

## FREQUENCY OF NERVE INJURIES FOLLOWING EXTRACTION OF IMPACTED MANDIBULAR 3RD MOLARS

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### ABSTRACT

**Objective:** The aim of the study was to know the frequency of the nerve injury following mandibular impacted third molar surgery.

**Methodology:** This study was carried out on 60 patients planned for extraction of impacted mandibular third molar under local anaesthesia in the Department of Oral & Maxillofacial surgery, Ayub Medical College Abbottabad from April 2007 to December 2007. All the 60 patients were operated for their impacted mandibular third molars after thorough evaluation based on history, clinical and radiological assessment. The patients were assessed for nerve injuries till 4th post extraction day.

**Results:** Female (60%) predominated male (40%), with the female to male ratio of 3:2. The age range was 18-40 years. Lingual nerve injury was noticed in 6 patients cases (10%). Inferior alveolar nerve injury was observed in 3 patients (5%).

**Conclusions:** In this study lingual nerve injury was more common than inferior alveolar nerve injury.

**Key words:** impaction, third molar, nerve injury.

### INTRODUCTION

Common complications of mandibular third molar surgical extraction includes pain, dry socket, infection, sensory nerve damage, trismus, iatrogenic damage to the adjacent second molar and mandibular fracture<sup>1</sup>. The frequency of complications reported in different literature is 6.7%, 12.6% and 14.5%<sup>2,3,4</sup>. Clinical and radiographic assessment are important variables in predicting difficulty in impacted third molar surgery and post surgical complication. Vertical and mesioangular third molar impactions are closely related to the inferior alveolar canal and this may represent an independent risk factor for nerve injury<sup>5</sup>.

Inferior alveolar nerve injury during impacted third molar surgery is an unusual but important complication<sup>6</sup>. The rate of these complications varies from 5% to 7% of temporary injuries and from 0.5% to 1%

of permanent injuries. The risk increases when there is a true approximation between an impacted molar and the mandibular canal<sup>7</sup>.

The reported incidence of injury to the lingual nerve after third molar extraction has a range of 0.6% to 2.0% by Pogrel et al<sup>8</sup> and 0.2 to 10% by Holzle et al<sup>9</sup>. The anatomic position of the lingual nerve relative to the lingual cortex in the region of the lower third molar is important and has been studied on cadavers, patients, and also with the help of imaging techniques such as magnetic resonance imaging<sup>10</sup>. Risk factors for the lingual nerve damage during the third molar surgery are deep bony impaction, distoangular angulation extension of root on to the lingual plate, anatomical variation of the lingual nerve, incision too far to the lingual side, bone removal, disto-lingually or lingual plate penetration of the bur, tooth sectioning, lingual flap elevation, retraction of the lingual flap, fracture of the lingual plate, resorbed lingual plate, stripping of the dental follicle adhering to the lingual tissues, recurrent pericoronitis and lingual side exploration<sup>11</sup>.

Injury to the nerve can be either neuropraxia,

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axonometesis and neurotemesis. In case of inferior alveolar nerve manifested as a sensory disturbance of the lower lip and chin up to the midline while lingual nerve injury manifest itself as numbness or sensory disturbance of half side of tongue on the affected side<sup>12</sup>.

The exact etiology of inferior alveolar nerve injury is imprecise and multi-factorial. Studies showed that mechanical injury from chisels, burs or elevators was most likely<sup>13-17</sup>. Howe and Poyton<sup>18</sup> concluded that crushing or tearing of the nerve from movements of the teeth was most likely cause, particularly if the inferior alveolar nerve have grooved or perforated the tooth. Crushing of the roof of the inferior alveolar nerve canal onto the inferior alveolar nerve has also been implicated. There is also an increased risk of inferior alveolar nerve damage with advancing age and difficulty of extraction<sup>18</sup>.

The purpose of this study is to find out the frequency of nerve injury following mandibular third molar surgery and their clinical manifestation.

**METHODOLOGY**

This study was carried out in the Department of Oral and Maxillofacial Surgery Ayub Teaching Hospital, Abbottabad during the period from 11<sup>th</sup> April 2007 to 10<sup>th</sup> December 2007. A total of 60 patients were recruited in this study irrespective of gender and age. These patients underwent surgical removal of impacted third molars under local anesthesia. Patients having active infection at the time of surgery, having diabetes and patients on steroids were excluded from this study.

Orthopantomogram and Periapical radiographs were taken to assess the type of impaction and relation of root with inferior dental canal. Procedure and protocol were explained to the patients and informed consent was taken. Extractions were planned according to the clinical and peri-apical radiographic position of impacted third molar in relation to second molar. After extraction same medications were prescribed and routine post extraction instructions were given. On 4<sup>th</sup> day of surgery patient was assessed for lingual and inferior alveolar nerve injuries. Those having subjective and objective signs of nerve injury were recalled for follow up after two weeks, one month and two months interval.

