

Radix Entomolaris: Case Report and Clinical Approach in Endodontics

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Abstract

Mandibular molars can sometimes present a variation called radix entomolaris, wherein the tooth has an extra root attached to its lingual aspect. This additional root may complicate the endodontic management of the tooth if it is misdiagnosed or maltreated. If present, an awareness and understanding of this unusual root and its root canal morphology can contribute to the successful outcome of root canal treatment. This report discusses endodontic treatment of mandibular molars with a radix entomolaris, which is rare macrostructures in the population. Avoiding procedural errors during endodontic therapy demand an adapted clinical approach to diagnosis and root canal treatment. Accurate diagnosis and careful application of clinical endodontic skill can favorably alter the prognosis of mandibular molars with this root morphology.

Key words: *Radix Entomolaris, Endodontic treatment, Radix paramolaris, Mandibular molar*

Introduction

The prevention or healing of endodontic pathology depends on a thorough chemomechanical cleansing and shaping of the root canals before a dense root canal filling with a hermetic seal. An awareness and understanding of the presence of unusual root canal morphology can thus contribute to the successful outcome of root canal treatment. It is known that the mandibular first molar can display several anatomical variations. The majority of first molars are two-rooted with two mesial and one distal canal.[1,2] In most cases the mesial root has two root canals, ending in two distinct apical foramina. Or, sometimes, these merge together at the root tip to end in one foramen. The distal root typically has one kidney-shaped root canal, although if the orifice is particularly narrow and round, a second distal canal may be present.[3] A number of anatomical variations have been described in the mandibular first molar: Fabra-Campos [4,5] and Bond [6] reported the presence of three mesial canals and Stroner [7] noted the presence of three distal canals. Like the number of root canals, the number of roots may also vary. An additional third

root, first mentioned in the literature by Carabelli [8], is called the radix entomolaris (RE).[9] This supernumerary root is located distolingually in mandibular molars, mainly first molars. An additional root at the mesiobuccal side is called the radix paramolaris (RP) The identification and external morphology of these root complexes, containing a lingual or buccal supernumerary root, are described by Carlsen and Alexandersen.[10,11] In this report one such case of RE is presented. The prevalence, external morphological variations and internal anatomy of the radix entomolaris is described. The clinical approach to diagnosis and endodontic treatment are also discussed and illustrated.

Case report

A 30 year old male reported to the department with spontaneous, throbbing, sharp pain in the tooth of lower left back region since 1 week. The pain aggravated on chewing and was relieved on medication. Clinical intraoral examination revealed a carious mandibular left first molar which was tender on vertical percussion. There was severe lingering pain to cold water.

The clinical history, coupled with clinical & radiographic examination, led to the presumptive diagnosis of irreversible pulpitis without apical periodontitis (Fig:1). Thus, endodontic treatment of 36 was proposed and the patient consented to the treatment plan.

After proper asepsis and rubber dam isolation the pulp chamber was opened, and canal orifices were located using

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an endodontic explorer (DG-16 Endodontic Explorer, Ash instruments, Dentsply, Gloucester, United Kingdom). Four distinct canal orifices were widened using Gates Glidden drills (Mani Inc., Japan).

Initial canal negotiation was done using a No.10 K-file. Disto-lingual canal showed a more lingually oriented access inclination. Instrument tip had a strong curvature on negotiation. Coronal flaring was done using Protaper SX file (Dentsply Malfifer, Switzerland). Electronic working length was determined using an apex locator (Dentaport ZX, J.Morita).

Working length radiograph was taken for confirmation. Glide path was established and the canals were prepared in a crowdown fashion using hand Protaper, as recommended by the manufacturer. During preparation, 17% EDTA (Glyde, Dentsply) was used as a lubricant and the root canals were disinfected with a sodium hypochlorite solution (3%). Cone fit was done using Protaper guttapercha corresponding to F3. Radiographic confirmation of the cone fit was done and obturation was completed using AH-plus sealer (Fig:2) (De Trey Dentsply, Konstanz, Germany). Post obturation composite restoration was placed. Pain subsided within 2 days, then permanent restoration of crown was done. Follow up done after 3 & 6 months (Fig:3)



