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Research Paper

A Study of position of mental foramen and accessory mental foramen in 300 mandibles of Gujurat population

Medical Science

KEYWORDS : Mental foramen; Accessory mental foramen; Mandible; Mental nerve; Premolar; Molar

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ABSTRACT

Mental nerve injury is the main complications of surgery of the mandibular canal and mental foramen region .Identification of mental foramen is very important for dental surgeons while giving nerve block and during surgical procedures like apicocurettage of mandibular premolars, retrograde amalgam filling and periodental surgery . In cases of mandibular fractures, 80 percent occur at the mental foramen and at the contralateral angel. In very few mandibles, there is also existence of accessory mental foramina in posterior or inferior area of the mental foramen. So Verification of the existence of this foramen would prevent injury to accessory nerve during periapical surgery. Present study was conducted using 300 dried human mandibles from different medical colleges of Gujurat. Out of these, 154 were dentulous mandibles, while rest of 146 was edentulous. Mental foramen was present in all 300 mandibles and it was bilateral. Accessory mental foramen was present in only two mandibles. None of the mandible was found with absence of mental foramen . Mental foramen was located below the apex of second premolar in 65 percent of mandibles; between first and second premolars in 21.7 percent and in 11. 7 percent, it was between second premolar and first molar. Accessory mental foramen was present 0.4 mm lateral to mental foramen and below the apex of first molar.

INTRODUCTION

Mandible (Latin, Mando, I chew) which is the largest and strongest bone of facial skeleton. On Medial surface of ramus of mandible, there is presence of mandibular foramen.This opening leads Into mandibular canal which curves downwards and forewards into body of mandible to open on external surface at the mental foramen. This foramen is a passageway for mental nerve and vessles, a branch of inferior alveolar nerve which supplies sensorial innervations to the lower lip, the buccal vestibule and first mandibular molar. Most studies describe the location of mental foramen below the apex of the second premolar 1, or between the apexes of the first and second premolars, although individual variation is important..Knowledge of the variable position of mental foramen is important for mental nerve block in periapical surgeries involving molars and premolars2.In most of these dental surgeries, regional block through mental nerve is preferred because alveolar bone supporting the mandibular premolars and molars is thick and particularly on the buccal aspect local infiltration is not effective in producing pulpal analgesia. For, accessory mental foramen much literature is not available but it may be present below the first molar; posterior or inferior to mental foramen. Presence of accessory foramen is due to branching of mental nerve before it passes through mental foramen. So, present study was conducted to know position of mental foramen and accessory mental foramen.

MATERIAL AND METHOD

Present study was carried out using three hundred ,dry , human mandibles of unknown sex in the Department of Anatomy from B.J.Medical college and other medical colleges of Gujurat .Out of 300 mandibles, 154 were dentulous having full complement of teeth while remaining 146 were edentulous. Observations taken in the study were distances from symphysis menti to mental foramen; from posterior border of ramus of mandible to mental foramen. The measurements were done with digital vernier calipers .Position of mental foramen was also observed in relation of mandibular teeth. As mental foramen is a bilateral structure observations were recorded on right and left sides separately for individual mandibles .Observations thus made were complied; tabulated and statistical data were calculated .During study ,presence of any additional mental foramen ,whether unilateral or bilateral were also observed.

OBSERVATIONS:

Table – I

Distance (in cms) of mental foramen from symphysis menti

Sr. No.	Value	Dentulous mandible		Edentulous mandible	
		Right	Left	Right	Left
1	No. of observations	154	154	146	146
2	Mean distance(cm)	2.37	2.32	2.30	2.25
3	Range	1.7-2.9	1.9-2.7	1.6-2.7	1.7-2.5

Table-I Shows distance of mental foramen from symphysis menti in cms. In dentulous mandibles mean distance from symphysis menti to most anterior point of mental foramen was 2.37 cms on right side and 2.32 cms on left side while in edentulous mandibles mean distance on right side was 2.30 cms and 2.25 cms on left side.

Table - II

Distance of mental foramen from posterior border of ramus of mandible

Sr. No.	Value	Dentulous mandible		Edentulous mandible	
		Right	Left	Right	Left
1	No. of observations	154	154	146	146
2	Mean distance(cm)	6.3	7.5	6.24	6.40
3	Range	5.1-7.4	5.6-7.1	4.9-7.3	5.5-7.0

Table – II Shows distance of mental foramen from posterior border of ramus of mandible. Mean distance between posterior border of ramus of mandible and most anterior point of mental foramen was 6.3 cms on right side and 7.5 cms on left side in dentulous mandibles while in edentulous mandibles mean distance on right and left side was 6.24 cms and 6.19 cms respectively.

