Multiple unilateral accessory mandibular foramina- a case report

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Abstract

Accessory foramina in the mandible are known to transmit branches of nerves supplying the roots of the teeth. The mandibular foramen is present on the inner surface of the ramus of the mandible which transmits the inferior alveolar nerve. An adult human mandible of unknown sex was found to have multiple mandibular foramina on the medial surface of right ramus. A large accessory mandibular foramen was present anterosuperior to the main mandibular foramen. The dimensions were 6 mm antero posteriorly and 11 mm vertically. The dimensions of the mandibular foramen were 9 mm antero posteriorly and 12 mm vertically. The distance between two foramina was 20 mm and between the accessory mandibular foramen and apex of lingula was 7 mm. The distance between the posterior border of the accessory mandibular foramen and posterior border of ramus were 15 mm. The accessory mandibular foramen led into a canal which was directed obliquely and joined the mandibular canal at the level of third molar tooth. Two more small mandibular foramina were present one just below the accessory mandibular foramen discussed above and second near the main mandibular foramen. Both of them were of too small size to measure. The accessory mandibular foramen is a rare variation and awareness of its incidence and its position is necessary. The structures passing through it can be compromised during surgical procedures of this area.

Key words: lingula, ramus, alveolar, canal, molar.

Introduction

The mandibular foramen is a foramen present on the medial side of the ramus of the mandible just above its centre. There can be an additional foramen known as accessory mandibular foramen on the medial side. A number of nerves may pass through these foramina: they are facial, mylohyoid, buccal and transverse cutaneous nerves. These foramina have been studied immune histochemically for the contents of these foramina and it showed the artery and nerve passing through it. In the presence of these accessory mandibular foramen if the local anaesthesia is given for dental extraction, it may fail as the branches of the inferior alveolar nerve pass through these accessory foramina and are not anaesthetized. These accessory foramina can provide route for spread of tumor following radiotherapy. The identification of the accessory mandibular foramina and the associated canals are of great importance in various branches of dentistry such as implant insertion. These are often undetected during diagnosing phase of implant treatment. The dental surgeons, clinicians and oncologists should be aware of this variation.

Case Report

The adult mandible of unknown sex presented here was found to have three accessory mandibular foramina on the medial side of right ramus. The large accessory mandibular foramen was lying anterosuperior to the main mandibular foramen. The diameter of the accessory mandibular foramen were 6 mm antero posteriorly and 11 mm vertically. The dimensions of the mandibular foramen were 9 mm and 12 mm vertically. The distance between the two foramina was 20 mm. The distance between the accessory mandibular foramen and the lingula was 7 mm and posterior border of the ramus of the mandible was 15 mm. The accessory mandibular foramen led into a canal which obliquely ends into the
main canal at the level of the third molar tooth. Other two small accessory mandibular foramina were seen one immediately below the first larger one and second was close to the main mandibular foramen. The left ramus contained only a single main mandibular foramen. No other anatomical variation were found in the mandible (Fig.1).

Discussion

The knowledge of incidence and morphology of accessory mandibular foramen is clinically important during dental procedures of the lower jaw as these indicate the presence of additional neurovascular bundle passing through it10. Macrosopically it has been observed that the bundle is formed by branches of mylohyoid nerve, sublingual artery and accompanying veins. It has been shown that entire nerve passes through it in 60% of cases and in 40% it is scattered11,12. Incidence has been reported from 0.08% to as high as 8%13. Some have reported the difference in the incidence in different races14. Presence of these accessory foramina causes failure of the nerve block during dental procedures. In the present specimen, the canal starting from the accessory mandibular foramen terminated close to the root of the third molar. The nerves transmitted by this canal can lead to inadequate anaesthesia. This can be avoided by giving anaesthesia at the higher level before the division of the mandibular nerve15. Presence of the accessory foramina makes it more vulnerable to the perineural spread of tumor cells from the cortical to the cancellous part of the bone following radiotherapy. Awareness of such canals can also help the radiologists to plan the radiotherapy. During the surgical procedures of ramus of mandible trauma to these accessory canals can cause unexpected bleeding, paraesthesia and traumatic neuroma are known to occur due to trauma to the accessory mandibular foramen and the structures entering it16. The knowledge of these variations can help in planning conservative resection procedures in tumor involvement, orthognathic or reconstructive surgeries of the mandible and dental implant procedures17. Anatomical and pathological variation can alter the appearance of mandibular canals in different radiological images18,19.

Embryological basis

During development initially there are three inferior alveolar nerves which innervates each of the three groups of mandibular teeth. Later on the nerves fuse and single inferior alveolar nerve is formed. The incomplete fusion of these three nerves lead to the development of multiple mandibular canals. Imperfectness of achieving anaesthesia of the inferior alveolar nerve is due to improper localisation of these accessory foramina and the associated variations20.

Conclusion

Awareness of this variation can help the oral maxillofacial surgeons and oncologists in their clinical practice. It is of help in planning the anaesthesia at the proper site for the surgeons doing lower jaw extraction procedures. So the proper precautions can be taken during emergencies and neurovascular bundles can be saved.

References

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