



## STUDY OF DISTANCE BETWEEN MANDIBULAR FORAMEN AND 3RD MOLAR TOOTH IN DRY HUMAN MANDIBLES

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### ABSTRACT

This study was carried out the distance between mandibular foramen and 3rd molar tooth of Madhya Pradesh (India) particularly in Gwalior region.

**Material and Method** - A total of 60 dry Human Mandibles with 3rd molar tooth was obtained from the Department of Anatomy, G.R. Medical College, Gwalior M.P. Digital vernier calipers had been used for taking measurements. A divider with fixing device was also used for taking the measurements. All the observations were tabulated and analyzed statistically and compared with the previous studies.

**Results**- The mean distance of the mandibular foramen from centre of 3rd molar tooth is  $23.53 \pm 3.99$  on right side and  $22.92 \pm 3.676$  on left side.

**KEYWORDS** : Anesthetic Injection, Inferior Alveolar Nerve, Mandibular Foramen.

### INTRODUCTION

The mandible is the strongest and largest bone of the face which forms the lower jaw. The mandibular foramen (MF) is an irregular foramen on the medial surface of the ramus of mandible, which is located near the centre. The MF leads into the mandibular canal (MC), a canal which traverses the body of the mandible. The inferior alveolar nerve (branch of the trigeminal nerve) and the vessels, after passing through the MF, traverse the MC to supply the mandibular teeth. The lingula is a tongue shaped bony projection which is just medial to the MF<sup>[1]</sup>. Previous studies have classified the lingula into the truncated, triangular, nodular and the assimilated type, depending on its shape<sup>[2]</sup>. The inferior alveolar nerve block is the commonest local anesthetic technique which is used for anaesthetizing the lower jaw in dentistry. The success of this technique highly depends on the proximity of the needle tip to the MF at the time of the anesthetic injection<sup>[3]</sup>. While performing the IAN block, if needle is inserted too far posteriorly, it may enter the parotid gland and damage the facial nerve leading to *transient facial palsy*.<sup>[3]</sup>

The anesthetic agent is injected slightly superior to the entry of IAN into the mandibular foramen being overhung by lingula.<sup>[3]</sup> The inferior alveolar nerve (IAN) and vessels pass through it which supplies the molar and premolar teeth directly, buccal mucosa from the incisors to the premolars and skin over the chin and lower lip by its mental branch and lower canine and incisor teeth by its incisive branch.<sup>[5,7]</sup> Most vital anatomical landmark for mandibular surgery is mandibular foramen.

Dentist anaesthetise the IAN before extracting the mandibular teeth.<sup>7</sup> The mandibular foramen (MF) is an irregular foramen which is located just above the centre of the medial surface of the ramus of the mandible.<sup>4</sup> The mandibular foramen curves downwards and forwards into the body of the mandible to form the mandibular canal which exit opens into mental foramen. The inferior alveolar nerve (IAN) and vessels pass through it which supplies the mandibular teeth.<sup>1</sup> Any other openings in the mandible other than mandibular foramen, sockets of teeth and mental foramen are called as accessory mandibular foramen (AMF)<sup>6</sup>. Different authors have used various methodologies to determine the location of the mandibular foramen in dry mandible, like distance from anterior border, posterior border, base of ramus and from mandibular notch. But in living subjects all are covered by soft tissues<sup>[14]</sup>.

IAN supplies (a) the molar and premolar teeth directly (b) buccal mucosa from the incisors to the premolars and skin over the chin and lower lip by its mental branch (c) lower canine and incisors by its incisive branch.<sup>7</sup>

### MATERIALS AND METHODS

A total of 60 adult human dry mandibles with 3<sup>rd</sup> molar tooth was obtained from the Department of Anatomy, G.R. Medical College, Gwalior M.P. sample missing molar teeth were excluded. the following measurements were taken by using a sliding digital Vernier Caliper. Digital Vernier calipers had been used for taking

measurements.



Photo - Digital Vernier calipers



Photo = distance between mandibular foramen and 3<sup>rd</sup> molar tooth

**Instrument:** The measurements of teeth were taken on an anatomically sound basis. All measurements were taken using a digital vernier caliper, taking into account the error if any, in the instrument. A divider with fixing device was also used for taking the measurements in some bones.

**Measurement Procedure:** The Distance between middle of the 3<sup>rd</sup> molar tooth to middle of the mandibular foramen were measured by using a sliding digital vernier calipers.

Statistical analysis was performed using **SPSS 16.0**

### RESULT

All measurements is in millimeters (m.m.)

No.	N = 60	
Side	Rt	Lt
Distance of 3rd molar tooth to mandibular foramen.(mean in m.m.) ± SD	23.53±3.99	22.92±3.676
Min (m.m.)	15.19	15.84
Max(m.m.)	34.1	32.79
t test	0.88	

SD – Standerd Deviation

Distance of 3<sup>rd</sup> molar tooth to mandibular foramen is  $23.53 \pm 3.99$  on right side and  $22.92 \pm 3.676$  on left side.

**DISCUSSION**

Population	Author		Distance of 3rd molar tooth to mandibular foramen	
			Rt side	Lt side
Dhaka (Bangladesh)	Hoque et al (2013) <sup>12</sup>		16.70±2.18	16.72±2.16
West Bengal (india)	Ghorai et al(2016) <sup>14</sup>	male	22.8±4.9	21.7±4.7
		female	21.8±6.6	21.6±5.6
Hong kong	Kilarkaje et al (2005) <sup>9</sup>		20.6	20.7
Calicut india	Gopalakrishna. K et al (2016) <sup>5</sup>		14.37±3.16	19.26±2.57
Raichur india	Deepa G et al (2016) <sup>15</sup>		25.5± 3.3	25.1±3.7
Gwalior (Madhya Pradesh) India	Present study		23.53±3.99	22.92±3.676

The study was conducted to determine the distance between 3<sup>rd</sup> molar tooth to mandibular foramen conducted on 60 mandibles. Present study close to Ghorai et al(2016)<sup>14</sup> who studied the people of west bengal which is state of India. Similar observations were made by, Deepa G et al (2016)<sup>15</sup> who demonstrated the distance 3<sup>rd</sup> molar tooth to mandibular foramen. useful in maxillofacial and dental surgeon during surgery

**CONCLUSION**

Inferior Alveolar Nerve Block . it is most common nerve block performed by dentistry to carry out dental procedures on the mandibular teeth'. In conclusion, the present study which is done in Gwalior region of Madhya Pradesh India mandibles will give a fair knowledge of position of MF from 3<sup>rd</sup> molar tooth in living human beings in local population of Gwalior Madhya Pradesh and can help maxillofacial and dental surgeon during surgical intervention in the region. These data may be of great help to locate the MF during surgery. They may also be useful in reconstructive surgery and anthropological assessments.

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