ORIGINAL ARTICLE

AODMR

Anatomical landmarks for location of the mental foramen in OPG and how it differs according to the age and sex

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ABSTRACT:

Background: Mental Foramen (MF) is an important topic in dentistry. The knowledge on the location of MF helps the practitioner the idea on how anesthesia will be administered. The position of MF changes as a person grows. It also varies with gender. The knowledge on MF and the entire mouth area have proved critical in forensic dentistry as it serves in human identification.

Aim: The aim of this study is to assess the position of mental foramen by measuring the vertical bone height from OPG as well as the variation of resorption pattern by gender and age.

Method: 50 patients were involved in the research composed of 25 males and 25 females. Their ages ranged between 21-50 years and divided into three groups. They were then subjected to panoramic radiography.

Results: The mean figures of comparison of the inferior border of mental foramen to lower border of mandible (I-L) and superior border of mental foramen to lower border of mandible (S-L) in females and males were significantly lower in females compared to males

Conclusions: The study concluded that the knowledge can play a critical role in identifying the age or gender of a person.

Keywords: Mandible, Mental Foramen, Orthopantomography.

INTRODUCTION

Mental foramen (MF) is a fundamental anatomic landmark in dentistry. The knowledge about MF's variable location (L) has an impact on the adequacy of local anesthesia and the wellbeing of surgical procedures. Assessing and analyses of the morphological attributes of bone is a common method used by forensic anthropologists and dentists in determination of individuals. Majority of anatomical landmarks such as orbital bone, frontal bone, tooth, maxillary sinus, and jaws in human skull are important for use in forensic science for determination of age or sex of the person or for individual identification.[1] The objective of this study is to evaluate the position of mental foramen by measuring the vertical bone height from OPG as well as the variation of resorption pattern by gender and age.

OBJECTIVE

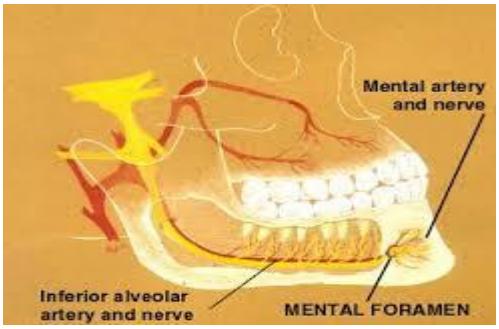
The objective of this study is to evaluate the position of mental foramen by measuring the vertical bone height from OPG and also the variation of resorption pattern by gender.

BACKGROUND

The mental foramen is located in the apical region of the mandibular premolars but it have some variations regarding its distance to both lower premolars and the base border of the mandible. This may make a problem especially for the oral surgeon in his work during operations like implantation. Therefore, this study is done to estimate the position of the mental foramen and how it varies according to age and sex.

Mental foramen is one of the two sets of foramina that is located on the anterolateral surface of the body of the mandible. It is an essential anatomical landmark for the dental surgeons and anesthetists during various oral and maxillofacial surgeries/ procedures. In addition, the anatomical location of the mental foramen may help in forensic identification especially with regard to determination of age and sex of an individual.

The shape of the mandible goes through definitive variations from birth onwards. It does not stop even up to the old age. The comparative location/position of the mental foramen changes accordingly too. Therefore, its evaluation provides a clue to the age of an individual. In infancy, the mental foramen is low and relatively located far posteriorly. It is below the first molar bud. When permanent teeth eruption, the mental foramen moves anteriorly, reaching its final destination that corresponds to the level of the second premolar tooth. This accounts for its relative ante-roposterior movement. In view of its relative vertical movement, the mental foramen seems closer to the alveolar margin in neonates. With eruption of teeth it moves down between the inferior and alveolar border. The mental foramen in adults is nearer to the inferior border while it moves upwards closer to the alveolar border when the individual grows old. This is due to the loss of teeth as well as bone resorption. Therefore, it is clear that the disparities in the mental foramen location are observed in different age groups.



Mental Foramen

METHODOLOGY

Randomly, all the participants with age of 21 to 50 years representing to the department of oral medicine and radiology will be subjected to the digital panoramic radiography after considering all the exclusion criteria and falling under inclusion criteria.

The measurements obtained for each of the radiograph will be presented in millimeters (mm).

The below measurements will be taken for the success of credible results.

Distance 1- The vertical distance beginning from the lower edge of mandible base on the image to the lower border of mental foramen, crossing through the center of the mental foramen.

Distance 2 – The vertical distance starting from lower edge of mandibular base on the image to the upper border of the mental foramen of the image, crossing through the center of the mental foramen.

