CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.3497442

Available online at: http://www.iajps.com *Research Article*

IMPAIRMENT OF MYLOHYOID, INFERIOR ALVEOLAR AND LINGUAL NERVE IMPAIRMENT AFTER 3RD MANDIBULAR MOLAR REMOVAL

Dr Hamza Zahid[1], Dr Zunaira Ghafoor[2], Dr Muhammad Kamran[3]

[1] BDS MJDF RCS Eng MFDS RCS Edin LDS RCS Eng., [1]Akhtar Saeed Medical and Dental College, Lahore, [2] Dental Section, Faisalabad Medical University, Faisalabad, [3] Nishtar Institute of Dentistry, Multan.

Article Received: August 2019 **Accepted:** September 2019 **Published:** October 2019

Abstract:

Objective: *The aim of this study was to determine the frequency of sensory impairment of the mylohyoid, inferior alveolar and lingual nerves after the removal of inferior third molar.*

Methods: *From 1275 subjects; 2456 total third mandibular molars were removed, 585 of whom were operated under GA, and local anaesthesia was given in 690 with or without sedation.*

Study design: *A prospective study.*

Place and Duration: *In the Oral and Maxillofacial surgery department of Mayo Hospital Lahore for two year duration from March 2017 to March 2019.*

Results: *The transient sensory impairment was seen in 58 (4.57%) from 1275 patients. The anaesthetic impairment was observed in 15 (1.18%) of cases and remaining 43 (3.42%) patient's injury was paraesthetic in nature. All of them recovered totally through study duration, excluding for 1 subject who had a permanent damage in the function of the lingual nerve and was from the GA group.*

Conclusion: *In the inferior mylohyoid and alveolar nerves; no permanent sensory impairment was noted.*

Keywords: *Inferior alveolar nerve, lingual nerve, third molar, mylohyoid nerve, sensory disorder, paraesthesia.*

Corresponding author:

Dr Hamza Zahid,

BDS MJDF RCS Eng MFDS RCS Edin LDS RCS Eng

Email: zahidhamza25@outlook.com

QR code

Please cite this article in press Hamza Zahid et al., ***Impairment Of Mylohyoid, Inferior Alveolar And Lingual Nerve Impairment After 3rd Mandibular Molar Removal.,*** *Indo Am. J. P. Sci, 2019; 06(10).*

INTRODUCTION:

The third molar teeth surgical removal is the most common surgical method performed in most oral and maxillofacial units. The 3rd mandibular molars are the usually affected teeth. 92% of the removals are performed without grave complications [1-3]. Injury to the sensory, inferior alveolar and lingual branches of myeloid nerves resulting from surgical third molars removal is a rare but serious problem. The goal should be to decrease nerve damage risk with advanced and safe surgical methods [4]. The lingual nerve carries the sense of taste from the anterior 2/3rd of the tongue. Human body studies by McGeachie and Pogrel have shown that the lingual nerve is approximately 27.7 mm from the inner surface of the mandible and only the periosteum is separated from the bone. 15% of the nerve may lies on top or top of the mandibular lingual plate[5]. They also noted erraticism in the lingual nerve position on the opposite side. These anatomical differences and the close approach of the lingual nerve to the 3rd molar ensure that it is at risk during operation. Dysesthesia occurring in the early postoperative period was reported in 11.6%. The sensory impairment is labelled permanent, if remained above six months[6]. The everlasting sensory loss incidence reported varies from 0.08% to 4%. In the mandibular canal with the vessels, inferior alveolar nerve enters accompanying the mandibular canal and flows down and forward in the middle lateral direction within the bone channel below the teeth apex. It exits the bony canal in the mental foramen as a mental nerve with sensory supply to the inferior lip skin and mucosa [7]. The radiolucent band presence corresponding to the mandibular canal overlaid on the mandibular third molar root and the loss of the rigid lamina of the canal were significantly associated with postoperative sensory problems. The inferior alveolar nerve impairment incidence varies between 0.55% and the permanent damage rate is 1%. Feifel et al. demonstrated that CT scan of high-resolution is the most appropriate method to establish a root canal relationship [8]. Permanent sensory impairment after removal of the 3rd mandibular molars is 1% approximately. The nerve complications incidence increases with surgical difficulty and with age. The myeloid nerve leaves the inferior alveolar nerve before entering the mandibular canal. Run down and onward in the on the mandibular medial surface shallow groove, more or less parallel to the main nerve[9]. At this location, it is possible to retract the lingual cover and insert the Howarth elevator to remove the lingual plate after the chamber. The sensory component provides a small area of the chin's prominence.

