

Management of Mandibular First Molar with three roots and five canals - Radix Entomolaris

Dr. Pradnya V Bansode, Dr. Vidya M. Patil

Dept of Conservative Dentistry and Endodontics, Govt Dental College and Hospita, Aurangabad, Maharashtra

Corresponding Author: Dr. Vidya M. Patil, Dept of Conservative Dentistry and Endodontics, Govt Dental College and Hospital, Aurangabad, Maharashtra**Type of Publication:** Case Report**Conflicts of Interest:** Nil**Abstract**

As we know a successful endodontic treatment requires a thorough knowledge of internal and external tooth morphology, correct interpretation of radiographs, and adequate access to and exploration of the tooth's interior. This case report presents the endodontic therapy of rare case of Radix Entomolaris in mandibular first molar with three roots(mesial, distal and distolingual) and five canals namely mesiobuccal, mesiolingual, distobuccal, first and second distolingual.

Introduction

A thorough mechanical and chemical cleansing of the entire pulp cavity and its complete 3-dimensional obturation with an inert filling material are the main objectives of endodontic therapy is the [1]. Ingle lists the most frequent cause of endodontic failure as apical percolation and subsequent diffusion stasis into the canal. The main reasons for this failure are incomplete canal obturation, an untreated canal and inadvertent removal of a silver cone. If a dentist fails to recognize the presence of canal, it is often left untreated. The clinician must have a detailed knowledge of root canal morphology before he or she can perform the successful endodontic therapy of a tooth. [2] If clinician fails to remove all the pulp tissue and microorganisms from the root canal system, it may lead to failure of endodontic treatment. [3] Being the first

posterior tooth that erupts, mandibular first molar is the tooth that most often requires root canal treatment. This tooth usually has two roots, but, occasionally, it has three, with two or three canals in the mesial root and one, two, or three canals in the distal root. Radix Entomolaris is a supernumerary root located distolingually in mandibular molar. 2/3 rd of Chinese and 4% of mandibular molar of Kuwaiti population had this occurrence. [Cohen]

This is the rare case report of management of mandibular right first molar with 5 canals; two in one Mesial root ;three canals in two distal roots (Distobuccal and Distolingual root)

Case Report

A 22 years old female reported to Dept. of Conservative Dentistry and Endodontics, Govt. Dental College & Hospital Aurangabad, with chief complaint of pain in lower right back teeth region since 6 months. Patient gave history of intermittent dull lingering pain which subsided on taking medication.

Clinical examination revealed deep occlusal caries with mandibular right first molar.

Tooth was tender on percussion. On Intraoral Periapical radiograph it was noted that tooth has deep occlusal caries involving pulp and also an additional distal root. Diagnosis was made as Chronic Irreversible Pulpitis with

symptomatic apical periododontitis and endodontic treatment was planned.

- After administration of local anesthesia the tooth was isolated with a rubber dam. Access cavity was prepared and four canals were located i.e. mesiobuccal, mesiolingual, distobuccal and first distolingual canal.
- After locating two distal canals i.e. distobuccal and first distolingual slightly off-center buccally , Access cavaity was modified in trapezoidal Shape and Fifth canal i.e. second distolingual canal was identified and located i.e mesiobuccal, mesiolingual, distobuccal, middle distal and distolingual canal.
- The presence of all the orifices was confirmed using an endodontic explorer (DG16, Dentsply, Gloucester, United Kingdom). The patency of the canals was established with a No.10 K-File (Dentsply Maillefer).
- Working length was determined by apex locator (Root ZX Mini , Morita, Tokyo, Japan) and confirmed by working length IOPA radiograph.



Figure 1: Preoperative IOPA radiograph



Figure 2 :Working length IOPA radiograph

- All canals were instrumented to size #F1 PROTAPER GOLD (DENSPLY, Maillefer) and during

instrumentation it was noted that the distobuccal canal communicated with the first distolingual canal..

- Irrigation was carried out frequently with 5.25% sodium hypochlorite. Canals were dried with sterile paper points and temporized with cotton pellets sealed with IRM.
- At the subsequent appointment, all canals were irrigated, recapitulated with the final instruments, dried, and mastercone IOPA radiograph was taken.
- Canals were obturated by lateral condensation of gutta percha with Resin sealer after verification of master cone length.
- A post obturation angled IOPA radiograph was taken. Then tooth is restored and referred for full crown.



