

## **ENDODONTIC MANAGEMENT OF MANDIBULAR FIRST MOLAR WITH 4 ROOTS AND 5 CANALS –A CASE REPORT**

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### **ABSTRACT**

Endodontic failures usually occur due to complex anatomy of root canals. Mandibular 1<sup>st</sup> molar is most the exposed tooth and frequently require endodontic therapy. It generally has two roots and 3 root canals i.e., one mesial root with two canals and other distal root with one distal canal. This case report describes the anatomical variation of mandibular permanent first molar diagnosed with four roots and five canals using Magnifying loupes and multiple angulated radiographs.

**Key words:**

Mandibular 1<sup>st</sup> Molar, five canals, four roots

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### **INTRODUCTION**

The mandibular first molar (MFM) is the most frequently endodontically treated tooth. The complexities and variations of the root canal system present a continuous challenge to endodontic diagnosis, treatment, and prognosis. The mandibular first molar generally has two separate roots with a round, or more frequently elliptical, canal in the distal root and two canals in the mesial root. It has shown to exhibit variations in canal number and configurations and the commonest variation is the presence of four canals in 35% cases. The distal root contains two canals, one in the buccal and the other in the lingual position. Sometimes, the "extra" canal is found in the mesial root, which therefore contains three canals. This is the middle mesial canal [MMC].<sup>[1]</sup> This case report describes a new variant of a maxillary second molar with 4 roots each with its own separate canals.

**Case History**

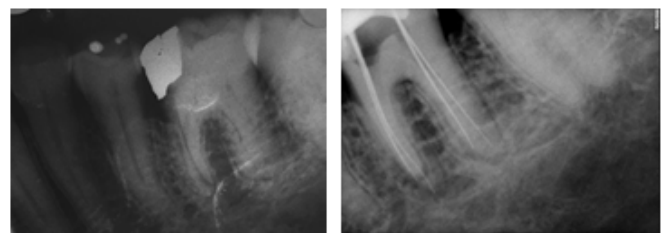
A 35-year-old male patient reported to Department of Conservative Dentistry and Endodontics, with chief complaint of pain in lower left back tooth region. History of present illness revealed episodes of pain since 2 months. Tooth was previously restored with amalgam restoration 2 years back. Clinical examination revealed class II amalgam restoration in tooth #36 with no signs of pain or tenderness on percussion. EPT showed delayed response. Radiographic examination revealed no periapical pathology, but radiographic contour of tooth revealed there might be two mesial and two distal roots.

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[Figure 1] From clinical and radiographic examination, a diagnosis of Symptomatic irreversible pulpitis was made on tooth #36. Initial radiographic x-rays showed that the tooth had additional roots.

Tooth was anesthetized using 2% lignocaine and treatment started under Rubber dam isolation. Access cavity was prepared with endo access bur (Dentsply, Switzerland). Earlier two canals in mesial- and two canals in distal root were identified. Working length was determined with the help of ISO 10 K-file and radiograph was taken. [Figure 1] Pulpal floor was explored using Magnifying loupes for additional canals and one more mesial canal was localized.



**Figure 1** pre- operative Radiograph and Working length radiograph revealing two mesial and two distal roots

A total five root canals were identified and radiograph taken. An apex locator (Canal Pro™ Apex Locator) was used to verify the working length in all five identified root canals. Root canals were instrumented with ProTaper rotary Ni-Ti instruments (Dentsply, Maillefer) using crown down technique and alternate irrigation with 5.25% sodium hypochlorite and 17% ethylene diamine tetra acetic acid (EDTA). Cleaning and shaping was done till F<sub>2</sub> in mesial canals and distal canals. After completion of the chemo-mechanical preparation, cavity

was sealed with Temporary Filling Material Cavit G (3M ESPE).

After a week, intra-canal dressing was removed with alternate instrumentation and irrigation with 5.25% sodium hypochlorite. The canal was finally rinsed with saline and EDTA. Mater cone confirmation x-ray was taken with mesial, straight and distal angulation revealing two mesial and two buccal roots. [Figure 2] The root canals were dried with paper points and obturated with sealer (Apexit, IvoclarVivadent) and respective Gutta-percha cones (Dentsply, Maillefer, Switzerland) using lateral condensation technique. [Figure 3] Temporary cement (Dental products of India) was placed and a postoperative radiograph was taken to assess the quality of obturation. One year follow-up showed patient is asymptomatic.



