. Dolanmaz D, Yildirim G, Isik K, Kucuk K, Ozturk A. A preferable technique for protecting the inferior alveolar nerve: coronectomy. *J Oral Maxillofac Surg.* 2009 Jun;67(6):1234-8.
16. Wang Y, He D, Yang C, Wang B, Qian W. An easy way to apply orthodontic extraction for impacted lower third molar compressing to the inferior alveolar nerve. *J Craniomaxillofac Surg.* 2012 Apr;40(3):234-7.

**Abbreviations**

IAN – Inferior Alveolar Nerve

IANI – Inferior Alveolar Nerve Injury

MC- Mandibular Canal

CBCT – Cone Beam Computed Tomography