

A Case Series on -Radix Entomolaris

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ABSTRACT:

A fundamental requirement for the effectiveness of endodontic treatment is a thorough understanding of the anatomy of the root canal. Additionally, there may be an extra root on mandibular molars that is situated buccally (radix paramolaris) or lingually (radix entomolaris). The success of root canal therapy is influenced by knowledge of the potential for and comprehension of uncommon exterior and interior root canal morphology. This report explains the endodontic treatment of Radix entomolaris' in mandibular first molar.

Key words: Anatomical variation, Endodontic treatment, Mandibular molar, Radix entomolaris, Extra root.

I. INTRODUCTION:

The primary goal is to eradicate microorganisms from the root canal system and to prevent additional reinfection into the canal. This is accomplished by thoroughly cleaning and biomechanically preparing the pulp area, then hermetically sealing it with high-quality obturating materials.

The endodontic procedure can be successful if the atypical root canal morphology is recognized and thoroughly understood. One mesial and one distal root, with two mesial canals and one distal canal, are mostly seen in mandibular first molars.⁽¹⁾

The mesial root often comprises of two root canals, which can either join to produce a single foramen at the root end or terminate in two distinct apical foramina. One bean-shaped root canal is typically found in the distal root. Although they are uncommon, mandibular molars with varying numbers of roots and root canals have been seen during dental procedures.

Radix entomolaris is present on the first, second, and third mandibular molar teeth, with the second molars having the least amount of prevalence. A bilateral occurrence with a frequency of 50–67% has also been documented in studies.

Carabelli characterized the third root as Radix Entomolaris (RE), in addition to the two roots of the mandibular first molar. Particular consideration should be given to three-rooted mandibular first molars since they differ structurally from the other two roots in terms of size, shape, and occasionally even both. While the incidence of third root varies by ethnic group, it is less than 5% among the Indian population.^(2,4) In communities that are Caucasian, African (Egyptian), European, and Indian, the prevalence of supernumerary roots in the mandibular first molar is minimal. In populations that are Mongoloids, such as Korean, Chinese, Eskimo, and Native American, the incidence is highest, potentially reaching 33–40%.⁽¹⁴⁾

ETIOLOGY: The main cause for a radix entomolaris is the mandibular molar's third root formation. It is the creation of dysmorphic, supernumerary roots that may be attributed to penetrance of an atavistic gene or polygenetic system, or to external stimuli which is occurring during odontogenesis process (atavism is the reappearance of a feature after multiple generations of absence). The Racial genetic factors in eumorphic roots usually affect the gene's deeper expression, which leads to a more noticeable phenotypic manifestation.^(5,6)

Morphology of RE:

The classification proposed by Carlsen and Alexanderson 1990 outlines four distinct types of RE based on the anatomical positioning of the cervical segment of the RE.^(7,8,9)

Type A – Cervical segment located distally with two normal components in the distal root.

Type B – Identical to Type A, but with only one normal distal component.

Type C – Cervical segment located mesially.

Type AC – Centrally positioned between the mesial and distal root components.⁽¹⁰⁾

De Moor et al 2004 classified RE based on the curvature in buccolingual orientation into three types.

Type I – Refers to a straight root/root canal.

Type II - Refers to an initially curving entry which continues as a straight root/root canal.

Type III – Refers to an initial curve in the coronal third of the root canal and a second buccally orientated curve starting from middle to apical third.^(11,12)

Two other newly characterized RE variations were also contributed by Song JS et al. 2010,

Less than half the length of the distobuccal root is considered small type.

Conical type is smaller than tiny type and lacks a root canal.⁽¹³⁾

The following case series discusses the endodontic treatment for three mandibular first molars with a RE in the Indian population along with clinical recommendations for effective care.

CASE REPORT : 01 (Radix entomolaris)

A 14-year-old male patient reported to the Department of Conservative Dentistry and Endodontics, with a chief complaint of blackish discolouration with severe pain in the left lower back tooth region (36) since last three days. The pain was intermittent in nature and aggravated on taking hot food and beverages, and lasted for 2–3 hours.

On clinical evaluation, it was found to be associated with deep caries and diagnosis was established as symptomatic irreversible pulpitis in relation to mandibular first molar. Radiographic diagnosis of mandibular first molar showed caries close to pulp and presence of an additional third root with periapical changes. Another radiograph was taken at 30deg mesial and distal angulation to confirm the presence of extra root. Access cavity preparation was done under local anaesthesia with an endo access bur (Dentsply, Switzerland). The first distal canal was located towards the buccal side indicating the presence of one additional canal on the shape of the access cavity was modified from triangular to a trapezoidal form to locate the fourth canal. DG-16 endodontic explorer was used to

locate the root canal orifices and 15 # K-file (Mani, Japan) was used to establish patency of the canals. Working length was determined using apex locator (Root ZX, J. Morita) and reconfirmed radiographically. Biomechanical preparation was done with rotary ProTaper Next (Dentsply, Switzerland) file system. During instrumentation, 1.3% sodium hypochlorite was used as an irrigant and 17% EDTA was used as final flush.

Obturation was performed with gutta-percha points using single cone technique. Restoration of access cavity was done with composite resin (tetric-N-ceram, ivoclarvivadent) and a post-obturation radiograph was taken.