MATERIALS AND METHODS:

This prospective study was conducted in the Oral and Maxillofacial surgery department of Mayo Hospital Lahore for two year duration from March 2017 to March 2019. From all patients informed consent was taken. The individuals were clinically evaluated and only patients with symptomatic 3rd molar teeth underwent surgical procedure for their extraction. The difficulty level was evaluated by surgical difficulty by evaluating the patient's clinical assessment and surgical cooperation and the position of the tooth on the orthopantomogram. According to perceived difficulty, the two groups were divided into local and general anaesthesia. For this study, 1351 subjects were included and 76 were omitted due to uncompromising medical history. From 1275 subjects; 2456 total third mandibular molars were removed, 585 of whom were operated under GA, and local anaesthesia was given in 690 with or without sedation and males were 512 (40%) and females were 763 (60%), aged between 16 and 40 years with 23 years mean age. The experience of surgeon varies from the specialist to the house surgeon, but no scrutiny was performed to distinguish the complication rate in terms of seniority. The purpose was to evaluate the efficacy of the surgical procedure. The distal incision was given along the outward curved peak to the gingival margin of the third molar partially erupting or to the oral distal face of the 2nd molar tooth. From the second molar, a relief incision was made downward and forward along the free mucosal line and adhered to first molar tooth distal surface. A Howarth Periodic Elevator was gently placed under the periphery in the distal lingual direction to loose reteteromolar tissues where it was at ease to recognise the subperiosteal plane. The flap was then raised forward to the second molar tooth distal surface. Precautions were taken not to tear the periosteum. The lingual flap was pulled without tension using a single Howarth Periodic Lift and moved either distally or mesially as needed to protect the lingual nerve. For bone extraction, low speed drills were used. Using vicryl 3.0 sutures, the wound was closed. In predesigned proforma, the operational notes were recorded (Table 1).

TABLE 1. INFORMATION RECORDED ON THE STUDY FORM

Information recorded before operation	
– Patients name, age, sex, hospital number and address	
– Operation side - right, left or both	
– Anaesthetic - general or local with / without sedation	
– Lingual flap raised - yes or no	
Information recorded at one week	
– Sensory impairment for each nerve	
Lingual - yes or no	If yes - right, left or both paraesthesia, anaesthesia, dysaesthesia
Inferior alveolar - yes or no	If yes - right, left or both paraesthesia, anaesthesia, dysaesthesia
Mylohyoid nerve - yes or no	If yes - right, left or both paraesthesia, anaesthesia, dysaesthesia
Follow up	
1 month	recovered - improved - no change
3 months	recovered - improved - no change
6 months	recovered - improved - no change
1 year	recovered - improved - no change

After discharge, the patient received written and verbal instructions for postoperative care. The 1st postoperative evaluation was performed seven days after the surgery. If there were any sensory impairment it was recorded. The response was checked with acute stimulation with probe, light touch with cotton and two-point discrimination using a divider as defined by McGrego and Ferdousi. The tests response was related with the normal side and alterations were documented. Patients with sensory disability were asked to have an additional examination at one, three and six months and 1 year after surgery or till full sensory recovery.

Data were analysed separately and together for general and local anaesthesia groups. For statistical analysis; Minitab software was used. To analyse the difference among groups; Chi-square test was used. Results were taken static if less than 0.05 P value was noted.

RESULTS:

One week after the operation, mylohyoid, inferior alveolar and lingual nerve sensory insufficiency was assessed in terms of local anaesthesia and general anaesthesia groups are summarized in Tables 2, 3 and 4.

TABLE 2: OVERALL INCIDENCE OF SENSORY IMPAIRMENT FOR **2456** MANDIBULAR THIRD MOLAR OPERATIONS FOR GENERAL AND LOCAL ANAESTHETIC GROUPS

Nerves	Numbers at one week	Numbers at one year
Lingual	74 (3%)	2 (0.08%)
Inferior alveolar	41 (1.7%)	0
Mylohyoid (sensory part)	5 (0.5%)	0.00

TABLE 3: INCIDENCE OF SENSORY IMPAIRMENT FOR **1097** MANDIBULAR THIRD MOLAR OPERATIONS FOR GENERAL ANAESTHETIC GROUP

Nerves	Numbers at one week	Numbers at one year
Lingual	60 (5.5%)	2 (0.08%)
Inferior alveolar	24 (2.2%)	0.00
Mylohyoid (sensory)	5 (0.5%)	0.00

In GA group; nerve complication ratio was higher significantly. (Table 5). Most of the nerves recovered in the 1st month of the surgery. In local anaesthesia group, 12 out of 14 and in 51 out of 60 for general anaesthesia group lingual nerve paresthesia was resolved.

