

# Management of a permanent maxillary first molar having five canals using dental operating microscope: A case report

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## INTRODUCTION

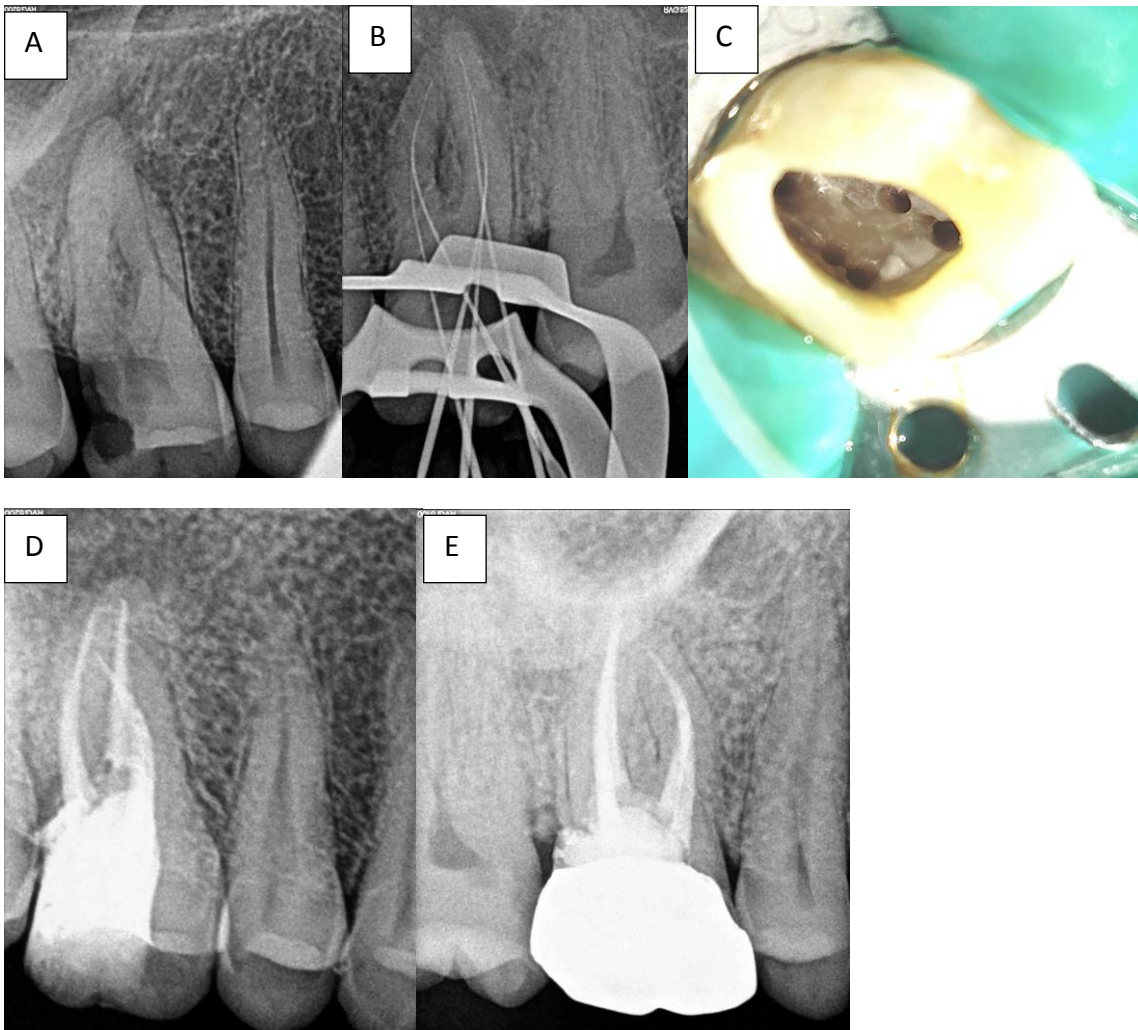
Thorough chemomechanical debridement of all the pulp cavity spaces and its three dimensional obturation with an inert material is the main objectives of root canal treatment. Knowledge of the external as well as internal anatomy of teeth is requisite for successful root canal treatment. An incomplete debridement of pulp space due to missed canals is one of most important reason of post treatment apical periodontitis(1)(2)(3). There has been extensive research which showed variations in anatomy of maxillary first molar with regards to number of roots and canals(4) . Most common variation encountered is presence of second mesiobuccal canal. Occurrence of two distobuccal canals is a rare entity and has been reported as low as 1.7 % (4). Various methods such as distal angulation radiographs along with straight angle radiographs, using can help in identification of additional canal location. Use of magnification and illumination using dental operating microscope has shown increase in location of additional number of canals in previous studies(5).

The present case report describes the management of a rare case of five canals maxillary first molar having two distobuccal canals, two mesiobuccal canals and one palatal canal using dental operating microscope.

## CASE REPORT

A healthy 39 year old male patient was referred for root canal treatment in right maxillary first molar. Medical history was inconclusive. Clinical intraoral examination showed a carious lesion with respect to right maxillary first molar. A carious lesion was revealed involving enamel, dentin and pulp on radiographic examination. On basis of clinical and radiographic examination a diagnosis of chronic apical periodontitis was made. Additional distal angulation radiographs were taken for additional canal identification along with straight angle radiographs. Local anaesthesia (2% xylocaine with 1:80,000 epinephrine) was administered. Preaccess analysis was performed after taking preoperative radiographs. With periodontal probe identification of CEJ was done as external anatomy reflects internal anatomy. Under aseptic conditions using rubber dam isolation access cavity was prepared with sterile carbide bur. Access preparation was done under x8 magnification (Moller Wedell Microscope VM 900) and modified to rhomboidal shape. For locating canals, laws of canal orifice location were followed. Pulp chamber inspection revealed two canals in distobuccal root, two canals in mesiobuccal root and one canal in palatal root. Access was refined using ultrasonic tip. Radiographs were taken to confirm additional canals in mesiobuccal and distobuccal root. MB as well as DB root showed Vertucci's Type II canal configuration. To obtain a straight line access to apical area, coronal shaping and enlargement were done using gates glidden drills (Dentsply Maillefer, Tulsa, OK). Root ZX apex locator (J Morita, Tokyo, Japan) was used for working length determination.

This working length was later verified using taking a radiograph. ProTaper gold rotary (Dentsply Maillefer) was used for canal preparation using crown down technique. 5.25% sodium hypochlorite (NaOCl) (Prevest Denpro, Jammu, India) was used for irrigation subsequent to changing each instrument. Canals were thoroughly 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 it was removed using Hedstrom files (Mani Inc, Brussels, Germany) along with copious irrigation of 5.25 % NaOCl after one week. Single cone obturation technique was used for obturation. Tooth was restored using composite restoration and a metal crown was given after two weeks. Patient was recalled after every three months for one year to check healing clinically and radiographically.



**Figure 1 :**

**A. Initial pre-treatment radiograph. B. Working length radiograph**  
**C. Access cavity Photograph showing two mesiobuccal and two distobuccal canal orifice**  
**D. After obturation radiograph E. Radiograph after 1 Year follow up**

### DISCUSSION

Although variations in mesiobuccal root canals are most commonly reported but a clinician should be aware of other variations root canal numbers in distobuccal root. A comprehensive idea of root canal anatomy, a painstaking pre-access analysis of the preoperative radiographs, along with CEJ identification and adjunct use of a magnification device such as dental operating microscope can help canal location with more predictability. The present case report highlights the unusual anatomy of a maxillary first molar with two mesiobuccal canals, two distobuccal canals and one palatal canal.

### Bibliography

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