Figure 01: PRE OP



Figure 02: Working length determination

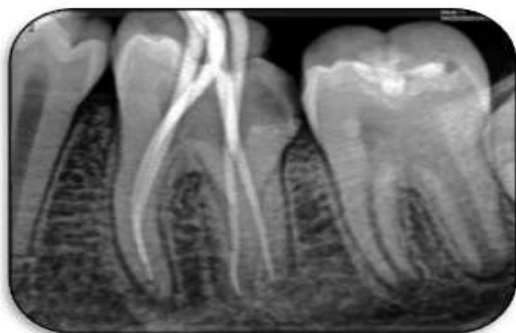


Figure 03: MASTER CONE



Figure 04: OBTURATION

CASE REPORT : 02 (Radix entomolaris)

A 37-year-old female patient reported to the department of conservative dentistry and endodontics with pain in the lower right back tooth region for five days. On clinical examination revealed deep proximal caries on the distal side of the right mandibular first molar (46). The tooth was tender on percussion, diagnosis was established as symptomatic irreversible pulpitis in relation to mandibular first molar and on radiographic examination first molar showed caries close to pulp and presence of an additional third root with periapical changes. Access cavity preparation was done under local anaesthesia with an endo access bur (Dentsply, Switzerland). The first distal canal was located towards the buccal side indicating the presence of one additional canal on the shape of the access cavity was modified from triangular to a trapezoidal form to locate the fourth canal. DG-16 endodontic explorer was used to locate the root canal orifices and 15 # K-file (Mani, Japan) was used to establish patency of the canals. Working length was determined using apex locator (Root ZX, J. Morita) and reconfirmed radiographically. Biomechanical preparation was done with rotary ProTaper Next (Dentsply, Switzerland) file system. During instrumentation, 1.3% sodium hypochlorite

was used as an irrigant and 17% EDTA was used as final flush.

Obturation was performed with gutta-percha points using single cone technique. Restoration of access cavity was done with composite resin (tetric-N-ceram, ivoclarvivadent) and a post-obturation radiograph was taken.



Figure 05: PRE OP



Figure 06: MASTER CONE



Figure 07: OBTURATION

CASE REPORT : 03 (Radix entomolaris)

A 29-year-old female patient reported to the department of conservative dentistry and endodontics with pain in the lower left back tooth region for past 1 week. On clinical examination revealed deep caries on the left mandibular first molar (36). The tooth was tender on percussion, diagnosis was established as symptomatic irreversible pulpitis in relation to mandibular first molar and on radiographic examination first molar showed caries close to pulp and presence of an additional third root with periapical changes. Access cavity preparation was done under local anaesthesia with an endo access bur (Dentsply, Switzerland). The first distal canal was located towards the buccal side indicating the presence of one additional canal on the shape of the access cavity was modified from triangular to a trapezoidal form to locate the fourth canal. DG-16 endodontic explorer was used to locate the root canal orifices and 15 # K-file (Mani, Japan) was used to establish patency of the canals. Working length was determined using apex locator (Root ZX, J. Morita) and reconfirmed radiographically. Biomechanical preparation was done with rotary ProTaper Next (Dentsply, Switzerland) file system. During instrumentation, 1.3% sodium hypochlorite was used as an irrigant and 17% EDTA was used as final flush.

Obturation was performed with gutta-percha points using single cone technique. Restoration of access cavity was done with composite resin (tetric-N-ceram, ivoclarvivadent) and a post-obturation radiograph was taken.

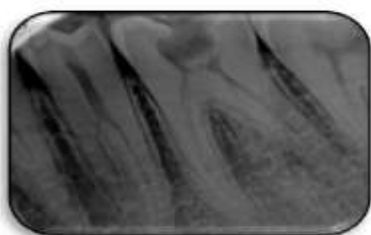


Figure 08: PRE OP



Figure 09: WORKING LENGTH DETERMINATION



Figure 10: MASTER CONE



Figure 11: OBTURATION

II. DISCUSSION:

In endodontic treatment, the existence of a RE has clinical significance. A "missed canal" or other issues during root canal therapy can be prevented with a precise diagnosis of these extra roots.

A "hidden" RE should be discovered carefully by examining the preoperative radiograph and interpreting the specific signs or features, such as an ambiguous image or outline of the root canal or the distal root contour. A second radiograph must be taken at a distal or mesial angle (30°) in order to show the RE. This way an appropriate diagnosis can be obtained in the majority of situations. In addition to a radiographic diagnosis, a clinical examination of the tooth along with periodontal probing investigation of the roots' cervical morphology can help to identify an extra root. An additional root may be present if there is a cervical prominence or convexity together with an extra cusp (tuberculum paramolare) or more pronounced occlusal distal or distolingual lobe.

The access cavity opening of a RE is affected mainly by the placement of the root canal orifice. Since the main canal or canals in the distal root are located more distolingually to mesiolingually from the orifice of the RE tooth.

Hence a more rectangular or trapezoidal outline form is will be produced when the triangular opening cavity is extended to the (disto) lingualcuspal area.

Thusthe exact location of the RE canal orifice can be determined by looking for a dark line on the pulp chamber floor and angled probe can also be used to examine the distal and lingual pulp chamber walls in order to uncover the pulp roof remnants or overlying dentin that conceals the root canal entrance.⁽¹⁾

III. CONCLUSION:

The intricacy of the root canal system frequently presents difficulties for the practitioner and the outcome of endodontic treatment may suffer if the RE is not diagnosed. Hence to avoid any misinterpretations for the diagnosis for RE tooth, the preoperative radiographs at mesial and distal angulations must be taken, and their interpretation must be accurately carried out. Thus the Endodontic success depends on a precise diagnosis and in-depth understanding of the variance in the root canal shape, prevalence, and canal layout of the involved Radix entomolaris tooth.

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