

Study of Variations in the Position of Mental Foramen in Mandible in Andhra Pradesh Population

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Abstract

36 adult non-pathological dried mandibles were studied. Distance between Mental Foramen (MF) and symphysis menti on both sides was measured and compared. Mean value of right side were 27.2 mm (SD ± 0.28) and mean value of left side was 26.3 mm (SD ± 0.35) 't' test value was 15.0 and 'p' value was highly significant ($p < 0.01$). Distance between MF and lower border of body of mandible was measured on both sides and compared, mean value of right side was 14.2 (SD ± 0.14) and left side was 13.2 (SD ± 0.26) 't' test value was 19.5 and 'p' value was highly significant ($p < 0.01$). The distance between MF and posterior border of ramus of mandible was measured and compared. Mean value of right side was 9.2 (SD ± 0.21) and mean value of left side was 70.2 (SD ± 0.15), 't' test value was 22.5 and p value was highly significant (SD ± 0.01) All these measure me were taken by vernier caliper. Mandible form the floor and cavity for tongue, the carcinoma of tongue also spread to body and ramus of the mandible moreover during accident chin or symphysis menti was commonly fractured. Hence these parameters will be quite useful to maxilla-facial surgeon to preserve the mental nerve which is sensory supply to lower lip, the buccal mucosa from incisor to the premolars and skin over the chin. Mental nerve also carries chorda tympani to labial minor salivary glands.¹ It is also useful anesthetist to give local anesthesia invasive procedure for buccal or oral surgery. Moreover, these parameters belong to adult mandible who are more prone to meet accidents.

Keywords: MF = Mental foramen; ramus; body; symphysis menti; venier caliper.

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Introduction

Mental foramen (MF) situated on antero-lateral aspects of the mandible and transmits mental nerve and vessels.² As a branch of inferior alveolar nerve, the mental nerve exits from the mental

foramen and provide sensory innervations to the lower lip gingiva and skin over the mental region. During the surgical procedures such as mandibular osteotomies, surgical removal of impacted teeth, apicectomy enucleation of cyst and excision of tumors the mental nerve can get damaged.³ Causing functional and psychosocial problems over the region where it innervates. Compression, injury of the mental nerve can also occur while excessive stretching of nerve during surgical procedures, Iatrogenic damage of the nerve can occur during implant of placement.⁴ Hence attempt was made to measure the various parameters of the mandible on both side and compared the same, so that it would be helpful to preserve the mental nerve and blood vessels passing through MF in above mentioned surgical procedures.

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Materials and Methods

- Thirty six dried, adult, non-pathological mandible were studied. The measurement was taken by vernier caliper.
- The distance between symphysis menti and mental foramen.
- Distance between lower border of body of mandible and mental foramen.
- The distance between posterior border ramus of mandible to mental foramen was measured. Measurement was taken on both sides of the mandible and compared statistically.

The broken and pathological mandibles were excluded from the study. The duration of study was about two year.

Results

Table 1: Comparison of measurement between symphysis menti to mental foramen right and left-The mean value of right side distance was 27.5 (SD \pm 0.28) and left side mean value was 26.3 (SD \pm 0.25) 't' test value was 15.06 *p* value was highly significant (*p* < 0.01).

Table 1: Comparison of measurement of distance between anterior margin of mental foramen to symphysis of mandible.

	Right anti border of mental foramen to symphysis menti (mm) (38) (A)	Left anti border of mental foramen to symphysis menti (mm) (38) (B)
Mean	27.25	26.32
SD	0.28	0.25
Test statistic	't' = 15.06, <i>p</i> < 0.01	

Statistically right anterior border of mental foramen to symphysis of mandible is highly significant more than Left anterior border of mental foramen to symphysis menti of mandible (*p* < 0.01).

Table 2: Comparison of measurement between inferior margin of mental foramen of mandible and lower border of mandible on both sides. Mean value of right side was 14.2 (SD \pm 0.14) and left mean value was 13.2 (SD \pm 0.26) and 't' test value was 19.3, *p* value was highly significant (*p* < 0.01).

Table 2: Comparison of measurement of distance between inferior margin of MF of mandible and Lower border of body of mandible.

	Right side	Left side
Mean	14.22	13.26
SD	0.14	0.26
Test statistic	't' = 19.55, <i>p</i> < 0.01	

Statistically right side distance between inferior margin of MF of mandible and over border of body of mandible is highly significant more than left side distance between inferior margin of MF of mandible and Lower border of body of mandible (*p* < 0.01).

Table 3: Comparison of measurement between inferior margin of mental foramen (MF) and posterior border of ramus of mandible. Mean value of right side 69.2 (SD \pm 0.21) and mean value of left side was 70.2 (SD \pm 0.15) 't' test value was 22.5 and *p* value was highly significant (*p* < 0.01).

Table 3: Comparison of measurement of distance between posterior margin of mental foramina and post border of ramus of mandible.

	Right side	Left side
Mean	69.29	70.23
SD	0.21	0.15
Test statistic	t = 22.52, <i>p</i> < 0.01	

Statistically right side distance between posterior margin of mental foramina and post border of ramus of mandible is highly significantly less than left side distance between posterior margin of mental foramina and post border of ramus of mandible (*p* < 0.01).

Discussion

The present study of variation in the position of MF of mandible in Andra Pradesh population. Comparison of measurement of distance between MF and symphysis menti was on right side mean value was 27.5 (SD \pm 0.28) and left side mean value was 26.3 (SD \pm 0.25) 't' test value was 15.06 and *p* value was highly significant (*p* < 0.01) (**Table 1**). Comparison of measurement between inferior margin of MF and lower border of body of mandible on right side mean value was 14.2 mm (SD \pm 0.14) and left side was 13.2 (SD \pm 0.26) 't' test value was 19.5 and *p* value was highly significant (*p* < 0.01) (**Table 2**). Comparison of measurement between posterior margin of MF and poster or border of ramus of mandible on right side mean value was 69.2 mm (SD \pm 0.21) and left side mean value was 70.2 (SD \pm 0.15) 't' test value was 22.5 and *p* value was highly significant (*p* < 0.01) (**Table 3**). These values were more or less in agreement with previous studies.^{5,6,7}

The variations in position of MF because MF usually situated below and between the position of the root apices of the premolar teeth because of the way mandible grows the opening of the MF usually points backwards in modern humans.⁸ Moreover, bone is in two halves at birth and does

not fuse until a year or more has elapsed. The Meckels cartilage atrophies in its great part, but in the front portion, taken into the bone is ossified and probably therefore represented in the bone between body and symphysis.⁹ A part from this, as proceeding of evolution has led to greater human brain and reduction of mandible has resulted into variations in the position of MF in different region and ethnicity.¹⁰ It cannot be forgotten that, the skeleton of a particular individual is able to adapt to its owners way of life. In addition to this, intracellular rearrangement of materials and same extracellular agents such as hormones nutrition may play a role in promoting regional differentiation of mesodermal derivatives.

Conclusion

The present study variation in the position of MF of mandible is quite useful to Maxillofacial surgeon, oncological surgeon, anaesthetist, anthropologist and anatomist. But this study demands further genetic, embryological, nutritional, anthropological study because exact ossification mechanism and duration of formation, regression of symphysis menti is still unclear.

This research is approved by Ethical Committee Nimra Institute of Medical Science Ibrahim Patnam, Vijayawada (Andhra Pradesh).

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