

## Case Report

### Radix Entomolaris: An Endodontic Challenge - A Case Report

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#### ABSTRACT

The presence of extra root or extra canal more common in mandibular first molar and its prevalence is 0.2%–32%. Complete knowledge of anatomy and morphology of teeth is the key of success full endodontic treatment. This case report discusses the management four rooted mandibular molars.

**Key words:** Endodontic treatment, Radix entomolaris

Received: 15 July, 2019

Revised: 19 August 2019

Accepted: 25 August 2019

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**This article may be cited as:** Baranwal HC, Kumar N, Singh A. Radix Entomolaris: An Endodontic Challenge - A Case Report. J Adv Med Dent Scie Res 2019;7(9): 29-31.

#### INTRODUCTION

A thorough understanding of root canal anatomy and morphology is required for achieving high level of success in endodontic treatment. Incomplete instrumentation and cleaning of the root canal space and faulty obturation are the main reasons for failure of endodontic treatment. Root canals are remain infected because the operator are not recognize their presence, especially in teeth which show anatomic irregularities or accessory or aberrant root canals.[1] mostly mandibular first molars have two rooted with one mesial and one distal root with two mesial and one distal canal. The major variant in this tooth type is the presence of an additional third root; a supernumerary root is found lingually referred as distolingual root, Radix entomolaris (RE), first described by Carabelli,[2] is an anatomical variant found in the permanent mandibular first molar. Radix entomolaris (RE) refers to mabdibular molars having an additional root located lingually. Endodontic literatures on RE in permanent mandibular first molars reveals its incidence ranging from 0%-43.7%, with highest prevalence among the Mongolian and Eskimo traits.[3] Based on different methods of investigation, the prevalence of RE is also found to be high among Taiwanese (Chinese)

population and found to be ranging from 21.1% to 33.33%, with a bilateral incidence ranging from 53.65% to 68.57% in them.[2] Because of its high frequency in these populations, the RE is considered to be a normal morphological variant. In spite of high prevalence of RE in certain races, its incidence among the Indian population is found to be very low and only 0.2%.[3] An awareness and understanding of this unusual root and its root canal morphology, locating the canal orifice, chemo mechanical cleaning and shaping of the root canals before a dense root canal filling with a hermetic seal can contribute to the successful outcome of root canal treatment. This case report is about the detection and management of radix entomolaris (RE) in a mandibular first molar during its root canal treatment.

#### CASE REPORT

A 38 year old male patient was referred to Department of Conservative dentistry and Endodontics IMS BHU, with throbbing pain in his mandibular left first molar for the past four days. On clinical examination of the patient his mandibular left first molar had a deep carious lesion. Tooth was severely tender on percussion. Intra Oral Periapical

(IOPA) Radiograph of tooth mandibular left first molar showed a broad coronal radiolucent area involving the pulp and also revealed the presence of an extra distal root with periapical radiolucency. From patient history and clinical examination a diagnosis of acute apical periodontitis was established. Buccal object rule (SLOB technique) clarify the additional root was distolingual root [RADIX ENTOMOLARIS] (Fig. 1). CBCT was confirmed that the additional root was distolingual(Fig-2&3). Left mandibular first molar was anesthetized using 2 ml of lidocaine containing 1:200,000 epinephrine and isolate by rubber dam. The pulp chamber was accessed by endoz bur. Four distinct canal orifices were located and negotiated using k-flex file ISO 15 (Dentsply Maillefer). The working length was determined by periapical radiograph (Fig.4) and later confirmed by apex locator (Dentaport ZX, J Morita). After debriding pulp tissues, Calcium hydroxide powder (DPI, India) mixed with saline was placed with an absorbent point and closed dressing was placed and patient was recalled after 5 days. At the second appointment the

