



Radix Entomolaris in Permanent Mandibular First Molars: Report of Cases

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Submitted: 15-12-2024

Accepted: 25-12-2024

ABSTRACT

The foremost goal of endodontic therapy is to prevent or heal apical periodontitis. However, root canal anatomy might present a clinical challenge, which may have a bearing on the treatment outcome. Racial variations are common characteristic in permanent molar's anatomy. Generally mandibular first molars have two roots; however the presence of a third root - Radix Entomolaris (RE) is a major anatomic variant amongst many population groups. The RE is considered to be unusual and is primarily an Asiatic trait. This paper reports two cases of mandibular first molars featuring this root morphology.

Keywords: mandibular molars, radix entomolaris, root canal morphology.

population.[3,4,6,7] The relationship between the finding of RE and various other factors such as bilateral occurrence, gender, right vs left side distribution and is said to be contradictory. Regarding gender predilection, no significant difference was found in the prevalence of RE, although few studies found male predilection for RE according to gender.[5] Similarly, no significant difference was found in the side occurrence, despite some studies reporting it to be more on the right side while other studies finding it more on the left side.[5] The bilateral occurrence of RE is reported to vary from 37.14 to 67%. However, since some studies have reported only unilateral occurrence of RE, further studies are required to clarify this aspect.[3,5,8,9]

I. INTRODUCTION

Radix entomolaris (RE) is an anatomical variant found most commonly in mandibular permanent first molar. It was first described by Carabelli.[1] It is characterized by the presence of an additional or extra third root, which is typically found lingually on the distal root. Radix entomolaris is found in the first, second, and third mandibular molars, among them least frequently in the second mandibular molar.[2-4] The prevalence of RE is reported to differ significantly with races and ranges from 0-43.1%. The prevalence of RE is said to be highest among the population of Mongolian origin such as Koreans, Taiwanese, and Chinese which is considered to be an eumorphic root morphology among them. RE is not much common in Caucasian, Eurasian, African and Indian population and it is said to be a dysmorphic root morphology in them.[4,5]

Despite RE is considered as an Asiatic trait with a high prevalence and a eumorphic root morphology in certain races such as Koreans, Taiwanese, and Chinese, the incidence of RE among the Indian population is found to be quite low and only 0.2%. However, few studies have reported higher prevalence of RE, with a range from 2.19-13.3%, among the Indian

II. CASE REPORTS

Case 1

A 32-year-old male patient reported with a chief complaint of pain in lower right back tooth region since 5 days. Tooth was tender on percussion. Periodontal probing and mobility were normal. Intraoral periapical RVG revealed a deep approaching the pulp along with periodontal ligament widening in mesial and distal root with an additional distolingual root as can be seen in figure 1a.

A diagnosis of acute symptomatic irreversible pulpitis with apical periodontitis was made. Endodontic treatment was planned and the procedure was explained to the patient with the complications and possible outcomes. After taking patient's consent local anesthesia was administered and the tooth was isolated using rubber dam. The pulp chamber was accessed and two mesial and one distal canal orifice were located using a DG-16 endodontic explorer.

An extra orifice was located toward distolingual part of pulpal floor. Root canal orifices were enlarged using Sx rotary file (Dentsply Maillefer, Switzerland) and then explored with K-File ISO #15. Working length measurement was performed using apex locator Propex pixi mini



Apex Locator (Dentsply Maillefer, Switzerland) and was confirmed radiographically (Figure 1b). Root canals were instrumented using ProTaper Next rotary files (Dentsply Maillefer, Ballaigues, Switzerland) in all canals. Irrigation of root canals were done using 5% sodium hypochlorite solution and were lubricated using AvuePrep EDTA Gel

(BLV Healthcare PVT LTD, India) in all canals.

Obturation was performed using AH Plus root canal sealer (Dentsply Maillefer, Ballaigues, Switzerland) and corresponding gutta percha points (Figure 1c and d). Access cavity was sealed and patient was appointed for full crown prosthesis.

