

Panoramic Radiographic Study of Mental Foramen in Selected Kashmiri Population.

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ABSTRACT

Background: The aim of this study was to investigate the most common accurate position of the mental foramen in selected Kashmiri population, which helps in several clinical procedure and nerve block anesthesia. **Methods:** The study sample included one thousand panoramic radiographs of selected population of Kashmir that presented to postgraduate department of oral and maxillofacial surgery, Govt. dental college and hospital Srinagar from 2008 to 2015. **Results:** The most common Horizontal position of the mental foramen was below the root of second premolar tooth i.e. position 4 (44.77%). **Conclusion:** This may help the clinicians and anthropologists in identifying the mental foramen more accurately.

Keywords: Mental foramen (MF), Mandible, Horizontal Position, Orthopantomogram (OPG).

INTRODUCTION

Mental foramen is an important anatomical landmark. Anatomy of the mandible and possible variations in position, course and type of emergence of its neurovascular bundle is important in gaining local anesthesia and during surgical procedure.^[1] Recently this issue has again become the center of interest due to the need for accurate preoperative surgical planning for the placement of mandibular implants. It has been recommended to consider a 2-mm distance between the implant and the margin of the mental foramen.^[2] Mental foramen is located on the anterolateral aspect of the body of mandible, lateral to and above the mental tubercle. It is felt as a slight depression. It gives passage to the mental nerve and vessels.^[3-5] Mean diameter of mental foramen is reported to be 3.8 mm.^[6-9] Anatomically there is one mental foramen each on each side of mandible. Variation in number of mental foramina also been reported.

More than one mental foramina in one side ranges from 2% to 10%^[11-14] whereas up to 0.06% incidence of absence of mental foramina is also reported.^[15] On an OPG, mental foramen is visible as a round or oval radiolucency. The aim of this study is identification of the accurate anatomical location of the mental foramen helps in several clinical procedure, nerve block anesthesia and implant placement.

MATERIALS AND METHODS

This study was based on one thousand (OPGs) of adult patients. This was a non-probability convenient sampling, cross sectional study design of selected population of Kashmir that presented to postgraduate department of oral and maxillofacial surgery, Govt. dental college and hospital Srinagar from 2008 to 2015. Panoramic radiographs of patients radiographed in the Radiology section within this time period were retrieved from the Medical records section and retrospectively evaluated 1000 panoramic radiographs were evaluated out of which 545 fulfilled the inclusion criteria. All OPG were examined two times in a dark room on an X-ray viewer. Here the mental foramen was located as radiolucency, traced by following the inferior alveolar canal. The data was analyzed by (SPSS Version 16), following some

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inclusion & Exclusion Criteria was used. Inclusion criteria are (1) Age 15 and above; (2) Film should show no radiographic exposure and processing artifacts; (3) OPG of adult patient of both sexes with permanent dentition at least having first molar teeth bilaterally; (4) Radiographs having bilaterally visible mental foramina taken by same machine. Exclusion Criteria are (1) Radiograph of edentulous patients; (2) Radiograph showing incomplete or mixed dentition; (3) Radiograph with pathologic lesion; (4) Unreadable and poor quality of OPG; (5) Missing teeth, especially missing lower canine must be excluded when mesial premolar drift occur; (6) Presence of supernumerary teeth in mandibular dentition; (7) Presence of periodontal lesion in mandibular dentition that may cause dental mesial drift; (8) Patients with previous and current orthodontic treatment.

The horizontal position in relation to the apices of adjacent teeth is more emphasized in different clinical procedures. Commonest position of mental foramen is described to be apical to the second premolar tooth,^[16,17] and between the roots of two mandibular premolar teeth. Most of the researchers classify the position of mental foramen in following position 1: MF situated anterior to the first premolar tooth. Position 2: MF situated in the line with the long axis of first premolar tooth. Position 3: MF Situated between the apex apices of the first and second premolar teeth. Position 4: MF situated in the line with the long axis of second premolar tooth. Position 5: MF Situated between the apex apices of the second premolar and first molar teeth. Position 6: MF situated in the line with the long of first molar tooth.

