

Endodontic management of maxillary first molar with two palatal canals: A case report

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INTRODUCTION

A thorough knowledge of the root canal anatomy and morphology is essential for complete debridement of pulp space which in turn determines the successful healing outcome after performing nonsurgical root canal therapy. A clinician should always be able to foresee additional canal existence especially while treating maxillary first molar. Maxillary first molar should be considered a three root and four canal teeth until proven otherwise. Average number of maxillary first molars with two canals in MB root ranges from 19-95%(1)(2).

Second canal in mesiobuccal root is most common variation to be expected in first maxillary molar. Cleghorn reported a single canal and a single foramen 99% and 98.8% in palatal root respectively(3). Baratto Filho et al. reported second palatal canal prevalence in ex vivo method, cone beam computed tomography and clinical method 2.05%, 4.55% and 0.65 % respectively(4). Ability to locate, negotiate and obturate all the canals is essential for a successful endodontic treatment outcome(5). If clinician is not able to do so, then it can lead to non-healing root canal treatment outcome. Along with second mesiobuccal canal, a clinician should also be aware of other variations in maxillary molar encountered while treating maxillary first molar.

CASE REPORT

A 42-year male was referred for root canal therapy in right maxillary first molar. Intraoral examination revealed a carious lesion with respect to right maxillary first molar. Medical and family history was non-contributory. Radiographic examination revealed carious lesion involving enamel, dentin, and pulp. Tooth was diagnosed with chronic apical periodontitis after clinical and radiographic examination. Straight along with distal angulation radiographs were taken to reveal root and canal morphology.

PROCEDURE

Local anaesthesia administration (2% xylocaine with 1:80,000 epinephrine) was done. Preaccess analysis of preoperative radiographs was done along with CEJ identification using a periodontal probe. Access was prepared using sterile carbide bur under rubber dam isolation under 8X magnification (Moller Wedell Microscope VM 900). Access was modified to rhomboidal shape. The laws of canal orifice location were taken into consideration for canal location(6). On inspection of pulp chamber, two palatal canals and one mesiobuccal canal and one distal canal were found. Troughing with ultrasonic tip was done to selectively remove dentinal shelf for locating the second mesiobuccal canal. Two files, number 10 K-file and 15 K file (Mani Inc, Japan) were placed in the suspected second palatal canal. To verify second palatal canal a digital radiograph was taken at different horizontal. Pulp chamber debridement and canal orifice identification was completed. Coronal shaping and enlargement were done using low speed Gates Glidden drills (Dentsply Maillefer, Tulsa, OK) to obtain a straightline access to the apical third of each root canal. The working length was determined with the help of a Root ZX apex locator (J Morita, Tokyo, Japan) and verified radiographically. Crown-down technique with rotary ProTaper gold rotary (Dentsply Maillefer) instruments for canal preparation. The finishing of the apical third was done with either an F2 in or F3 file at the working length depending on the size of apical preparation after gauzing with a 2% tapered hand instrument. Irrigation was done with 5 mL 5.25% sodium hypochlorite (NaOCl) (Prevest Denpro, Jammu, India) subsequent to changing each instrument. After complete canal instrumentation the Canals were irrigated with 5.0 mL 17% EDTA (Prevest Denpro, Jammu, India) for 1 minute followed by a final irrigation with 5.0 mL 5.25% NaOCl after complete canal instrumentation. Calcium hydroxide (Prevest Denpro) paste was used as intracanal medicament and Intermediate Restorative Material (Dentsply Ltd, Weybridge, UK) was used to seal the access cavity temporarily. Patient was recalled for a second visit after 1 week. Calcium hydroxide paste was removed with Hedstrom files (Mani Inc, Brussels, Germany) followed by ample irrigation with 5.25% NaOCl. Canals were obturated using the single cone technique. After obturation, the cavity was permanently restored with bonded composite restoration. Postoperative radiograph was taken. A metal crown was

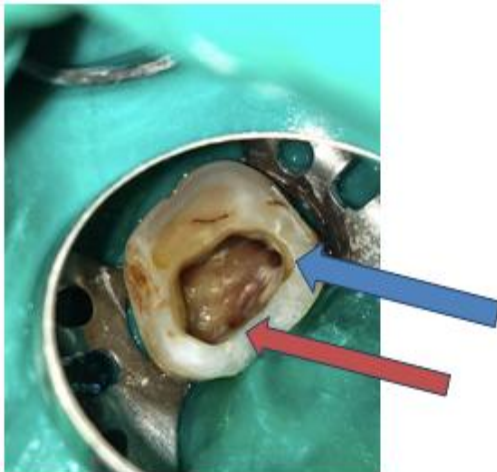
placed after 2 weeks. Patient was recalled at 3 months and 6 months and follow up. At 6 months, patient was asymptomatic and follow up radiograph showed decrease inperiapical radiolucency.



Initial pre-treatment radiograph.



Working length radiograph



Photograph showing two palatal canals (Blue arrow) and MB2 canal (Orange arrow)



After obturation radiograph



Radiograph after crown placement



Radiograph after 6 months follow up

DISCUSSION

A clinician should not only have thorough knowledge of root canal anatomy and morphology but also should be well aware of infrequent presentation of different variations in root canal numbers in palatal root also along with mesiobuccal root. Along with comprehensive knowledge of anatomy, an attentive pre-access analysis of the preoperative radiographs, the systematic identification of the CEJ, and the use of a dental operating microscope in adjunct with ultrasonic tips can help in access cavity preparation and location of canals with high precision. This case report highlights the unusual anatomy of a maxillary first molar with two palatal canals, two MB canals and one DB canal which is extremely rare. MB root showed Vertucci's Type IV and palatal showed Vertucci's Type II canal configuration. The use of operating microscope was crucial both for the detection and for management of the additional canals.

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