

## A STUDY OF DIFFERENT PREDISPOSING FACTORS ON LINGUAL NERVE DAMAGE DURING LOWER THIRD MOLAR SURGERY

\*ABDUL WAHID, BDS

\*\*MOHAMMAD ISHFAQ, BDS, FCPS

\*\*\*ASHFAQ-UR-RAHIM, BDS

\*\*\*\*ABDUS SALAM, BDS, MDS, FCPS

### ABSTRACT

*Damage to lingual nerve is one of the common complications of the removal of mandibular third molars. A random data was collected in the Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar. Effects of different factors (age and sex of the patient, experience of the operator and surgical method employed) were documented. Purpose of the study was to determine the frequency of lingual nerve damage and the effects of different variables on lingual nerve damage during the removal of mandibular third molars. It was shown in this study that age of the patient, sex of the patient and side of the lower jaw (right or left) operated has no significant effect on the frequency of lingual nerve damage, while experience of the surgeon and elevation of the lingual flap during extraction of the lower third molar significantly effects the frequency of lingual nerve damage. It is suggested that lingual flap elevation should be avoided in each case and if it is unavoidable to elevate the lingual flap then plenty of vigilance and care is necessary for the protection of lingual nerve.*

**Key words:** *Lingual nerve damage. Mandibular third molar. Complications of lower third molar surgery.*

### INTRODUCTION

The complications of lower third molar surgery are well documented. Almost all patients experience some pain, swelling and difficulty in mouth opening after operation. Temporary or permanent iatrogenic nerve damage is not uncommon. Most studies of lingual nerve damage have shown an incidence ranging from about 0 to 23 per cent during surgical removal of lower third molars<sup>1,18&19</sup>, although a recent study found an

incidence of 11 per cent.<sup>2</sup> This nerve damage is permanent in some cases. Sensory deficit lasting longer than 6 months is likely to be permanent,<sup>3</sup> and attempts to restore nerve function for these patients are often unsuccessful.<sup>4</sup> Despite these complications, the removal of third molars associated with disease is generally justified,<sup>5,7</sup>

Lingual nerve is the internal branch of the mandibular division of trigeminal nerve. It receives the

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\*Ex-Senior Registrar, Department of Oral and Maxillofacial Surgery, Sardar Begum Dental College and Hospital, Peshawar.

\*\* Assistant Professor, Department of Oral and Maxillofacial Surgery, Sardar Begum Dental College and Hospital, Peshawar

\*\*\* Senior Registrar, Department of Oral and Maxillofacial Surgery, Sardar Begum Dental College Hospital, Peshawar

\*\*\*\* Prof, Principal and Head of Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar

**Correspondence:** Dr Abdul Wahid, Sardar Begum Dental College & Hospital, Jamal-u-Din Afghani Road, University Town, Peshawar. E mail: [dr\\_abdulwahid@yahoo.com](mailto:dr_abdulwahid@yahoo.com). Phone No: 03339325606.

chorda tympani, which carries visceral efferent and taste fibers from the facial nerve. In the most posterior part of the oral cavity the nerve is superficial and can even be seen through the mucous membrane above the mylohyoid line at the level of the second and third lower molars. At this point it is closely related to the lingual cortical plate of the mandibular third molar. So this nerve is always in danger when operating on the lower wisdom tooth<sup>10, 11</sup>

A great deal of research has been undertaken in relation to the incidence of nerve injury during lower third molar surgery, but little is known about the factors affecting the rate of damage. A randomized comparison of the lingual split procedure and removal using surgical burs did not find significant differences<sup>9</sup> A number of studies point to the elevation of the lingual flap as the most important surgical factor causing lingual nerve damage.<sup>2,8</sup>

The study reported here was designed to investigate the importance of factors (patient's age and sex, experience of the surgeon and lingual flap elevation) that may affect the frequency of nerve damage during mandibular third molar surgery. This study will help to point out the importance of these factors in iatrogenic injury of the lingual nerve which will provide the base for the further studies in our region.

**MATERIALS AND METHODS**

Three hundred patients were collected randomly from Khyber College of Dentistry, Peshawar from September 2002 to December 2004. A standard history and examination chart was filled by the operators who performed these procedures. The chart contained information about the demographic data of the patient, radiographic features of the mandibular third molars, steps of surgical procedure and condition of the lingual nerve on follow up visits. The chart also contained information about the experience and designation of the surgeon. Each patient was checked for the numbness of the tongue on the day of surgery and on follow up visits.

**RESULTS**

**Frequency:** One hundred and seventy patients, out of total 300 patients, were operated for the left side of their lower last molars and remaining 130 patients for

the right side. Eighteen patients (6%) were found to have impaired lingual sensation. The frequency of lingual nerve damage was 6.47% on the right side and 5.38% on the left side (Fig 1).

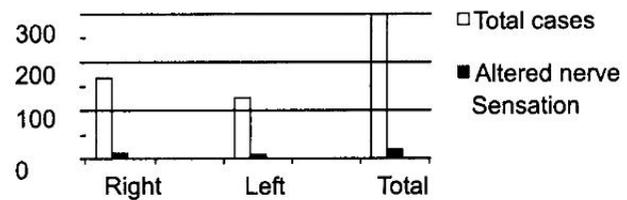


Fig. 1

**Gender:** The ratio male to female patients was 1:1 where as lingual nerve injury in males was 8% and in females was 4% (Fig 2).