Lingual nerve injury was subjectively assessed by

asking the patient if there was any feeling of numbness or any sensory alteration in his/her tongue. Patient were asked about any numbness in his/her lower lip to evaluate inferior alveolar nerve injury. Patient were assessed clinically by two point discrimination, light and crude touch and thermal testing. All the necessary information gathered about the variables of the study were recorded on a specially designed proforma.

The data was entered into SPSS version 17. All variables were presented as nominal data. Descriptive statistics were used to calculate mean and standard deviation for age of the patients. Percentages were calculated for nerve injury and gender of the patients.

**RESULTS**

Out of total 60 patients 40% were male, while 60% were female with a male to female ratio of 2:3. The age distribution of these patients were such that 53% were in the age group 18-25 years followed by 35% in the age group 26 to 35 years of age group. The details are given in the Table-1.

Nerve injury was noticed in 15% of the cases, in these majority were of the lingual nerve (66.67%) details are given in Table- 2.

Table 1. Age distribution

Age group in years	n	%
18- 25	24	53
26-35	22	35
36- 40	14	12
<b>Total</b>	<b>60</b>	<b>100</b>

Table 2. Frequency of nerve injury

Nerves	n	%
Lingual nerve	6	66.67
Inferior alveolar injury	3	33.33
<b>Total</b>	<b>9</b>	<b>100</b>

**DISCUSSION**

The US national institutes of health recommend that patients should be informed of potential surgical risks including any transitory condition that occurs with an incidence of greater than 5% and any permanent condition with an incidence of greater than 0.5%<sup>19</sup>. The factors that usually contribute to such problems are numerous and include patient related,

tooth related and the surgeon's operative experience.

In this study the age range was 18-40 years. This correlates with the studies of Lysell and Rohlin<sup>20</sup> and Jerjes et al<sup>21</sup>. However the results of mean age differ from Leone and Edenfield<sup>22</sup>, Knutsson et al<sup>23</sup>, and Venta et al<sup>24</sup>. Most of the patients came for surgery in the age range of 18 to 25 years (53%). The reason was recurrent pericoronitis because of partial eruption.

In this study 60% of the patients were females as compared to 40% males. The results of this study coincide with that of Knutsson et al<sup>23</sup> and Sasano et al<sup>25</sup> while different from the studies conducted by Bamgbose<sup>26</sup> and Haq<sup>27</sup>.

Lingual nerve injury was noticed in six cases (10%). These patients were having subjective feeling of numbness on half side of tongue. Objectively in two patients there was disturbed fine and crude touch, abnormal two point discrimination while in four cases only fine touch response was disturbed. Response to painful stimuli was intact in all cases. The reported frequencies of injury to the lingual nerve after third molar extraction have a range of 0.6% to 2.0%<sup>8</sup> and 0.2 to 10%<sup>9</sup>. The frequency of lingual nerve damage was determined as 6% in a prospective study carried out at Khyber College of Dentistry Peshawar<sup>5</sup>.

In this study the frequency of lingual nerve damage is higher than the studies performed by Pogrel<sup>8</sup>, Chiapasco<sup>28</sup>, Francois Blondeau<sup>29</sup>. The reason for this is that most patients presented were having history of recurrent pericoronitis. Moreover lingual flap retraction with periosteal elevator method was used and all the surgeries were performed by post graduate trainees; recurrent pericoronitis, less experience and lingual flap retraction are known risk factors for lingual nerve damage<sup>30</sup>.

Inferior alveolar nerve injury was observed in three (5%) of cases. These patients were complaining of abnormal sensation on half side of the lower lip. Clinically, in all patients, there was abnormal two point discrimination disturbed fine and crude touch while the nociception response was intact. This study correlates with the studies of Smith et al<sup>6</sup>, Brann et al<sup>31</sup>. The frequency of inferior alveolar nerve damage was 3.67% in a prospective study carried out at Khyber College of Dentistry Peshawar<sup>5</sup> which is less than this study. The reason might be that 47% of the patients were above 25 years and according to Howe

and Poyton<sup>18</sup> advancing age is a risk factor for trauma to inferior alveolar nerve. However all cases of lingual and inferior alveolar paresthesia were transient and no prolonged altered sensations were observed after two months which correlates with the studies of Smith et al<sup>6</sup>.

## CONCLUSION

From the results of this study it is concluded that:

1. Impacted mandibular third molar surgery can lead to nerve injury complications.
2. Lingual nerve injury shows considerably high percentage and need a lot of attention and further research.
3. Preoperative evaluation and experience of the operator may reduce nerve injury complication during third molar extraction.

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