

Endodontic Management of Bilateral First Maxillary Molar with diverse root canal configuration-A Case Report

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INTRODUCTION

Beyond the basic perception lies an intricate and a complex root canal system. Hence, complete knowledge and thorough understanding are imperative to deliver an ideal root canal treatment.

The root canal anatomy of maxillary first molars have always been challenging, the commonest variation presence of MB2 canal (18% and 96.1%) Other variations include one, four, and five roots and unusual morphology of root canal systems within individual roots.^{1,2} This mesiobuccal canal of maxillary first molar has awakened all observations, led to a continuous research and even causes frustration more than any other root in the mouth.

Advanced diagnostic aids like CBCT and Dental operating microscope have revolutionized endodontics. CBCT over routine radiographic examination have x-ray beam limitation, rapid scan time, and effective dose reduction.

Matherne *et al*³ and Baratto Filho *et al*⁴ in a study concluded that CBCT images always resulted in identification of additional canals in evaluating the internal morphology of maxillary first molars. Gorduysus *et al*⁵ also discussed use and importance of DOM and stated it is not critical for locating ML canal.

Case: A 27yr old patient Somnath reported to the department of Conservative dentistry and Endodontics, I.T.S Dental College, Muradnagar, with a chief complaint of pain and sensitivity in upper left back tooth region.

History: Pain aggravated by thermal stimuli on mastication since 1 week and slight pain due to food accumulation on the upper right side.

Clinical examination revealed: Deep proximal caries wrt 26, 16 and 17.

Radiographic examination revealed: Radiolucency approaching pulp wrt 26,16 and 17

TREATMENT PLANNING: According to the clinical examination and radiographic evidence all were indicated for root canal treatment. As per patients's response and major chief complaint 26 was decided to treat first.

Procedure: Preoperative radiograph was taken (fig 1). A standard endodontic procedure was carried out after local anesthesia under rubber dam. Access cavity was prepared (fig 2) and pulp floor was examined with DG16 explorer revealing 3 distinct canals-MB, DB, and P canal. After complete pulp extirpation, careful troughing was done around mesiobuccal and distobuccal orifices. Exploration in the area around MB canal with C file #10, MB2 orifice was appreciated with a slight catch. The conventional triangular access was modified to a trapezoidal and using surgical operating microscope another mesiobuccal canal was located nearly (1mm) near the MB1 (fig 2 & 3). Coronal flaring was done with a nickel-titanium ProTaper orifice shaper Sx to improve the straight-line access. All canals were negotiated, and were chemo-mechanically prepared by crown-down technique using 2.5% NaOCl, 17% EDTA and saline as irrigating solution. The working length was assessed using apex locator and reconfirmed with radiographs taken at different angulations (fig 4). Prepared canals were obturated using AH-PLUS sealer (fig 5).

Before starting endodontic treatment wrt 16 (fig 6) caution was taken as same patient already exhibited diverse canal morphology. Similarly, a standard endodontic procedure was carried with modified access preparation (fig 7). Deroofing and exploration revealed two canals one mesiobuccal, one distobuccal, and two palatal. However, the radiographs did not clearly reveal the number and morphology of root canal systems. It was confirmed by CBCT imaging so as to clear the doubt of one mesiobuccal canal. The CBCT confirmed the presence of only four canals (fig 8). working length was assessed with apex locator confirmed using a radiograph (fig 9). Chemo-mechanical preparation was done using ProTaper nickel-titanium rotary instruments following crown-down technique Final obturation done with AH-PLUS sealer (fig 10).

