

BIFID MANDIBULAR CANAL - LOCAL ANESTHETIC CHALLENGES TO A DENTIST -A CASE REPORT

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ABSTRACT

The presence of bifid mandibular canal reported in the literature varies from 0.08% to 0.9%. The mandibular canal which transmits the inferior alveolar nerve which is responsible for the innervations of pulp tissue of all mandibular teeth is a target area for mandibular block technique. Failure to achieve a profound anesthesia during dental extraction is a challenge for the dental practitioner. This case report examines all the possible features about the bifid mandibular canal.

Keywords : bifid mandibular canal, inferior alveolar canal

INTRODUCTION

The mandibular canal transmits the inferior alveolar artery and nerve which is a branch from the third division of trigeminal nerve extending from mandibular foramen to mental incisive region. Dental and incisive branches leave the inferior alveolar nerve within the canal to supply all mandibular teeth and adjacent structures. Within the canal, the alveolar nerve is approximately 4mm in thickness. A secondary collateral of the inferior alveolar artery vascularises the sheath and nerve as well as the bony tissue around the canal.¹

The presence of bifid mandibular canal has been determined from extra oral panoramic radiographs by a number of authors.²⁻⁴ Oliver⁵ found the inferior alveolar nerve in a single canal is 60%. Nortje et al⁶ found an occurrence of bifid mandibular canals of 0.9%. Grover and Lorton⁷ were able to find 0.08% of radiographs suggestive of bifurcation of inferior alveolar nerve. The incidence has been variably reported as 0.08%,⁷ 0.4% and 0.9%.⁶ The condition has been postulated as one of the possible reasons for the failure of mandibular anesthetic technique while giving an inferior alveolar nerve block.

According to Chavez et al⁹, three inferior alveolar nerves form in the course of embryologic development to innervate the incisors, canine premolars and the molars

of the mandibular arch. This development is followed in time by fusion of these nerves. This theory would explain the persistence in some patients of double mandibular canals, secondary to incomplete fusion of these three nerves. However, few studies on the morphology and distribution of this nerve have detailed the infrequent presence of this anatomic variant.^{10,11}

Langlais et al⁸ found 0.95% cases of bifid mandibular canals, of which 33% occurred in males.

CASE REPORT

A 63 year old male patient reported to Immanuel Dentofacial Centre with a history of dislodging lower artificial denture since six months. On detailed clinical examination, there was a small bulge on the right retro molar area which was painful on pressure. The patient was referred to take an orthopantomogram for further evaluation. Orthopantomogram revealed an impacted molar teeth in the 48 region. The patient was advised surgical removal of the impacted tooth under local anaesthesia. The existence of bifid mandibular canal was also noticed (Fig.1) and care taken to completely block both the mandibular canal areas with 2% lidocaine with adrenaline solution. Patient was totally comfortable during the surgical procedure and the wound healing was also uneventful.

DISCUSSION

Literature revealed that the occurrence of bifid canals are unusual but is not thought of as being rare. The clinical relevance of this case is to remind clinicians of the variable anatomy of the mandibular canal.

Bifid mandibular canals may have some important clinical implications. Inadequate anaesthesia may be possible with any bifurcation type, but especially when there are two mandibular foramina. When third molar surgery has to be carried out, extreme care must be used when there are bifid canals. Gow – Gates technique¹² can be followed where the anesthetic solution is injected at a higher level

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before the bifurcation of mandibular nerve. As a second neurovascular bundle may be contained within the bifid canals, complications such as traumatic neuroma, paraesthesia and bleeding could arise because of failure to recognize the presence of this anomaly.¹³

Further more, in cases of mandible fractures care should be ensured so that the neurovascular bundle is lined up exactly to avoid impingement when the fracture is reduced. The alignment becomes much more difficult with a second neurovascular bundle located in a different plane.¹³ The complete study of the mandibular canal is mandatory before any surgical intervention of the jaw is performed for the safety and betterment of the patient.

CONCLUSION

Bifid mandibular canals are present in a very tiny segment of the population. It is often unnoticed even though they can be recorded in panoramic radiographs. Cross sectional CT images provide best information regarding the precise course of mandibular canal. The main purpose of this review is to call attention to an apparently harmless anomaly which can induce complications when surgery has to be performed.

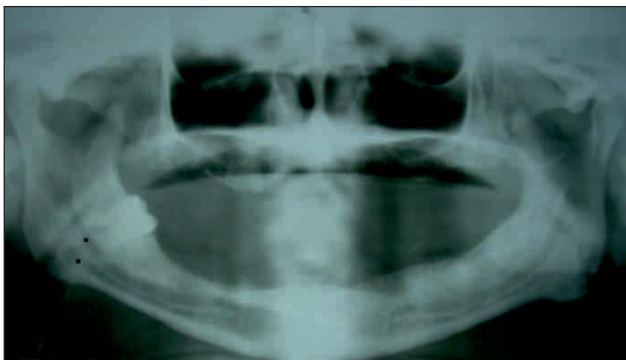


Fig. 1 : Orthopantomograph showing bifid mandibular canal (asterix)

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