



MANAGEMENT OF RADIX ENTOMOLARIS : A REPORT OF 3 CASES

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ABSTRACT Presence of Radix entomolaris in mandibular molars greatly affect the treatment protocol and outcome. The anomalous morphology of a three-rooted mandibular first molar occurs infrequently but cannot be ignored. The prevalence of RE is reported to differ significantly with races and ranges from 0.33-1%. Achieving the endodontic success in the presence of an RE requires knowledge about its prevalence, diagnosis, morphology, canal configuration, and clinical approach.

KEYWORDS : radix entomolaris, anatomical variation, distolingual root

INTRODUCTION

A successful endodontic treatment includes locating the root canal orifice, chemomechanical cleaning and shaping of the root canals before the final root canal filling. Complete knowledge of anatomic variation of macrostructure and internal and external root canal anatomy is very important for the clinician¹. It is known that the mandibular first molar can display several anatomical variations². Carabelli³ in 1844 first mentioned a major anatomical variant of the two rooted mandibular first molar that was present distolingually. The tooth with a third root present distolingually to the distal root is named as the Radix Entomolaris (RE)⁴ and if present mesiobuccally to the mesial root is named as radix paramolaris⁵. The latter is even a rarer entity described by Bolk⁴. Radix entomolaris can be found in the first, second, and third mandibular molars, occurring the least frequently in the second molar⁶. It has been described by various names in literature such as "extra third root" or "distolingual root" or "extra distolingual root"⁷.

The prevalence of RE is reported to differ significantly with races and ranges from 0.33-1%. The prevalence of RE is said to be highest among the population of Mongolian⁸ (5 to more than 30%) origin such as Chinese(32%), Taiwanese(25.6%), and Koreans(24.5%) which considered to be an eumorphic root morphology among them. Radix entomolaris is not very common in African, Eurasian, Caucasian and Indian population (2.19-13.3%) and it is said to be a dysmorphic root morphology in them.

This case report presents the endodontic management of radix entomolaris in 3 cases.

Case Report 1

A 15 year old female reported to the department of pedodontics and preventive dentistry with a chief complaint of pain in right lower back tooth region since three days. Pain was of intermittent type, aggravated on taking hot foods and persists even after the removal of stimulus. Tooth was not mobile and EPT gave premature response. On intraoral examination grossly carious tooth w.r.t 46. A diagnostic radiograph revealed the presence of deep caries with pulpal involvement(fig 1). Radiograph has been taken with SLOB technique. Root canal treatment in 46 was initiated under rubber dam, following local anesthesia(2% Lidocaine with 100000 epinephrine) and access preparation was done with an endo access bur no.1 (Dentsply Switzerland). The distal canal orifice was located on the buccally side. Access cavity preparation was extended distolingually to locate orifice of RE. Close inspection revealed presence of two mesial and two distal orifices. Canal orifices were located with DG 16 endodontic explorer (Hu-Friedy, Chicago, IL, USA). The pulpal tissue remnants were extirpated from the canals using K file no.10 & no.15 (Dentsply Maillefer, Switzerland). Working length was determined using an apex locator (Root ZX, Morita, Tokyo, Japan) and radiovisiography (fig-2). All the canals of 46 were cleaned and shaped using rotary NickleTitanium Protaper files (Dentsply Maillefer, Switzerland) in a crown down manner at 300 rpm and 2,4N/cm of torque by using a speed-controlled motor (X-Smart; Dentsply Tulsa Dental, Tulsa, OK) till a size of F2 and irrigated using normal saline along with 5.25% sodium hypochlorite (Deor, Azure laboratories, Kochi, India) and 17% EDTA gel (Glyde, Dentsply). Master cone radiograph revealed proper fitting of cones (fig-3). The canals were dried using paper points and obturated with F2 ProTaper gutta percha and Sealapex(Kerr, Sybron, USA)

(fig-4). The access cavity was restored with glass ionomer cement and a micro-hybrid composite. Patient was kept on follow up.

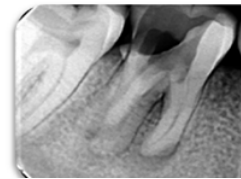


Figure 1 pre Operative



Figure 2 Working Length

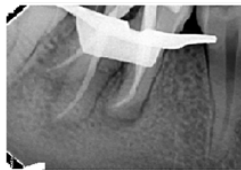


Figure 3 Master Cone

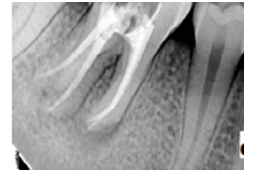


Figure 4 Post Operative

Case 2

A similar 10-year-old female patient reported with dull aching pain while chewing food on mandibular left first molar (tooth 36). The tooth had deep disto-lingual carious lesion and was moderately sensitive to percussion. Radiographic examination of tooth 36 revealed the pulpal extent of the caries along with small indistinct periapical radiolucency around the mesial root and distal root. It also showed a double distal root outline indicating the presence of an RE (fig-5). After achieving adequate anesthesia, access opening was made. Examination of the floor of the pulp chamber showed three canal orifices. However, due to the radiographic findings, further modification of the access opening was carried out. Exploration of the pulp chamber floor using an endodontic explorer revealed an extra canal orifice situated distolingually and confirmed the presence of RE. The endodontic procedure was carried out similar to case 1. Following canal negotiation, working length was determined (fig-6) and canals were cleaned and shaped in a crown-down manner using rotary Ni-Ti files and 5.25% sodium hypochlorite and 17% EDTA solutions as irrigants during instrumentation. Subsequently, canals were obturated with gutta-percha point master cones and Sealapex (fig-7). Access cavity was restored with GIC and microhybrid composite. Patient was kept under follow up.