TABLE 4: INCIDENCE OF SENSORY IMPAIRMENT FOR **1359** MANDIBULAR THIRD MOLAR OPERATIONS FOR LOCAL ANAESTHETIC GROUP

Nerves	Numbers at one week	Numbers at one year
Lingual	14 (1%)	0.00
Inferior alveolar	17 (1.2%)	0.00
Mylohyoid (sensory)	0.00	0.00

Except for two cases of the GA group, patients recovered completely within 3 months. The decrease in the paraesthesia area was good recovery sign. No improvement was seen in 2 (0.08%) patients after 1 year and were labelled permanent disabled.

TABLE 5: THE COMPARISON OF SENSORY IMPAIRMENT FOR LINGUAL AND INFERIOR ALVEOLAR NERVES FOR LOCAL AND GENERAL ANAESTHETIC GROUPS AT ONE WEEK POST OPERATION

Nerves	L A group	G A group	Significance level (P value)	x^2 and degree of freedom value
Lingual	14/1359	60/1097	<0.001	$x^2 = 40.9$, df = 1
Inferior alveolar	17/1359	24/1097	<0.07	$X^2 = 3.2$, df = 1

Most cases of sensory insufficiency of the inferior alveolar nerve improved within 3 months. However, in the GA group, 3 patients has sensory impairment lasted up to 6 months and 1 patient requires one year for full recovery. One week after the operation, the alteration between these groups was not significant statistically (P <0.07).

The myeloid nerve sensory component was impaired in five (0.5%) patients for the general anaesthesia group and no complications were observed in the local anaesthesia group. All of these improved within a month and took 13 weeks to recover.

DISCUSSION:

The incidence of sensory deficiency was recorded for the first time in one week following the surgical visit [10-11]. This protocol was adopted due to the difficulty of avoiding discomfort to the patient by calling the day after surgery and evaluating sensory innervation in the presence of discomfort and swelling [12].

Several analysis have been conducted to determine the frequency and reasons of sensory impairment of the inferior and lingual alveolar nerve after the third

mandibular molar surgery, so treatment plan can be improved to minimize this infrequent but problematic barrier. In his survey, Schawartz cited the different causes of lingual paresthesis [13]. The main causes were damage due to injection needle, lingual flap retraction, prolonged infection and anatomical anomaly, cysts or loss of the lingual plaque due to the inclined third molar in the lingual. Only one cause for this complication has not been found. In some cases, surgeons were surprised by these sequelae, which had easily openable effects. In other readings, distal lingual bone removal, depth of action and surgical methods are considered to be usual contributing factors. The placement of the Howarth Periodic Elevator can cause a crushing lesion of the lingual nerve and is not enough large to guard the nerve during lingual bone removal. We use Howarth Periodic Elevator to pull the lingual flap with great care to avoid damaging the lingual periosteum during going up [14]. All participants were recommended strongly to avoid tension in the lingual flap. In our analysis, the operator skill level was not determined. Though, in over-all, the easiest removal was performed by supervised young staff, and the most problematic teeth were detached by a senior surgical intern or consultant. The aim of doing this was to evaluate the procedure that is helpful for everyone and to anticipate the general need for postoperative follow-up. One week after the operation, the overall sensory insufficiency ratio of inferior and lingual alveolar nerve was 3% and 1.7%, and the annual permanent paresthesia was 0.08% and 0%, respectively. According to Blackburn and Bramley findings, the difference between general anaesthesia and local anaesthesia groups was statistically significant (P <0.001). In the GA group; the lingual nerve permanent damage was noted. This is because of selection criteria, most difficult cases have been performed under GA. Patient selection for general anaesthesia was based on perceived surgical difficulty based solely on clinical and radiographic examination. The pattern of nerve damage is probably neuro-toxic, since most cases have improved within a few weeks. The inferior alveolar nerve sensory impairment in permanent form was not observed [15]. The 1 year required for a patient to recover from sensory impairment in general anaesthesia group. The sensory impairment incidence in one week for general and local anaesthesia groups was 1.3% and 2.3%, respectively, and all were paraesthetic in nature. The alteration between these 2 groups was not significant statistically (P <0.07). Almost all of these were aesthetic in nature, and the decrease in sensory deterioration was a sign of good recovery. Muhonen et al; 32 of the inferior alveolar nerves had 7/550 (1.27%) dysesthesia and all improved within a few months. No previous studies have directly examined the involvement of the sensory branch of the mylohyoid nerve in the removal of the inferior third molar.

