

## Research Paper

# The Age- and Gender-wise Assessment of the Position and Shape of Mental Foramen in Patients' Panoramic Radiography



Hamzeh Ekran<sup>1</sup> , Amin Ghanbarnejad<sup>2</sup> , \*Masomeh Afsa<sup>3</sup> 

1. Department of Endodontics, School of Dental, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
2. Department of Biostatistics, School of Health, Hormozgan University of Medical Sciences, Hormozgan, Iran.
3. Department of Radiology, School of Dental, Hormozgan University of Medical Sciences, Hormozgan, Iran.



**Citation:** Ekran H, Ghanbarnejad A, Afsa M. [The Age- and Gender-wise Assessment of the Position and Shape of Mental Foramen in Patients' Panoramic Radiography (Persian)]. Journal of Arak University of Medical Sciences (JAMS). 2021; 23(6):806-817. <https://doi.org/10.32598/JAMS.23.6.6089.1>

 <https://doi.org/10.32598/JAMS.23.6.6089.1>



### Article Info:

Received: 31 Jan 2020

Accepted: 07 Aug 2020

Available Online: 01 Feb 2021

### Keywords:

Mental foramen, Panoramic radiography, Position of mental foramen, Mental foramen

## ABSTRACT

**Background and Aim** Recognizing the position of the Mental Foramen (MF) is essential in numerous cases, such as anesthesia injection and periapical surgeries in the anterior region of the mandible. Furthermore, the diversity in the location and position of MF can develop problems during surgery in this region.

**Methods & Materials** The present study examined anatomical landmarks based on panoramic radiographic images obtained in Bandar Abbas City, Iran. In total, 450 panoramic radiographic images of men and women were assessed. All explored images were converted to JPEG format and entered in real size in Auto CAD software (2014). The collected data were analyzed in SPSS by one-way Analysis of Variance (ANOVA), Student's t-test, and Chi-squared test.

**Ethical Considerations** This study was approved by the Ethics Committee of Hormozgan University of Medical Sciences (Code: IR.HUMS.REC.1394.189).

**Results** The obtained data revealed that the mean distance from the MF to the lower edge of the mandible on the right and left was 10.53 mm and 10.51 mm, respectively. The mean distance from the MF to the posterior side of the mandible equaled 49.36 mm on the right and 48.72 mm on the left. Moreover, the mean distance of MF to the midline of the lower jaw on the right and left was calculated as 27.16 and 26.27 mm, respectively. Furthermore, in most cases, the anterior-posterior position of MF was symmetrical concerning anatomical landmarks. The anterior-posterior distance of MF to mandibular midline was significantly different between the explored males and females ( $P < 0.001$ ). There was no significant gender-wise difference in the shape of the MF ( $P = 0.89$ ).

**Conclusion** The present research results signified that the most frequent anterior-posterior position of the MF is between the apex of the first and second premolars. Furthermore, the most prevalent shape of MF is oval per panoramic images.

## Extended Abstract

# N

### 1. Introduction

umerous surgeries are performed on the anterior region of the lower jaw (the area

between two chin holes). Furthermore, the location of the chin hole (Mental Foramen; MF) is critical in multiple cases, like anesthesia injection and periapical surgeries in the anterior lower jaw. Besides, the diversity in the location and position of this hole can generate problems during surgery in this region.

### \* Corresponding Author:

Masomeh Afsa, PhD.

Address: Department of Radiology, School of Dental, Hormozgan University of Medical Sciences, Hormozgan, Iran.

