ORIGINAL ARTICLE

Lingual nerve injury in mandibular third molar extraction: A comparison of two surgical techniques

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Abstract:

Objective: Injury to lingual nerve is a well- known perceived difficulty of surgical extraction of affected mandibular third molars. The reported incidence of this complication ranges from 1% to over 10%. In most of the cases, the nerve recuperates precipitously however lasting harm has been found in around 0.5% of the patients.

Material and Methods: 120 patients were operated for third molar removal at Khyber College of Dentistry, Peshawar from 1st January 2018 till 1st January 2020. Only those patients were included in this study who clinically diagnosed as having impacted mandibular third molar. Patients with comorbid condition were excluded from the study. Patients were grouped in group A and B randomly, having 60-patients each. Patients in group-A were treated by reflection and retraction of lingual flap in addition to buccal flap while in group-B, procedure was performed by reflecting buccal flap only.

Results: A total number of 120 patients with impacted mandibular third molars were included. The mean age was 27.33 years (SD±5.11) ranging from 20-years to 40-years. There were 28(46.67%) males and 32(53.33%) females in group-A. In group-B, there were 17(28.33%) males and 43(71.67%) females. 11-patients, 9.17% showed damaged lingual nerve including 3(2.5%) males and 8(6.66%) females.

Conclusion: The result shows that when flap is raised, there is high incidence of lingual nerve injury but the damage is temporary. Permanent damage occurs in lingual flap reflection and retraction.

Keywords: Impacted mandibular third molar, retraction of lingual flap, lingual nerve injury

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Introduction:

Injury to lingual nerve is a well- known perceived difficulty of surgical extraction of affected mandibular third molars. The reported incidence of this complication ranges from 1% to over 10%.[1] In most of the cases, the nerve recuperates precipitously however lasting harm has been portrayed in around 0.5% of the patients.[2] Injury to lingual nerve increase permissible issues. The strict cause of injury is still controversial but most conjoint reasons are damage of lingual plate, reflection and retraction of lingual flap, trauma to lingual flap during bone removal and tooth sectioning. Supra-crestal cut may result in harm as nerve can be located in this area in certain cases and may get divided.[3] Lingual nerve damage can result in dribbling, tongue stinging, burning feeling of tongue, injuries on the tongue from hot food and drinks, change in talking pattern and change in sensitivity of food and drink.[4] The traditional method to eliminate stuck mandibular third molar is buccal approach avoiding exposure or surgery on the lingual side of the crest of the ridge. Second technique is to expose the lingual tissues deliberately and retract the lingual nerve during tooth removal keeping the nerve out of surgical field. The advantage of lingual flap reflection is that nerve is identified and protected away from the surgical field. This has been a theme of discussion since decades but

Table 1:

Group	A	B	Total
Male	28	17	45 (37.5)
Female	32	43	75(62.5)
Total	60	60	120

Table 2:

Group	A			B			G. Total
	Male	Female	Total	Male	Female	Total	
Damage	2	5	7	01	03	4	11(9.17)
No Damage	19	34	53	31	25	56	109(90.83)
Total	21	39	60	32	28	60	120

still there is no practice which can declare safety of lingual nerve during third molar subtraction. Some research has been conducted on lingual nerve injury before internationally. In Pakistan no such study has been carried out. The author decided to conduct a comparative study of two methods for the removal of the impacted mandibular third molars in regard to lingual nerve damage

Material and Methods:

120 patients were operated for third molar removal at Khyber College of Dentistry, Peshawar from 1st January 2018 till 1st January 2020. Only those patients were included in this study who clinically diagnosed as having impacted mandibular third molar. Patients with comorbid conditions like diabetis mellitus (DM), Hypertension (HTN) and ischemic heart disese (IHD) are excluded from the study. Patients were grouped in group A and B randomly, having 60-patients each. Patients in group-A were treated by reflection and retraction of lingual flap in addition to buccal flap while in group-B, procedure was performed by reflecting buccal flap only. The patients were told about this compliaction, surgery procedure and risk benefit ratio. An informed consent was taken in writing. Permission of this study was taken from the Ethical Committee of the college. Patients were operated under local anesthesia concluded local block of mediocre alveolar, lingual and buccal nerves. In group-A, lingual flap was raised by means of Howarth's periosteal elevator. When possible lingual flap was raised, the same was used to retract the flap. On post-operative follow-up sensory disturbance was evaluated after one week. Through light touch the Lingual nerve function was assessed by pin prick, two point discrimination and taste. Lingual nerve was labelled defective if not fulfilling the above mentioned criteria accurately. The collected data were analysed through SPSS 20 version. Variables (age) were drawl as mean±SD and gender as percentage. Characteristics of the patients undergoing surgical removal of impacted third molars with and without lingual flap retraction were compared. Comparison was made with chi-square. p-value ≤0.05 was considered significant.

