

Study of accessory mental foramen in dried mandibles

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INTRODUCTION:

Human mandibles with over one mental foramen (MF) on one aspect do not seem to be such a rare discovery. Depending on the comparative size of the multiple MF traced on one side of a mandible, only one of them is considered as the main MF, while the others are regarded as accessory mental foramina (AMF). In order to distinguish an AMF from common buccal foramina without continuity with the mandibular canal, which are regarded as nutrient foramina, an AMF is defined as a foramen of an accessory bony canal originating from the mandibular canal (AMF). (2) This foramen transmits the accessory branch of mental nerve. The knowledge of this foramen is essential to achieve complete anaesthesia. (1)

The mental foramen (MF) is present on the anterolateral aspect on the body of the mandible. It transmits mental nerve and vessels. Mental nerve which is a branch of the inferior alveolar nerve supplies sensation to lower lip, labial mucosa, lower canines and premolars. Anaesthetising the anterior teeth together with premolars and avoiding inferior alveolar nerve block is feasible by injecting anesthetic solution adjacent to the mental foramen. This is where determining the presence and location of AMF becomes helpful. This study helps to localise the neurovascular bundle that passes through this area. (2)

Studying the position and morphological variations of MF is vital, because it will be useful to localize the vital maxillofacial neurovascular bundle passing through the MF, however the position of MF vary among racial groups and genders.(3,4,5,6,7)The foremost common position of MF is in line with the Longitudinal axis of the 2nd pre-molar tooth followed by allocation between the 1st and 2nd pre-molar tooth. (3, 9)

The study of the incidence of AMF can facilitate to localize the vital neuromuscular bundle passing through MF. (10)Hence, the location, size, shape, position and incidence of MF and AMF would facilitate the dental surgeons to use nerve block in various surgical procedures involving lower jaw and to attain complete anaesthesia and additionally useful to avoid injury during periapical surgery.(11)

Precise knowledge on variations within the position, form and the size of MF and the presence of AMF would be of great and immense use for dental surgeons while performing surgical procedures on the mandible, such as curettage of premolars, filling procedures, dental implants, root canal treatments, orthognathic surgeries etc. (12, 13)

MATERIALS AND METHOD:

This study was meted out using 77 dried unsexed human mandibles in the Department Of Anatomy, Saveetha Dental College, to determine the position of AMF from MF. Any mandible with obvious pathology, antecedently undertaken surgical intervention, or traumatic injury was excluded from this study. Digital Vernier caliper with an accuracy of 0.01 mm was used to measure the position of AMF. The relative position of AMF with MF was determined.

RESULTS:

AMF as shown in the fig.1 was present unilaterally in 7 out of 77 mandibles (9.09%). Position of AMF with regard to MF was variable. It had been determined that AMF was located below the premolar and first molar. (1) Average distance between AMF and MF was 5.85mm. AMF was unilaterally located; it was on the right side in 3 mandibles and on the left side in 4 mandibles. The position of AMF relative to MF was variable. In one mandible, it had been 1mm above the MF. In another mandible, it had been 13mm behind MF. AMF are smaller in size when compared to MF.

DISCUSSION:

Mental foramen was present in all 77 mandibles under study and it had been bilateral. In the present study, 7 mandibles had AMF, therefore, the incidence was 9.09%. According to Gershenson et al. (1986), AMF was present in 2.8% Israeli mandibles. (14)The incidence of AMF varies in the literature. (15) Singh R and Srivastav AK observed AMF in 13% mandibles.(12)But, the incidence of AMF was reportable to be solely 2.70% by Serman.(16) In the study conducted by Virendra B et al.(15) the incidence of AMF was found in 6.6%. AMF was found in 5.81% in the study conducted by Zhang L et al.(17) As can be seen from Table-I below, it might be observed that the incidence of prevalence of AMF as reported by various workers was found starting from 2.67% to 8.33%, with the finding in the present study (8%) in close proximity to the findings of Prabodha et al.(4)

The limitation of the this study is that there is every possibility for human errors to have taken place while measuring various parameters, despite utmost care and precaution taken by the authors, even though the measurement was carried out using Digital Vernier Calipers. Another limitation is the restricted accessibility to dry human mandibles (77 numbers only).

Sl. No.	Authors	No. of Mandibles	No. of AMF	% of Occurrence
1	Prabodha LBL et al. (2006).(4)	24	2	8.33
2	Naitoh M et al. (2009).(18)	157	11	7.00
3	Sumit G et al. (Mar, 2012).(2)	120	8	6.67
4	Udhaya K et al. (Aug, 2013).(19)	90	5	5.56
5	Virendra B et al. (2013).(15)	105	7	6.60
6	Vimala V et al. (Sept, 2015).(11)	35	2	5.71
7	Alma Voljevica et al. (2015).(13)	150	4	2.67
8	Shukla RK et al. (2015).(20)	70	5	7.20
9	Zhang L et al. (2015).(17)	172	10	5.81

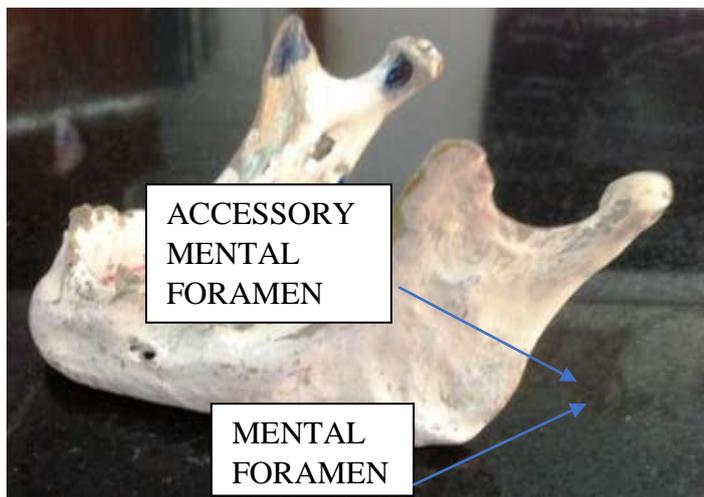
The incidence of occurrence of AMF reported by various other workers are shown in Table-I

CONCLUSION:

The present study discovered variations in location and position of MF and incidence of prevalence of AMF. Prior knowledge about variations in size, shape, location and position of MF and presence of AMF will assist the dental surgeons and anatomists alike to attain full anaesthesia after nerve block.

The knowledge about the position and incidence of accessory mental foramen is useful in achieving complete anaesthesia and avoiding injury to the inferior alveolar nerve.

Further research and analysis in the field with considerably larger numbers of mandibles will certainly uncover interesting and useful findings.



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