Distance 3 – The vertical space of the lowest point on the mandibular foramen on the image to the mandibular incissors, crossing through the center of the mandibular foramen.

Distance 4 – The vertical distance of the to the inferior edge of the mandibular ramus on the image to the lowest point on the mandibular incisures, crossing through the center of the mandibular foramen.

Source of Data

The sample of this study was collected from 50 patients (25 males and 25 females) of Saveetha Dental College and Hospitals. The patients selected in this study' age ranged between 21-50 years and were divided into three groups: according to special criteria, according to the radiographs examined, and then the position of the mental foramen for each patient was estimated.

RESULTS

The analyzed information collected using panoramic radiographs show that the mean figures of comparison of inferior border of mental foramen to lower border of mandible (I-L) and superior border of mental foramen to lower border of mandible(S-L) in females and males were significantly lower in females

compare to males. Comparing IL and SL on the left and right side for the same participant did not present significant differences.

POSITION	1	2	3			4	5			6
			3A	3B	3C		5A	5B	5C	
Group A	0	0	0	5	12	17	1	3	2	0
Group B	2	0	0	8	13	16	1	0	0	0
Group C	0	1	0	7	15	12	0	5	0	0
Group D	0	3	0	5	11	13	2	6	0	1
Group E	0	2	0	7	6	21	1	2	0	1
			0	32	57		5	16	2	
TOTAL	2	6	89			79	23			1

Gender Comparison Results

The average distance from the lower border of the mandible to the upper border of the mental foramen (SL) on the right side in males was observed to be 17.5 mm. The same for females was observed to be 16.0 mm. For the left side for males, the distance was observed to be 17.4 mm. For females, the distance was observed to be 15.6 mm.

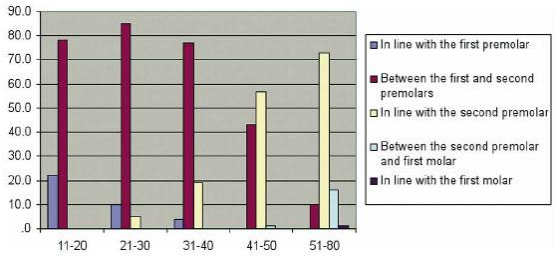
For the right side, the meant distance from the lower border of the mandible to the lower border of the mental foramen (IL) was observed to be 12.6 mm for males. For females, the distance was observed to be 11.4 mm. The distance in males for the left side was observed to be 12.5 mm, while it was 11.2 mm in females.

The comparison of SL between females and males indicated a high significant distance of 0.001 on both the left and the right sides. Likewise, comparing of the IL between females and males indicated high significant difference of 0.0022. The comparing of IL and SL between the left side and the right side for males did revealed non-significant difference of 0.84 and 0.67, respectively. Similarly, the comparing of the left side and the right side in females showed non-significant difference of 0.76 and 0.57 respectively.

Age Comparison Results

The occurrence of the L in association to age was first assessed and analyzed descriptively. The Fisher's exact and Pearson chi-square tests were used to evaluate the relationship between participants' demographic variables, with ET, L, and frequency of AMF. SPSS software was used to analyze the data collected. The level of significance was set as 0.05. There was insignificant difference in the distance of the mental foramen for adults who had all the teeth or missed some.

This study concludes that age is less clearly associated to mental foramen apparently can be associated to the fact that this study was conducted using radiographs of adult individuals aged between 20 and 50 years. The extremes of human ages were not incorporated in the research (Fukase, 2014). Considering statistically significant sex disparities were evidently in the location of mental foramen and all the other variables included in the study, it is proposed that the connection of the age and other different parameters should be drawn separately for males and females and of different ages. On the same note the relationship between age and different parameters ought being drawn for the whole sample but not among different age groups especially because there was no significant differences that were observed between different age groups for almost all of the parameters integrated in the study.



CONCLUSION

The mandibular foramen and mental foramen, which are paired, are an essential anatomic point existing in the mandible bones. The morphometric dimensions, mandibular foramen, and mental foramen are increasingly becoming useful resources and tools for planning surgical approach in clinical dentistry. They have proved critical in forensic dentistry as it serves in human identification. They can also be used in medico-legal issues. The analyses conducted in this research demonstrate how mental foramen varies between genders and age. There is significant difference in the position of the mental foramen between males

and females. However, the difference is non-significant when the comparison is done with candidates of different age groups. This could be due to the limitation of this study, as it did not involve people in the extreme ages such as children and senior citizens.

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