

Radix Entomolaris: A Case Report

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ABSTRACT

An extra root can be found disto-lingually, termed radix entomolaris (RE), or mesio-bucally, named radix paramolaris, on lower molars (RP). Root canal treatment is more successful when the complexities of root canal morphology are recognized and understood.

Key words: Anatomical variations, Endodontic treatment, Lower molar, Radix entomolaris

INTRODUCTION

Endodontic success requires a thorough knowledge of dental anatomy and a comprehension of the possibility for deviations from the norm. The reason behind recurrent infection around endodontically treated molars is probably missed canals and failure to eliminate all bacteria and pulp remains from the root canal system. It is therefore important that clinicians have an awareness and good understanding of the variations.^[1]

The number of root and root canals in the lower first molar have been described as anatomical variations.^[2] This extra root can be found distolingual in the lower molars, particularly first molars. The radix paramolaris is an extra root on the mesiobuccal side (RP). When present, complete diagnosis and treatment plan are necessary and clinician should take it as an additional canal to fill [Figures 1a-d].^[3]

Prevalence of RE

The primary difference in the lower first molars is the existence of a extra root in addition; this can be found distolingually.^[4] Carabelli (1844) introduced this macrostructure for the 1st time in the literature under the name radix entomolaris (RE). Based on certain reports, the RE occurs bilaterally somewhere between 50% and 67% of incidences.

RE has been shown to occur in the lower first molar with a maximal frequency of 3.4–4.2% in European populations. In African populations a maximum of 3% is found.^[5] Less than 5% of populations among Eurasians and Indians. About 5% to more over 40% of populations with Mongoloid features, including Chinese, Eskimo, and American Indians, have RE.

Etiology

- The etiology of RE is still unknown.
- Its origin in dysmorphic supernumerary roots may be due to extrinsic stimuli during odontogenesis, or to the penetration of an atavistic or polygenetic system. Racial genetic variables in eumorphic roots determine a gene's more sustained expression, which in turn causes a more prominent phenotypic manifestation.^[6]

Morphology of RE

As stated by De Moor *et al.* (2004).^[7]

- Type I: Refers to a straight root/root canal.
- Type II: Describes a root/root canal that begins with a curved exit and then becomes straight.
- Type III: In the coronal third of the root canal, there is a first curve, and there is a second curve that starts in the center and extends to the apical third.^[8]

CASE REPORT: 1

- A female patient 18-year-old came for endodontic treatment of the lower right first molar. Clinical evaluation revealed that the tooth was deep carious and had irreversible pulpitis. Radiographically no periapical lesion was found [Figure 2a].

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- After desensitizing the tooth, an endo-access bur was used to prepare the access, and a DG 16 endodontic explorer was used to find the canal orifices. K-file 10 verified the initial root canal negotiations. Far off from distal root canal orifices, the fourth distolingual canal orifice was present [Figure 2b].
- The canal lengths were determined radiographically with K file ISO 15 size and electronically with Root ZX [Figure 2b]. They were cleaned with 2.5% sodium hypochlorite along with EDTA and shaped with protaper rotary system till a size of F-2 and patient was recalled after 3 days. At next appointment patient was asymptomatic, canals were obturated with zinc oxide eugenol sealer after being dried with paper point [Figure 2c].

CASE REPORT: 2

A 28-year-old male was referred for endodontic treatment of the lower right second premolar and first molar with irreversible pulpitis. Radiographical examination of the lower first molar showed two distal root and no signs of apical periodontitis [Figure 3a]. Access cavity of the lower first molar was prepared and four distinct canal orifices were found with a K-file #10. The lengths of these canals were measured radiographically and verified using apex locator (Root ZX Triauto ZX) [Figure 3b]. The canals were cleaned with 2.5% sodium hypochlorite solution and Glyde (Dentsply Maillefer), and shaped with ISO instruments with

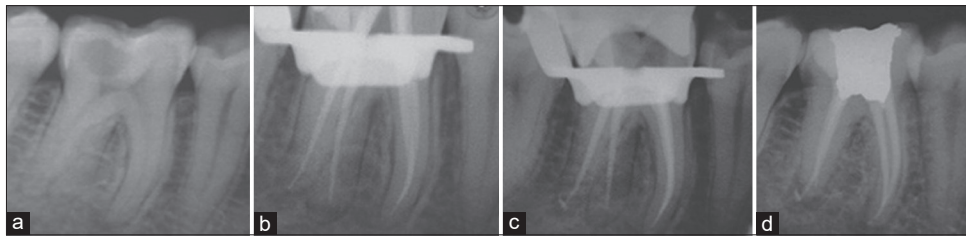


Figure 1: (a) Preoperative radiograph (b) working length (c) master cone radiograph (d) obturation and post endodontic restoration

