

Radix Entomolaris: An Obscure Dilacerated Three Legged Molar – A Case Report

¹Dr. Shikha Sharma, PG Student, Department Of Conservative Dentistry and Endodontics, Triveni Institute of Dental Sciences Hospital and Research Center, Bilaspur, Chattisgarh, India

²Dr. Kiran. S, Professor, Department of Conservative Dentistry and Endodontics, Triveni Institute of Dental Sciences Hospital and Research Center, Bilaspur, Chattisgarh, India

Citation of this Article: Dr. Shikha Sharma, Dr. Kiran. S, “Radix Entomolaris: An Obscure Dilacerated Three Legged Molar – A Case Report”, IJDSR – March - 2021, Vol. – 3, Issue - 2, P. No. 01-06.

Copyright: © 2021, Dr. Shikha Sharma, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Corresponding Author: Dr. Shikha Sharma, PG Student, Department Of Conservative Dentistry and Endodontics, Triveni Institute of Dental Sciences Hospital and Research Center, Bilaspur, Chattisgarh, India

Type of Publication: A Case Report

Conflicts of Interest: Nil

Abstract

A thorough knowledge of root canal anatomy and its variations is very important for successful endodontic therapy. At times the clinicians are challenged with variations in morphology of root canal, one of such variations is observed in mandibular first molar. Mandibular first molar show most of the anatomical variations not only in the number of canals but also in the presence of number of roots and their morphology. The presence of additional root either lingually or buccally in addition to two roots is one of the complex morphological variations. 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 case report discusses the endodontic treatment of mandibular first molar with a dilacerated radix entomolaris (RE) which is a rare macrostructure. A diagnosis and appropriate

clinical endodontic skill application can favorably change the prognosis of mandibular molars with such type of root morphology.

Keywords

Radix entomolaris, Dilaceration, Mandibular molar.

Introduction

Successful outcome of root canal treatment is determined by the awareness, knowledge, and thorough cleaning and shaping of all the root canals before the root canal filling. Like the number of root canals, the number of roots may also vary.^[1] It is well known that both primary and permanent mandibular first molars usually have two roots, one mesial and distal and rarely an additional third root (supernumerary root), when it is located distolingually to the main distal root is called “radix entomolaris (RE)” and when it is placed

mesiobuccally to the mesial root is called “radix paramolaris (RP).^[2]

The additional third root in mandibular first molars was first mentioned in the literature by Carabelli in 1844^[3] and is described by various terms, such as “extra third root” or “distolingual root” or “extra distolingual root” or “Radix entomolaris”. The presence of a RE or a RP has clinical implications in endodontic treatment. Clinicians should take into consideration the presence of such anatomical variations, because an inaccurate diagnosis of these supernumerary roots may lead to complications or a missed canal during root canal therapy.

Concerning the RE, there are some existing traits of tooth crown and cervical morphology that may indicate the presence of an additional root during clinical inspection. These traits include the presence of a prominent occlusal, distal or disto-lingual lobe, in combination with a cervical prominence or convexity.^[4] The diagnosis and management of RE are of paramount importance from the point of endodontic success. This case report further emphasizes the rare occurrence and successful management of dilacerated radix entomolaris in mandibular first molar and that one should attempt to see the unseen.^[5]

Case Report

A 22-year-old male patient reported to the Department of Conservative Dentistry and Endodontics

region for 1 months. The patient revealed a history of mild intermittent pain for the past 1 month, which had increased in intensity during the past 1 week. The patient reported prolonged sensitivity to hot and cold substances. The pain was spontaneous and aggravated particularly at night.

Clinical examination revealed deep occlusal carious lesions on mandibular first molar. The tooth 46 was tender to vertical percussion. The preoperative radiograph revealed radiolucency of carious lesion involving the pulp with respect to 46. Based on the clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis with respect to 46 was made, informed consent was obtained, and endodontic treatment was initiated.

The teeth were anesthetized using local anesthesia (2% lignocaine with 1:100,000 epinephrine). Rubber dam isolation was done, caries excavated and access cavity was prepared in tooth 36. On inspection with a DG-16 endodontic explorer initially, the pulp chamber floor revealed three canals – mesiobuccal, mesiolingual, and the distal. A search for the second distal canal was made by further exploration of the pulpal floor with a DG-16 endodontic explorer. A catch disto lingually unveiled the second distal orifice, and the access cavity was modified from a triangular form to a trapezoidal shape to include the distolingual canal (Figure no. 1)



Fig No 1: Access cavity preparation

Working length was determined with 15 No. K files and was verified using periapical radiograph. The working length radiograph (Figure no. 2) taken with

different horizontal angulations revealed the presence of a third root located distolingually which had a sharp bend in the apical third.

