

Frequency of Lingual Nerve Damage during Surgical Removal of Impacted 3rd Molar

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ABSTRACT

Introduction: Professional skills, training and experience is mandatory for removing impacted 3rd molars with aid of local/general anesthesia, sedation. As for symptomatic 3rd molars decision for removing is not difficult usually, but for removing asymptomatic 3rd molars decision is less clear & requiring good clinical experience.

Objective: The objective this study was to determine frequency of lingual nerve damage during surgical removal of impacted 3rd molar

Design: Descriptive cases series

Study Setting: This study was conducted at Department of Oral and Maxillofacial Surgery, Sandeman Provincial Hospital Quetta over 6 months (April 10, 2018 till Oct 10, 2018).

Materials and Methods: All 149 cases after approval of hospital ethical committee fulfilling the inclusion criteria were included in this study. After clinical and radiographic diagnosis of affected tooth like depth, position or any other difficulty, the surgical procedure was selected. An impacted tooth was labeled when it was failed to explode into the dental arch within the expected developmental window. After operation surgical sites of all patients were reviewed by the same consultant after 7 days. It was instructed to all patients that report any problem in lingual sensation; by clinical examination sensory deficits were recognized bilaterally.

Results: The mean age of all cases was 29.82 ± 6.81 years with minimum and maximum age of 18 and 40 years. There were 83(55.7%) male and 66(44.3%) were females. According to types of impaction 22(14.8%) cases had Mesioangular, 10(6.7%) had Horizontal, 12(8.1%) had Vertical, 17(11.4%) had Distoangular, 14(9.4%) had Class I, 15(10.1%) had Class II, 11(7.4%) had Class III, 14(9.4%) had Class A, 16(10.7%) had Class B and 18(12.1%) cases had Class C. A total of 16(10.7%) cases had inguinal injury in this study.

Conclusion: This study concludes that 10.7% cases had inguinal injury in this study. So, this procedure of impacted mandibular third molar is associated with minor but expected complications like the lingual nerve damage. Hence, preoperative and intraoperative consideration must be taken up to reduce this preventable complication.

Keywords: Impacted tooth, 3rd molar, surgery, complications, lingual nerve damage

INTRODUCTION

Tooth impaction involves failing of tooth for attaining a functional position that is normally attained. Impacted 3rd molars are encountered commonly and routinely in dental practice. The rate of impaction is greater for 3rd molars as compared to other teeth. The mandibular 3rd molar impaction is because of inadequate space in between distal area of 2nd mandibular molar & anterior area of ascending mandibular ramus. These impacted teeth may be related with several pathologies for example caries, tumors, pericoronitis and cysts, & also root-resorption in adjacently located tooth or these may be asymptomatic.¹ The 3rd molar surgery is commonly performed procedure in maxillofacial and oral surgery offices.² Some sensory changes like pain is present because of lingual nerve injury.^{2, 3} Usually these alterations are temporary but other complications that are not as much common, for example fungiform papillae atrophy, show an uncertain prognosis.² Impacted mandibular 3rd molar teeth closely located to lingual, mylohyoid, inferior alveolar & buccal nerves.² Most cases show temporary sensory disturbances, although permanent may also be present as some diagnosis, dysaesthesia that is unpleasant abnormal sensation,

hypoesthesia that is reduced sensation. Direct or sometimes indirect forces may lead to damaging of nerves.⁴ Because of nerve's anatomical location direct trauma may occur to lingual nerve during several surgical procedures, for example. those for trauma management, cysts, pre-prosthetic problems, tumors & orthographic surgery, instruments caused damage, & third molars removal most commonly.^{3, 4} The association in anatomical structures for retromolar region complicates procedures that are executed for this region, mandibular 3rd molar extraction is a frequent surgical procedure accomplished there. These procedures if performed by inexperienced professional causes risks for lingual nerve.⁵

There were reported 18 cases of total 300 for example 6% with lingual damage of nerve after impacted 3rd molar extraction. It was also reported that lingual damage of nerve when operated by Assistant Professor & Registrar was 4.54%, when by Post Graduate Students was 6.6%, when by Dental practitioners was 7% & by house-surgeons was 10%, respectively.⁶ One more study in 2011 shows that of total 90 patients overall lingual nerve frequency was 6.6%.⁷

The rationale of this study is to determine frequency

of lingual nerve damage after third molar extraction. There are limited data available on local population and international studies are also done with almost similar incidence of Lingual nerve injury in third molar extraction. If we find higher incidence then in future pre considerations was adopted to prevent the complications. It will be labeled as positive if patient having a history or complain of numbness on seventh postoperative day on probing .If there is no pain on probing we consider it as lingual nerve damage.

