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Short Communication

Mandibular canals

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ABSTRACT

Diagnosis is a very crucial part of patient care that largely affects determination of prognosis and customization of treatment plan. The aim of this article is to look into one of the aspects of diagnosis of a mandibular vital structure i.e., the mandibular canal and the inferior alveolar neurovascular bundle and vessels related to it. It is critical to determine the location and configuration of mandibular canal and related vital structures during procedures like implant placements, osteotomies, trauma, posterior RCT etc to avoid unintentional damage to these structures as well as for adequate anesthesia. Literature was selected through search of case reports, literature reviews and standards books for radiology. No restrictions were imposed regarding year of publication.

1. Introduction

The mandibular canal is an intraosseous canal that has its course between the mandibular foramen and mental foramen. Also known as the inferior alveolar canal, it houses the inferior alveolar never, inferior alveolar artery and vessels.[1]

As the canal is usually in close proximity to mandibular posterior teeth, it is important to assess the same so as to come up with a fitting treatment plan for patients. In panoramic X-ray images, the MC appears as a dark band of radiolucence flanked by two radio-opaque lines cast by the lamella of bone that bounds the canal. During surgery, the MC is used as a reference point.[2] In order to preserve anatomical structures which pass through it, knowledge about its morphology and topography is important while carrying out procedures in the mandible. Not only is anatomical knowledge about the region a contributory factor to success in some procedures such as successful local anaesthesia in the inferior alveolar nerve terminal branches, but also it may be a determining factor in reducing haemorrhage and parasthesia occurrence, as well as lowering the risk of complications during surgical procedures such as osteotomy and mandibular implant positioning.

2. Anatomy of the Mandibular Canal

The mandibular canal begins in mandibular foramen on the medial surface of the ascending mandibular ramus. It runs obliquely downward and forward in the ramus, and then horizontally forward in the body till mental foramen. The part that runs anterior to mental foramen is called the mandibular incisive canal.[3]

According to the study of Obradovic et al., the average diameter of MC in its horizontal part is about 2.6mm.

3. Variations

Histologic studies have shown that the inferior alveolar nerve usually runs along the mandible as one major trunk with branches extending to apices of teeth. However, there are multiple smaller branches running roughly parallel to the major trunk and can be sometimes large enough to have a secondary canal.

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Such bifid canals are seen most commonly on panoramic and cone beam images.

Patients with bifid canals are at a greater risk of inadequate anesthesia or difficulties with jaw surgeries including trauma and implant placements.

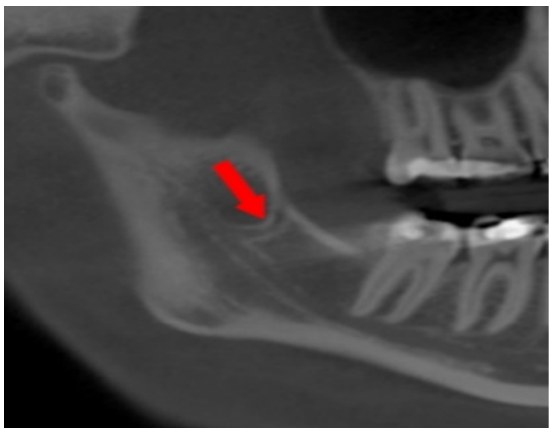

Fig. 1:

4. The Relationship of Mandibular Canal to Lower Teeth

The relationship between MC and lower teeth may vary, from one in which it is in close proximity to the root apices of premolars and molars to one in which it has no intimate relationship with the posterior teeth.

However usually, the mandiular canal is in contact with the apex of the third molar. As the canal runs its course anteriorly, the distance between teeth apices and MC increases.

Fig. 2:

When the apices of the molars are projected over the MC, lamina dura may be overexposed, appearing more radiolucent than normal and giving off an impression of thickened periodontal ligament or mising lamina. Such tooth should be subject to other clinical testing (eg : vitality testing) to ensure their soundness.[4]

While performing RCT of the second molar, a dentist must ensure not to extend past the tooth root with either the reamer tool or root canal filling material. If an implant is being placed in this area, the attending surgeon must ensure that the placement of implant does not interfere with the mandibular canal.

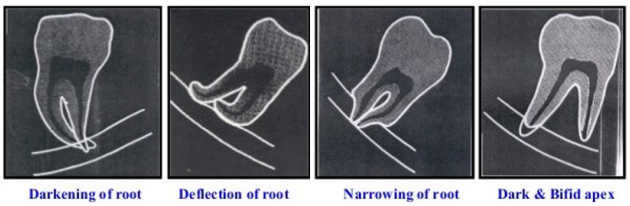

Fig. 3: Howe and Poyton; 1960

5. Conclusion

The assessment of mandibular canal holds a lot of importance in dentistry as it houses important vital structures. Accurate assessment of its position, morphology and relationships not only helps in adequate and successful local anesthesia but helps in proper diagnosis and treatment planning for the patient.[5]

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None.

7. Conflict of Interest

None.

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