



## INFERIOR ALVEOLAR NERVE INJURY ASSESSMENT AFTER SURGICAL REMOVAL OF MANDIBULAR THIRD MOLAR.

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**ABSTRACT... Objectives:** To assess the nerve injury (inferior alveolar nerve) after surgical removal of mandibular third molars under local anesthesia. **Study Design:** Observational study. **Setting:** Oral & Maxillofacial Surgery Department LUMHS Jamshoro/Hyderabad. **Period:** From 11<sup>th</sup> November 2015 to 10<sup>th</sup> May 2016. **Material & Methods:** This study consisted of one hundred patients. Inclusion criteria's were patients with impacted mandibular third molar, patient's age from 18 to 45years and irrespective of gender. Exclusion criteria were patients younger than 18yrs of age of above 45 years, patients having neurological disorders, medically compromised patients, patients receiving radiotherapy or chemotherapy, patients with known allergy to local anesthesia, patients having pathology due to mandibular third molars, patients radiographically root is very near to inferior dental canal. **Results:** Out of 100 patients incorporated in this research 66 were male (66%) and 34 female (34%). The mean age was 29+3.20 years. Common indication of extraction were recurrent pericoronitis 52(52%) cases followed by deep caries/pulpitis in 28(28%) cases, orthodontic reason in 11(11%) cases and caries to adjacent tooth in 9(9%) cases. Third molar impaction according to winter's classification were Mesioangular in 54(54%) cases followed by Horizontal in 26(26%) cases and Vertical in 11(11%). Radiographic showed Narrowing of root in 21% cases and narrowing of inferior dental (ID) canal 20% cases, followed by diversion of ID canal in 16 % cases, deflection of root 14 % cases and darkening of root in 11% cases. After surgical removal of mandibular third molar, the inferior alveolar nerve injury was observed in 6(6%) cases. **Conclusion:** We conclude that inferior alveolar nerve paresthesia occurs in 6% after surgical removal of mandibular third molars.

**Key words:** Dental Caries, Indication, Pericoronitis, Surgical Extraction, Third Molar.

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### INTRODUCTION

Impaction is the stoppage of absolute eruption into a standard purposeful position of one tooth within precise instance due to lack of room in the dental arch caused by hindrance of another tooth or maturity in an uncharacteristic position".<sup>1</sup>

Maxillofacial surgeons routinely carry out minor oral surgical procedures, the removal of wisdom is also one of them.<sup>2,3</sup> "Ninety percent of people have at least one impacted wisdom tooth".<sup>4</sup> Most mandibular third molar extractions are carried out without intra- or post-operative difficulties, but sometimes severe complications may also occur, like pain, trismus, dry socket, infection, hemorrhage, sensory nerve damage (Inferior Alveolar Nerve, Lingual Nerve), and damage to

adjacent second molar".<sup>2,4,5</sup>

Before procedure radiographic evaluation has been considered as an important factor to predict possible IAN (Inferior Alveolar Nerve) injury during surgery.<sup>6</sup> Orthopentogram (OPG) and periapicalx-rays are complementary radiographs taken before procedure for evaluation of degree of surgical difficulty, third molar morphology and position, operative risk and proximity to adjacent vital structures, such as Inferior Alveolar Nerve. Certain radiographic signs in OPG mostly show inferior alveolar nerve damage, advance knowledge about the third molar position is very essential before planning the surgical procedure.<sup>6</sup>

The Inferior Alveolar Nerve runs in ID (Inferior

Dental) canal which is usually near to apices of mandibular third molar, if third molars are impacted so their roots are present close to nerve.<sup>7,8</sup>

On routine clinical examination impacted mandibular third molar are commonly seen and they are in close relation to the lingual and inferior alveolar nerve, during surgical extraction these nerves can be damaged.<sup>5, 9,10</sup>

In a literature review seven radiographic indicators of a close relationship between inferior dental canal and impacted third molar are observed , four signs are seen in the root of tooth (darkening, deflection, narrowing and bifid root apex) and the other three are seen in inferior dental canal (diversion, narrowing and interruption in the canal).<sup>10</sup> Generally during surgical removal of mandibular third molars temporary Inferior Alveolar Nerve injury observed 0.5% to 7% and permanent 0.4% to 0.6% depending on surgeon skills.<sup>10,11</sup>

Inferior Alveolar Nerve may be traumatized during surgical procedures carried out for the management of trauma, cyst, tumors, pre-prosthetic problems, placement of dental implants and most commonly surgical removal of lower third molars.<sup>12</sup>

Most cases of nerve injury during surgical subtraction of lower third molars are not identified at the time of surgery, but in the postoperative period on third, fifth and seventh day, patients will be asked about numbness of lip.<sup>9</sup>

**Data Collection Procedure**

The study was performed after the permission of ethical committee of hospital and written knowledgeable approval for the study was obtained from the patient. Every patient was explained in their own language about possible outcomes of surgery, preoperative predictive variables were recorded with data record of name, age, gender, residence, type of impaction, using OPG and intraoral periapical radiographs. Classification of third molar used were Pell and Gregory and winter criteria.