Fig:1 pre operative radiograph



Fig:2 obturation done



Fig:3 Post obturation radiograph after 6 months

Discussion

The internal anatomical configurations have infinite variations. The root canal anatomy of each tooth has certain common characteristics as well as numerous atypical ones that can be road maps to successful endodontics. The radix entomolaris is one such anatomical variation. The RE is located distolingually, with its coronal 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. An RE can be found on the first, second and third mandibular molar, occurring least frequently on the second molar. [12] Some studies report a bilateral occurrence of the RE from 50 to 67%. [13,14]

In most of the cases the pulpal extension is radiographically visible. In general, the RE is smaller than the distobuccal and mesial roots and can be separate from, or partially fused with, the other roots. A classification by Carlsen and Alexandersen.[10] describes four different types of RE according to the location of the cervical part of the RE: types A, B, C and AC. Types A and B refer to a distally located cervical part of the RE with two normal and one normal distal root components, respectively. Type C refers to a mesially located cervical part, while type AC refers to a central location, between the distal and mesial root components.

The presence of radix entomolaris has clinical implications in endodontic treatment. An accurate diagnosis of these supernumerary roots can avoid complications or a 'missed canal' during root canal treatment. Thorough Clinical inspection of the crown, Cervical Crown morphology and Radiographic analysis can predict the presence of such variations. A second radiograph should be taken from a more mesial or distal angle (30 degrees). This way an accurate diagnosis can be made in the majority of cases.

Conservative access opening can often lead to missed canals in such cases. Use of proper visual aids such as loupes and dental operating microscope would help in proper location of these canals. Care should be taken not to remove an excessive amount of dentin on the lingual side of the cavity and orifice of the radix entomolaris to avoid perforations.

Therefore, after relocation and enlargement of the orifice of the RE, initial root canal exploration with small files (size 10 or less) together with radiographical root canal length and curvature determination, and the creation of a glide path before preparation, are step-by-step actions that should be taken to avoid procedural errors.

Conclusion

In the case of an RE the conventional triangular opening cavity must be modified to a trapezoidal form in order to better locate and access the distolingually located orifice of the additional root. Patience and perseverance also play an important role in deciding the success of endodontic treatment

References

1. Barker BC, Parson KC, Mills PR. Anatomy of root canals. III. Permanent mandibular molars. Aust Dent J. 1974;19.
2. Vertucci FJ.. Root canal anatomy of the human permanent teeth. Oral Surg Oral Med Oral Pathol. 1984; 58.
3. Thoden Van Velzen SK, Wesselink PR, De Cleen MJH. Endodontologie. 2nd ed. Bohn Stafleu Van Loghum, Houtem/Diegem. 1995.
4. Fabra-Campos H. Unusual root anatomy of mandibular first molars. J Endod. 1985;11.
5. Fabra-Campos H. Three canals in the mesial root of mandibular first permanent molars: a clinical study. Int Endod J. 1989;22.
6. Bond JL. Clinical management of middle mesial root canals in mandibular molars. J Endod. 1988;14.
7. Stroner WF. Mandibular first molar with three distal canals. Oral Surg. 1984;57.
8. Carabelli G. Systematisches Handbuch der Zahnheilkunde. 2nd ed. Vienna: Braumuller und Seidel. 1844.
9. Bolk L. Bemerkungen über Wurzelvariationen am menschlichen unteren Molaren. Zeiting fur Morphologie und Anthropologie. 1915;17.
10. Carlsen O, Alexandersen V. Radix entomolaris: identification and morphology. Scan J Dent Res 1990;98.
11. Carlsen O, Alexandersen V. Radix paramolaris in permanent mandibular molars: identification and morphology.. Scan J Dent Res. 1991;99.
12. Visser JB.. Beitrag zur Kenntnis der menschlichen Zahnwurzelformen.. Hilversum:Rotting. 1948.
13. Steelman R. Incidence of an accessory distal root on mandibular first permanent molars in Hispanic children.. J Dent Child. 1986;53.
14. Yew SC, Chan K.. A retrospective study of endodontically treated mandibular first molars in a Chinese population. J Endod 1993;19.