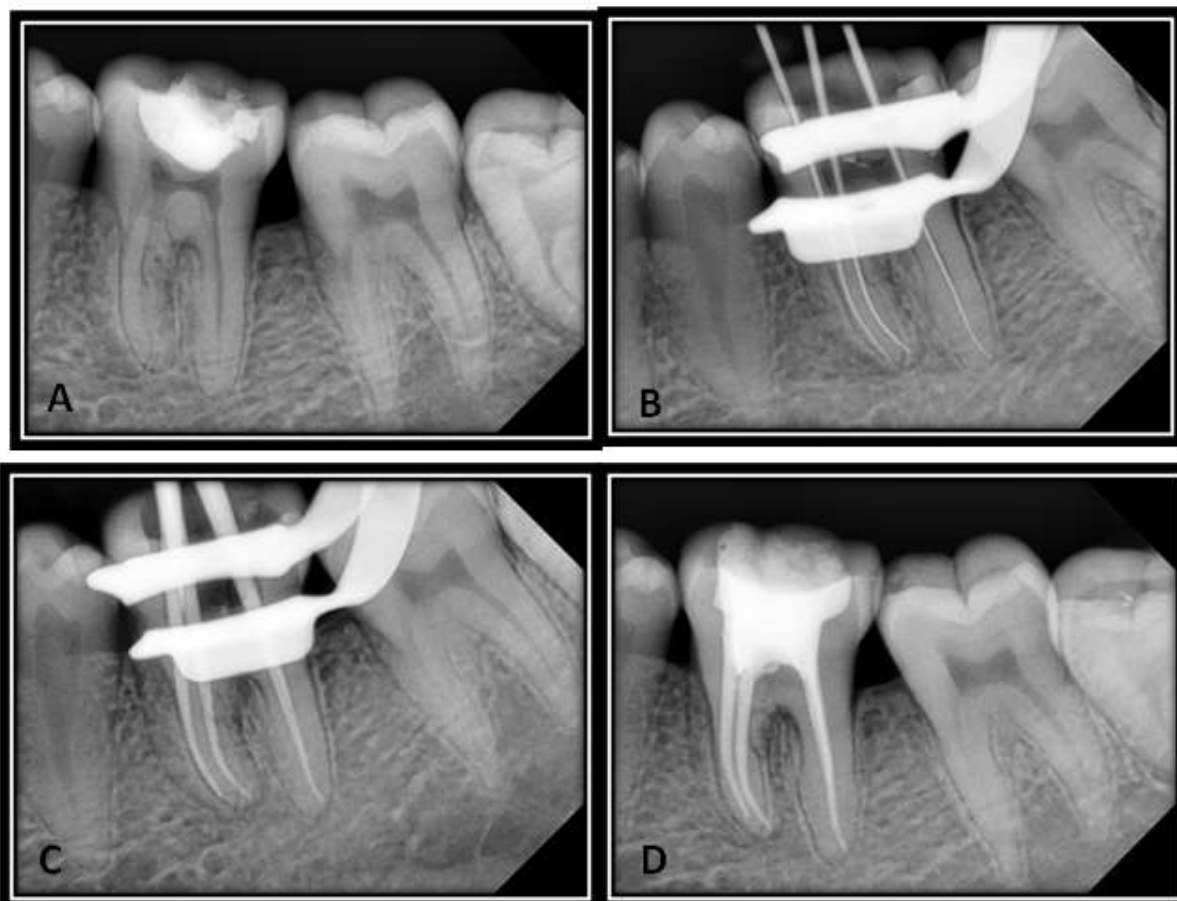


Figure 1: (a) Pre-operative radiograph, (b) working length determination, (c) gutta-percha cone fit, (d) post-operative radiograph

Case 2

A 32-year-old female patient with a chief complaint of severe pain in right lower back tooth region since 2 days. On clinical examination, tooth #46 was found to be carious. It was tender on percussion. Tooth was sensitive to hot and cold. Intraoral periapical RVG revealed a deep carious lesion in close proximity to pulp along with periodontal ligament widening. An additional root was also seen as can be seen in Figure 2a. Based on the above findings, a diagnosis of acute symptomatic irreversible pulpitis was made and root canal treatment of the tooth was planned. After application of rubber dam and administration of anesthesia the pulp chamber was accessed and two

mesial and one distal canal were found. Another orifice was located toward the distolingual part of the pulpal floor. On taking radiographic working length RVG a separate lingual root was identified as RE (Figure 2b). All canals were disinfected with 5% sodium hypochlorite solution and were lubricated using AvuePrep EDTA Gel (BLV Healthcare PVT LTD, India) in all canals. Shaping was done with ProTaper Next (Dentsply Maillefer, Ballaigues, Switzerland) files. Obturation was done using AH Plus sealer (Dentsply Maillefer, Ballaigues, Switzerland) (Figure 2c and d). Access cavity was sealed and patient was appointed for full coverage crown.