Angle formed between the intersected longitudinal axes of mandibular molars (second and third) was the main determent for angulation of mandibular third molar i.e in winter classification. Pell and Gregory classification system was used for classification on basis of level (depth) of impaction. Relationship to the occlusal surface of the neighboring second molar and their arrangement according to anterior limit of the ramus of the mandible was the criteria used here for assessment of impacted teeth.”

Surgical procedure were done under local Anesthesia (Xylocaine 2% with adrenaline), flap was made with surgical blade no 15 and the bone removal was done with the help motor driven surgical bur (Stain less steel straight fissure and round bur) under constant irrigation of normal saline. Suturing was done by using vicryl 3-0.”

At the postoperative visits on 3rd, 5th and 7th day of surgery, each patient was asked for dissimilarity in sensation of lower lip and chin between operated and unoperated sides.” Tests like two point discrimination test, pin prick test (PP), and light touch assessment test was performed on each patient before and after procedure on their follow up visits at the time of suture removal.

**RESULTS**

66 male (66%) and 34 female patients (34%); with male to female ratio of 1.9:1 were found in this study (Table-I).

There was variation of age ranging from a minimum of 18 years to 45 years. The mean age was 29+3.20 years (Figure-1).

Gender			
Female		Male	
No: of Patients	% Age	No: of Patients	% Age
34	34%	66	66%

**Table-I. Gender Distribution.**

**Male: Female Ratio = 1.9:1**

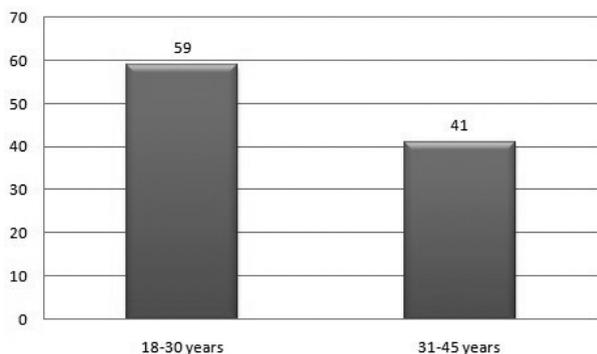


Figure-1. Age distribution.

In our study mostly common indication of extraction were recurrent pericoronitis in 52(52%) cases followed by deep caries/ pulpitis in 28(28%) cases, orthodontic reason in 11(11%) cases and caries to adjacent tooth in 9(9%) cases. (Figure-2).

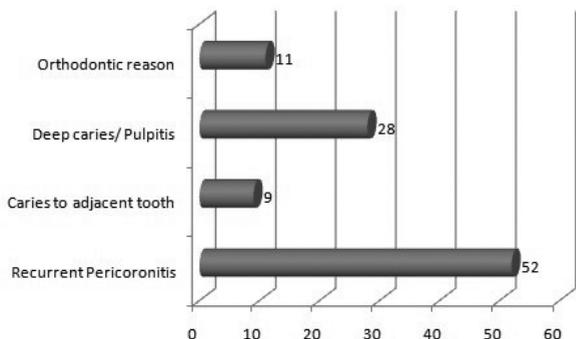


Figure-2. Indication of extraction.

In our study third molar impaction according to winter’s classification were Mesioangular in 54(54%) cases followed by horizontal in 26(26%) cases and vertical in 11(11%) (Table-II).

Third Molar Impaction	No. of Patients (n=100)	Percentage (%)
Horizontal	26	26%
Mesioangular	54	54%
Distoangular	9	9%
Vertical	11	11%

Table-II. Third molar impaction according to winter’s classification.

In our study class wise distribution of impacted teeth according pell and gregory classification

were Class 1 in 42(42%) cases followed by Class 2 in 49(49%) cases and Class 3 in 9(9%) (Figure-3).

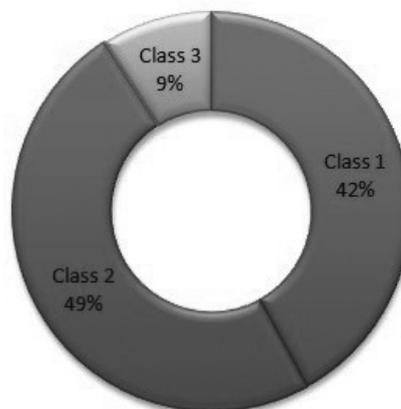


Figure-3. Impacted teeth according pell and Gregory classification.

