

Radiographic Determination of Position and Symmetry of Mental Foramen in Central Indian Population

¹Shweta Gangotri, ²VM Patni, ³RS Sathwane

¹Postgraduate Student, Department of Oral Medicine and Radiology, VSPMs Dental College and Research Center, Nagpur, Maharashtra, India

²Professor and Head, Department of Oral Medicine and Radiology, VSPMs Dental College and Research Center, Nagpur, Maharashtra, India

³Professor, Department of Oral Medicine and Radiology, VSPMs Dental College and Research Center, Nagpur, Maharashtra, India

Correspondence: Shweta Gangotri, Postgraduate Student, Department of Oral Medicine and Radiology, VSPM'S Dental College and Research Center, Digdoh Hills, Hingna Road, Nagpur-440019, Maharashtra, India, e-mail: shwetagangotri@yahoo.com gangotrisumbh@gmail.com

ABSTRACT

The mental foramen has been reported to vary in position in different ethnic groups. Repeated failures during injections and operative procedures involving the mental foramen suggest the presence of local differences in a given population.

The aim of the present study was to determine the position and symmetry of mental foramen (MF) in a digital panoramic view (OPG) in 90 patients. They were clinically divided into three groups: Group I–Angle's class I malocclusion, group II–Angle's class II malocclusion and group III–Angle's class III malocclusion. The assessment was made for location of mental foramen with reference to the first and second premolars in a digital panoramic view (OPG).

The results obtained showed that the common position of mental foramen is below 2nd premolar and between 1st and 2nd premolar.

This study concluded that there exists no difference in the appearance of the mental foramen in Angle's class of occlusion and they are not always symmetrical in same individual.

Keywords: Mental foramen, Malocclusion, Panoramic view.

INTRODUCTION

The mental foramen (MF) is a funnel-like opening in the lateral surface of the mandible at the terminus of the mental canal. The mental foramen has been reported to vary in position in different ethnic groups.

Repeated failures during injections and operative procedures involving the mental foramen suggest the presence of local differences in a given population. The mandibular premolars are located close to the mental foramina. As such, various events affecting these teeth, such as odontogenic infection and orthodontic, endodontic, periodontal or surgical misadventure, may result in neurosensory disturbance of the mental nerves.¹⁻⁵

Knowledge of the position of the mental foramen is important when administering regional anesthesia, orthodontic tooth movement/surgery and performing periapical surgery in the mental region of the mandible.¹

Paul V Abbott (1996)² reported a case in which placement of an extensive pin retained amalgam restoration in a patient's lower right second premolar tooth resulted in paresthesia of mental nerve. Radiographs indicated that the mental foramen was close to the apex of this tooth and it was assumed that postoperative pulpitis and periapical inflammation had caused the paresthesia through the effects of pressure on the mental nerve. Similarly, heavy orthodontic forces used during molar

distalization and skeletal class III cases requiring genioplasty resulted in mental nerve paresthesia.^{4,5}

AIMS AND OBJECTIVES

The aim of the present study was to determine the position and symmetry of mental foramen (MF) in a digital panoramic radiograph (OPG) in 90 patients having Angle's class I or class II or class III molar-relation.

MATERIALS AND METHODS

The present study comprised of 90 patients clinically divided into three groups of 30 each:

- Group I–Angle's class I molar-relation
- Group II–Angle's class II molar-relation
- Group III–Angle's class III molar-relation.

The assessment was made for location of mental foramen with its reference to the first and second premolars in a digital panoramic radiograph (OPG).

The OPG machine used in this study is 'The Kodak 8000 C Digital Panoramic and Cephalometric System' having following specifications:

- 72 kVp, 10 mA and 13.9 seconds
- The positions of mental foramen:
 - a = mental foramen mesial to 4 (1st premolar) (Fig. 1)
 - b = mental foramen below 4

- c = mental foramen distal to 4 (Fig. 2)
- d = mental foramen between 4 and 5
- e = mental foramen mesial to 5 (2nd premolar)
- f = mental foramen below 5.
- g = mental foramen distal to 5.

OBSERVATIONS AND RESULTS

Observations and results of the 90 panoramic radiographs were analyzed, 60% in class I and class II, and 63.05% in class III showed mental foramen were symmetrical.

The most common position was in line with the longitudinal axis and apex of the second premolar—right side 35.52% and left side 34.41% followed by the position between the first and second premolar—right side 26.64% and left side 24.42%.

Relationship between class of occlusion and position, and symmetry of mental foramen is as shown in Table 1.

DISCUSSION

In this study, determination of the position and symmetry of mental foramen by considering the Angle's class of occlusion in seven different positions were observed. The MF was observed in position d and f in majority compared to the positions a,b,c and g (see figs 1 and 2) . The results of this study are in accordance with the study by Wei Cheong and Yusof (2003).¹

The next common position for the mental foramen was position e—16.15% on right side and 25.53% on left side. In

only 61.01% the MF were symmetrical. This shows that variability exists in MF position of a same subject (Fig. 3). In present study, mental foramina were studied for position and symmetry in Angle's classes for molar-relationship as there are reported cases of mental nerve paresthesia in orthodontically treated cases.³

Accessory MF, if present, adds to the prior complication in treatment of mandibular posterior region. If the position or location of MF is known, then these complications can be avoided.⁶



Fig. 2: Mental foramina present distal to first premolar



Fig. 1: Mental foramina present mesial to first premolar



Fig. 3: Mental foramen with asymmetric location

Table 1: Relationship between class of occlusion and position and symmetry of mental foramen

Position of mental foramen	Class I		Class II		Class III	
	Right	Left	Right	Left	Right	Left
a = mental foramen mesial to 4	0	0	2 (6.6)	0	1 (3.33)	1 (3.33)
b = mental foramen below 4	1 (3.33)	1 (3.33)	2 (6.6)	1 (3.33)	3 (9.9)	1 (3.33)
c = mental foramen distal to 4	0	0	1 (3.33)	2 (6.6)	1 (3.33)	2 (6.6)
d = mental foramen between 4 and 5	7 (23.7)	5 (16.5)	10 (33.0)	10 (33.0)	7 (23.7)	7 (23.7)
e = mental foramen mesial to 5	8 (26.4)	12 (39.6)	3 (9.9)	4 (13.2)	4 (13.2)	7 (23.7)
f = mental foramen below 5	10 (33.0)	7 (23.7)	10 (33.0)	12 (39.6)	12 (39.6)	12 (39.6)
g = mental foramen distal to 5	4 (13.2)	5 (16.5)	2 (6.6)	1 (3.33)	2 (6.6)	0
Symmetry	18 (60)		18 (60)		19 (63.27)	

CONCLUSION

This study concludes that there exists no statistically significant difference in the appearance of the mental foramen in class I, class II or class III group of patients. The most common position being below 1st premolar (position f) and between 1st and 2nd premolar (position d).

Mental foramen is not always symmetrical in same individual.

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