Figure 5 pre operative

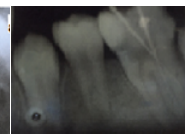


Figure 6 working length

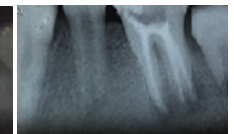


Figure 7 post operative

Case 3

A 16-year-old male was presented with excruciating pain in a mandibular left first molar (tooth 36). Clinical examination of the tooth showed the presence of deep caries. Radiographic examination of tooth 36, revealed an extra root (fig-8). Root canal treatment was initiated under local anesthesia and rubber dam isolation. Access opening modification and inspection of the pulp chamber revealed two additional orifice – middle mesial and disto-lingual apart from the

three regular orifices, two mesial and one distal. Working length was determined (fig-9) and endodontic procedure was carried out further. Canals cleaning and shaping were carried out using rotary Ni-Ti files and crown-down method. A total of Sodium hypochlorite (5.25%) and 17% EDTA solutions were used for canal irrigation. Then, gutta-percha point master cones were selected and obturation was done using Sealapex (fig-10). Access cavity was restored with GIC and microhybrid composite. Patient was kept under follow up.



Figure 8 pre operative

Figure 9 working length

Figure 10 post operative

DISCUSSION

Knowledge of tooth and root canal anatomy is important for dentist to identifying variations in the root canal configurations that can impose problems during endodontic treatment. Presence of Radix entomolaris in mandibular molars greatly affect the treatment protocol and outcome. Periapical radiographs or Radiovisioigraphy (RVG) at three different angles i.e. 20 degree mesial, straight and 20 degree distal are used to assess the presence of RE. Cone beam Computed tomography which is the recent advances in technology is used now a days to eliminate the presence of RE. However, in the present study due to added radiation and cost, periapical radiography or RVG was preferred.

The anomalous morphology of a three-rooted mandibular first molar occurs infrequently but cannot be ignored. Verma et al⁹ evaluated the prevalence of Radix entomolaris in mandibular first molar in Himachal Pradesh to be 9.23%.

Preparation of access cavity needs to be larger to identify the orifice of third root since such tooth do not follow law of symmetry and the canal is found far more lingually. Hence, the conventional triangular cavity should be modified to a trapezoidal form to locate the orifice of the additional root.

According to Weine¹⁰ majority of the extra roots found were curved (in some cases an additional curve may start from the mid root portion or in the apical third). The finding is very important to forewarn the operator to shape this type of curved canal carefully without increased risk of separation of the NiTi rotary instruments used. The use of the zone technique, in which the first step is to determine if there is a curvature of any significance and how far the curvature is from the apex, is recommended to avoid errors during the procedure¹¹.

With proper treatment, the prognosis for these teeth should be considered the same as that of any other mandibular molar¹².

CONCLUSION

Correct interpretation of the preoperative radiographs and careful clinical inspection of the pulp chamber floor may reveal the presence of a third root. Hence, a clinician must be aware of such existence.

REFERENCES

1. Shailendra Gupta, Deepak Raisingani, Rishidev Yadav The Radix Entomolaris and Paramolaris: A Case Report *J. Int Oral Health* 2011
2. Calberson FL, De Moor RJ, Deroose CA. The radix entomolaris and paramolaris: Clinical Approach in Endodontics. *J Endod.* 2007 Jan;33(1):58–63. Epub 2006 Jul 26.
3. Carabelli G. Systematisches Handbuch der Zahnheilkunde. 2 nd ed. Vol. 114. Vienna: Braumuller and Seidel; 1844.
4. Bolk L. Bemerkungen über Wurzelvariationen am menschlichen unteren Molaren. *Zeitung für Morphologie und Anthropologie.* 1915;17:605–10.
5. Calberson FL, De Moor RJ, Deroose CA. The radix entomolaris and paramolaris: clinical approach in endodo Anatomic variations of lower first permanent molar roots in endodontics. *J Endod.* 2007 Jan;33(1):58–63.
6. Segura-Egea JJ, Jimenez-Pinzon A, Rios-Santos JV. Endodontic therapy in a 3-rooted mandibular first molar: Importance of a thorough radiographical examination. *J Can Dent Assoc* 2002;68:541-4.
7. De Moor RJ, Deroose CA, Calberson FL. The radix entomolaris in mandibular first molars: An endodontic challenge. *Int Endod J* 2004;37:789-99.
8. Curzon M. E., Curzon J. A. Three-rooted mandibular molars in the Keewatin Eskimo. *Journal of the Canadian Dental Association.* 1971;37(2):71–72.
9. Verma et al., *JAMMR*, 27(5): 1-6, 2018; Article no. *JAMMR*. 42955
10. Weine FS. Access cavity preparation and initiating treatment. In: *Endodontic therapy.* 4th edition Saint Louis (MO): C.V. 1989:245-251.
11. McSpadden JT, Bonaccorso A, Tocchio C, Rapisarda E, Tripi TR. The zone technique. *ENDO (Lond Engl)* 2008;1:33-41
12. De Moor RJ, Deroose CA, Calberson FL. The radix entomolaris in mandibular first molars: an endodontic challenge. *Int Endod J* 2004;37:789-799.