RESULTS

The age of the subjects ranged from 16 years to 60 years (mean age 28.33). Gender distribution shows male predominance with males being 65.32% (n=356) and females being 34.68% (n=189) [Table 1]. Position 1 was found to be in 44 OPGs on the right side and 21 OPGs on the left side. Its frequency was reported as 8 % on the right side and 3.85% on the left side. Position 2, was found to be in 49 OPGs and frequency was reported as 9% on the right side and in 54 OPGs on the left side where frequency was 9.9 %. Position 3 was found to be in 142 OPGs & frequency is 26% on the right side and 146 OPGs on left side and frequency is 26.6 % Position 3 was the second most common location of MF as viewed in OPG. Position 4 was found to be in 240 OPGs on right side and 244 on left side. Its frequency was 44% on right side and 44.77% on left side. Hence, Position 4 is the most common position of MF as viewed in OPG. Position 5, was found to be in 50 OPGs on the right side and 54 OPGs on the left side. Its frequency was 9.1% on the right side and 9.9% on the left side. Position 5 and Position 2 is the third most common location of MF as viewed in OPGs. Position 6 was found to be in only 20 OPGs and 26 OPGs on the right and left side. Its frequency was reported as 3.67 % and 4.77% for the right and left side. Position 6 is the least common position of MF as viewed in OPG as shown in [Table 2].

Table 1: Gender Distribution.

Gender	Frequency	%age
Male	356	65.32
Female	189	34.68

Table 2: Location of mental foramen (in Horizontal axis).

Horizontal position	Right side Frequency %age	Left side Frequency %age
Position 1	44 8	21 3.85
Position 2	49 8.99	54 9.90
Position 3	142 26	146 26.78
Position 4	240 44	244 44.77
Position 5	50 9.17	54 9.90
Position 6	20 3.67	26 4.77
Total	545 100	545 100

DISCUSSION

Determination of position of mental foramen has been a topic of great interest for the investigators emphasizing on important anatomical landmarks of the maxillofacial region.^[18] Radiography is the only available non-invasive method for diagnosis and treatment planning of major surgical procedures of the mandible. Although it is clear from previous studies that position of mental foramen is the pre requisite for any mandibular anterior surgical procedure, there are significant

differences between different populations. Hence, it is important to know these differences anatomically and statistically and our study has shown the same in Kashmiri population. We utilized panoramic radiographs because they have certain advantages over intra-oral radiography. It includes a greater area of hard and soft tissues and also the visualized area in continuity, thus allowing for a more accurate location of the mental foramen in both the horizontal and vertical dimensions. This study overcomes drawbacks of using Intraoral Periapical (IOPA) for determining the position of mental

foramen as done by Fishel et al.^[19] The weighted frequency of the location of the mental foramen in some studies was in position 3.^[19,26-28] But in our study most common position in horizontal axis is position 4, which is in accordance to various studies.^[20-25,29,30] Position 3 is the second most common position. Hence, it is clear that location of mental foramen varies with different population. No significant gender differences were found in the population we selected, which is in agreement with previous studies.

CONCLUSION

In conclusion, according to our results the location of the mental foramen on the panoramic radiographs of selected Kashmiri population was most commonly in the line with the long axis of second premolar tooth (position 4). In majority of cases, there was bilateral symmetry in the position. Radiographic studies have made a large account of studies of position of mental foramen, as these are easily accessible, large sample sizes available and non-invasive. We therefore stress the importance of accurate radiographic identification of mental foramen and interpretation before administration of local anesthesia or conducting any surgery of mandible in the vicinity of mental foramen. These findings can be used as reference material by the dental practitioners of Kashmir while performing clinical procedures that involve mental foramen.

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