CONCLUSION:

The overall results are analogous to many earlier analysis and support the surgical protocol we follow in the surgical treatment of mandibular third molars. Careful use of Howarth's single periodic elevator gives better results. The operator's surgical experience does not seems to be directly linked to the sensory impairment incidence after the third mandibular molar surgery. Using the correct subperiosteal dissection technique, lingual flap is recommended as a safe procedure to prevent long-term damage to the lingual nerve. The permanent lingual nerve sensory impairment was seen in one case only. According to Pratt, few postoperative complications in this series led us to conclude that routine follow-up is not mandatory and only a selective postoperative review is recommended. Avoid discomfort to patients and recover the resources of health care.

REFERENCES:

1. MI, Thaufiq Ahamed, Naveen Jayakumar, and R. S. Neelakandan. "Incidence of neurosensory deficits following surgical removal of mandibular third molars: a prospective clinical study." *International Journal of Research in Medical Sciences* 7, no. 5 (2019): 1546.
2. MI, Thaufiq Ahamed, Naveen Jayakumar, and R. S. Neelakandan. "Incidence of neurosensory deficits following surgical removal of mandibular third molars: a prospective clinical study." *International Journal of Research in Medical Sciences* 7, no. 5 (2019): 1546.
3. Suda, Ryan, and Seth Herway. "LMA Morbidity: A Case of Unilateral Recurrent Laryngeal Nerve Palsy." In *Clinical Anesthesiology II*, pp. 267-281. Springer, Cham, 2019.
4. Shadlinski, V. B., and A. S. Abdullayev. "tHe CoURse, BRAnCHes oF tHe InFeRIoR ALveoLAR neRve AnD Its AnAtoMICAL FoRMs In tHe MAnDIBULAR CAnAL." *ECOLOGY, HYGIENE, PUBLIC HEALTH*: 47.
5. Pickens, Cassidy. "EFFECTIVENESS OF PROPHYLACTIC LINGUAL STRENGTHENING EXERCISES FOR PATIENTS WITH HEAD AND NECK CANCER A SYSTEMATIC REVIEW." (2019).
6. Hardiman, Rita, Omar Kujan, and Nabil Kochaji. "Normal Variation in the Anatomy, Biology, and

Histology of the Maxillofacial Region." *Contemporary Oral Medicine: A Comprehensive Approach to Clinical Practice* (2019): 1-66.

7. Yoshida, Kazuya. "Botulinum Neurotoxin Therapy for Lingual Dystonia Using an Individualized Injection Method Based on Clinical Features." *Toxins* 11, no. 1 (2019): 51.
8. Pasquini, L., and A. Bozzao. "Imaging of Trigeminal Neuralgia." In *Pain Imaging*, pp. 83-118. Springer, Cham, 2019.
9. Sudiwala, Sonia, and Sarah M. Knox. "The emerging role of cranial nerves in shaping craniofacial development." *genesis* 57, no. 1 (2019): e23282.
10. Klein, Amanda H. "The orotrigeminal system." In *Handbook of Clinical Neurology*, vol. 164, pp. 205-216. Elsevier, 2019.
11. Felix, Cecilia C., Megan E. Joseph, and Stephanie K. Daniels. "Clinical Decision Making in Patients with Stroke-Related Dysphagia." In *Seminars in speech and language*, vol. 40, no. 03, pp. 188-202. Thieme Medical Publishers, 2019.
12. Whyte, A., Boeddinghaus, R., & Matias, M. A. T. J. (2019). Diagnostic Imaging Principles and Applications in Head and Neck Pathology. *Contemporary Oral Medicine: A Comprehensive Approach to Clinical Practice*, 173-253.
13. Whyte, Andy, Rudolf Boeddinghaus, and Marie Anne Teresa J. Matias. "Diagnostic Imaging Principles and Applications in Head and Neck Pathology." *Contemporary Oral Medicine: A Comprehensive Approach to Clinical Practice* (2019): 173-253.
14. Aletribi, Alaa Mostafa. "Two Different Designs of the 4-Implants Used for Assisting Mandibular Complete Overdentures: Clinical Evaluation." PhD diss., Mansoura University, 2019.
15. Orhan, Kaan, and Franciszek Burdan. "Connection Between the Temporomandibular Joint and Temporal Bone." In *Imaging of the Temporomandibular Joint*, pp. 323-359. Springer, Cham, 2019.