Table – III

Position of mental foramen in relation to mandibular teeth

Sr. No.	Mandibular teeth	Right side mental foramen	Left side mental foramen	Percentage
		Mandible No.	Mandible No.	
1	Between 1st and 2nd premolar	30	35	
2	Below the apex of 2nd premolar	100	95	65
3	Between 2nd premolar and 1st molar	20	15	11.7
4	Below the apex of 1st molar	4	13	4.3

Table – III Shows position of mental foramen in relation to mandibular teeth. Most common position of mental foramen was observed below the apex of 2nd premolar in 65% of cases.Second most common position was between 1st and 2nd premolar in 21.7 % of cases. In 11.7% of cases foramen was between 2nd premolar and 1st molar and in 4.3% of cases it was below the apex of 1st molar .

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DISCUSSION:

Pain is the common distressing symptom in dental practice. Depending upon the cases, different techniques are used to relieve pain. One of these is mental nerve block. This has proved to an effective and convenient way to anaesthetize premolar, canine and incisor areas of the mandible. So proper knowledge of position of mental foramen, through which mental nerve and vessles merge is very important. Significant variations in the location of foramen were seen in this study. Different text books describe the location of foramen differently.

In present study, it has been found that mean distance measured from most anterior point of mental foramen to symphysis menti was 2.37 cms on right side and 2.32 cms on left side in dentulous mandibles while in edentulous mandibles this distance on right and left side was 2.30cms and 2.25 cms respectively. According to K.Gopinathan[3], S. Singh[3] and S. Chhabra (1992) mean distance measured most anterior point of mental foramen to symphysis menti was 2.47cms on right side and 2.26 cms on left side. Grant[4] and Curningham[5] (1985) mentioned that foramen lies 3 cms from symphysis menti. In present study, mean distance from mental foramen to posterior border of ramus of mandible was 6.3 cms on right side and 7.5 cms on left side in dentulous mandibles while it was 6.24cms and 6.40 cms in edentulous mandibles. Wang et at[6]observed that the distance between mental foramen and posterior border of ramus of mandible was 7.4 cms but has not mentioned the side difference. Present study revealed variable position of mental foramen. Foramen was below the apex of 2nd premolar in 65% of mandibles; between 1st and 2nd premolars in 21.7% of mandibles ;between 2nd premolar and 1st molar in 11.7% and below the apex of 1st molar in 4.3 % of mandibles studied. Tebo and Telford[7] had observed location of foramen blow the apex of 2nd premolar tooth. W.J. Hamilton [8](1958) R.J. Last[9] (1966) have reported position of mental foramen below the interval between two premolar teeth .Nathan H [10](1986) observed most common position of mental foramen in front of the apex of 2nd premolar. According to S.Kanta Singh[3] and S. Chhabra , the most common position of mental foramen was below the apex of 2nd premolar tooth in 68.75% of mandibles; between 1st and 2nd premolar in 17.71%; between 2nd premolar and 1st molar in 11.46& and in 2.08% it was below the apex of 1st premolar. During this study, accessory mental foramen was also observed below the first molar in two mandibles and in one mandible foramen was present bilaterally. Cag irankaya [11]and L.B. Kansu reported accessory mental foramen at same position. For position of accessory mental foramen in relation to teeth much literature is not available in India.

CONCLUSION:

Of the 300 mandibles studied following conclusions can be drawn:-

In dentulous mandibles ,distance from symphysis menti to mental foramen and from posterior border of ramus of mandible to foramen was more than in edentulous mandibles .In majority of cases , position of mental foramen was bilaterally symmetrical . Most common position of mental foramen was found to be below the apex of 2nd premolar, Second common position was between 1st and 2nd premolar. Knowledge of this information is of great clinical significance for achievement of effective nerve block and for prevention of damage to mental nerve during surgical procedures on lower jaw.

Double mental foramen on right side

Double mental foramen on left side

REFERENCE

(1) Philips – JL –Journal of endodontics- Aug.1992 18 383-6 size and position of mental foramen | (2) By Byars, - (1954)- A Study of location of mental foramen and its importance. | (3) K. Gopinathan, S.Kanta Singh- Variation in the position and number of MF in mandibles of north Indian population- Anat,Soc India,1992 Vol.41 page .47-51 | (4) Grant's book of Anatomy 10 ED - 1979 | (5) Curningham's Text book- 15 ED (1985)- Manual of practical anatomy- Fifteenth edition (Head and neck) | (6) Wang T.M.(1986). A Clinical and anatomical study of the location of MF in adult Chinese mandible.Acta Anat. 126 : 29 | (7) Tebo and Telford- An analysis in 1976 of the variations in the position of MF Anat. Rec. 106, 254-255. | (8)) W.j. Hamilton and G.simon (1958) | (9) R.J. Last- Anatomy Regional & Applied (1966) | (10) Nathan H (1986) Mental foramen and mental nerve; changes with age. Acta;126(1) 21-28 | (11) Cag¯irankaya, L. B. & Kansu, H. An accessory mental foramen: a case report. J. Contemp. Dent. Pract., 9:98-10