MATERIALS AND METHODS

This descriptive case study was completed in 6 months after approval of synopsis (April 10, 2018 till Oct 10, 2018) at department of Oral and Maxillofacial Surgery, Sandeman Provincial Hospital Quetta. Non-probability consecutive sampling was used to collect data from 149 cases the sample size was estimated using expected frequency of lingual nerve injury as 6.6%.⁷ We used 95% confidence level and 4% margin of error. Patients aged 18-40 years of either gender planned for surgical removal of impacted mandibular third molar were included while medically compromised patients such as with diagnosis with cardiovascular diseases (on echo), liver disease (deranged lipid profile), renal failure (when renal function test show, creatinine greater than 1.7mg/100ml), cases with history of diabetic nephropathy, chronic smokers were excluded from the study. All 149 cases after approval of hospital ethical committee fulfilling the inclusion criteria were taken from Department of Oral and Maxillofacial Surgery, Sandeman Provincial Hospital Quetta. All data regarding demographic profile (name, age, sex, contact no.) will also be taken after obtaining Informed consent from patients or attendants. After clinical and radiographic diagnosis of affected tooth like depth, position or any other difficulty, the surgical procedure was selected. An impacted tooth was labeled when it was failed to explode into the dental arch within the expected developmental window. There are several types of impacted tooth assessed on OPG. A single doctor was performed all the procedures. Among all cases buccal approach using atrapezoidal mucoperiosteal flap was used. All surgeries were done using the same instruments of surgery using local anesthesia (lidocaine hydrochloride 2% with adrenaline 1:80, 000) with local tissue infiltration and inferior alveolar nerve block. After operation surgical sites of all patients were reviewed by the same consultant after 7 days. It was instructed to all patients that report any problem in lingual sensation; by clinical examination sensory deficits were recognized bilaterally.

Lingual nerve injury was labeled as an abnormal altered or absent sensation in tongue region, either unilateral or bilateral, all data was recorded by research herself on attached proforma. All collected data was entered and analyzed using SPSS version 20. All qualitative data like gender, types of impacted tooth (Mesioangular, Horizontal, Vertical And Distoangular, Class A,B,C Class I,II,III) and lingual nerve injury was presented in the form of frequency (%). Mean ± standard deviation was used to express the continuous variables like age. Data was stratified for age and gender. Post stratification Chi-square test was calculated by considering p-value ≤ 0.05 as significant.

RESULTS

The mean age of all cases was 29.82 ± 6.81 years with minimum and maximum age of 18 and 40 years. There were 68(45.6%) cases were 18-29 years old and 81(54.4%) cases were 30-40 years of age. There were 83(55.7%) male and 66(44.3%) were females. According to types of impaction 22(14.8%) cases had Mesioangular, 10(6.7%) had Horizontal, 12(8.1%) had Vertical, 17(11.4%) had Distoangular, 14(9.4%) had Class I, 15(10.1%) had Class II, 11(7.4%) had Class III, 14(9.4%) had Class A, 16(10.7%) had Class B and 18(12.1%) cases had Class C. A total of 16(10.7%) cases had lingual injury in this study. When data was stratified for age, the frequency of lingual injury was statistically same in both age group i.e. 9(13.2%) in 18-29 years age group and 7(8.6%) cases in 30-40 years of age group, p-value = 0.367. Among male and female cases, the frequency of lingual nerve injury was also statistically same i.e. in male it was seen in 7(8.4%) and in female cases was 9(13.6%), p-value 0.308.

Table -1: Frequency distribution of types of impaction

Parameter	Category	Frequency	Percent
Mean age	29.82±6.81 years		
Age groups	18-29	68	45.64
	30-40	81	54.36
Gender	Male	83	55.7
	Female	66	44.3
Types of Impaction	Mesioangular	22	14.8
	Horizontal	10	6.7
	Vertical	12	8.1
	Distoangular	17	11.4
	Class I	14	9.4
	Class II	15	10.1
	Class III	11	7.4
	Class A	14	9.4
	Class B	16	10.7
Lingual nerve injury	Yes	16	10.74
	No	133	89.26

