

Original Research

Study of variation of Mental Foramen in a known population

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ABSTRACT:

Background: This study was conducted to evaluate the morphological features and morphometric parameters of mental foramen with reference to surrounding landmarks. **Material and Methods:** The location, size, and quantity of mental foramina were examined in 100 dry adult human mandibles of undetermined sex. They were sized with a digital vernier calliper, and their statistical data was analysed by mean. **Results:** The most common position was on the longitudinal axis of second premolar (position 4) followed by positions 3, 5, 2 and 6. The MF was not observed in position 1 in any mandible.

Conclusion: Knowing the many variations of the mental foramen beforehand helps surgeons plan surgery in that area to prevent nerve damage and also make it possible for effective mental nerve block anaesthesia.

Key words: Mental Foramen

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INTRODUCTION

The mental foramen (MF) is the opening through which the mental nerve exits the mandible and is usually located either between the roots of the first and second mandibular premolars or apical to the second premolar. The mental nerve represents one of the terminal branches of the mandibular nerve and divides into three branches supplying the lower lip, cheeks, chin, and the vestibular gingival of mandibular incisors.¹ Although the anatomy of the mandibular nerve is well established, some anatomic variations have been reported which must be taken into consideration to avoid clinical complications. One of these variations is the accessory mental nerve, which passes through small foramina in the area surrounding the MF known as accessory mental foramina (AMF).²

Radiographically, the mental foramen is observed as a rounded or oval radiolucent area at the level of the lower premolar apices or superimposed on them. In the hemimandible, the mental foramen normally

appears as a single structure, but there are some rare reports on the anatomical variations of the mental foramen, presence of accessory foramina or the absence of mental foramen.³⁻⁸ In these situations, the nerves and vessels that go through the mental foramen must follow alternative courses.⁹

Hence, this study was conducted to assess the variation of mental foramen in a known population.

MATERIAL AND METHODS

For the investigation, 100 dried adult human mandibles of undetermined sex were acquired. We looked at the location, size, and quantity of MF. Using a digital vernier calliper, we determined the size of the mental foramen by measuring the distance of the MF (in mm) from several landmarks such as the symphysis menti, alveolar crest, posterior border of the ramus of the jaw, and lower border of the mandible.

RESULTS

The position of MF was classified in relation to teeth of the lower jaw:

1. Foramen lying on a longitudinal axis passing between canine and first premolar;
2. foramen lying on the longitudinal axis of first premolar;
3. foramen lying on a longitudinal axis passing between first and second premolars;
4. foramen lying on longitudinal axis of second premolar;
5. foramen lying on a longitudinal axis passing between second premolar and first molar;
6. foramen lying on longitudinal axis of first molar.

Table 1: The relation of the mental foramen to lower teeth (n=100)

Position	1	2	3	4	5	6
Right	0	2	16	72	9	1
Left	0	3	13	69	13	2

The most common position was on the longitudinal axis of second premolar (position 4) followed by positions 3, 5, 2 and 6. The MF was not observed in position 1 in any mandible.

DISCUSSION

Precise knowledge of vital anatomical structures such as the inferior alveolar nerve and the mental nerve is fundamental to obtaining favorable results after surgical procedures such as dental implant placement. This also applies to the mental foramen, through which the ramifications of the inferior alveolar nerve emerge.¹⁰ Although rare, variations associated with the mental foramen have been reported which might cause morbidities in the patient, such as possible injuries due to surgical procedures, if undetected.^{4,8} Regarding the mental foramen, variations are observed in its location, with the reference point being encountered more anteriorly, below the canine, or posteriorly, close to the second molar. Variations in the number of foramina have also been reported, with more than one mental foramen being present on one or more sides of the mandible. These additional foramina are called accessory mental foramina. This variation results from the ramification of the mental nerve before emerging into the mental foramen.^{11,12}

In this study, the most common position was on the longitudinal axis of second premolar (position 4) followed by positions 3, 5, 2 and 6. The MF was not observed in position 1 in any mandible.

Katakami et al.¹² in a study of 150 patients, observed the presence of 17 accessory mental foramina by CBCT, with 59% of them being located posteriorly to the mental foramen. Another study conducted on 157 patients demonstrated the presence of 15 accessory mental foramina, nine of them located posteriorly to the mental foramen.¹³

Several studies claim that the position of AMF is usually inferior or posteroinferior to the MF, and that

locating the MF position should be sufficient for most surgical procedures.^{14,4}

CONCLUSION

Knowing the many variations of the mental foramen beforehand helps surgeons plan surgery in that area to prevent nerve damage and also make it possible for effective mental nerve block anaesthesia.

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