Radix Entomolaris In Mandibular First Molars: A Case Report

Abstract

Successful root canal treatment depends critically on proper identification of all the canals, thorough chemo-mechanical preparation followed by three-dimensional obturation with hermetic seal. Unable to recognize the unusual tooth morphology may lead to failure. Usually mandibular molars have two roots with three canals (mesiobuccal, mesiolingual and distal) but in a few teeth, the number of roots and canals vary. The variation in the number of roots is called Radix Entomolaris. This article presents a case report of mandibular first molars with radix entomolaris.

Keywords: Anatomical variations, Mandibular molars, Radix entomolaris, Endodontic treatment, Variations, Extra roots.

Introduction

Root canal treatment is the principal treatment modality that must be preceded by mechanical and chemical debridement of all the canals before three-dimensional sealing with an inert filling material. Failure in root canal treatment occurs due to improper cleaning and shaping of canals, lack of understanding of root canal morphology, failure of establishment of hermetic seal, under-fillings, over-fillings and also due to improper identification of canals.

Most of the mandibular first molars are two-rooted with one mesial root and one distal root, but number of roots and location of root canals may vary. An additional third root in mandibular molar first mentioned in the literature by Carabelli is called the Radix Entomolaris (RE). In Radix Entomolaris, the supernumerary root is located distolingual to the mesial root of the mandibular molars. The other variant of Radix is Radix Paramolaris in which an extra root is present on the buccal side.

The present report outlines the diagnosis and endodontic treatment of Radix Entomolaris.

Case Report

An 18-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with pain, which was continuous and severe on intake of hot foods since last 3 days. The patient’s medical history was non-contributory. Clinical examination revealed the presence of deep carious lesion in left mandibular first molar. Thermal pulp testing followed by radiographic examination confirmed the diagnosis of irreversible pulpitis (Fig. 1).

Non-surgical endodontic therapy was initiated. The patient was given local anesthesia of 2% lidocaine with 1:80,000 epinephrine. A conventional endodontic access opening was made under isolation with rubber dam (GDC India) and the pulp chamber was completely deroofed. The first distal canal was located away from the center (buccally). This indicated that the other canal will be on the lingual side. Access cavity outline was modified from a triangular shape to a trapezoidal form and the fourth canal was located. The root canals were located with DG-16 endodontic explorer and canals were made patent with 15 number K-file (Dentsply Maillefer...
Company, USA). Working length was determined using electronic apex locator Root ZX (J. Morita MFG. Corporation, Kyoto, Japan) and was confirmed radiographically (Fig. 2). The root canals were cleaned and shaped by Rotary Hyflex file system along with GLYDE (Dentsply Maillefer Company, USA) using crown-down technique. The root canals were copiously irrigated with 2.5% sodium hypochlorite. Calcium hydroxide (Prime Dental Products, Thane) was placed as intracanal medicament and access cavity was temporized with Cavit. Patient was recalled after one week; the tooth was asymptomatic. Root canals were irrigated again with normal saline and dried using paper points. Before obturation, master points were seated to test their suitability to canals and a radiograph was taken (Fig. 3).

The canals were obturated with selected master gutta-percha cone (variable taper) and AH-Plus sealer (Dentsply Maillefer Company, USA) using lateral condensation technique (Fig. 4). The coronal gutta-percha cones were sheared off, using heated instrument, and vertical compaction was done using heated pluggers at the individual canal orifices. A temporary restoration with IRM was placed. The patient was recalled after one week for post-endodontic restoration, and permanent restoration was done.

Discussion

The etiology of Radix Entomolaris is still not known. Some authors believe that it may be due to disturbance during odontogenesis or may be due to an atavistic gene. Incidence varies from 5 to 30% and also among different populations. To confirm the diagnosis of Radix Entomolaris two diagnostic radiographs are necessary using buccal object rule. Even the presence of an extra cusp may sometimes indicate the presence of Radix Entomolaris.

If the presence of Radix Entomolaris has been confirmed at the diagnostic phase, then the access cavity shape can be modified and the area to be searched for the additional canal can be identified. With a good knowledge of law of symmetry and law of orifices, various methods like visualizing the dentinal and canal bleeding points, using DG-16 explorer, micro-opener, troughing of the grooves with ultrasonic tips, staining the chamber floor with 1% methylene blue dye, champagne bubble test, magnetic resonance microscopy and micro computed

Figure 1. Pre-operative IOPAR
Figure 2. Working Length IOPAR
Figure 3. Master Cone IOPAR
Figure 4. Post-operative IOPAR
tomography will be useful to locate the canals.\textsuperscript{5}
Usually, orifice of the RE is located disto- to mesio-lingually from the main canal or canals in the distal root. A severe root inclination or canal curvature, particularly in the apical third of the root can cause shaping aberrations such as straightening of the root canal, ledge formation, root canal transportation, resulting in loss of working length. Therefore, after the canal location, orifice enlargement and working length determination, flexible nickel-titanium rotary files should be used which allow a more centered preparation with restricted enlargement of the coronal third of the root canal.

**Conclusion**

Clinicians should be aware of the morphological variations of the tooth like additional roots, root canals and their incidences. The morphological variations of the Radix Entomolaris in terms of root inclination and root canal curvature demand careful, adapted clinical approach to avoid procedural errors during endodontic therapy.

**Conflict of Interest:** Nil

**References**


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