Anatomical Science (2022) Volume 5
doi:10.24294/as.v1i3.732

Radiographic Position of the Mental Foramen

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ABSTRACT

Background: The location of the mental foramen is important for dental surgeons. Variations in its locations can be a cause of complications during local anesthesia or surgical procedures which involving mandible. The usual location of the mental foramen in an Indian population has not been previously reported. Aim: The purpose of this study was to evaluate the most common location of the mental foramen in an Indian population. Materials and Methods: 260 panoramic radiographs were evaluated with regard to the location and symmetry of the mental foramina in male and female subjects. Results: We found that the mental foramen was located between the first and second premolars in 20% , in line with the second premolar in 61%, between the second premolar and mesial root of first molar 3.8%, In the line of mesial root of first molar 5.3% and distal to mesial root of first molar 0.3%. It was symmetrical in 59 %. Conclusions: This study emphasis that the most common location of mental foramen is in the line of second premolar followed by between the two premolars. The clinician should asses the location of mental foramen before any surgical intervention involving mandible.

Keywords: Mental Foramen; Mental Nerve; Mental Vessels.

1. Introduction

The mental foramen is present on each side of the buccal cortex of the mandibular bone and lies near the apices of the premolars. The opening of the mental foramen may directed in superolateral, anterolateral, lateral and posterolateral. The mental nerve and vessels transmitted from mental foramen[1]. The mental nerve is a terminal branch of the inferior alveolar nerve and gives sensory nerve supply to the lower lip, the buccal vestibule, and the gingiva mesial to the first mandibular molar[2]. The mental nerve can be injured during surgical procedures, resulting in paresthesia or anesthesia in the area innervated by the nerve. Additionally, local anesthesia of the terminal incisive branches of the inferior alveolar nerve and the mental nerve can be achieved if the mental canal is accurately located and anesthetic solution deposited around it. Thus, accurate information regarding the location and orientation of the mental canal and its foramen can be very important[3]. As the bone density increases, the mental foramen becomes more difficult to identify on radiographs[4]. Such cases, in which the mental foramen cannot be identified on panoramic radiographs under ordinary exposure[5]

We evaluated 260 panoramic radiographs of patients who had been referred to our Department of oral and Maxillofacial Surgery in Dr. Rajesh Kambe Dental College Akola Maharashtra India. Presence of a radiolucent lesion in Parasymphysis region, presence of a missing tooth in the lower jaw, blurred mental foramen, patient under 15 years were excluded from this study. The position of the mental foramen was recorded according to their positions.

doi: 10.24294/as.v1i3.732

Position 1	Mesial or In line with the first premolar
Position 2	Between the first and second premolars
Position 3	In line with the second premolar
Position 4	Between the second premolar and mesial root of first molar
Position 5	In the line of mesial root of first molar
Position 6	Distal to mesial root of first molar.

Table 1. Positions of Mental Foramen

We used a ruler to identify the longitudinal axis of the tooth nearer to mental foramen and the position of the mental foramen was recorded in relation to this. After evaluation of each panoramic radiograph, the location of the mental foramen on each side was recorded.

2. Results

Out of the 260 panoramic radiographs analyzed, 140 were that of males and 120 that of females. The most common position for the mental foramen was position 3(61%) and least position of position 6(0.3%).

In 154 cases (59.23%) the mental foramina were symmetrically located. For the symmetrically placed mental foramina, the most common location was position 3, followed by position 2. No statistically significant differences were seen between males and females in symmetry and asymmetry location of mental foramen in both sides.

Position 1	23	8.8 %
Position 2	52	20 %
Position 3	160	61 %
Position 4	10	3.8 %
Position 5	14	5.3 %
Position 6	1	0.3 %

Table 2. Position of mental foramen percentage wise

Figure 1; Position of mental foramen just apical to mesial root of first molar**.**

3. Discussion

There is considerable data regarding position of the mental foramen in various populations. In our study 260 panoramic radiographs the location of the mental foramen varied widely, being found at any position between the root of the first premolar and the roots of the first molar[2-4]. According to this study, in 61% of the cases the mental foramen was in the line of second premolars and in 20% between the first and second premolars thus these two positions accounted for 81% of the cases. Mental foramen at Mesial or In line with the first premolar is 8.8%, Between the second premolar and mesial root of first molar 3.8%. In the line of mesial root of first molar 5.3% and distal to mesial root of first molar accounts 0.3%.

Olasoji *et al* in Northern Nigerian adults showed that the most common location of the mental foramen was between the two premolars. In our study most of foramen was in the line of second premolars. In this study we used panoramic radiographs because the mental foramen is seen more consistently on the wide field of mandible view in panoramic radiographs than on periapical radiographs[6].

We selected patients over the age of 15 because all teeth are erupted and mental foramen can be easy to locate. The presence of periodontal lesions and also previous

orthodontic treatment could cause tooth migration therefore, we omitted these cases from our study.

The limitations of our study is the use of panoramic radiographs for localization of the mental foramen instead of the use of an anatomic study on skulls.

In conclusion, the most common locations of the mental foramen are in the line of second premolar (below and/or mesial to the second premolar).

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