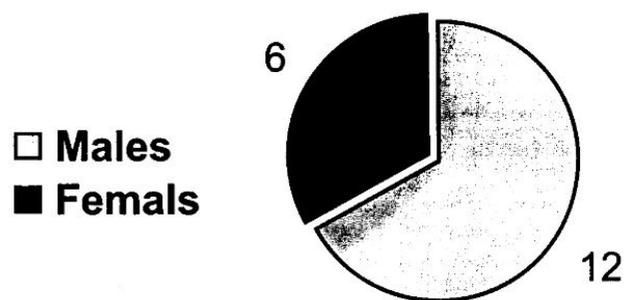


Fig. 2

**Age:** The age range of the patients was 21 to 50 years (Table: 1)

TABLE 1:

Age groups	No. of cases	Altered nerve sensation	Percentage
21-30	245	15	6.1%
31-40	40	2	5%
41-50	15	1	7%

**Operators:** The frequency of lingual nerve damage was found to be highest among house surgeons (10%) and lowest among Professors and Associate Professors (3.6%) (Table: 2).

TABLE 2:

	No of cases	Altered nerve sensation	Percentage
Professors and Associate Prof	30	1	.3.6%
Asstt Prof & Registrar	110	5	4.54%
Post-graduate Students	100	7	7.0%
Dental Surgeons	30	2	6.6%
House Officers	30	30	10%

**Flap Elevation:** The lingual nerve damage was found to be less when only buccal flap was raised during the surgery, whereas elevation of lingual flap was found to be associated with higher chances of lingual nerve injury (Figure: 3)

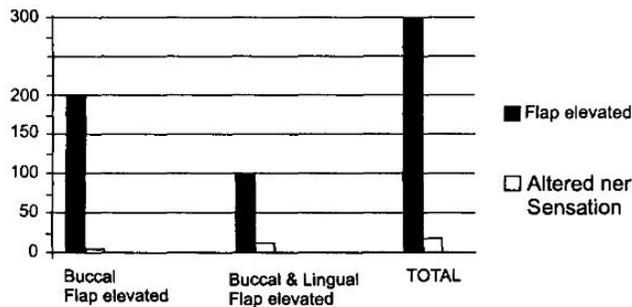


Fig. 3

## DISCUSSION

The frequency of 6% of altered lingual sensation was found in this study. In the present study care was taken to include even trivial alterations in sensation of the lingual nerve occurring in the immediate post operative period and even if there was quick recovery. Rood 1983<sup>13</sup>, excluded those cases who recovered in the first ten days, but still results are consistent with this study. However, this could be explained by changes in surgical technique and improved surgical management since 1983. No statistically significant difference was found between males and females. Most of the impacted lower wisdom teeth were removed in the age group 21-30 and in this group the lingual nerve damage is 6.1%. In age group 31-40 the lingual nerve damage is 5%. No significant difference was found between different age groups. There is limited study in the literature

to show the significance of age in relation to lingual nerve injury.

The question of whether the operator's experience affects the consequences of lingual nerve damage was examined. There was variable frequency among the operators, the frequency of lingual nerve damage was found to be the highest with the most junior operator. The reason is that they have lack of experience and because the tooth extraction need cutting of distal and buccal bone and sometime lingual bone with retraction of the lingual flap and tooth sectioning. In the study of Mason<sup>8</sup>1988 and Blackburn and Bermley<sup>2</sup>1989, a lot of difference was found among the different operators on the frequency of impaired lingual sensation.

Retraction of the lingual flap resulted in higher frequency of temporary lingual nerve damage. Further more, there is no increase in the permanent lingual nerve damage when lingual flap retraction is avoided. The use of Howarth's Elevator for lingual flap retraction does not afford any protection to the lingual nerve. There are two possible explanations; firstly the instrument may not always be correctly placed between the bone and lingual periosteum and may trap the lingual nerve against the lingual plate. Entering the correct layer is impossible to achieve on every occasion and is particularly difficult in the presence of scar tissue resulting from chronic infection". Secondly, the Howarth's elevator may not always be positioned correctly to intervene between the tip of the rotating burs and the lingual nerve. The retraction of the lingual flap and inserting a wide specifically designed lingual retractor does not result in an increase in the chances of lingual nerve damage as compared to other techniques of lingual flap retraction. The length of Howarth's instruments can produce damage by leverage and direct traction on the lingual nerve if the lingual tissue are not adequately released<sup>15</sup>.

For removal of lower third molar, when the approach was buccal with no lingual flap retraction, the incidence of temporary lingual nerve damage reduced from 10 to 1 % and permanent damage to 0 %. The problem seems to be lying in the retraction of the lingual flap. The high incidence of lingual sensory disturbance, following lower third molar removal in the UK, may be due to the elevation of a lingnerve.<sup>12,16&17</sup>sertion of a Howarth's periosteal elevator in an attempt to protect the lingual nerve.<sup>12,16&17</sup> Robinson,

PP, Smith, KG<sup>12</sup> in their study found that surgery with lingual flap retraction resulted in lingual sensory disturbance in 6.9% while surgery without lingual flap retraction resulted in lingual sensory disturbance in 0.8% ( $P < 0.0001$ ) of cases.

## CONCLUSIONS

It is concluded from the present study that no single factor can be attributed strongly as a cause of lingual nerve damage during third molar surgery. Except for complexity of extraction and experience of the surgeon, no relation could be found regarding age, sex and sides operated on the lingual nerve damage.

It is suggested that lingual flap elevation should be avoided in each case and used only in those cases where unavoidable e.g. significant resistance present on the lingual side requiring bone cutting. However plenty of vigilance and care is required for the protection of lingual nerve during elevating lingual flap.

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