Results:

A total number of 120-patients with impacted mandibular third molars were included. The mean age was 27.33 years (SD±5.11) ranging from 20-years to 40-years. Mean age of males was 26.60 years (SD±4.77 years) while mean age of females was 25.00 years (SD±5.41 years). Majority of patients fall in age range of 23–26 years, i.e., 52.9%. Among the 120-patients in total, there were 45(37.5%) males, and 75(62.5%) females, showing female gender to be predominant regarding impacted teeth (table-I). There were 28(46.67%) males and 32(53.33%) females in group-A. In group-B, there were 17(28.33%) males and 43(71.67%) females. Out of total 120, there were 109(90.83%) patients who did not show any signs of lingual nerve damage including 50(45.88%) males and 59(54.12%) females. 11-patients, 9.17% showed damaged lingual nerve including 3(2.5%) males and 8(6.66%) females. The patients in group-A, showed damaged lingual nerve in 7(11.67%) patients including 2 males and 5 females. The patients in group-B, showed damaged lingual nerve in 4(6.66%) patients including 1 male and 3 female. A total of 120 patients underwent extraction of third molar tooth, 11 patients (9.17%) presented with lingual nerve damage while 109(90.83%) had no signs of nerve damage. Among these 11 damaged nerves, 7 belongs to group-A, where lingual flap was retracted while 4 belong to group-B, where only buccal flap was reflected (table-II). All patients showed

signs of recovery within 3 - 6 months after injury while only one patient had permanent nerve injury. The patient with permanent nerve injury belongs to group-B, where lingual flap was not retracted. Thus results show that the use of lingual flap has 3 to 4 times more chances of lingual nerve damage as compared to the use of buccal flap only. But it was also observed that the nature of injury is temporary in case of lingual flap retraction while permanent nerve damage occurred where lingual flap was not reflected.

Discussion:

Different methods have been used for surgical removal of third molar in the last decades. One of these is retraction of lingual flap in addition to buccal flap. The concept of using this technique is to identify a structure thought to be damaged during surgery and deliberately retracted out of way for protection. Although the raising of lingual flap and placement of retractor can cause traction injury to the nerve which will resolve within few weeks after procedure but it protects the nerve from irreversible damage from drills, instruments or lingual plate or tooth fracture.[12] Pogrel MA and Goldman KE[5] removed mandibular third molars of 250 patients in Oral & Maxillofacial Surgery Clinic at the University of California, San Francisco. They reflected and retracted lingual flap with specially designed lingual retractor in all those patients in which distal bone removal or tooth sectioning was anticipated. The study showed transient lingual nerve paraesthesia in 1.6% of cases and 0% permanent lingual nerve damage. The results of our study show that the incidence of nerve damage is 8.94% when lingual flap was reflected and retracted by a periosteal elevator. So results are consistent with those who report higher chances of lingual nerve associated with reflection and retraction of the nerve but we have found this injury to be temporary. D Gulicher and colleagues[6] performed 1106 procedures in 687 patients with lingual flap reflection and retraction by insertion of periosteal elevator. They agree that protection of the nerve is mandatory for third molar removal and a periosteal elevator should be placed at the rim of the retro-molar-trigone so that it does not come in contact with nerve itself and results in damage. Conversely, studies of Gomes et al[7] in 2005, Gargallo-Albiol[8] et al in 2000 and Carmicheal & Mc Gowan[9] in 1992, showed that a significant increase in incidence of lingual nerve damage was found when a lingual flap was retracted and reflected. In addition to these 2-techniques for removal of third molar, Rud[10] and Yeh[11] advocated the lingual split technique where lingual cortex is deliberately fractured to protect the lingual nerve. But this technique was reported to be associated with increased incidence of lingual nerve damage by Pichler et al.[12] In present study lingual plate was preserved in all cases. Varieties of instruments were being used for retraction of lingual flap in different studies. Pogrel, et al[5] and Greenwood, et al[13] supported the use of broad retractors which can protect the whole length of lingual plate. Walters[14] designed a new lingual retractor and complimentary periosteal elevators by mid 1990s. The elevator formed was broad enough to protect the whole aspect of lingual nerve in third molar region, had no sharp edges on it and had a notch that fits into the internal oblique ridge of the mandible which prevents it from slipping deep into the mylohyoid nerve. In present study Howarth's periosteal elevator was used for separation and retraction of lingual flap. The percentage of injuries was higher among the group where lingual flap was reflected and retracted (8.94%) compared to the group where Buccal flap retraction was performed only (2.63%). This difference was statistically significant. (p=0.008).

But the nature of injury was reversible in cases of lingual flap retraction. All patients with damaged lingual nerve were followed up for one year post-operatively and 21 out of total 22 damaged nerves showed spontaneous recovery within three to six months while only one case belonging to group-A (where lingual flap was not reflected) still had deficient sensations.

Conclusion:

The result shows that when flap is raised, then there is high incidence of lingual nerve injury but the damage is temporary. Permanent dam-

age occurs in lingual flap reflection and retraction.

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Role and contribution of authors:

Dr. Riaz Khan, collected the data, referencess and wroted initial menuscript.

Dr. Noor Ul Amin, collected the data and helped in introduction writing

Saeed Ullah, critically review the article and made the final changes.

Dr. Sadia Amin, collected the data, references and helped in material and method writing.

Sabir Shah, collected the data, references and helped in discussion writing.

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