Figure 3 : Mastercone IOPA radiograph



Figure 4 : Postobturation IOPA radiograph

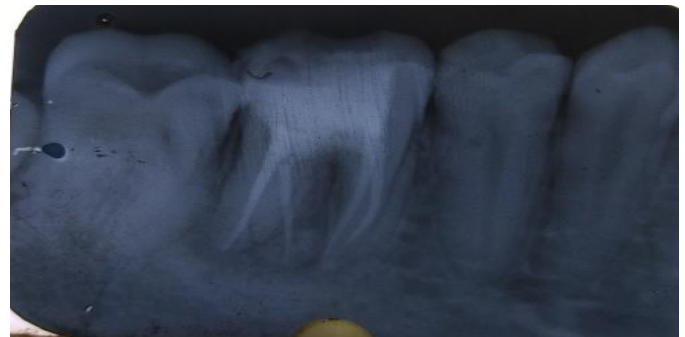


Figure 5: Post RC Restoration IOPA

Discussion

Failure to find and fill all the canals present in tooth has been demonstrated to be a causative factor in the failure of endodontic therapy. It is of utmost importance that all canals be located and treated during the course of nonsurgical endodontic therapy. Although these cases are rare, these canal systems do exist so that the dentist should perform thorough examination of the pulp chamber floor even after the expected number of canals.[1]

First molars in the majority of Caucasian are two-rooted with two mesial and one distal canal (Barker et al. 1974, Vertucci 1984). Carabelli (1844) reported for first time the major variant in this tooth type is the presence of an additional third root; a supernumerary root which can be found lingually.[4], is called radix entomolaris (RE)[5]

Its frequency in European populations has been reported of 3.4–4.2%. In Eurasian and Indian populations the frequency is less than 5%. The incidence in the Indian population alone is very low, at only 0.2%.

De Moor *et al* in 2004 [4], on the other hand, categorized REs into only 3 types: type I, with a straight root/root canal; type II, with an initially curved entrance which continues as a straight root/root canal; and type III, with an initial curve in the coronal third of the root canal and a second curve beginning in the middle and continuing to the apical third. On the other hand Carlsen and Alexandersen 1990 [6,7] categorized REs into 4 types according to the location of the cervical portion: A, B, C, and AC.

In types A and B, the cervical portion is located distally, and there are 2 and 1 normal distal root components, respectively; in type C, the cervical portion is located mesially, while in type AC it is located centrally, between the distal and mesial root components.

Most of the first molars of the Caucasian population exhibit two canals: one mesial and one distal; the mesial

root has two canals either ending into two different apical foramina or united at the root ending, resulting in a single foramen. The distal root generally shows a large kidney-shaped root canal; however, if the orifice is narrow and round, a second distal canal may be present. The anatomical variations have been described in the mandibular first molar: The presence of three mesial canals and three distal canals was reported by Fabra-Campos and Stroner respectively. [8]

In radix entomolaris this supernumerary root is located in distolingual position, mainly in the mandibular first molars. When located in the mesiobuccal surface, the anomaly is called radix paramolaris. Carlsen and Alexandersen described the identification and external morphology of this anomaly containing a supernumerary lingual or buccal root [7].

In the present case the access cavity was modified from triangular to trapezoidal shape in order to find the extracanal. De Moor *et al* suggested some key learning points in his article like

- Clinicians should be aware of this unusual root morphology in mandibular first molars in Caucasian people.
- To identify this additional root radiographs exposed at two different horizontal angles are needed.
- Modification of access cavity should be done in a distolingual direction in order to visualize and treat the RE, this results in a trapezoidal access cavity.

Conclusion

1. In reaching conclusions when diagnosing and treating endodontic case, dentist should be aware of the potential for unusual root morphologies in the mandibular first molars.
2. The correct use of diagnostic aids as angled radiographs, operating microscope and the modification of the access cavity are also of

fundamental importance for the location of the root canal orifice present in such cases.

3. Whenever suspected modification of access cavity should be done in order to find extra roots and canals.

References

1. Frank J. Vertucci, D.iU.D.,* Gainesville, Fla. Root canal anatomy of the human permanent teeth Oral Surg. November, 1984
2. Ingle JJ: Endodontics, ed. 2, Philadelphia, 1965, Lea & Febiger, p. 43.
3. Orofacial dental pain emergencies: endodontic diagnoses and management. In: Cohen S, Burns RC, eds. Pathways of the Pulp, 8th edn. Boston, MA, USA: Mosby, pp. 31–75.
4. De Moor RJG, Deroose CAJG, Calberson FLG. The radix entomolaris in mandibular first molars: an endodontic challenge. International Endodontic Journal, 37, 789–799, 2004.
5. Carabelli G. Systematisches Handbuch der Zahnheilkunde. 2. ed. Viena: Braumuller und Seidel; 1844. p. 114.
6. Sinha DJ et al), Radix Entomolaris: A Report of Two Cases Bull Tokyo Dent Coll (2016) 57(4): 253–258
7. Carlsen O, Alexandersen V (1990) Radix entomolaris: identification and morphology. Scan J Dent Res 98: 363–373.
8. Felipe Davini1 Radix entomolaris – A case report RSBO. 2012 Jul-Sep;9(3):340-4.