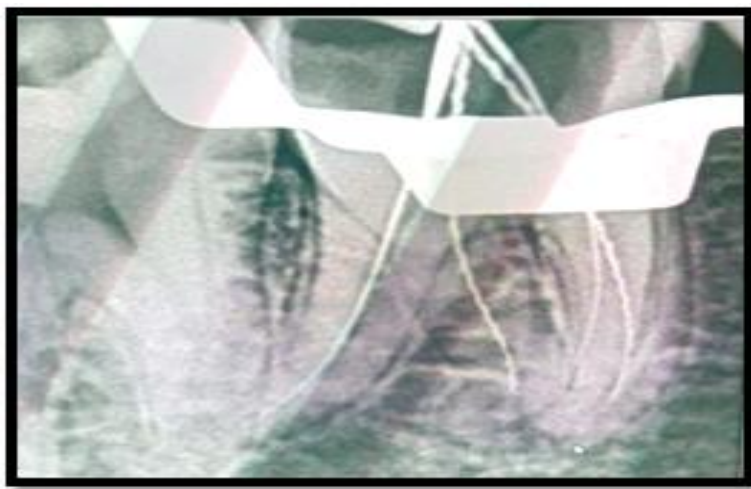


Fig No 2: Working length determination irt 46

Chemomechanical preparation was completed in all the canals initially with hand NiTi files #15,#20,#25 followed by Protaper Next (Dentsply Maillefer, Switzerland) till X2 in a torque – controlled cordless endodontic engine (Canal Pro CL2, Coltene ENDO, Coltene Whaledent, Germany) using the crown down technique. Copious irrigation of the root canal was intermittently done during instrumentation with 3%

sodium hypochlorite, Normal saline(Infutech Healthcare limited, Navalakha crossing, Indore, Madhya Pradesh) using 17% EDTA (Prime Dental Products Pvt Ltd, Thane, Maharashtra, India) as lubricant. Calcium hydroxide intracanal medicament was placed followed by temporization with Cavit G. The patient was recalled after 1 week.



Fig No 3: Master cone radiograph irt 46

The patient reported after 1 week and was totally asymptomatic. The temporary filling was

removed; canals were irrigated and finally flushed with 2 % chlorhexidine (Neelkanth Health Care (P) Ltd,

Jodhpur, Rajasthan, India), and sterile saline thereafter dried with paper points (Dia Dent Group International, Burnaby, Canada). The corresponding gutta-percha points were placed, and a final radiograph was taken to establish the quality of the obturation (Figure no:4).



Fig No 4: Post obturation radiograph

Discussion

The presence of RE or a radix paramolaris has clinical implications in Endodontics, and an accurate diagnosis of these supernumerary roots can avoid complications or a “missed canal” during root canal treatment. Because RE is mostly situated in the same buccolingual plane as the distobuccal root, a superimposition of both roots can appear on the preoperative radiograph, resulting in an inaccurate diagnosis. A thorough inspection of the preoperative radiograph and interpretation of particular marks or characteristics, such as an unclear view or outline of the distal root contour or the root canal, can indicate the presence of a “hidden” RE.

To reveal the RE, a second radiograph should be taken from a more mesial or distal angle (30°). The location of the orifice of the root canal of an RE also has implications for the opening cavity. The orifice of the

Root canal filling was thereafter completed, and the postendodontic permanent restoration was performed with metal modified glass ionomer restoration (Miracle Mix). Patient was recalled after a week for tooth preparation for full coverage crown.

RE is located distolingually to mesiolingually from the main canal or canals in the distal root. An extension of the triangular opening cavity to the distolingual results in a more rectangular or trapezoidal outline form. This way an accurate diagnosis can be made in the majority of cases. [4, 6-9]

Endodontic literatures on RE in permanent mandibular first molars reveals its incidence prevalence among the Mongolian and Eskimo traits and its incidence among the Indian population is found to be very low. [10]

The etiology behind the formation of the RE is still unclear. In dysmorphic, supernumerary roots, its formation could be related to external factors during odontogenesis, or to penetrance of an atavistic gene or polygenetic system (atavism is the reappearance of a trait after several generations of absence). In eumorphic roots, racial genetic factors influence the more profound

expression of a particular gene that results in the more pronounced phenotypic manifestation (19, 23). Curzon suggested that the 'three-rooted molar' trait has a high degree of genetic penetrance as its dominance was reflected in the fact that the prevalence of the trait was similar in both pure Eskimo and Eskimo/ Caucasian mixes.^[11]

An RE can be found on the first, second and third mandibular molar, occurring least frequently on the second molar (25). Some studies report a bilateral occurrence of the RE from 50 to 67%.^[11, 12]

This report aims to present the root canal treatment of a three-rooted mandibular third molar with a dilacerated distal root. Dilaceration is commonly defined as a deviation or bend of 90-degree angle or greater along the axis of the tooth or root.^[13] Mechanical trauma, effects of related anatomical structures and idiopathic developmental disturbances are possible etiological factors for root dilacerations. The occasion of this developmental anomaly ranges between 3.3 to 30.92% and can occur anywhere along the length of the root from the coronal third to the root apex.^[13,14]

Classification^[9, 15, 16]

De Moor et al. (2004) classified RE based on the curvature of the root or root canal:

- 1. Type 1:** A straight root or root canal
- 2. Type 2:** A curved coronal third which becomes straighter in the middle and apical third
- 3. Type 3:** An initial curve in the coronal third with a second buccally oriented curve which begins in the middle or apical third.