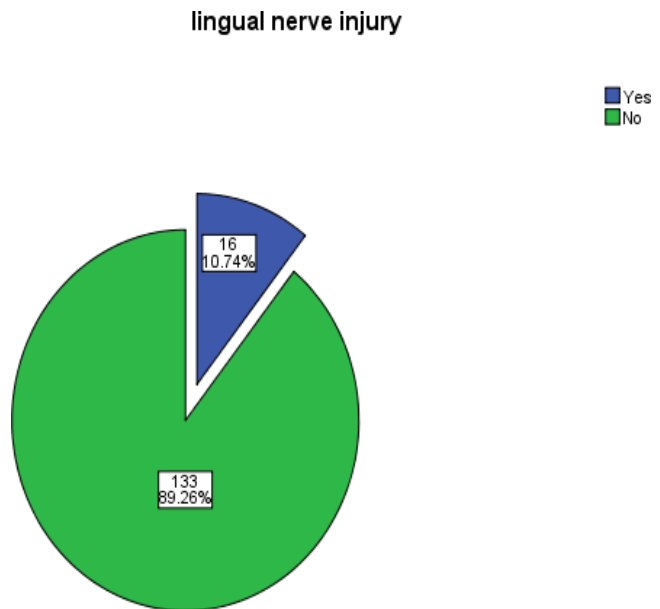


Fig-3: Frequency of distribution of lingual injury

Table – 2: Comparison of lingual nerve injury with respect to age groups (years)

		lingual nerve injury		Chi-square / p-value
		Yes	No	
Age (years)	18-29	9(13.2%)	59(86.8%)	0.814/ 0.367
	30-40	7(8.6%)	74(91.4%)	
Gender	Male	7(8.4%)	76(91.6%)	1.038 / 0.308
	Female	9(13.6%)	57(86.4%)	

DISCUSSION

Researchers are attempting to establish proper clinical-practice guidelines that allows for dealing of impacted teeth⁸. Oral and Maxillofacial surgeons commonly perform surgeries for removing 3rd mandibular molar teeth⁹. The impacted tooth fails to erupt in dental-arch following an expected time because of less space in dental-arch, dense and overlying bone, soft tissues becoming excessive, hereditary abnormalities & different pathologies associated with erupting tooth. Impacted mandibular 3rd molars may be related with several problems which also includes pericoronitis, periapical infection, dental caries & adjacent tooth root resorption. They also cause different lesions requiring impacted tooth removal¹⁰.

Pain, dry socket, hemorrhage, regional nerves injury & mandible fractures are some of complications associated with this procedure. Damage of Lingual nerve damage is frequently associated with 3rd molar removal. Patient age, depth and angulation of impacted tooth, ramus bone that is over laying, surgeon skill & surgical methods used are main factors increasing risks of LN injury in procedure¹¹. As for incidence range of transient LN damage it is reported as 0% to 23% in literature and for permanent LN sensory disturbance alters from 0% and 8%¹².

Preventing LN injury after 3rd molar surgery has been a focus of researchers recently. Lingual flap- retraction causes improvement of accessing surgical site & simplifying 3rd molar removal. Cheunget al, in his study reported the LN damage frequency during removal in surgery of impacted mandibular 3rd molar with lingual flap-retraction as 0.91% and that without lingual flap- retraction as 0.58% with no statistically significant difference $p = 0.58$ ¹⁴. One local study, reported frequency for LN injury in surgical extraction for impacted mandibular 3rd molar with lingual flap-retraction was noted as 10% and without lingual flap-retraction was noted as 1% with sample size taken as 300 cases¹⁵. In present study 16(10.7%) subjects showed LN damage. Another study reported incidence rate for LN injury as 6.6%. It may be associated to anatomical variations for LN¹⁶. This was less for above cited & literature and present study¹⁵.

Retraction of Lingual flap has 3.4 times increased chances of LN damage in mandibular 3rd molar extraction when retraction is done but damage is possibly reversible. Researchers demonstrated that LN damage can occur in 8.94% for Group A for which retraction of lingual flap is performed but damage is reversible. For group B, 2.63% LN damage is observed & damage is permanent. There was statistically significant difference ($p=0.008$)¹⁷.

CONCLUSION

This study concludes that 10.7% cases had inguinal injury

in this study. So, this procedure of impacted mandibular third molar is associated with minor but expected complications like the lingual nerve damage. Hence, preoperative and intraoperative consideration must be taken up to reduce this preventable complication.

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