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## Case Report

### ENDODONTIC MANAGEMENT OF A RARE CASE OF MAXILLARY FIRST PREMOLAR WITH THREE ROOT CANALS USING DENTAL MICROSCOPE: CASE REPORT

Asiya Shaikh\*, Vivek Hegde and Srilatha .Shanmugasundaram

Department of Conservative Dentistry & Endodontics, M.A. Rangoonwala  
Dental College and Research centre, Pune

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#### ABSTRACT

**Aim:** The aim is to report the diagnosis and successful endodontic management of patient with anatomical variation in maxillary first premolar.

**Summary:** Maxillary 1<sup>st</sup> premolars have variable root canal morphology. Although it usually has two canals, it may rarely have three and this third canal can easily be missed. Thus meticulous knowledge of tooth morphology along with careful interpretation of angled radiographs, proper access cavity preparation and a detailed exploration root canal is needed to ensure a proper endodontic treatment. This article reports a rare finding of three canals in a maxillary first premolar with non well defined root outline radiographically during an elective root canal treatment.

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#### INTRODUCTION

Successful endodontic treatment requires a thorough knowledge of tooth anatomy and root canal morphology, so as to achieve a desired treatment outcome. Human dentition present with a wide range of anatomical variations in the number, shape of roots and root canals (Vertucci 2005, Ahmed and Abott 2012, Ahmed and hashem 2016). One of the most important reason for failure of endodontic treatment is a missed root canal<sup>1,2</sup>.

The anatomy of maxillary 1<sup>st</sup> premolar is such that it has two roots, two cusps i.e. buccal and palatal and most commonly two canals. Variations in the anatomy consists of fused roots with separate canals, fused roots with fused canals, fused canals with separate roots or separate roots with separate canals<sup>1, 11</sup>. The prevalence of two canals is considered normal however and incidence of three canals accounts for 9.2 %. (Mariusz et al). The incidence of one root varies from 22 to 29.9%, two roots 50.6 to 72% and three roots 0 to 6%<sup>12/13/14/1</sup>. This article describes a case report of maxillary 1<sup>st</sup> premolar with three canals which is a rare clinical occurrence.

#### Case Report

A 35 years old woman reported to the department of conservative dentistry and endodontics M.A.Rangoonwala

dental college, Pune with a history of severe pain in tooth 24, clinically deep proximal caries were observed, the tooth was tender to percussion. A preoperative radiograph confirmed the presence of caries on the distal aspect with pulpal involvement.



Fig 1 Preoperative image

#### Endodontic treatment

Prior to beginning of treatment an informed consent of the patient was taken. Endodontic therapy was initiated under local anaesthesia and rubber dam isolation. Access cavity preparation was done with Endo access bur no A0164 (Dentsply) followed by safe ended bur. A large buccal and palatal canals were visualised.

\*Corresponding author: Asiya Shaikh

Department of Conservative Dentistry & Endodontics, M.A. Rangoonwala Dental College and Research centre, Pune

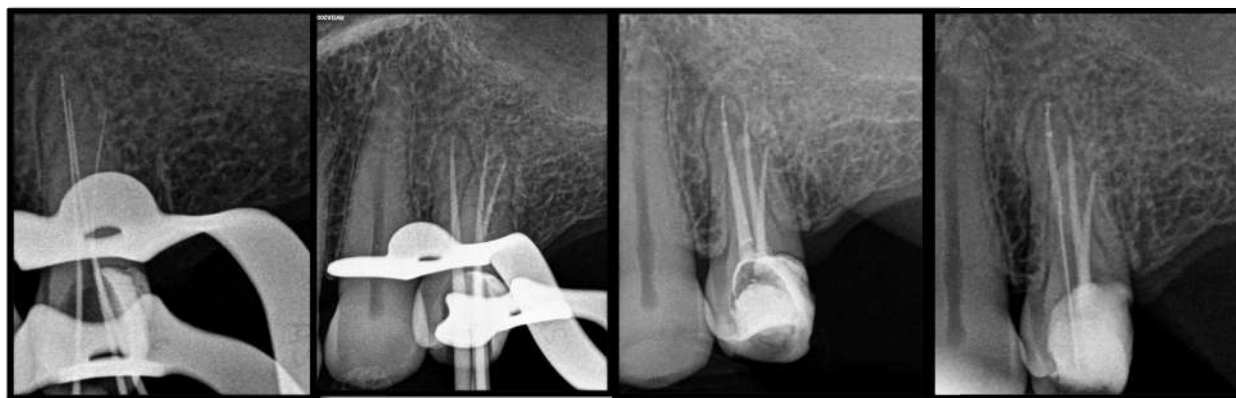


Fig:3 Working length determination

Master cone selection

Obturation

Final restoration with post

Exploration of canals was performed using no 10 k file (Dentsply), the working length determination was done using electronic apex locator (J Morita) during radiographic confirmation an extra canal was suspected in the buccal root and hence the case was taken under microscope, exploration of three canals i.e. Mesio-buccal, disto-buccal and palatal canal was performed using 10 K file, resulting into confirmation of three canals (Vertucci Type III) fig 2. All the canals were prepared to size 20 k file followed by use of Flexicon rotary files using crown down technique up to size 25 .04. along with copious irrigation of 5.25% sodium hypochlorite and normal saline which was activated using endoactivator (Dentsply Tulsa, USA). A calcium hydroxide intracanal medicament was placed for 1 week followed by obturation with Gutta percha and AH plus sealer Fig 3. After 1 week the patient was evaluated for symptoms following which post space preparation with peeso reamer was done followed by bonding of fiber post as shown n fig 3.

## DISCUSSION

Identifying and accessing root canals is particularly challenging in endodontic treatment of tooth with atypical canal configuration. Maxillary 1<sup>st</sup> premolar presents with variable canal and root morphology, most frequently with separate canals and two apical foramina in (72%)<sup>13</sup>. For a successful endodontic treatment it is essential to identify, clean and shape the root canal system thoroughly before obturation<sup>41 1</sup>. A root canal may be left untreated because of the dentist failing to recognise the presence<sup>27</sup>. It is extremely important for the clinicians to be aware of the complexity of root canal system. Diagnosis of three canals in maxillary premolar on preoperative radiography can be often difficult. Although a preoperative radiograph gives a two dimensional image of three dimensional object, whenever abrupt loss of radiolucent continuity is present extra canals can be suspected. Root canal orifices act as best guide in determining the additional canals. An ovoid outline form is recommended for maxillary premolars, however a third canal orifice if separate should be considered by making a bucco -proximal angle cut from the entrance of buccal canals to cavosurface angle, as suggested by Balleri et al 1994. The

## CONCLUSION

Clinicians should be aware of the possible anatomical variations in maxillary premolar and able to apply this knowledge in radiographic interpretation. Maxillary 1<sup>st</sup> premolars with complex anatomy may be predictably managed following its identification and negotiation.

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