FIGURES



Fig 1: Preoperative radiograph



Fig 2: Dental operating microscope

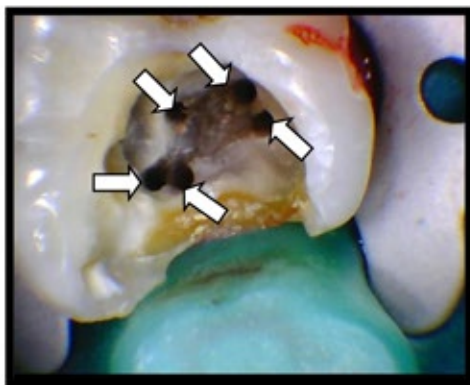


Fig 3: Access cavity

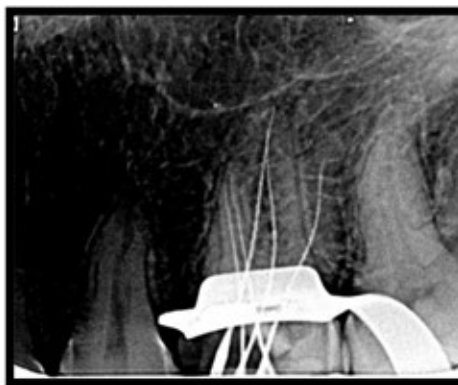


Fig 4: Working length



Fig 5: Master cones and Obturated canals



Fig 6: Preoperative radiograph

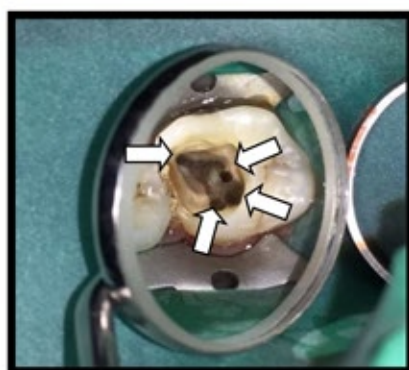


Fig 7: Access cavity



Fig 8: CBCT images: single mesiobuccal canal, one distobuccal and two palatal canals

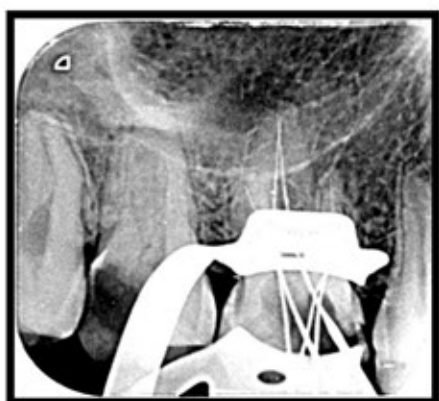


Fig 9: Working length

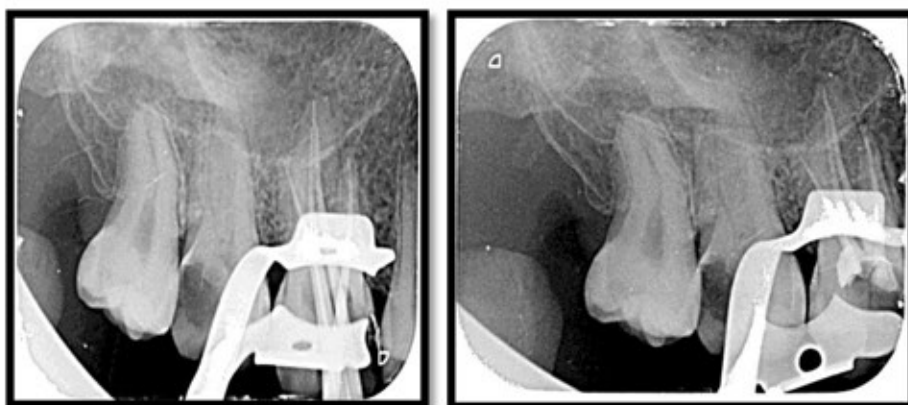


Fig 10: Master cone and Obturated canals

Conclusion

It would be quite erroneous to refer this complex system simply as the “Root Canal”- because it actually is a very complex system of finely tuned small tributaries running through the entire length and breadth of the tooth. It is crucial to be aware and admire the various complexities of the spaces we are expected to clean and fill.⁶

The present case report discusses the endodontic management of an unusual case of a maxillary first molar and highlights role of operating microscope and CBCT scanning as an objective analytic tool to ascertain root morphology. The concept of three canals in the maxillary first molar should not be considered as a rule and the clinician should be aware of the incidence of extra canals in the maxillary first molar for achieving predictable success.⁷

REFERENCES

1. Kulild JC, Peters DD. Incidence and configuration of canal systems in the mesiobuccal root of maxillary first and second molars. *J Endod* 1990 ;16: 311–317
2. Buhley LJ, Barrows MJ, BeGole EA, et al. Effect of magnification on locating the MB2 canal in maxillary molars. *J Endod* 2002 ;28:324–327.
3. Matherne RP, Angelopoulos C, Kulild JC, Tira D. Use of cone-beam computed tomography to identify root canal systems in vitro. *J Endod* 2008; 34:87–89.
4. Baratto Filho F, Zaitter S, Haragushiku GA, et al. Analysis of the internal anatomy of maxillary first molars by using different methods. *J Endod* 2009;35:337–342.

5. Gorduysus M, Gorduysus, Friedman S. Operating microscope improves negotiation of second mesiobuccal canals in maxillary molars, *J Endod* 2001; 27:683- 686.
6. Tikku AP, Pandey WB, Shukla I. Intricate internal anatomy of teeth and its clinical significance in endodontics. *Endontology* 2012;24(2):160-9.
7. Chande KP, Manwar N, Chandak M, Lokande J. Maxillary and mandibular first molar with five root canals diagnosed with cone-beam computed tomography: A review and two case reports. *J Dent Med Sci* 2013;10(5):6-11.