

A case report on management of grossly decayed radix entomolaris in mandibular second molar

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ABSTRACT

Among ethnic groups, the presence of radix entomolaris (RE) in a mandibular first molar is common, while the presence of RE in a mandibular second molar is rare. It is essential to anticipate and treat the distolingual root canal considering the presence of RE in the mandibular second molar. In our present case, along with the presence of an extra root in 37, there was loss of crown structure and occlusal morphology which made the treatment plan of postendodontic restoration difficult. This case report highlights the necessity and indications of endocrown as a successful postendodontic restoration.

Keywords: Radix entomolaris, endocrown, postendodontic restoration, second molar

Introduction

The major cause of failure of root canal therapy is due to the complexity of the root canal system. Mandibular molars can manifest with several anatomical variations based on the internal and external morphology of the tooth.^[1] The most common variation in the mandibular first molar is the presence of a distolingual supernumerary root called radix entomolaris (RE), mentioned first by carabelli, or mesiobuccal root (radix paramolaris).^[2,3] According to manning, 22% of mandibular second molars have one root, 76% have two roots, and 2% have three roots. It has been noted that a patient's age, sex, and race have a direct relationship with second molar anatomy.^[4]

The most common root morphology in the second molars of Indians is the two-rooted morphology with three canals. Type IV and Type I canals predominating in the mesial and distal roots. These teeth showed both Mongoloid and Caucasian traits, with 8.98% of the teeth having three roots.^[5] The number of roots on the mandibular

first molar is related to certain ethnic groups.^[6] The prevalence of RE in the mandibular first molar is 40% in those with Mongolian traits, 3.4–4.2% in Europeans, 3% in Africans, and <5% in Indians and Eurasians.^[7-13] Identification and treatment of RE are important because a missed canal remains a center for infection and can compromise the treatment outcome.

Endocrown-type restorations are single prostheses indicated for endodontically treated molar teeth that have significant loss of coronal structure. Endocrown offers advantages for the restoration of root canal treated molar tooth, as they promote adequate function and esthetics, and also maintain the biomechanical integrity of the compromised structure of nonvital posterior teeth.^[14]

This is a case report of management RE of a mandibular second molar with loss of crown structure and occlusal morphology restored with a metal-ceramic endocrown.

Case Report

A 27-year-old male patient reported to the departments of conservative dentistry and endodontics with a chief complaint of spontaneous pain in the lower left back tooth for the past 3 days. The patient gave a history of intermittent pain for the past 1 month. On clinical examination, the presence of decay in the mandibular left second molar was observed. The tooth was tender to percussion and not on palpation. Periodontal probing was within the physiological limits with no mobility. Heat test resulted in intense lingering

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pain. The involved tooth showed premature response to electronic pulp stimulation. The pre-operative radiograph showed occlusal radiolucency with pulpal involvement and periodontal space widening relative to the mesial and distal roots with an additional distolingual root [Figure 1]. Based on these findings, the tooth was diagnosed as dental caries with symptomatic irreversible pulpitis and symptomatic apical periodontitis. Endodontic management was planned for the involved tooth.