Tel: +98 (76) 33330458

E-mail: masomeh.afsa@hums.ac.ir

**Table 1.** Age-wise Mean±SD values of the anterior-posterior distances of the mental foramen

Variables	Mean±SD								P Right	P Left
	Age Group A		Age Group B		Age Group C		Age Group D			
	Right	Left	Right	Left	Right	Left	Right	Left		
Distance to midline	25.5±2.95	26.4±3.26	27.2±3.14	26.1±3.25	27.25±2.96	26.41±2.81	27±3.85	27.2±3.08	0.64	0.35
Distance to the posterior side	48.01±5.18	46.66±6.16	49.59±4.53	48.96±5.12	49.28±4.66	48.72±4.58	48.9±4.28	48.6±4.2	0.28	0.09
Distance to the lower side	9.9±1.32	9.9±1.75	10.43±1.54	10.49±1.5	10.72±1.56	10.63±1.59	11.41±1.33	10.91±1.22	0.001	0.04


 Journal of  
Arak University of Medical Sciences

## 2. Materials and Methods

In this study, 450 panoramic radiographic images of men and women were evaluated. All images were converted to JPEG format and entered in real size in Auto CAD software (2014). Data analysis was performed in SPSS using one-way Analysis of Variance (ANOVA), Student's t-test, and Chi-squared tests.

## 3. Results

The mean distance from the MF to the lower edge of the mandible on the right and the left were equal to 10.53 mm and 10.51 mm, respectively. The mean distance from the MF to the posterior side of the lower jaw was measured as 49.36 mm on the right and 48.72 mm on the left. Additionally, the mean distance of this hole to the midline of the lower jaw on the right and left was 27.16 and 26.27 mm, respectively. In most explored cases, the anterior-posterior position of this hole was symmetrical concerning anatomical landmarks. The anterior-posterior distance of MF to the lower jaw midline presented significant gender-wise differences ( $P<0.001$ ). The shape of the MF provided no gender-wise significant difference ( $P=0.89$ ) (Table 1 & 2).

## 4. Discussion and Conclusion

The current research results suggested that the most frequent anterior-posterior position of the MF is located between the apex of the first and second premolars. Furthermore, the most prevalent shape of the MF using panoramic images was oval. According to the data obtained in the present study and other investigations, the shape of the MF in the offending population was mainly oval. In general, the differences in the location and position of the MF in this research, compared to other studies can be attributed to morphological and anthropological variations in various populations.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of Hormozgan University of Medical Sciences (Code: IR.HUMS.REC.1394.189).

### Funding

This article is extracted from the MD. dissertation of dental dentistry of the first author at the Department of End-

**Table 2.** The gender-wise Mean±SD scores of the anterior-posterior distances of the mental foramen

Variables	Mean±SD				P Right	P Left
	Males		Females			
	Right	Left	Right	Left		
Distance to midline	27.62±3.19	26.68±3.19	26.74±2.99	25.9±3.03	0.001	0.006
Distance to posterior border	50.5±4.65	49.8±4.27	48.34±4.31	47.76±5.43	<0.0001	<0.0001
Distance to lower border	11.14±1.5	11.08±1.55	9.98±1.35	10.0±1.31	<0.0001	<0.0001


 Journal of  
Arak University of Medical Sciences

**Table 3.** Gender-wise shape of the mental foramen in panoramic radiography

Variables	No. (%)			
	The Shape of the Chin Hole on the Right Side of the Mandible		The Shape of the Mental Foramen on the Left Side of the Mandible	
Gender	Round	Oval	Round	Oval
Males	32 (15.1)	180 (84.9)	27 (12.7)	185 (78.3)
Females	37 (15.5)	201 (84.5)	32 (13.4)	206 (86.6)
P	0.89		0.82	

odontics, School of Dental, Shahid Sadoughi University of Medical Sciences, Yazd.

#### Authors' contributions

Conceptualization and supervision: Masoumeh Afsa; Data collection, Writing – original draft: Hamzeh Ekran; Data analysis, writing – review & editing: Amin Ghanbarnejad.

#### Conflicts of interest

The authors stated no conflicts of interest.

#### Acknowledgements

We would like to thank all Staff of Hormozgan University of Medical Sciences and all the staff and colleagues of the School of Dentistry, Department of Radiology who contributed to this research.