

## Radix entomolaris in mandibular Second molar: A rare case report

Ravi SV<sup>1,\*</sup>, Swapna Honwad<sup>2</sup>, Sreekanth Puthalath<sup>3</sup>, Ranjith Madhavan<sup>4</sup>, Surabhi Mahidhar<sup>5</sup>

<sup>1,3,4,5</sup>Reader, <sup>2</sup>Senior Lecturer, Dept. of Conservative & Endodontics, KMCT Dental College

**\*Corresponding Author:**

Email: svravismg@gmail.com

### Abstract

Radix entomolaris (RE) is a common variation present in mandibular first molars, in which on the lingual aspect we can find an extra root. But it's extremely rare to find an additional root in mandibular second molars. So understanding and being aware of this uncommon variant, helps to do endodontic therapy in a better way. Prognosis of mandibular molars with this root canal morphology will depend on an accurate diagnosis and careful application of clinical endodontic skill. This case report discusses endodontic management of one such rare case with RE in mandibular second molar.

**Keywords:** Radix entomolaris, Mandibular second molar, Root canal treatment

### Introduction

The awareness and understanding of root canal anatomy of mandibular molar is very essential for the clinician to achieve the successful endodontic outcome. One of the main reasons for failure of root canal treatment (RCT) in molars is missed canal.<sup>(1,2)</sup>

The number, location of roots and root canals of permanent mandibular molars may vary. Generally, mandibular molars have 2 roots, however, the presence of an extra root is a major anatomic variant, first identified by Carabelli in 1844. This third root in human permanent mandibular molars can be located either lingually - radix entomolaris (RE) or facially - radix paramolaris (RP).<sup>(3)</sup>

By analyzing pre-operative radiograph we can certainly identify anatomic variations in root morphology. To avoid complications or missing of canals (RE/RP) during endodontic therapy, an accurate diagnosis of is very important. Since these additional root canal is mostly located bucco-lingual plane which is same as the other two roots. So it may go undiagnosed because of superimposition. A complete examination and analysis of any such variations like an unclear outline / contour of any root (mesial or distal), is very important as it may suggest an "hidden" RE/RP.<sup>(4)</sup> Ingle *et al* has recommended a thorough radiographic study of the involved tooth, using exposure from the standard buccal-to-lingual projection, one taken 20° from the mesial, and the third taken 20° from the distal to obtain basic information regarding the anatomy of the tooth.<sup>(5)</sup>

A 1985 study by Walker and Quackenbush claimed that panoramic radiographs resulted in an accuracy rate of approximately 90%.<sup>(6)</sup>

According to a review of literature RE has been reported occurring in the first (7.4%), second (0%), and third mandibular permanent molars (3.7%) occurring with a least frequency or none on the second molar.<sup>(7)</sup>

But in an another study the prevalence of radix molars in the Malaysian population was 9.9% (4.9% in first, 2% in second and 3% in third molar).<sup>(8)</sup>

Tratman and others surveyed the Indian population found its frequency <5% Presence of RE in the first mandibular molar is most commonly seen in the Mongoloid population.<sup>(9)</sup> There was no specific incidence rate in relation to mandibular second molar.

So with present available literature we can understand that incidence of radix entomolaris in mandibular second molar is very rare. The following case report describes management of one such rare case.

### Case Report

A Female patient of 19 years of age was referred to the clinic. Her chief complaint was pain in the lower right back tooth area since 3days. There was tenderness on vertical percussion. No abnormality on periodontal probing and no mobility was found. On radiographic examination a deep carious lesion very close to pulp was seen. There was periodontal widening seen on both mesial and distal aspect of the both roots. There was an additional root present on distolingual aspect.

With these examination, it was confirmed the diagnosis of irreversible pulpitis with apical periodontitis.

A non-surgical root canal therapy was planned and explained to the patient with possible outcomes and prognosis.

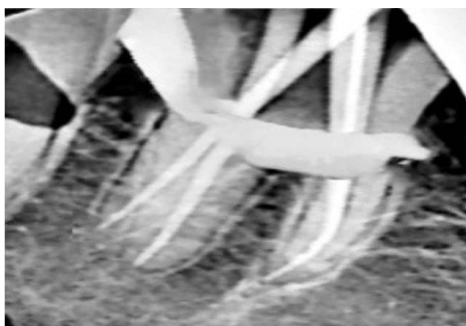


**Fig. 1: Pre-operative radiograph**

Patient was administered local anesthesia. Rubber dam isolation provided for the tooth. Access cavity was prepared. Initially two orifices in mesial root and one orifice in distal root were found. But a dark line was extended in the pulpal floor guiding towards an extra orifice in the distolingual part of the pulp chamber. Root canal orifices were initially enlarged with GG drills (Mani Inc., Japan) followed by exploring of canals was done using K file ISO # 10.

Apex locator was used to measure the working length.

Preparation of all the canals was done using pro-taper universal rotary files and x-smart endo motor till size F1 (Dentsply Mailefer, Ballaigues, Switzerland). A thorough irrigation was performed during instrumentation using 5.25% hypochlorite. Glyde was used as lubricant (Dentsply Mailefer, Ballaigues, Switzerland).



**Fig. 2: Master cone radiograph**

Obturation was performed using AH Plus sealer (Dentsply Maillefer, Ballaigues, Switzerland) and corresponding gutta-percha points and cold lateral condensation technique. Access cavity was sealed and patient was referred for corresponding full crown prosthesis.



**Fig. 3: Post obturation radiograph**

## Discussion

To achieve the best endodontic outcome of these radix molars, it is utmost necessary to have a sound clinical approach as described by Calberson et al. Thorough knowledge of presence of extra root and its orifices, analyzing with periodontal probing for cervical morphology, presence of an extra cusp or more prominent distolingual lobe in combination with a

cervical prominence.<sup>(3)</sup> Use of an angled radiograph (SLOB technique) to identify an additional root that appears as a shadow or a thin radiolucent line in the radiograph and use of advanced radiographic technology such as Cone Beam Computed Tomography (CBCT) are ways to identify this morphological variant.

The cause for presence of radix entomolaris is not yet clear. Presence of dysmorphic roots, and formation of them could be attributed to external factors during Odontogenesis or penetrance of an atavistic gene or poly genetic system. Atavism is the condition where there is reappearance of a trait after several generations of absence.<sup>(10)</sup>

Usually orifice of radix entomolaris will be present disto-lingual to main distal canal orifice. So the access cavity should be rectangular in shape. Complete deroofting of pulp chamber is must to locate the RE orifice. The presence of dentinal map will be a useful guide. Other aids like loupes, intra oral camera or operating microscope will be helpful. Since the curvature is present, the relocation of orifice is necessary to provide straight line access. Presence of severely curved canals will often lead to procedural errors such as straightening of canal, ledge, and loss of working length or root canal transportation may occur in the apical third of the root canal during the biomechanical preparation. Hence, using flexible nickel-titanium rotary files in such cases allows for a more centered root canal preparation with restricted enlargement of the coronal third of the root canal and orifice relocation.

Its seen that file separation chances are quite high in severely curved canals. So canals should initially explored with 10 k-file followed by determination of working length and then the canal should be negotiated. This will develop a systematic approach to glide pathway upto apical foamina.

## Conclusion

Clinician should be aware of the fact that though it's rare, RE can be present in mandibular second molars. An accurate diagnosis, followed by a modified access cavity preparation, location of orifice and preparation of canals with a careful and adapted method may avoid mishaps during endodontic therapy. Application of skilled endodontic therapy will improve the prognosis of the tooth irrespective of file system used.

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