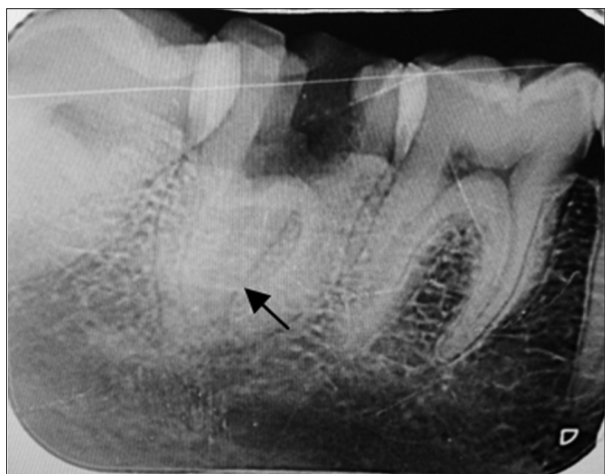


Figure 1: Pre-operative radiograph with evident extra root



Figure 2: Mater cone



Figure 3: Obturation done

An inferior alveolar nerve block was administered with 1.8 mL of 2% lidocaine containing 1: 200,000 epinephrine (LOX 2%, Neon Laboratories Ltd., Mumbai, India) followed by buccal infiltration (1.8 mL) of the same anesthetic solution. The endodontic access cavity was prepared under rubber dam isolation. The conventional triangular outline form of the access cavity was modified into a trapezoidal form to place the distolingually located RE under the dental operating microscope. Clinical examination was carried out with a DG16 endodontic explorer (Hu-Friedy, Chicago, IL, USA), and the dental microscope (Carl Zeiss) revealed two mesial and two distal canal



Figure 4: Minimal crown preparation done

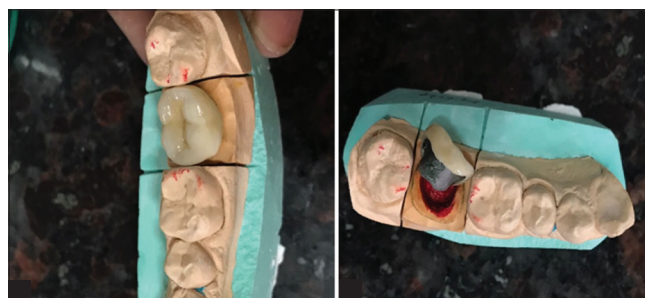


Figure 5: (a and b) Endocrown (metal-ceramic)



Figure 6: Endocrown cemented

orifices. The canal length was determined with an electronic apex locator (Root ZX, Morita, Tokyo, Japan). The canals were thoroughly cleaned and shaped, and obturated with 25 size 0.06% taper gutta-percha along with AH plus resin sealer [Figures 2-3]. The gutta-percha was sheared off at the orifice and cavity was filled with interim restorative material.

After a 1-week follow-up of endodontic treatment, the patient was recalled for postendodontic restoration of 37. The pulp space was cleared of any remaining gutta-percha or sealer. Minimal crown preparation was done with a shoulder finish line. Impression was made using putty condensation silicone heavy and light body. The impression was sent to the laboratory for fabrication of a metal-ceramic endocrown. Later, endocrown was cemented using Type 1 [Figures 4-5] glass ionomer cement (luting) [Figure 6].

Discussion

Accurate diagnosis of supernumerary roots like RE can contribute to the successful outcome of endodontic treatment.^[3,15,16] The RE is located distolingually and its dimensions vary in each individual.^[17] The presence of RE in the mandibular first molar has been extensively evaluated in the literature, but only a few studies have evaluated the morphology of mandibular second molars.^[4,5]

Distolingually located RE varies from short conical extension to a mature root with normal length.^[3] Even though genetic factors may strongly influence the presence of RE, the etiology behind its formation remains unknown.^[17-20] This unusual morphology of mandibular molars could be related to the penetration of an atavistic gene or polygenetic system or due to external factors during tooth development.^[3,21]

After identifying RE from the pre-operative radiographs, the access cavity was modified into a trapezoidal outline to locate the distolingual RE, following previous studies in mandibular first molars.^[3,18,22,23]

Root canal treatment was carried out according to the clinical protocol. To restore the lost crown structure and occlusal morphology, metal-ceramic endocrown was fabricated. Endocrowns are relatively new, easy, and quick to perform. It has several advantages like less number of interfaces in the restorative system; preparation design is conservative and biologic width is minimal. As the core is filled with the metal, retention also is better.

Conclusion

It is essential to anticipate and treat the distolingual root canal considering the presence of RE in the mandibular second molar in order to increase the longevity of the tooth. Identification of RE through radiograph and operating microscope is made easy. The endocrown fits perfectly with the concept of biointegration and can serve as a conservative and esthetic option for restoration of nonvital tooth. It can be successfully used in restoring teeth with loss of crown structure and occlusal morphology.

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