



A Study of Incidence of Accessory Mental Foramen in Dry Human Mandibles of Rajasthan State

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Abstract

Introduction: Accessory Mental Foramen (AMF) is an additional Mental Foramen (MF) situated nearby the regular MF and usually placed posterior to the MF. It is a rare anatomical variation in human mandibles. The incidence of accessory mental foramen depends on age, sex, Race, ethnicity, population. Its position, number and distance from usual mental foramen and the surrounding bony landmarks are highly variable. The accessory branch of the mental nerve passes through it. AMF may be one of the factors implicated in regional anaesthesia failure.

Aims and Objectives: The aim of this study is to evaluate the incidence of the accessory mental foramen, which is occasionally traced additional to the main mental foramen in the population of Rajasthan State.

Materials and Methods: The present study was conducted using 50 dried human mandibles of unknown age & sex for analysing the incidence and morphological details of accessory mental foramen.

Results: 4 out of 50 (8 %) mandibles had Accessory Mental Foramen (AMF). Three specimens had unilateral AMF and one specimen had bilateral AMF. Shape of all AMF was circular with smooth margin.

Conclusion: The anatomical knowledge about existence of accessory mental foramen may be helpful to dental surgeons to avoid injury to neurovascular bundle during surgical procedures involving mandibular region. The detection of AMFs may reduce the rates of postoperative pain and paraesthesia in surgical procedures.

Keywords: Accessory mental foramen, Incidence, Mandible, Mental foramen.

Introduction

The Mental Foramen (MF) is a small foramen which is located in the antero-lateral aspect of the body of the mandible. It is situated midway between the upper and the lower border of the mandible and it transmits mental nerve, artery and vein.^[1,2]

Mental nerve is the branch of the inferior alveolar nerve which supplies the sensation to the lower lip and the labial mucosa and the lower canines and the premolars. The most useful injection for

anesthetizing the mandibular teeth is the inferior alveolar nerve block.^[3]

MF is an important anatomical landmark to facilitate diagnostic, surgical, local anesthetic and other invasive procedures for Dental Surgeons performing peri apical surgery in the mental region of mandible. Normally, MF is located below the interval between the two premolars.^[4,5]

The mental nerve and vessels emerges through the MF and supply sensory innervation and blood supply to the soft tissues of the chin, lower lip and gingiva.^[6,7]

Variations of MF are often encountered ranging from difference in shape and positions to presence of Accessory Mental Foramen (AMF) or even complete absence in some cases.^[4,8-13]

Any foramen which is in addition to MF is considered as an Accessory Mental Foramen (AMF) and it is usually located below the 1st molar tooth.^[15,18,19,20]

Ethnic variations in relation to AMF have also been reported earlier.^[10]

The AMF may transmit the branches of the mental nerve. AMF is due to the branching of mental nerve before passing through MF. The study of the incidence of AMF will help to localize the important neuromuscular bundle passing through MF.^[21]

Precise knowledge of the presence of AMF would be of great 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.^[5,17]

Since numerous surgical procedures in oral and maxillofacial surgery as well as several aspects of dental practice involve the mental region, the knowledge of its anatomical variations is essential for the clinician.

So, the aim of the present study was to evaluate the incidence and the anatomical features of the Accessory Mental Foramen (AMF), which is occasionally traced additional to the main mental foramen.

Materials and Methods

The study was conducted on 50 dry adult human mandibles of unknown sex and age obtained from the Department of Anatomy, Sawai Man Singh Medical College & Hospital (SMSMC&H), Jaipur, Rajasthan.

The study was carried out to determine the incidence of AMF on both sides of mandible by using a magnifying glass.

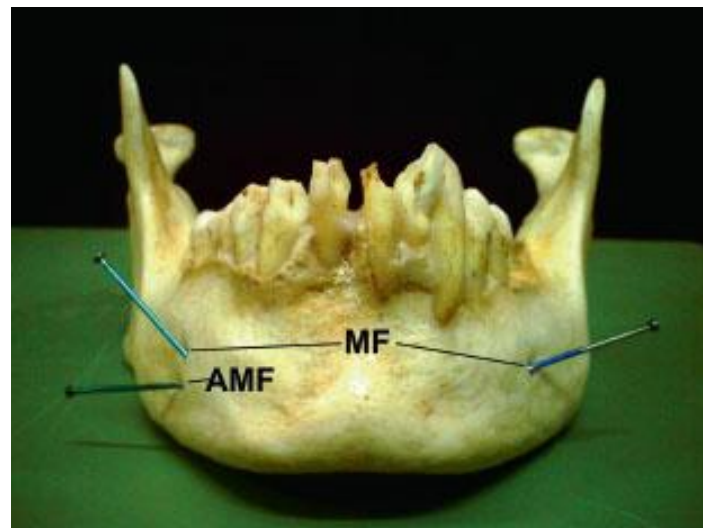


Fig. 1 Occurrence of Mental Foramina on Right & Left Sides & Accessory Mental Foramen on the Right Side of the Mandible.

