

Endodontic Management of Radix Entomolaris in Mandibular third Molar – A Case Report

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Abstract

Normally, the permanent mandibular third molar has two roots, mesial and distal. However, mandibular molars may have an additional root located either buccally (radix paramolaris) or lingually (radix entomolaris [RE]). Understanding of the presence of an additional root and its root canal anatomy is essential for successful treatment outcome. The aim of this paper is to present a case of permanent mandibular third molar with an additional third root (RE) in Indian population. The presence of an additional third root in permanent mandibular third molars may affect the prognosis of tooth if it is misdiagnosed. Thus, an accurate diagnosis and thorough understanding of variation in root canal anatomy is essential for treatment success.

Keywords: Radix entomolaris, Mandibular third molar, Supernumerary root.

INTRODUCTION

Anatomic variations in permanent mandibular molars are uncommon in Indians but the prevalence of variations are commonly documented in Chinese, Eskimos, and native American populations.^[1,2] Permanent mandibular third molars like their other molar counterparts are known to have two distinct morphological roots mesial and distal.^[1] Sometimes, the number of their roots could be unpredictable, and there might be some discrepancy in different individuals.^[1,3,4] An additional root located mesiobuccally is called radix paramolaris (RP) while the distolingually placed one is called radix entomolaris (RE).^[5] Worldwide, RE is more commonly observed than RP.^[3] Radiographic diagnosis plays a key role in successful endodontic treatment of tooth. Hence, radiographs taken at different angulations give information about extra canals or roots.^[6]

RE has an occurrence of <5% in the Indian population such cases are not routinely observed during dental procedures. Therefore, the aim of this paper was to present a rare case of a Indian patients with three rooted mandibular third molar. To the best of our knowledge, this is the first report from our center and region.

CASE REPORT

A 35-year-old male patient reported with a complaint of pain on chewing in the left lower back tooth region. On clinical examination, there was deep occlusal decay and mesial middle third surface decay in mandibular left third molar (tooth #38) and grossly decayed second molar (tooth #37). Tooth #38 showed lingering response on vitality testing and was tender on percussion. Intraoral periapical radiograph revealed widening of periodontal ligament. This radiograph also showed that the tooth had an additional distolingual root (RE) (Figure 1). Diagnosis of symptomatic irreversible pulpitis with apical periodontitis was made and root canal treatment was initiated.

Local anesthesia (inferior alveolar nerve block) was administered. The tooth was isolated by a rubber dam, and then, the access cavity was prepared with distolingual extension to provide proper access to distolingual canal.

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After finding orifices of the canal, a radiograph was taken to determine the working length of the canals with two instruments in mesial root and two instruments in the distal roots (Figure 2). Cleaning and shaping was performed using rotary ProTaper files (Dentsply, Maillefer, Ballaigues) in crown down manner. Apical preparation was done till size F2 ProTaper file. The canals were irrigated with 5.25% sodium hypochlorite during instrumentation and finally with normal saline. The canals were then dried with paper points. Master cone were selected and confirmed radiographically (Figure 3). Obturation was done. The access cavity was restored with temporary and post-obturation radiograph was taken (Figure 4).

DISCUSSION

A thorough knowledge of the root canal anatomy is very important for the clinician. With the advent of newer technologies and recent concept on access preparation, it is very easy to locate the aberrant canals. Inadequate knowledge of anatomic variations resulting in missed canals is one of the critical reasons for failure of endodontic therapy.^[7]

There are various methods to locate additional canals such as knowledge of law of symmetry, law of orifice location, visualizing the dentinal map, and canal bleeding points. The tactile sensation using hand instrument such as endodontic explorer, pathfinder, DG 16 probe, and micro-openers is also helpful. Champagne bubble test is another useful means of locating the orifice. The remaining pulpal tissue in the canal produces effervescent bubbles when sodium hypochlorite is placed in the pulp chamber, indicating the location of canal orifice. Advanced imaging techniques can aid to locate and confirm additional canals in case of multirooted teeth, especially molars. These techniques include digital radiography, fiber-optic illumination, dental endoscopy and oroscopy, surgical loupes, operating microscope, micro-computed tomography (CT), visualization endograph using Ruddle's solution, and magnetic resonance microscopy.^[8,9]

With the advent of newer radiographic modalities such as radiovisiography and spiral CT, detection of RE is easier. Although a spiral CT is a 3D modality, it is an expensive and an inconvenient tool. Moreover, it is not appropriate to

