

# A Study on Mental Foramen of South Indian Adult Dry Mandibles

Vikas.C.Desai<sup>1</sup>, Hussain Saheb Shaik<sup>2</sup>

<sup>1</sup>Asst. Prof, Department of Dentistry, BLDE University's,  
Shri. B. M. Patil Medical College Hospital and Research Centre, Bijapur – 586103, Karnataka State.  
<sup>2</sup>Asst professor of anatomy, JJM Medical College, Davangere- 577004.

## Abstract

**Background** As the mental foramen is an important landmark to facilitate surgical, local anesthetic, and other invasive procedures, the present study was aimed to elucidate its morphological features and morphometric parameters with reference to surrounding landmarks.

**Materials and Methods** Totally 150 mandibles were used for this study, from different dental Institutes. The following measurements were measured and recorded. The results were expressed in the form of Mean  $\pm$ SD.

**Results** It was found that, the mean transverse diameter was  $3.26 \pm 0.61$ mm and the mean longitudinal diameter  $2.53 \pm 0.91$ mm. The location of mental foramen was found 74.71% in line with the longitudinal axis of the second molar teeth, 11.63% was present in between first and second molar teeth. In relation with location the mean distance between symphysis menti and foramen was  $25.71 \pm 5.93$ mm on right side and left side it was  $28.42 \pm 3.41$ mm. The mean distance between mental foramen and alveolar margin was  $14.15 \pm 3.39$ mm on right side and  $12.91 \pm 3.97$ mm on left. The mean distance between mental foramen and lower border of mandible was  $11.48 \pm 2.68$ mm on right side and  $13.32 \pm 2.72$ mm on left. The shape of foramen was oval in 65%. The knowledge of mental foramen is very important for blockage of mental nerve.

**Conclusion** The knowledge of mental foramen is very important for blockage of mental nerve.

**Key words:** Mental foramen, Dental surgeries, Symphysis menti, Mandible, Molar teeth.

## INTRODUCTION

The Mental Foramen is located in the body of the mandible, midway between the inferior and the alveolar margins of the body, it is present between the premolars, in a vertical line with the supraorbital notch. It provides a passage for the exit of the mental nerve and the vessels. Mental foramina in general oriented postero-superiorly. The precise knowledge on the variations in the position, shape, and the size of the mental foramen and the presence of the accessory mental foramen would be of much use for dental surgeons while they do surgical procedures on the mandible, such as the Curettage of the premolars, Filling procedures, Dental implants, Root Canal Treatments, Orthognatic surgeries, etc. It is also essential to have an effective and a successful anaesthesia during nerve blocks, prior to the surgical procedure. Many studies have been reported by various authors, which were done in different ethnic groups and on populations of different races, but such studies which have been reported in the South Indian population are sparse. Hence, an attempt was made in our present study, to determine the most common position and size of the mental foramen in adult South Indian mandibles, which may be useful for the future implications in our South Indian population. Variations in the position of mental foramen have been analysed. It may lie between the apices of lower premolars, below the apex of second premolar[1]. A review by Green[2] demonstrated a clear racial trend in the position of the mental foramen. Any foramen in addition to mental foramen is known as accessory mental foramen in the body of mandible. Hence location, size, shape, position and incidence of mental

foramen would facilitate the dental surgeon to apply nerve block in different surgical procedures involving lower jaw. In addition to this, if this nerve is not blocked, in the structures supplied by it, paresthesia will be less.

## MATERIALS AND METHODS

Totally 150 mandibles were used for this study, from different dental Institutes. The following measurements were measured and recorded. The mean transverse diameter, mean longitudinal diameter, the mean distance between symphysis menti and foramen on right and left side, the mean distance between mental foramen and alveolar margin was on right and left side, the mean distance between mental foramen and lower border of mandible on right and left side were measured. The results were expressed in the form of Mean  $\pm$ SD.

## RESULTS

It was found that, the mean transverse diameter was  $3.26 \pm 0.61$ mm and the mean longitudinal diameter  $2.53 \pm 0.91$ mm. The location of mental foramen was found 74.71% in line with the longitudinal axis of the second molar teeth, 11.63% was present in between first and second molar teeth. In relation with location the mean distance between symphysis menti and foramen was  $25.71 \pm 5.93$ mm on right side and left side it was  $28.42 \pm 3.41$ mm. The mean distance between mental foramen and alveolar margin was  $14.15 \pm 3.39$ mm on right side and  $12.91 \pm 3.97$ mm on left. The mean distance between mental foramen and lower border of mandible was  $11.48 \pm 2.68$ mm on right side and  $13.32 \pm 2.72$ mm on left.