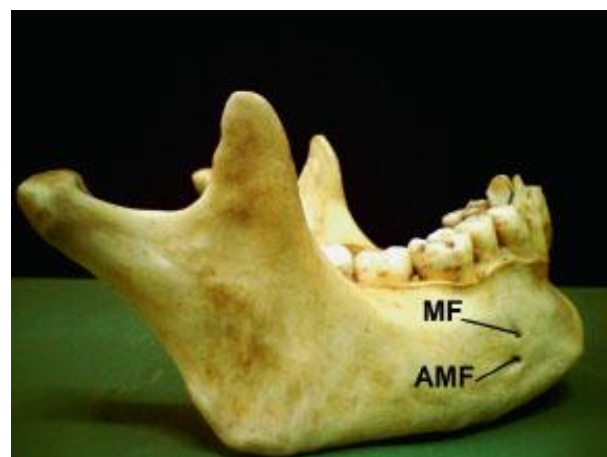


Fig. 2 :- The Right Half of the Mandible depicting Mental Foramen & Accessory Mental Foramen.

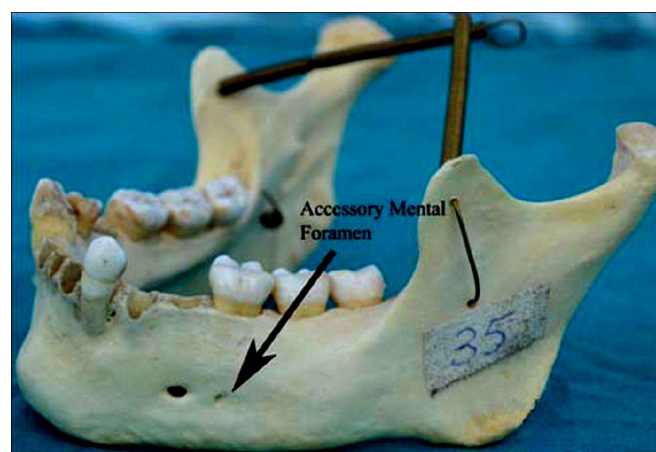


Fig. 3 The Left Half of the Mandible depicting Mental Foramen & Accessory Mental Foramen.

Results

Shape of AMF

Shape of all AMF was circular with smooth margin.

Incidence of AMF

Accessory Mental Foramen (AMF) was observed in 4 mandibles out of 50 mandibles. That is, the incidence of occurrence of AMF was 8%.

Out of the 4 mandibles, the AMF was located on the right side in three mandibles (6%) and one (2%) had the AMF on the left side.

Three specimens had unilateral incidence of AMF and one specimen had bilateral incidence of AMF.

Discussion

The incidence of AMF varies in the literature.^[7]

Singh R and Srivastav AK observed AMF in 13% mandibles.^[5]

However, the incidence of AMF was reported to be only 2.70% by Serman.^[24]

In the study conducted by Virendra B et al, the incidence of AMF was found 6.6%.^[7]

AMF was found in 5.81% in the study conducted by Zhang L et al.^[23]

As can be seen from the below Table-I, it could be ascertained that the incidence of occurrence of AMF as reported by various workers was found ranging from 2.67% to 8.33%.

With the finding in the present study (8%) very close to the findings of Prabodha et al^[14] ascertained that the incidence of occurrence of AMF as reported by various workers was found ranging from 2.67% to 8.33%.

The incidence of occurrence of AMF reported by various other workers are shown in Table-1.

Table- 1

Sl. No.	Authors	No. of Mandibles	No. of AMF	% of Occurrence
1	Prabodha LBL et al (2006)	24	2	8.33
2	Naitoh M et al (2009)	157	11	7.00
3	Sumit G et al (Mar, 2012)	120	8	6.67
4	Udhaya K et al (Aug, 2013)	90	5	5.56
5	Virendra B et al (2013)	105	7	6.60
6	Vimala V et al (Sept, 2015)	35	2	5.71
7	Alma Voljevica et al (2015)	150	4	2.67
8	Shukla RK et al (2015)	70	5	7.20
9	Zhang L et al (2015)	172	10	5.81
10	Present Study	50	4	8.00

Incidence of accessory mental foramina was different in various populations in the world. In Sri Lankans it was 8.33%, Asian Indians 6.62%^[14], Chinese 5%^[25] and in Turks 6.5% and bilateral 0.5%^[26], 2.6% in French, 1.4% in American Whites, 5.7% in American Blacks, 3.3% in Greeks, 1.5% in Russians, 3.0% in Hungarians, 9.7% in Melanesians.

According to Gershenson *et al.* (1986), AMF was present in 2.8% Israeli adults' mandibles. It is 1.8% for American whites and 12.5% in Polynesians.^[22]

Oliveira Junior *et al.* reported 5% AMF in mandibles. Highest incidences of AMFs were reported in Negros and Maori males.^[16]

This study concluded that the presence of bilateral accessory mental foramen is very rare and incidence is very less in Indian population.

Conclusion

The present study revealed incidence of occurrence of AMF. Prior knowledge about variations and presence of AMF will help the Dental Surgeons and Anatomists alike to achieve full anaesthesia after nerve block.

The findings of our study will be of great help to Dental Surgeons for determining accurate site of local anaesthesia and in avoiding injury to mental nerve and prevent unwanted spread of infections while performing periodontal or endodontic surgery.

Further research in the field with significantly larger numbers of mandibles will definitely bring interesting and useful findings.

Acknowledgement

We acknowledge our thanks to the working staff of Department of Anatomy, SMS Medical College & Hospital, Jaipur who have supported us in our study.

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