In our study inferior alveolar nerve injury was observed surgical removal of mandibular third molars in 6(6%) cases (Table-III).

Yes		No	
No: of Patients	Percentage	No: of Patients	Percentage
6	6%	94	94%

Table-III. Inferior alveolar nerve injury.

**DISCUSSION**

It was observed in the current study that out of 100 patients included in this study 66 were male (66%) and 34 female (34%); with male to female ratio of 1.9:1. However study of Thomas Schneider<sup>13</sup> reported that male to female ratio was 1.04:1 which is lower from this study. In the present study, a minimum of 18 years to 45years. The mean age was 29+3.20 years, whereas maximum number of cases was seen in 3<sup>rd</sup> and 4<sup>th</sup> decade. In the study conducted by F. EzoddiniArdakani<sup>14</sup> reported that age range was 15-63 years with a mean age of 26.5 years.”

The American Association of Oral and Maxillofacial Surgeons (AAOMS) have set the contributing risk factors that can be helpful in taking decision that when and which way to go for surgical removal.<sup>15</sup> AAOMS and other health care systems have suggested that underlying pathology, infection

and harm to adjacent structures as the indications for absolute removal.<sup>15,16</sup>

But here pericoronitis 52% was the chief reason of extraction of the third molar; that follows occurrence of caries (28%). These statistics are very much comparable to outcomes acquired in studies by Abdulai A.E et al that shows almost 49.25% surgical extractions were carried out due to severe pericoronitis and 26.12% due to caries.<sup>17</sup> In a Nigerian study repeated pericoronitis happening in comparatively younger age was also the key reason for surgical withdrawal of impacted third molars.<sup>18</sup>

Factors which may affect the probability of nerve damage occurring is the depth of the impacted mandibular third molar and its lingual angulation. In our study third molar impaction according to winter's classification were Mesioangular in 54(54%) cases followed by Horizontal in 26(26%) cases and Vertical in 11(11%) cases. However in the study of Vikas Sukhadeo Meshram reported considering angulation of third molars in our case series, teeth with mesial angulations were reported in 42.1%, horizontal angulation in 25.1%, vertical angulation in 24.4% and disto angulation in 6.8%, one case each of lingual version and inverted is also noted.<sup>12</sup>

As we have said that there is elevated discrepancy in IAN/third molar relationship, so to lessen the risk of postoperative dysaesthesia a thorough pre-operative radiographic estimation is requisite to spot the position (buccal, lingual or inferior) and rough calculation of mandibular canal to third molar.<sup>19,20</sup> In our study radiographs mostly showed narrowing of root in 21% cases and narrowing of ID canal 20% cases. Followed by diversion of ID canal in 16 % cases, deflection of root 14 % cases and darkening of root in 11% cases. However study of Koong reported radiolucent band 54(75%) cases, thrashing of mandibular canal border 55 (76%) cases, and change in mandibular canal direction 67 (93%) cases, narrow root 40 (56%) cases, deviated root 48 (67%) cases, bifid apex 39 (54%) cases, superimposed 22 (31%) cases and others 3 (4%) cases.”

The incidence of neurosensory impairment ranges from 0.35% to 8.4%, which is one of the complication after wisdom tooth removal.<sup>21,22</sup> In 2013, Smith<sup>23</sup> produced a clinical study on 1000 patients and he removed 1589 impacted mandibular third molar teeth. Of the 1589 mandibular third teeth taken out, 466 confirmed a far-off connection of their apices to the mandibular canal, 869 were close to the canal, and only 254 were deemed to be quite near to the canal by radiographic confirmation. Postoperatively, in 40 extractions 39 patients account neurosensory trouble over the distribution of the IAN nerve. Seven patients sustained everlasting sensory loss. Horizontal impaction pattern showed larger percentage of nerve damage that is 4.7% while vertical pattern encountered least which is only 0.9%. In our study IAN injury was encountered post surgically in (6%) cases.”

## CONCLUSION

This study concludes that there are chances of inferior alveolar nerve injury after surgical removal of mandibular third molar i.e about 6%. Further, by reviewing this study dentist can establish the risk/benefit ratio before surgical removal of impacted mandibular third molar teeth.

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2	Muhammad Irfan Khan	Results, References.	
3	Hira Fatima	Manuscript Designing.	
4	Salman Shams	Data collection, Discussion & Proof read.	