



STUDY OF ANATOMICAL VARIATIONS OF MENTAL FORAMEN IN DRY ADULT HUMAN MANDIBLES IN TELENGANA REGION.

Anatomy

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ABSTRACT

Aim: The mental foramen is a small foramen which is located in the antero-lateral aspect of the body of the mandible. It is situated midway between the upper and the lower border of the mandible and it transmits the mental nerve and the vessels. The knowledge on the anatomy of the mental foramen is very important in clinical dentistry and in surgical procedures which involve that area.

Material and Methods: this study was conducted on 60 adult dry human mandibles from the South Indian population, irrespective of age and sex. The location, shape of Mental Foramen, Presence of the Accessory Mental foramen, Accessory Mandibular foramen and Retro Molar Foramen were studied by visual examination.

Results: Mental Foramen:

In our present study, 57 bones (95%) showed a single Mental Foramen on the left side and 57 bones (95%) showed a single foramen on the right side. out of 60 bones in 45 bones shape of mental foramen is oval (75%), in remaining 15 bones the shape of Mental foramen is round (25%).

Conclusion: The knowledge on the variations in the position and size of the mental foramen and the presence of the accessory foramen may be of much use to dental surgeons.

KEYWORDS:

Mental foramen, Mandible, Accessory Mental Foramen

INTRODUCTION:

The Mental Foramen (MF) is located in the body of the mandible, midway between the inferior and the alveolar margins of the body^{1,2}. 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 vessels³. Most of the mental foramina are oriented postero-superiorly. Variations in the position of the MF have been reported by many authors in different ethnic groups^{4,5} and various shapes have also been noticed⁶. Any foramen which is in addition to MF is considered as an Accessory Mental Foramen⁷ (AMF) and it is usually located below the 1st molar teeth⁸. This accessory mental foramen may transmit the branches of the mental nerve. The precise knowledge on the variations in the position, shape of the mental foramen, the presence of the Accessory Mental Foramen, Accessory Mandibular Foramen and Retro Molar Foramen (RMF) 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 (RCT), Orthognatic surgeries, etc. but such studies which have been reported in the South Indian population are sparse. Hence, an attempt was made in our present study.

MATERIAL AND METHODS:

The mandibles which were used for our study were procured from the Department of Anatomy, Osmania Medical College (Hyderabad) and Kakatiya Medical College (Warangal), Telangana state, India. About 60 adult dry South Indian mandibles, irrespective of age and sex, with either all the teeth intact or with preserved alveolar margins, were used for our study. The position, shape of Mental Foramen, Presence of the Accessory Mental foramen, Accessory Mandibular foramen and Retro Molar Foramen were studied by visual examination. The position of the mental foramen were measured by taking MLF: measurement of the distance from the sagittal median line of the mandible to the center of the mental foramen. LRF: distance from the lower rim of the mandible to the center of the mental foramen using a digital vernier caliper.

RESULTS:

Mental Foramen:

In our present study, 57 bones (95%) showed a single Mental Foramen on the left side and 57 bones (95%) showed a single foramen on the right side. out of 60 bones in 45 bones shape of mental foramen is oval (75%) (Table-1&3), in remaining 15 bones the shape of Mental foramen is round (25%) (Figure-1&2).

Position of Mental Foramen in relation to borders were measured by taking MLF, LRF distance from the lower rim of the mandible to the center of the mental foramen using a digital vernier caliper. The range of MLF on right and left sides are 18-25mm and 20-26mm respectively with average distance 21.5mm on right side, 22mm on left side. The range of LRF on right and left sides are 7-12mm and 6-12mm respectively with average distance 9mm on right side, 8mm on left side (Table-2).

Accessory Mental Foramen (AMF):

The incidence of the AMF Out of 60 bones, 3 bones showed accessory mental foramen on right side (5%), 3 bone showed accessory mental foramen on left side (5%), 4 bones showed accessory mental foramen bilaterally (6.3%). In the remaining 45 bones no accessory mental foramen were found (83.7%) (Table-4).

Retro Molar Foramen (RMF):

The incidence of the RMF Out of 60 bones, 4 bones showed Retro Molar Foramen on right side (6.3%), 2 bones showed Retro Molar Foramen on left side (3.2%), 4 bones showed Retro Molar foramen bilaterally (6.3%). In the remaining 50 bones no Retro Molar foramen were found (84.2%) (Table-4).

Accessory Mandibular Foramen:

The incidence of the Accessory Mandibular Foramen, Out of 60 bones, 6 bones showed Accessory Mandibular Foramen on right side (10%), 6 bones showed Accessory Mandibular Foramen on left side (10%), 6 bones showed Accessory Mandibular Foramen bilaterally (10%). In the remaining 42 bones no Retro Molar foramen were found (70%) (Table-4).

DISCUSSION:

In our present study, 57 bones (95%) showed a single Mental Foramen

on the left side and 57 bones (95%) showed a single foramen on the right side. out of 60 bones in 45 bones shape of mental foramen is oval(75%), in remaining 15bones the shape of Mental foramen is round(25%) (Table-1&3).

Our study documented the oval shape as the most common shape of the Mental Foramen than the round shape. Our study results differed from those of the studies from East India^{9,10,11,12}, as they noticed more percentages in favour of the round shape than the oval shape. But our results were in close association with those of Gershenson¹⁵, Mbajioru et al.¹³ and Agarwal and Gupta⁶. Hauser and De Stefano¹⁶ stated that the different variants may have occurred due to the epigenetic traits, as they could be the products of the genetically determined growth processes of other tissues, which had affected the bone formation. Subsequently, they undergo modifications during ontogeny and variable degrees of expression. Thus, the variations in the position, shape, number and size of the MF depends on the gene modification, Yesilyurt H. et al¹⁴.

In our study the incidence of the Accessory Mental Foramen (AMF), Out of 60 bones,³ bones showed accessory mental foramen on right side (5%),³ bone showed accessory mental foramen on left side (5%), 4 bones showed accessory mental foramen bilaterally (6.3%). Our results were in contrast with those of Singh and Srivastava¹⁰, where they found 8% AMFs on the left side and 5% on the right side. The incidence of the AMF in the Israeli population¹⁵ was 2.8%, it was 1.8% among the American whites, it was 12.5% among Polynesians.

Position of Mental Foramen in relation to borders were measured by taking MLF,LRF. The range of MLF on right and left sides are 18-25mm and 20-26mm respectively with average distance 21.5mm on right side,22mm on left side. The range of LRF on right and left sides are 7-12mm and 6-12mm respectively with average distance 9mm on right side,8mm on left side. The literature on this are very sparse in Indian studies.

CONCLUSION:

The knowledge on the variations of the mental foramen is important for dental surgeons while they perform endodontic and periodontal surgeries, dental implantations, orthognatic surgeries, etc. Also, the verification on the presence of the AMF would prevent an accessory mental nerve injury during surgery and inadequate paraesthesia.

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