VARIATIONS IN MENTAL FORAMEN POSITION & NUMBER IN POPULATION OF MADHYA PRADESH STATE (CENTRAL INDIA)

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ABSTRACT

Introduction: Mental foramen is a important landmark for giving anesthesia and surgical operation of low jaw and teeth (dental surgery).

Aim: So this study done with a purpose to knowing exact position of mandibular foramen . **Materials and Methods:** For this study Fifty mandible bones (toothed / Non-toothed mandibles) belonging to Madhya-Pradesh state were studied. All mandibles are of adult person (of either sex - male/Female). In study we observe Position of mental foramen in relation with body of mandible (distance from symphysis menti, from posterior border of ramus of mandible, from base of mandible & from alveolar margin) and in relation with tooth (below molar or below premolar).

Result: We find out Mean Distance between mental foramen and base of mandible - 10.5 mm , Mean Distance of mental foramen from alveolar margin -15.25 mm. Mean distance between mental foramen and symphysis menti was - 30.00mm. Mean distance of mental foramen from posterior border of ramus -60.00mm . In study we also observe number of mental foramen on each side in a single mandible.

KEY WORDS: Mandible, Mental foramen, Dental surgery.

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INTRODUCTION

Mandible is bone of lower jaw. It is a movable bone . Mandible is tooth bearing bone .Each mandible has a single body, two ramus, two condyle and two coronoid process It has 2 ramus (right & left) Rami at its upper end has 2 process , condylar (at anterior end) and coronoid (at posterior end). Each ramus has inner / medial and outer /lateral surface. Inner /medial surface of ramus has a mandibular foramen and outer /lateral surface has a mental foramen. Mandible has lower margin (base), upper margin (alveolar creast –in which tooth socket present),outer and inner surface. Outer surface of body of mandible is placed antero-laterally.

Mental foramen located bilaterally on antero-lateral surface of of mandible. From mental foramen, mental nerve (branch of Inferior alveolar nerve of mandibular nerve (Part of 5th nerve) immerses [1].

In dental operative surgery if there is damage of mental nerve, anesthesia occur in chin area. So identification of exact position of mental foramen is very necessary. In periodontal surgery, flap operation of lower teeth and other lower lip surgical operation, where block anesthesia for mental nerve is choice. Exact point of emergence of mental nerve is very important before implant dental surgery to avoid mental nerve injury.

Present study was done on mandibles in Madhya-Pradesh state to find out exact position of mental foramen (For knowing exact emerging point of mental nerve).

Aim and Objective: To find out exact position of Mental Foramen to prevent damage of mental nerve in dental surgery.

MATERIALS AND METHODS

Fifty dry human mandibles (toothed/Non-toothed mandibles) belonging to Madhya-Pradesh state (We collect Mandible from various medical college of Bhopal, Gajra Raja Medical College (Gwalior), Bundelkhand Medical College (sagar), M.P. are materials used for this study.

Various parameters measured from mental foramen on right and left side are

- (1) Vertical distance from alveolar crest
- (2) Vertical distance from base of mandible
- (3) Distance from symphysis menti
- (4) distance from posterior border of mandible along a line drawn parallel to horizontal plane
- (5) Relationship of mental foramen to teeth (Molar/Premolar)
- (6) Number of mental foramen on each side.
- (7) Shape (oval/circular)

All these above parameter measured by a digital vernier caliper and statistically analyzed by mean.

OBSERVATIONS

Table 1: Measurements of various parameters.

S. No.	Distance of mental foramen from (in millimeter)	Right side (Mean) (mm)	Left side (Mean) (mm)	Mean of right & left side (mm)	Mean difference between right & left side (mm)
1	symphysis menti (S)	29	31	30	-2
2	Posterior border of ramus (P)	58	62	60	-4
3	alveolar crest (A)	16	14.5	15.25	1.5
4	base of mandible (B)	10.7	10.3	10.5	0.4

Total height of body of mandible (From alveolar crest to base of mandible)

- 25.75 mm (A+B distance)

Various parameter studied are follows

- (1) Mean distance between mental foramen and symphysis menti was (S)– 30.00mm.
- (2) Mean distance from posterior border of

ramus (P)– 60.00mm

Ratio between (S)& (P) - 1:2

(3) It was observed that mental foramen is nearer to base of mandible - Distance between base to mental foramen (B) -10.5 mm

(4) Distance between alveolar margin to mental foramen (A) - 15.25 cm.

Fig. 1: Showing the parameters and anatomical land marks used.