In apical two third of RE a moderate to severe mesially or distally oriented inclination can be present. Based on the curvature of the separate RE variants in

buccolingual orientation De Moor et al. (Ribeiro & Consolaro) classified:

Type I: refers to a straight root/root canal

Type II: refers to an initially curved entrance which continues as a straight root/root canal

Type III: refers to an initial curve in the coronal third of root canal and a second curve beginning in the middle and continuing to the apical third.

In the present case report, the location and identification of the canal orifices were done by conventional methods using the DG-16 endodontic explorer, knowledge of the roots, and root canal anatomy along with that of the conventional periapical radiographs to determine the canal configuration. The RE in the case was found to be with straight root with sharp curvature in apical third of the root canal classified to be De Moors Classification Type III which was managed successfully.

Conclusion

The clinician should be wide aware of such uncommon anatomy in the mandibular first molars and must diagnose it before the start of the endodontic treatment, so as to avoid mislocation of any canal and future problems.. Thorough knowledge and careful examination of the floor of the pulp chamber to determine the root canal anatomy, in clinical conditions, are essential parts of successful management of anatomical variations in endodontic treatment. Extra aids such as operating microscope, CBCT, and radiographs of different angulations may help in achieving the above.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be

reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Acknowledgment

I would like to thank Dr. Srikumar G.P.V, HOD, Department of Conservative dentistry and Endodontics, Dr. Kiran.S, PG Guide, Professor Department of Conservative dentistry and Endodontics and for guiding me throughout in management of this case with this new treatment modality.

References

1. **Souza-Flamini LE, Leoni GB, Chaves JF et al.** The radix entomolaris and paramolaris: A micro-computed tomographic study of 3-rooted mandibular first molars. J Endod 2014; 40:1616-21.
2. **Sudha K, Ashok Chaganti, Laxmana Rao Ch et al.** Radix Entomolaris And Paramolaris: A Review. Annals And Essences Of Dentistry.: Jan- Mar 2017 Vol. IX Issue 1.
3. **Carabelli G.** "Systematisches Handbuch der Zahnheilkunde". 2nd ed. Vienna: Braumuller und Seidel, (1844): 114.
4. **Calberson F, De Moor R, Deroose C.** The radix entomolaris and paramolaris: Clinical approach in Endodontics. J Endod, 2007; 33:58-63.
5. **Kohli T, Gupta A, Kawatra AS, Abraham D.** Endodontic management of radix entomolaris in a mandibular third molar. Endodontology 2019; 31:179-82.
6. **Attam K, Nawal RR, Utneja S, Talwar S.** Radix entomolaris in mandibular first molars in Indian population: A review and case report. Case Rep Dent 2012;2012:595494.
7. **Hasjem AA, Ahmed HM.** Endodontic management of a mandibular first molar with unusual canal morphology. Eur Endod J 2017;2:5.
8. **Fava LR, Weinfeld I, Fabri FP, Pais CR.** Four second molars with single roots and single canals in the same patient. Int Endod J 2000;33:138-42.
9. **Sarangi P, Uppin VM.** Mandibular first molar with a radix entomolaris: An endodontic dilemma. J Dent (Tehran) 2014;11:118-22.
10. **Pai V, Singh V, Vaitheeswaran MB, Thapa A, Kundabala M.** Radix entomolaris: A case report. J Nepal Dent Assoc. 2010;11(2):162-165.
11. **Curzon ME.** Miscegenation and the prevalence of three-rooted mandibular first molars in the Baffin Eskimo. Community Dent Oral Epidemiol 1974; 2:130 –1.
12. **Yew SC, Chan K.** A retrospective study of endodontically treated mandibular first molars in a Chinese population. J Endod 1993;19:471–3.
13. **Jafarzadeh H, Abbott PV.** Dilaceration: review of an endodontic challenge. J Endod 2007;33:1025-30.
14. **Malcic A, Jukic S, Brzovic V, Miletic I, Pelivan I, Anic I.** Prevalence of root dilaceration in adult dental patients in Croatia. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006; 102:104-9.
15. **Parashar A, Gupta S, Zingade A, Parashar S.** The radix entomolaris and paramolaris: A review and case reports with clinical implications. J Interdiscip Med Dent Sci 2015;3:1-5.
16. **Mukhaimer R, Azizi Z.** Incidence of radix entomolaris in mandibular first molars in Palestinian population: A Clinical investigation. Int Sch Res Notices 2014;2014: 405601.