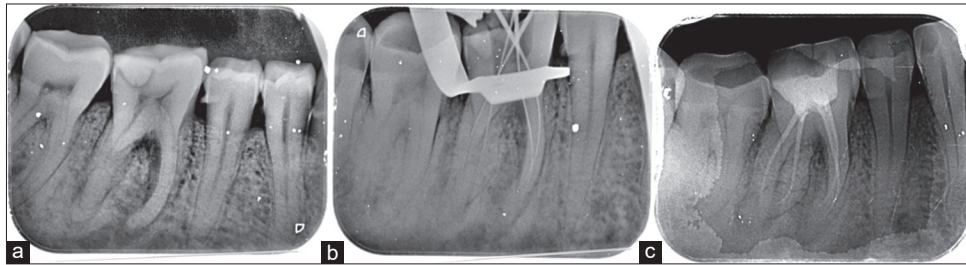


Figure 2: (a) Pre-operative (b) Working length (c) Obturation and post-endodontic restoration

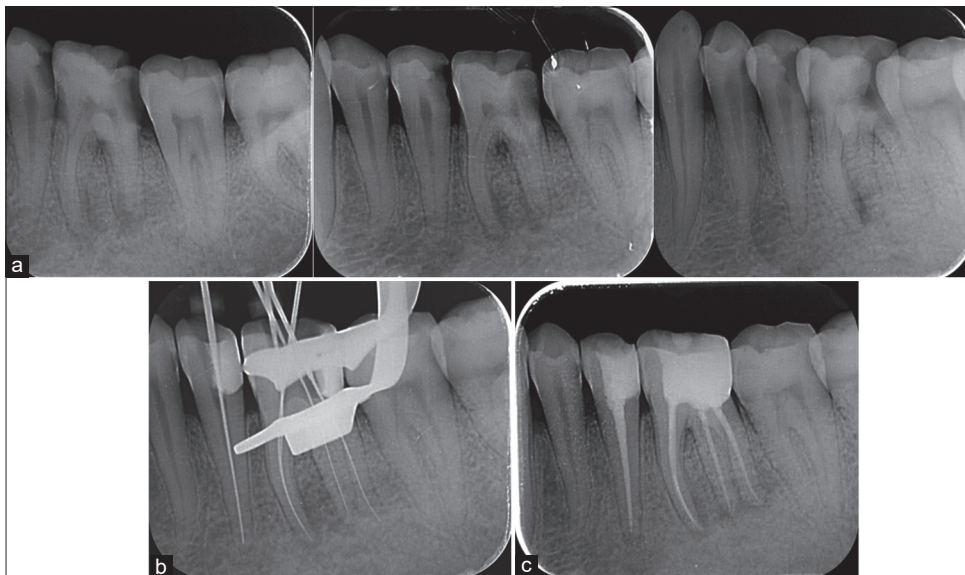


Figure 3: (a) Pre-operative radiograph with different horizontal radiograph (b) working length (c) obturation and post-endodontic restoration

crowd down technique. All canals were filled with gutta-percha and ZOE sealer [Figure 3c].

DISCUSSION

Endodontic procedures

The failure of root canal therapy due to missed canal in the distolingual root can be minimized by accurate clinical and radiographic evaluation. Most important basic principle for successful root canal treatment is the principle of “straight-line access.” Because the orifice of the RE is placed distolingually, the shape of the access cavity can be changed from the traditional triangular shape to a trapezoidal or rectangular shape to locate the orifice of the distolingual root. The RE is located by following the laws of symmetry in the root canal orifices.^[9] Because the majority of radices entomolaris are curved, straight line access is required. Excessive dentin removal or gauging during access cavity preparation should be avoided because this can weaken the tooth structure.

Oral surgical procedures

RE may pose difficulty during extraction and orthodontic procedure. Because the distolingual root is smaller than the mesial and distobuccal roots, it should be fully luxated during extraction.

Orthodontic procedures

The presence of the distolingual root and its curve makes tooth movement difficult during orthodontic treatment.^[10]

CONCLUSION

This variation in structure of permanent lower first molars should be known by oral health care specialists. To optimize

the endodontic procedure and avoid treatment failures, the initial diagnosis is important. The number of roots and their morphology can be determined by properly interpreting radiographs collected at various horizontal angulations. It was concluded that a usual triangular cavity should be modified to a trapezoidal form distolingually once the additional root has been identified.

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