Endodontic Management of Radix Entomolaris: A Case Report
Department of Endodontics, IUSD
J.B. Adams; G.X. Zhou; K.J. Spolnik; A. Ghoneima; Y. Ehrlich

Abstract

Radix Entomolaris (RE) is a rare morphological alteration in mandibular molars. Cone Beam Computed Tomography (CBCT) is used for the 3D imaging of teeth. This report presents the use of 3D imaging in the endodontic management of an infected RE.

Case Report

A 41-year-old, Caucasian female presented with irreversible pulpitis in tooth #19. CBCT imaging revealed the tooth’s complex anatomy and helped guide root canal therapy in that tooth. Following the procedure, healing was successful and the tooth is in the process of being restored.

Conclusion: This case demonstrated CBCT guided root canal therapy for treatment of rare morphological alteration, RE.

Figure 1.

Medical History: No medical conditions, medications, or allergies

Dental History: Tooth #19 had an occlusal alloy restoration placed ~25 years ago. The alloy was replaced with a core buildup and full coverage crown porcelain fused to metal (PFM) 1 month prior to root canal therapy (RCT).

Clinical Exam:
- #19 PFM crown
- #19 Percussion ++, Palpation: -

Radiographic Exam: (Fig. 1B, 1C and Fig. 2A)
- #19 Widened PDL space, irregular root border, sparse trabeculation with condensing osteitis around mesial root.
- CBCT axial slice revealed RE and location of canal.

Diagnosis:
- Pulpal: Symptomatic Irreversible Pulpitis
- Apical: Symptomatic Apical Periodontitis

Treatment Options explained to the patient: No treatment, extraction, and non-surgical root canal therapy.

Treatment: First appointment: Anesthesia obtained (lidocaine 2% w/ epinephrine 1:100k) via a mandibular block, buccal infiltration and intrascoraneous injections. Access achieved through (PFM) crown. Apical patency was achieved with size 10 hand files in all four canals; verified using electron apex locator. The root canal system was disinfected via irrigation with 10ml 6% NaOCl and by mechanical debridement. All canals were shaped with Profile rotary files to a 25.04 size at initial visit. Second appointment. The interim restoration was removed. The master apical file sizes were 35.04 for mesial canals and 40.04 for the distal canal. Due to the extreme curvature of RE, this canal was taken to 30.04 using controlled memory NiTi wire Edge Endo rotary files. The canals were obturated via warm vertical compaction with gutta percha and Roth’s sealer.

Conclusion

Endodontic treatment of RE is challenging. A CBCT was utilized to confirm location of RE, degree of curvature, and approximate length.

Figure 2. (A) Pre-operative radiograph showing radix entomolaris of tooth #19, (B) Radiograph of file lengths for tooth #19, (C) Post-operative radiograph of tooth #19, (D) An example of another tooth with radix entomolaris.

Background

Knowledge of root canal anatomy is essential for successful root canal treatment. Failure to remove all the pulp tissue and bacteria from an unidentified root canal can result in the failure of endodontic treatment.¹

Permanent mandibular first molars usually have two roots located mesially and distally and three root canals, but an additional third root can sometimes be found mesiodistally.¹⁻² This mesiodistal root was first described by Carabelli and termed radix entomolaris by Bolk.¹⁻³ This extra root is typically smaller than the distobuccal root and is usually curved, which can make it challenging to instrument and fill.¹⁻³ Radix entomolaris has an incidence of 4% in Caucasian, African, Euraisan, an Indian populations, but has a prevalence of 5% to 40% in Monogold populations (Chinese, Eskimo, and Native American).¹⁻⁷

Cone beam computed tomography (CBCT) scans are three-dimensional images that are useful for successful endodontic treatment.⁴ CBCT imaging eliminates superimpositions of two-dimensional radiographs and allows the visualization of the exact position of the extra distolingual root in permanent mandibular first molars.⁴ CBCT scans have reduced cost and less radiation exposure compared to computed tomography (CT) scans.⁵⁻⁶ Locating the radix entomolaris in a mandibular first molar and visualizing its length and degree of curvature with CBCT scans increases the success and efficiency of the root canal system evaluation, cleansing, and filling.⁶

References