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Mandibular third molar impaction vs. inferior alveolar nerve– A review

Dr. Vijay Ebenezer [(1)], Dr. Bala Krishnan [(2)], Dr. A. Aarthee [(3)]

1 Professor and Head of the Department, Department of Oral and Maxillo Facial Surgery, Sree Balaji Dental College and Hospital, Bharath University, Chennai – 600100, Tamil nadu.
2 Professor, Department of Oral and Maxillo Facial Surgery, Sree Balaji Dental College and Hospital, Bharath University, Chennai – 600100, Tamil nadu.
3 PG student, Department of Oral and Maxillo Facial Surgery, Sree Balaji Dental College and Hospital, Bharath University, Chennai – 600100, Tamil nadu.
Email id: aarthee1995dentist@gmail.com

ABSTRACT

Impacted third molar is more likely to have inferior alveolar nerve involvement. Surgical extraction of this tooth without proper evaluation of pre operative investigations can lead to neurovascular damage which will lead to sensory loss in lower lip that is extremely unpleasant to the patient. This review article is to gain knowledge about how to know the association of nerve injury in the surgical extraction of mandibular third molar and its preservation technique.

KEYWORDS : Impaction, nerve paralysis, IANB, Mandibular third molar

INTRODUCTION

Inferior alveolar nerve is the largest branch of mandibular nerve which runs beneath the external pterygoid muscle and then between sphenomandibular ligament and the ramus of the mandible to the mandibular foramen. It then advances inside the mandibular canal and exit through the mental foramen divides into mental and incisive branches. Inferior alveolar nerve innervates all the mandibular teeth, gingiva, skin and the mucous membrane over the lower lip. Thus, Inferior alveolar nerve block anesthetizes the mandibular teeth and the gingiva. There are many techniques to anesthetize the inferior alveolar nerve like conventional IANB, Gow- Gates technique, closed mouth / vazirani akinosi technique and Fischer 1, 2, 3 IANB technique [(1)]. Among that single penetration IANB technique by malamed SF have fewer complications [(2, 3)]. Injury to the inferior alveolar nerve leads to parathesia of the lower lip, skin over the chin, gingiva and lower teeth that may permanent or temporary. Risk of injury to the inferior alveolar nerve is quite higher in surgical extraction of impacted third molar tooth when compared to coronectomy procedure [(6)]. Coronectomy also have complications such as root migration, dry socket, trismus and infection.

RADIOGRAPHIC EVALUATION OF IAN RELATIONSHIP WITH MADIBULAR THIRD MOLAR

Radiographs such as Intra Oral Peri Apical radiograph, Orthopantomograph (OPG) are commonly used to assess inferior alveolar nerve relationship with the impacted mandibular third molar [8]. They are cost effective when compared to the three dimensional imaging technologies.

Howe and poyton classification [9]

In 1960, Howe and poyton suggested 7 radiological signs that is

1) Darkening of the root
2) Deflection of the root
3) Narrowing of the root
4) Dark and bifid root
5) Interruption of white line
6) Diversion of inferior alveolar nerve white line
7) Narrowing inferior alveolar nerve white line.

White line indicates the floor and roof of the mandibular canal. Any interruption in the canal will be appreciated by the absence of white line in the radiograph [10].

Winter's classification

In 1926, winter classified the position of third molar as

1) Horizontal
2) Vertical
3) Mesio angular
4) Disto angular
5) Inverted

Surgical extraction of horizontally impacted tooth which lie down along the course of inferior alveolar nerve and deeply positioned vertically impacted tooth has great chances to injure the inferior alveolar nerve. So care must be taken while planning to remove these impacted teeth.

Tube shift technique (SLOB rule)

By this technique we came to know whether the canal is buccal or lingual to that of the impacted third molar tooth [11]. Various factors influence the images of tube shift technique are 1) Distance between the mandibular third molar root and the inferior alveolar canal 2) Tube movement. If there is more distance between the inferior alveolar canal and the third molar root, there will be greater shift in the inferior alveolar canal. If there is no contact between the canal and the root, there will be no movement in the canal [18].

EVALUATION OF INFERIOR ALVEOLAR NERVE RELATIONSHIP USING CT and CBCT

Computer tomography (CT) and Cone beam computed tomography (CBCT) is a three dimensional imaging diagnostic aid which is accurate to find the approximation of inferior alveolar nerve with the

impacted tooth [13]. Their imaging voxels are same in all the three dimensional directions. So they have higher level of accuracy in reconstruction of the exact dimensions of the subject [12]. It can provide three dimensional views of the inferior alveolar nerve course, bucco lingual configuration, distance between the impacted third molar root and the canal, number of roots and root morphology [19].

CBCT can be used when white line interruption is appreciated in radiographic assessment. Higher radiation exposure is the main disadvantage associated with the three dimensional imaging technologies [14].

IINFERIOR ALVEOLAR NERVE PRESERVATON TECHNIQUES

CORONECTOMY

Coronectomy is defined as the partial extraction of crown part alone and by leaving the root inside the socket which is indicated primarily when close proximity between the inferior alveolar canal and the root of impacted mandibular third molar is found. Risk factors associated with the nerve injury includes older age (due to resorption of the alveolar process) and in case of increased depth of impaction [19]. Coronectomy is contraindicated in patients with chronic periodontitis and infected tooth.

CONCLUSION

Surgical extraction of impacted third molar tooth doesn't always involve inferior alveolar nerve. It can be evaluated by radiographic findings, computed tomography (CT) thereby reducing the risk associated with nerve injury. There are many techniques to avoid injury to the inferior alveolar nerve. Careful observation of investigations and surgical technique play a major role in the preservation of nerve.

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