Distance between base to mental foramen (B)
Mean distance between mental foramen and symphysis menti was (S)
Mean distance from posterior border of ramus (P)
Distance between alveolar margin to mental foramen (A)

Fig. 2: Showing the Measurement of Distance between alveolar margin to mental foramen (A) by vernier calipers

Fig. 3: Diagram showing Measurement of Distance between alveolar margin to mental foramen (A) by vernier calipers.

Fig. 4: Diagram showing Measurement of Distance between base to mental foramen (B) by vernier calipers.

Fig. 5: Diagram showing Measurement of Distance between symphysis menti to mental foramen (S) by vernier calipers

Fig. 6: Diagram showing Measurement of Distance between posterior border to mental foramen (B) by vernier calipers

Fig. 7: Diagram showing Measurement of Distance between posterior border to mental foramen (B) by vernier calipers.

Table 2: Position of mental foramen

S.No.	Exact Position	No. of Mandible	%
1	Below between 1 st & 2 nd Premolar	30	60
2	Below 2 nd Premolar	13	26
3	Below between 2 nd Premolar & 1 st molar	4	8
4	Below 1 st molar	3	6

Mandible showing most common position of mental foramen - between 1st & 2nd premolar

Fig. 8: Showing mental foramen Below 2ndPremolar

Table 3: Shape of mental foramen:

S.No.	Shape	No. of Mandible	%
1	Circular	35	70
2	Oval	15	30

Fig. 9: Showing circular mental foramen.

Fig. 10: Showing oval mental foramen

Table 4: Multiple foramen - Occasionally an additional foramen near to mental foramen also found, this foramen is called as **Accessory mental foramen** usually it present posterior to mental foramen. This variation is called multiple foramen in mandible. It may be either on left or on right side or on both right & left side.

S.No.	Mental foramen (Single/Double)	No. of Mandible	%
1	2(1 on right & 1 Left) Single M.F.	47	94
2	3(2 on right & 1 Left) Double M.F.	2	4
3	3(2 M.F. on Left & 1 right	1	2

Fig. 11 : Showing Accessory mental foramen (AMF).

DISCUSSION

In present study most common position of mental foramen was below between 1st and 2nd premolar (60%). According to Tebo & Telford²(1950) position of mental foramen in 49% case was below to apex of 2nd premolar. It was position below 2nd premolar by Miller (1953)³. By Wang et al (1986)⁴ it was 58.98% cases. However in British mandible (santini & land, 1990)⁵, the mental foramen lie below between 1st & 2nd Premolar teeth in 65% cases.

In present study ratio of distance from symphy-

sis menti & posterior border of ramus of mandible from mental foramen was 1:2

This ration was 1:2.6 in adult Chinese mandible (wang et al 1986) 1:2.7 in British Mandible (santini & Land, 1990).

In our study mean value of distance of mental foramen from symphysis menti is 30 mm While santini & Land, 1990 found it was 27.8 mm in Chinese and 26.4 mm in British mandible.

In our study total height of body of mandible 25.75 mm (A+B distance). According to Wang et al (1986) total height of mandible was 30 mm/ 3.03 cm.

Mostly text books have described that mental foramen lie midway between alveolar margin & base of mandible. (HAMILTON, W.J.(1976) Text Book of Anatomy)⁶

But in our study mental foramen was found nearer to the base, This finding is also supported by Wang et al (1986).

In our study ratio between oval & circular types of mental foramen was 1:2.33 .

According to De Frietas et al (1979)⁷ Mental foramen were absent in 0.4% mandible. But in our study mental foramen was found in each mandible. Absence of mental foramen not observed in our study. In our study double mental foramen (Accessory mental foramen) a mandible was found in 6% cases .Gershensn et al (1986)⁸found double mental foramen in 4.71% in adult Indian mandible and 2.8% in adult Israeli mandible. 3 Mental foramen also reported in 1.14% in adult Israeli mandible.

Accessory mental foramina of mandible are usually unnamed and infrequently described .Yet a study of 2450 mandible 300 accessory mental foramina was found (Sutton 1974). In this study we found Accessory mental foramina in 6% cases. Since mostly Accessory mental foramina transmit a small nerves to teeth (branch from facial / mylohyoid / buccal / transverse cervical cutaneous), their occurrence is significant in dental blocking procedure .(gray's anatomy)⁹ After all above discussion measurement of body of mandible, position, size & No. of mental foramen vary with population.

Conflicts of Interests: None

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