Figure 2 Mater cone x-ray with straight, mesial and distal angulation revealing two mesial and two buccal roots

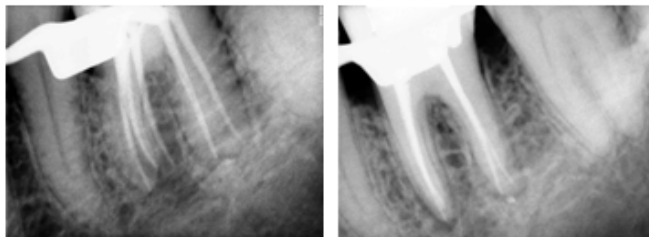


Figure 3 Post-operative radiograph

## DISCUSSION

A number of anatomical variations have been described in the mandibular first molar. William F. Stroner *et al.* [2] reported cases with three canals in the distal root and two in the mesial root. Ernest S. Reeh [3] examined molar with seven canals: 2 mesiobuccal, 2 mesiolingual and 3 distal canals. Kottoor *et al.* [4] reported the presence of three distal canals, while Ghoddsi *et al.* [5] noted the presence of four distal canals. Like the number of root canals, the number of roots may also vary. The major variant is the presence of an additional third root; a supernumerary distolingual root called radix entomolaris. Its prevalence varies in different populations ranging from 3% of the African population [6] to more than 30% of the Mongoloid population. [7] An extremely rare variation of an additional mesiobuccal root is called the radix paramolaris (RP). [8]

Morita [9] in a laboratory study examined 2,164 extracted mandibular first molars. He reported only one single four-rooted first molar, in a male patient, which formed 0.04% of the total sampled Japanese population (Mongoloid race). Friedman *et al.* [10] reported mandibular first molar with 5 root canals, 3 of which were located in 3 distal roots. Seung-Jong Lee *et al.* reported mandibular first molar with three distal roots using computer-aided rapid prototyping. However, both have reported three distal and one mesial root. The present report describes a four-rooted mandibular first molar with two mesial and two distal roots in which each of the four roots have an independent root canal.

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The authors deny any conflicts of interest related to this case.

## References

1. Arnold castellucci. Access Cavity and Endodontic Anatomy. Endodontics, 1<sup>st</sup> ed, Florence, Italy, IL Tridente; 2004; 291-2
2. Stroner WF, Remeikis NA, Carr GB. Mandibular first molar with three distal canals. *Oral Surg Oral Med Oral Pathol* 1984;57:554-7
3. Reeh ES. Seven canals in a lower first molar. *J Endod* 1998; 24:497-9.
4. Kottoor J, Sudha R and Velmurugan N "Middle distal canal of the mandibular first molar: a case report and literature review," *International Endodontic Journal*, 2010; 43:714-722.
5. Ghoddsi J, Naghavi N, Zarei M and Rohani E, "Mandibular first molar with four distal canals," *Journal of Endodontics* 2007; 33:1481-1483.
6. Sperber GH and Moreau JL, "Study of the number of roots and canals in Senegalese first permanent mandibular molars," *International Endodontic Journal* 1998; 31:117-122.
7. Walker RT and Quackenbush LE, "Three-rooted lower first permanent molars in Hong Kong Chinese," *British Dental Journal* 1985; 159: 298-299.
8. Calberson FL, De Moor RJ and Deroose CA, "The radix entomolaris and paramolaris: clinical approach in endodontics," *Journal of Endodontics* 2007; 33: 58-63.
9. Morita M, "Morphological studies on the roots of lower first molars in Japanese," *ShikaGakuho* 1990; 90:837-854(Japanese).
10. Friedman S, Moshonov J and Stabholz A, "Five root canals in a mandibular first molar," *Endodontics and Dental Traumatology* 1986; 2:226-228.

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