The shape of foramen was oval in 65%. The knowledge of mental foramen is very important for blockage of mental nerve.

### DISCUSSION

The mandibular canal, through which the inferior alveolar nerve and vessels pass, bifurcates and forms the mental and incisive canals [3]. The mental foramen is an important anatomical landmark and is a funnel-like opening located on the anterolateral aspect of the mandible which marks the termination of the mental canal, to facilitate diagnostic, surgical, local anesthetic and other invasive procedures of the oral and maxillofacial region. The mental nerve and vessels radiate through the mental foramen and supply sensory innervation and blood supply to the soft tissues of the chin, lower lip and gingiva on the ipsilateral side of the mandible. Knowledge of the precise location of mental foramen is important in performing effective mental nerve block and which in turn will invariably reduce the relative risks during these procedures. The standard anatomy text books states that the mental foramen is most commonly found between the apices of the first and second lower premolar. As the mental foramen cannot be clinically visualized or palpated in clinical situations, it is localized in relation to the lower teeth. In such cases, mental foramen can be accurately localized if the distance from the symphysis menti is known[4].

In present study it was found that, the mean transverse diameter was  $3.26 \pm 0.61$  mm and the mean longitudinal diameter  $2.53 \pm 0.91$  mm. The location of mental foramen was found 74.71% in line with the longitudinal axis of the second molar teeth, 11.63% was present in between first and second molar teeth. In relation with location the mean distance between symphysis menti and foramen was  $25.71 \pm 5.93$  mm on right side and left side it was  $28.42 \pm 3.41$  mm. The mean distance between mental foramen and alveolar margin was  $14.15 \pm 3.39$  mm on right side and  $12.91 \pm 3.97$  mm on left. The mean distance between mental foramen and lower border of mandible was  $11.48 \pm 2.68$  mm on right side and  $13.32 \pm 2.72$  mm on left. The shape of foramen was oval in 65%. The knowledge of mental foramen is very important for blockage of mental nerve. Our results are in correlation with previous studies. According to Aktekin et al[4] normally mental foramen is located under and between the apices of the two premolars, at a little angle towards the back. Wang et al.[5] showed that the location of the mental foramen under the apex of the lower first premolar was the most common location in 58.98% cases, on the average the distance of the most anterior portion of the anterior border of the foramen to the mandibular symphysis was 28.06 mm, between the most anterior portion of the anterior border of the foramen to the posterior border of the mandible was 74.14 mm, between the inferior portion of the foramen to the inferior border of the mandible was 14.70 mm and between the superior portion of the foramen to the crown of the second lower premolar was 2.50 mm. The most common position of the foramen was inferior to the crown of the second premolar and of approximately 60% of the distance from the point of the vestibular cuspid of this tooth to the inferior border of

the mandible, confirming also some of our findings. Santini & Land[6] studied the anterior-posterior portion of the mental foramen in 68 Chinese mandibles and in 44 British mandibles. The position of the mental foramen in Chinese mandibles was the longest on the longitudinal axis of the second pre molar while in the British mandibles it was located between the apices of the first and the second premolars. According to Mbajorgu et al[7] by the anatomical transverse sectional study in 32 mandibles of black adults from Zimbabwe the mental foramen was found to be a round shape in 14 of the 32 mandibles (43.8%) and of an oval shape in 18 mandibles (56.3%). The distance to the upper border was 13.6 mm on the right side and 14.62 mm on the left side. The horizontal dimension of the mental foramen was 2.93 mm on the right side and 3.14 mm on the left side. The vertical dimension was 2.38 mm and 2.64 mm on the right and left sides respectively. Souaga et al[8] studied 61 dry mandibles in which, for the male sex, the mental foramen was found 14.89 mm above the lower border of the mandible and 16.16 mm below the alveolar ridge. In the feminine mandibles the foramen was located 14.21 mm above the lower mandible border and 15.66 mm below the alveolar ridge. The precise identification of position of the mental foramen is important in both diagnostic and clinical procedures of the mandible. Clinically, mental nerve bundle emerging from the mental foramen may get injured during surgical procedures with resulting anesthesia along its sensory distribution[9]. The present study results are in correlating with our previous study results. The knowledge of mental foramen location and measurements are very helpful for blockage of mental nerve in facial and dental surgeries.

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