

Position of Mental Foramen among two south Indian Population

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Abstract

Introduction and Objective: India is a diverse country with different ethnic origin. Mental foramen is a significantly important anatomical landmark whose position determines the treatment outcome of many dental procedures. The purpose of the present paper was to evaluate the location of mental foramen between the populations of Karnataka and Kerala.

Materials and Method: A total of 100 Digital Panoramic radiographs suitable for our study were selected from the records of PMNM dental College and Hospital department of Oral Medicine and Radiology of which 50 radiographs belonged to the Kerala population and 50 radiographs belonged to the local inhabitants of Bagalkot Karnataka. The location of mental foramen was differentiated into 6 types with reference to the mandibular posterior teeth.

Results: The mental foramen was situated between the two premolars in both the population.

Conclusion: The study concluded that there was no significant difference in the location of mental foramen among two south Indian inhabitants.

Keywords: Mental foramen, Karnataka, Kerala, OPG

Introduction

The Mental Foramen (MF) is a breach on the body of the lower jaw through which the mental nerve and vessels egress and supply the soft and hard tissues anterior to the first molar.^(1,2) Mental foramen is a significant land mark in dental procedures like mental nerve block during the mandibular teeth extraction, placement of implants and in forensics to assess the age and sex.⁽³⁾

The location of the mental foramen is very unusual and hence difficult to assess it clinically. The most accurate and convenient method to assess the position of MF would be on the radiographic examination by using a panoramic radiograph. Panoramic radiograph is one of the most routinely used modes of radiographic investigation in dentistry which gives a complete view of both the mandible and maxilla and also the bilateral position of the MF in a single view.^(4,5)

The location of MF may change with age as it is more closer to the superior border in edentulous arch as a result of bone resorption in aged patients and it is appreciated between canine and first molar in childhood.⁽⁶⁾ Paleoanthropologically also there are disparity in the site of MF between various races and civilization. Various studies have been conducted that have assessed the position of MF in individual inhabitants of a particular country,^(1,5,7,8,9) and few comparing the position among different races. The rationale behind the study was to contrast the difference in the location of MF between the two south Indian states, Karnataka and Kerala using Orthopantomogram (OPG) as there is only handful of studies comparing the population belonging to population of South India.

Materials and Method

A total of three thousand five hundred and fifty four radiographs were examined from the archives of department of Oral Medicine and Radiology, PMNM Dental College and Hospital Bagalkot Karnataka by retrospectively the demographic data between 2011-2014. 100 radiographs which showed the bilateral presence of MF and their borders clearly identified, met the inclusion and exclusion criteria which were selected. 50 radiographs belonged to the local population from Karnataka and 50 from Kerala. The Kerala population mainly comprised of dental and medical students who had come to the dental college seeking various dental treatment from different parts of Kerala. All the radiographs were taken in Kodak 8000C (tube voltage 60-90 kV, tube current 2- 15 mA, tube focal spot 0.5 mm, total filtration >2.5 mm eq. Al and exposure time 4-14 seconds).

Inclusion Criteria:

1. Bilateral presence of mental foramen which could be clearly identified on the radiograph.
2. Presence of all the teeth in the mandible between right second and left second molar.
3. Age 16-45 years and above with presence of all permanent teeth in the mandible.
4. Absence of crowding of the mandibular teeth.

Exclusion Criteria:

1. Patients with periodontal problems.
2. Periapical lesions in the mandible.
3. Patient who are taking/ undergone orthodontic treatment.
4. Patients who have undergone maxillofacial surgeries in the mandible.
5. Radiographs with impacted or mixed dentition.
6. Poor quality of radiograph.

7. Supra-eruption or pathological migration of mandibular teeth.

The position of the mental foramen on the OPG was classified as per the criteria given by^(10,11,12)

Position 1: Position of MF anterior to the first premolar.

Position 2: Location of MF along the long axis of first premolar.

Position 3: MF amid the apices of the first and second premolar.

Position 4: Situation of MF in line with the long axis of second premolar.

Position 5: MF located between the apices of the second premolar and first molar.

Position 6: MF situated along the long of first molar tooth.

Results

Data was statistically analyzed using descriptive analysis to determine the percentage of position of MF in the two population. Table 1 reflects in percentage the position of MF in both Karnataka and Kerala population. Position 3 was the most prevalent followed by position 4 with 58% and 22% respectively in Karnataka population, similarly in Kerala population Position 3 was frequent with 56% followed by Position 4 with 24%.

Table 1: Position of Mental Foramen

Position of mental foramen on OPG	Karnataka Population (%)	Kerala Population (%)
Position 1	3%	3%
Position 2	16%	14%
Position 3	58%	56%
Position 4	22%	24%
Position 5	0%	1%
Position 6	1%	2%

Discussion

The precise location of MF is very valuable for various dental trial.⁽¹¹⁾ The outcome of the study suggests that the most frequent position of MF encountered in both Karnataka and Kerala inhabitants is position 3 that is between the two premolars. The result obtained are comparable with similar studies done on inhabitants of Southern states of India.^(13,14) As there are no studies comparing the position of MF between the two population we compared the parameters and found no significant difference between the position of MF.

The rationale behind the findings could be that the basic origin of both the population can be traced to the Dravidians, the original inhabitants of South India,⁽¹⁵⁾ the other explanation could be that they share basically the same diet and climate which has a huge influence on the development of craniofacial structures.⁽¹⁶⁾ Other studies done in population of North Indians have shown that the most common position of

MF is position 4.^(17,18,19) The present study justifies that there is no difference between the position of MF in different South Indian population but when the data is compared with the data on North Indian population there is a clear difference, hence this difference in the position of MF can be used as a unique identification landmark in cases mass disaster, forensic, anthropological studies. Further it can also lend a hand in various dental procedures like nerve block, implant placement, orthognathic surgeries.

Conclusion

The most common position of MF in Karnataka and Kerala population was between the two mandibular premolars and as the sample size was small further studies have to be carried out in order to draw a definite conclusion.

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