



## Type III Radix Entomolaris in permanent mandibular second molar

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### Abstract

Various dental anomalies including either crown or root portion can be seen during clinical practice. Radix Entomolaris is an uncommon radicular anomaly characterized by being a third root seen attached to lingual aspect of main distal of the mandibular molar. The purpose of this paper is to present a rare case of RE exhibiting in permanent mandibular second molar which is rarely reported so far.

**Keywords:** Root anomaly, Radix entomolaris, mandibular second molar, root canal treatment, permanent molar

### Abbreviations - RE - Radix Entomolaris

#### Case report

A 45-year-old male patient reported to a private dental clinic complaining of decayed tooth in the lower right back tooth region. Patient was well nourished, moderately built with no history of medical illness. There were no any obvious signs and symptoms of syndromes or metabolic disorders. On intra oral examination deep dental caries was observed in mandibular right second molar which was tender to percussion. Possible treatment options including root canal treatment was advised. As the patient was not in affordable condition showed willingness for removal of the decayed tooth. The offended tooth was extracted following local anesthesia infiltration. Some obstruction was experienced by an oral surgeon during extraction but on careful luxation, the tooth was extracted without fracture of the roots. When the tooth was observed, an extra third root was observed along with normal one mesial and one distal root (Figure 1). The extra root was smaller in size compared to other two roots and was found attached to distal root on lingual side. Therefore, based on both clinical examination of the root and using literature search the case was diagnosed as Radix Entomolaris.

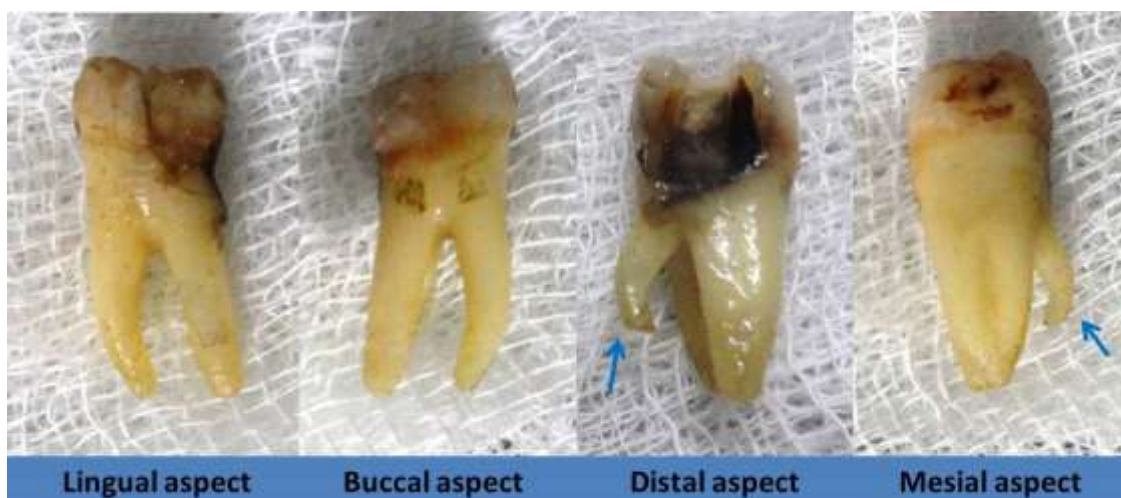


Figure 1: Photograph showing different aspect of mandibular second molar with RE (Type III). RE is attached to lingual aspect of the main distal root (blue arrow).

## Discussion

Radix Entomolaris (RE) is an uncommon root anomaly extensively reported in the dental literature. RE is an additional third root first reported by Carabelli in 1844, and described by various synonyms like “distolingual root”, “extra third root” and “extra distolingual root”.[1] The prevalence in various ethnic group is been done using extracted teeth, periapical radiographs, recently by using microcomputed tomography and cone-beam computed tomographic scans. The reported prevalence varies as 9% in Chinese, 5.97% in Indians, 24.5% in Koreans, 32.35% in Shanghai Chinese, 3% in SriLankans and 22% in Taiwanese people.[2] Carabelli showed that there is no gender predilection for this rare radicular structure and more commonly seen on right side (unilateral occurrence more compared to bilateral presence). Re is found most frequently in first molars (7.4%) followed by third molars with a least frequency or none in second molars (0%).[1] Therefore the uniqueness of this paper is that such rare occurrence of RE in mandibular second molars is presented in this paper.

The exact etiology behind occurrence of RE is still unknown. However, literature states that RE formation could be due to external factors during odontogenesis or to penetrance of an atavistic gene or polygenetic system. In external morphology, RE appears smaller and more curved than the distobuccal or mesial root and is placed in the same transverse plane as the two other roots. It is found distolingually with its coronal third completely or partially fixed to the distal root. Its dimension usually varies from a short conical extension to a mature root with normal length and root canal. In cross section it appears more circular than the distal root, projected lingually about 45% to the long axis of the tooth and has the type I canal system. It is also stated that RE is not simply a division of the distal root but rather is a true extra root with a separate canal orifice and root apex.[3]

Literature shows different classification given by various researchers based on its morphology. The first morphological classification of RE was given by De Moore et al who classified RE into 3 types.[4] In his research he studied numerous extracted first molars and divided morphologic features of this extra third root into three types based on the pattern of its curvature.[4] According to this classification, Type I refers to – A straight root and canal, II – initial entrance is curved but the root is straight, and type III – the coronal third of the root canal is curved, in addition, there is a second, buccally oriented curve from the middle to the apical third. Based on this classification the present case was diagnosed as type III as the morphology exactly resembled to type III (Figure 1).

In RE, an accurate diagnosis is very essential to overcome complications or canal missing during root canal treatment. As RE is placed in the same bucco-lingual plane as the other two roots, a superimposition of both roots can appear on the preoperative radiograph and remain undiagnosed. [1,2] To rule out presence of hidden RE, a thorough examination of the preoperative radiograph is essential and interpretation of particular marks or characteristics, like an unclear view, or outline of the distal/mesial root contour or the root canal is required. During clinical practice, extraction of the molar with RE should be carried out carefully compared to normal molar without RE.[2-5] Root fractures occur if rotational movements are used, because RE is divergent and curved in morphology. Although pre-operative radiograph was not taken to before the extraction and root fracture did not happen in this case, but evidence of extra root seen following extraction clearly indicates importance of diagnostic radiographs and anticipation of such complications seen with RE.[6-7] Presence of RE has also got implications in other clinical procedures like in endodontic procedures, periodontics, and orthodontic procedures. RE is of great interest in anthropological studies also as the presence of extra roots shows existence of atavistic feature.[1-5]

The author of this paper has published numerous articles on this anomaly occurring mainly in first molars.[2,3,5] Publications on RE occurring both in permanent and primary teeth including its prevalence, case reports and literature review are also reported.[2,3,5] But presence of RE in permanent second molar was not reported so far. Therefore this paper adds more light on the literature pertaining to existence of RE in the second molars and also alerts all clinician about RE during treatment of permanent mandibular second molars.

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