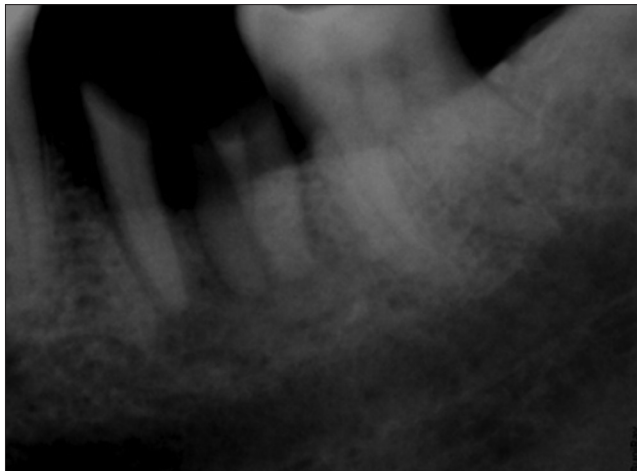


Figure 1: Pre-operative periapical radiograph of tooth #38



Figure 3: Master cone selection

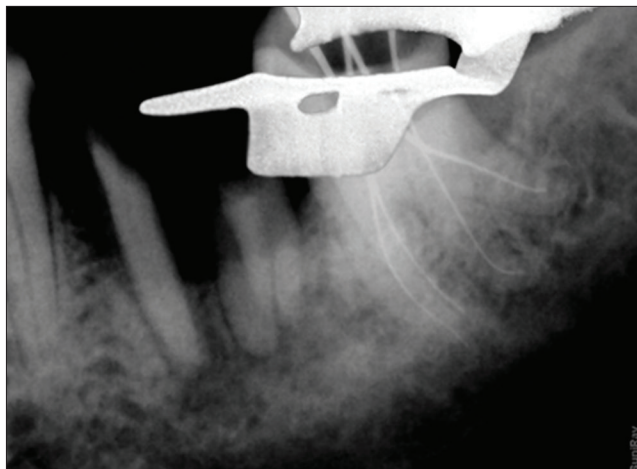


Figure 2: Working length established



Figure 4: Post-obturation radiograph

subject the patient to high doses of radiation of spiral CT for endodontic diagnostic purposes and can be used occasionally for study purposes only. Hence, conventional and digitalized radiography would suffice for the diagnosis of RE/RP.^[9] In the present case reports, the variations in distal root anatomy were identified through careful reading of angled IOPA radiographs. The radiograph with a mesial shift of approximately 20° angulation can provide the definite image. This buccal object rule has also been called same lingual, opposite buccal rule/Clark's rule/Walton's projection.^[8,10] An additional root appears as a shadow or a thin radiolucent line in the radiographs.^[9,10] The existence of an accessory cusp (tuberculum paramolare) and periodontal probing for cervical prominences can also provide an indication of an additional root.^[10]

Straight-line access in this respect has to be emphasized, as the majority of the radix root is curved. With the advent of rotary instruments, access burs such as Endo Z, SS white access burs, and access can be modified to get a straight-line access. This was a part of our protocol for the treated cases.^[9,10] The distal root typically has one kidney-shaped root canal, if the orifice is particularly narrow and round, a second distal canal may be present. The conventional triangular access cavity should be modified into a more trapezoidal cavity to locate and open the orifice.^[9,10] Thus, knowledge of the location of additional roots and its root canal orifices, adapted clinical approach, avoids or overcomes procedural errors during endodontic therapy and reduces incidence of retreatment.

CONCLUSION

Ability to correctly interpret the radiograph, careful inspection of the pulp chamber floor, and use of recent concepts in access cavity preparation along with the sound knowledge of the variable anatomy of the root canal are very important for the clinician to locate and treat the root canals in case of RE or RP.

REFERENCES

1. Kuzekanani M, Walsh LJ, Haghani J, Kermani AZ. Radix entomolaris in the mandibular molar teeth of an Iranian population. *Int J Dent* 2017;2017:9364963.
2. Pai AV, Jain R, Colaco AS. Detection and endodontic management of radix entomolaris: Report of case series. *Saudi Endod J* 2014;4:77.
3. Carlsen O, Alexandersen V. Radix entomolaris: Identification and morphology. *Scand J Dent Res* 1990;98:363-73.
4. Tratman E. Three rooted lower molars in man and their racial distribution. *Br Dent J* 1938;64:264-74.
5. Carabelli G. *Systematisches Handbuch der Zahnheilkunde*. Germany: Georg Olms Verlag; 1985. p. 1-43.
6. Karunakar P, Faizuddin U, Nagarjun M, Ranga Reddy MS. Endodontic management of radix entomolaris in second molar. *Contemp Clin Dent* 2018;9:137-9.
7. Pattanshetti N, Gaidhane M, Al Kandari AM. Root and canal morphology of the mesiobuccal and distal roots of permanent first molars in a Kuwait population-a clinical study. *Int Endod J* 2008;41:755-62.
8. Parashar A, Shikha G, Zingade A, Parashar S. The radix entomolaris and paramolaris: A review and case reports with clinical implications. *J Interdiscipl Med Dent Sci* 2015;3:161.
9. Ingle JI, Heithersay GS, Hartwell GR. Endodontic diagnostic procedures. In: Ingle JI, editor. *Endodontics*. 4th ed. Philadelphia, PA: Lea and Febiger; 1994. p. 123-7.
10. Fava L. Incidence of radix entomolaris in the Indian population-an *in vitro* and *in vivo* analysis. *J Int Oral Health* 2011;5:35-46.