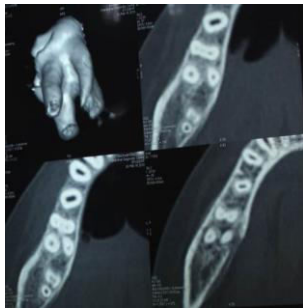
coronal access was modified by Gates Glidden burs (Dentsply, Maillefer) and canals were shaped with protaper. Cleaning and shaping was done by Nickel Titanium rotary instruments (Dentsply, Maillefer) and irrigation was performed using 2.5% sodium hypochlorite and lubrication with RC-Prep. The canals were enlarged by crown down preparation using F2 protaper rotary instrument to the working length. Calcium hydroxide powder mixed with saline was placed with an absorbent point after cleaning and shaping, and the access cavity was sealed with a temporary coronal sealing material. At the third appointment after 5 days, the patient was completely asymptomatic and canals were dry. The root canal system was obturated with 6% Gutta percha and lateral condensation with accessory points and Grossman's sealer (Zical). Post-operative radiographs were taken from varying angulations (Fig. 5). Patient was recalled after a week for check up, she was completely asymptomatic and then she was given an appointment for permanent restoration.



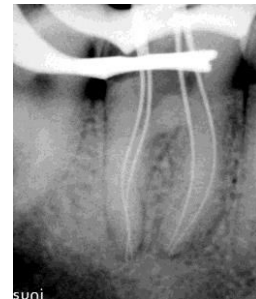
**Fig. 1:** Pre-operative radiograph



**Fig. 2:** CBCT show four roots



**Fig. 3 -** CBCT show four roots and four canals



**Fig. 4:** Working length radiograph



**Fig.5-** Periapical radiograph after obturation

## DISCUSSION

Anatomic variations of permanent mandibular molars are documented in the literature. The RE is located distolingually, with its coronal third completely or partially fixed to the distal root. Etiology of radix is still unclear, In dysmorphic, supernumerary roots formation could be affected by external factors during odontogenesis or polygenetic system where as in eumorphic roots and genetic factors influence the expression of a particular gene that results in the more pronounced phenotypic manifestation.[4] An RE can be found on the first second and third mandibular molars, occurring least frequently in second molar. Some studies report a bilateral occurrence of the RE from 50-67%. [5-10] Calberson *et al.* found 4 types of RE,[7] and De Moor *et al.* classified REs evaluated from extracted teeth into types I–III.[5]

- *Type A & B:* Distally located cervical part of the RE with two normal and one normal distal root components respectively
- *Type C:* Mesially located cervical part
- *Type AC:* Central location between the distal and mesial root components.

In apical two third of RE a moderate to severe mesially or distally oriented inclination can be present. Based on the curvature of the separate RE variants in buccolingual orientation De Moor *et al.* (Ribeiro & Consolaro) classified:

- *Type I:* refers to a straight root/root canal
- *Type II:* refers to an initially curved entrance which continues as a straight root/root canal
- *Type III:* refers to an initial curve in the coronal third of root canal and a second curve beginning in the middle and continuing to the apical third.

The presence of an RE has clinical implication in endodontic treatment. An accurate diagnosis of these can avoid complications or a 'missed canal' during root canal treatment. Because the (separate) RE is mostly situated in the same buccolingual plane at the distobuccal root, a superimposition of both roots can appear on the preoperative radiograph and resulting in an inaccurate diagnosis. A thorough inspection of the preoperative radiograph and interpretation of particular marks or characteristics such as an unclear view or outline of the distal root contour.

or the root canal can indicate the presence of 'hidden' RE. To reveal the RE, a second radiograph should be taken from a more mesial or distal angle (30°). Clinically, a good knowledge of law of symmetry and law of orifices and

various methods like, visualizing the dentinal map and canal bleeding points, using DG-16 explorer, micro-opener, toughing of the grooves with ultrasonic tips, staining the chamber floor with 1% methylene blue dye, champagne bubble test, magnetic resonance microscopy and micro computed tomography will be useful to locate the canals.[4] Further, good illumination and the use of accessories like magnifying loupes, microscopes etc are also valuable in locating and managing RE.

## CONCLUSION:

Clinicians should be aware of unusual root morphological variation of the RE in terms of root inclination and root canal curvature demand careful, adapted diagnostic and clinical approach to avoid or overcome procedural errors during endodontic therapy. The initial diagnosis of a RE before RCT is important to facilitate the endodontic procedure and to avoid 'missed canals'. Preoperative periapical radiographs exposed to two different horizontal angles and clinical diagnosis are required to identify these additional roots.

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