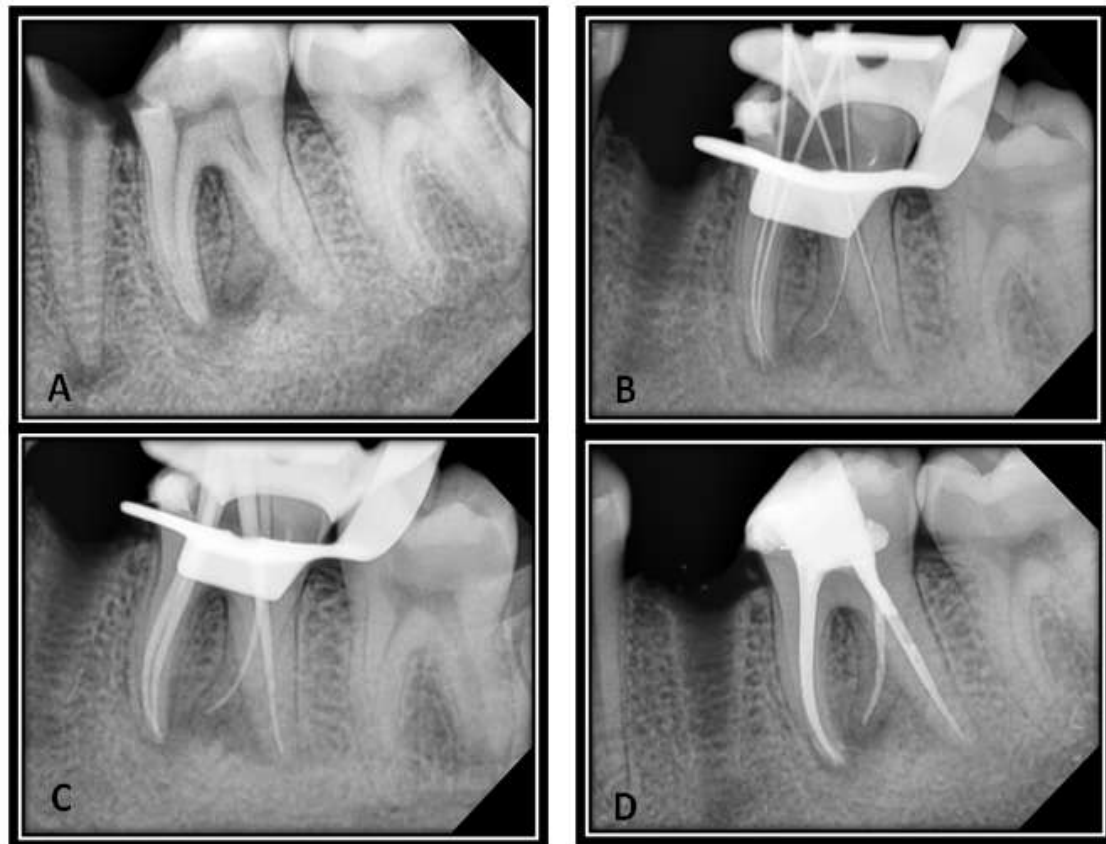


Figure 2: (a) Pre-operative radiograph, (b) determination of working length, (c) gutta percha master cone fit, (d) post-operative radiograph.

III. DISCUSSION:

The RE is located lingually on the distal root, with its coronal one third completely or partially fixed to the distal root. The dimensions of the RE can vary from a short conical extension to a 'mature' root with normal length and root canal. In general, the Radix Entomolaris is smaller than the distobuccal and mesial roots and can be separate form, or partially fused, with the other roots. It is considered as to be an Asiatic trait [10,11] and according to Grossman [12], the incidence of radix entomolaris is 5.23 %. According to Carlson and Alexander [13] RE can be classified into four different types depending on the location of its cervical part.

Type A: Located lingual to the distal root complex, which macrostructures. has two cone-shaped

Type B: Located lingual to the distal root complex, which macrostructures. has one cone-shaped

Type C: Located lingual to the mesial root complex.

Type AC: Located lingual between the mesial and distal root complexes.

Each type of RE has a sub-classification which

allows identification of separate or non-separate RE.

Ribeiro and Consolaro [14] proposed a classification for Radix Entomolaris is as follows:

Type I refers to a straight root canal.

Type II refers to an initially curved entrance and the continuation 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 oriented curve starting from the middle to apical third.

No two teeth are ever alike and the occurrence of anatomic variations is a constant challenge to the clinician. Knowledge and understanding of tooth morphology & careful evaluation of preoperative radiographs of each and every case is mandatory. The morphological variations of the Radix Entomolaris in terms of root inclination and root curvature demand a careful and adept clinical approach to avoid or overcome procedural errors during endodontic therapy.

Conflict of interest: None

Funding: None



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