

Case Report

Maxillary first molar with two palatal canals: A case report

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ABSTRACT:

A thorough knowledge of the root canal anatomy and its variations is essential for successful completion of the endodontic treatment. The endodontic treatment of maxillary molar with an unusual root canal morphology can be diagnostically and technically challenging. Astonishing morphology in multirouted teeth is a constant challenge for diagnosis and successful endodontic treatment. Presence of extra canals, lateral canals, apica deltas is commonly encountered.

The purpose of this study was to report a clinical case of maxillary first molar with an unusual morphological variation of palatal root having two palatal canals that appears to be unite in the apical third of the root. The incidence of two palatal canals in a palatal root is quite rare and reported to be 2–5.1%.

Keywords: Astonishing root canal morphology, Endodontic treatment, Two palatal canals.

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INTRODUCTION

A thorough knowledge of root canal morphology is an important aspect of root canal treatment. Failures to detect aberrant root canals and to identify extra roots are one of the main causes for failure in the endodontic therapy.[1] The main objective of the chemo-mechanical preparation is the proper chemical debridement and creating space for a biologically acceptable root canal filling material followed by a good coronal restoration to prevent ingress of microorganisms.[2]

Human molars demonstrate relatively high anatomic variations and abnormalities with respect to number of roots and root canals. The literature delineates wide variations in root canal morphology of maxillary first molars.[2]

There are several reports in literature which shows variations in number of palatal roots and canals in maxillary first molar. They describe the existence of either one palatal root with two canal or two separate palatal roots each with its own canal. With the introduction of magnification tools such as loupes and dental operating microscope (DOM), detection of extracanals became more frequent.[3]

The presence of additional canals in the palatal root of maxillary molars has been reported to be 2 to 5.1%. Christie and Thompson speculated maxillary molars with two palatal roots may be encountered once every 3 years in a busy endodontic practice. However, Stephen reported a case of a maxillary first molar with two canals in the palatal root in which the canal join at the apical one-third. Although, the incidence of an extra canal in the palatal root is not high, it is important to take this variation into consideration during root canal therapy in order to ensure success.[4]

These extra canals must be identified and debrided to prevent endodontic failure. Even when the frequency of radicular anatomy abnormality is extremely low, dentists must consider the possibility that a tooth has extra root canals or even extra roots.[5]

The purpose of this study was to report a clinical case of maxillary first molar with an unusual morphological variation of palatal root having two palatal canals that appears to be unite in the apical third of the root.

CASE REPORT

A 19-year-old male patient reported to the Department of Conservative and Endodontics, Genesis Institute of Dental Sciences and Research, Ferozepur with chief complaint of pain in the right upper back region i.e 16 since 15 days. Medical history was noncontributory.

Patient got his OPG (orthopantomogram) done from the private dental clinic 10 days back and reported to our department with that OPG showing generalised attrition that approaching pulp in right maxillary first molar (fig.1) On clinical examination diagnosis of symptomatic irreversible pulpitis is confirmed w.r.t 16 and non-surgical root canal treatment was suggested to the patient.

The patient was anesthetized with 1.8 mL of Lidocaine HCL 2% containing 1:100,000 epinephrine (Lignospan® Standard- Septodont). After placement of rubber dam, adjustments to the access opening was done. Typically, maxillary first molars access cavity is located within the mesial half of the occlusal surface slightly shifted buccally . A rhomboidal access can be extended to insure locating second mesial canals if present . The entire roof of the pulp chamber was removed to ensure proper cleaning and locating any extra canal office. Three canals were found at the beginning (Mesio-Buccal, Disto-Buccal, and Palatal). Upon proper examination of the pulp chamber floor using a DG16 Endo probe, a fourth canal orifice was detected about 2mm distal to the main palatal canal.

There was no second mesiobuccal canal. The access cavity was slightly modified to a Rectangular shape (fig.2), the pulp chamber was flushed with 5.25% sodium hypochlorite to remove debris. A size 10 K-file (Dentsply Maillefer, Switzerland) is used initially to confirm the patency. Working length of the four canals was determined using the apex locator (Root ZX, J Morita, Japan) and confirmed by a digital radiograph. The radiograph confirmed the presence of the two canals in the palatal root (fig.3). Root canals were prepared using crown down technique with rotary ProTaper, and all the canals were enlarged to the finishing file F2 (fig.4). The canals were irrigated with 2.5% sodium hypochlorite then flushed with sterile saline solution and completely dried with absorbent paper points. The canals were obturated using standardized gutta-percha points and AH-26 root canal sealer (fig.5).



Figure 1: Preoperative radiographic

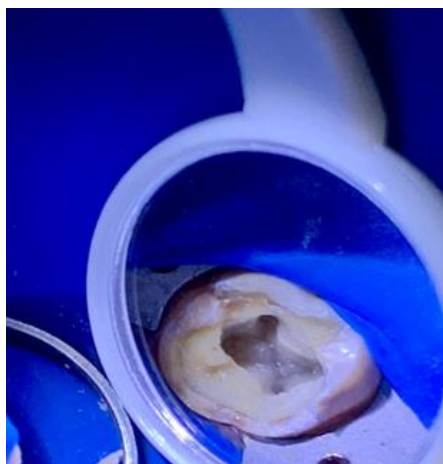


Figure 2: Rectangular shape access opening



Figure 3: Working length radiograph showing two canals in palatal root

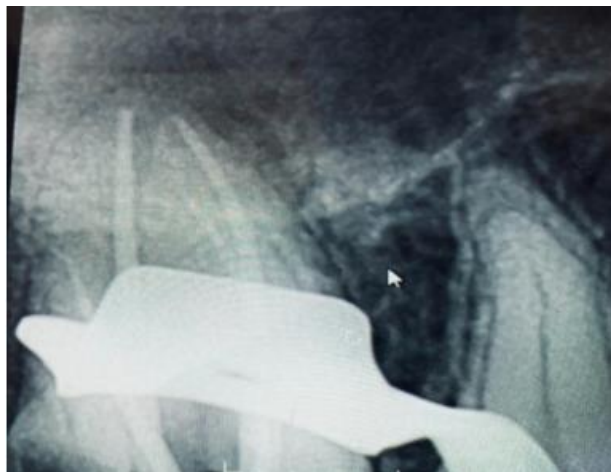


Figure 5: Master cone radiograph



Figure 6: Postoperative

DISCUSSION: Limited number of cases with 2 palatal roots/canals (Table 1) and cases with fused buccal roots have been reported. The frequency of a maxillary first molar with two roots or two palatal canals is very low, 3.9% and 1% respectively [6]. A brief review of recent case reports of extra palatal canals in maxillary first molars is presented in Table 1. TABLE: 1

Investigators	Study type	Key information
Johal 2001.[7]	Clinical RCT	2MB, 1DB, 2P
Holderrieth & Gernhardt 2009.[8]	Clinical RCT	2MB, 1DB, 2P
Aggarwal et.al.2009.[9]	Spiral CT	1MB, 1DB, 2P
Deepalakshmi et.al.2009.[10]	Spiral CT	2MB, 1DB, 2P

MB- mesiobuccal, DB- distobuccal, P- palatal

However, other researchers reported a contrasting result. Bond reported a case of maxillary first molar with six canals: Two in the mesiobuccal, two in the distobuccal and two in the palatal root.[11]

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Although, the incidence of an extra canal in the palatal root is not high, it is important to take this variation into consideration during root canal therapy in order to ensure success. These extra canals must be identified and debrided to prevent endodontic failure.

Even when the frequency of radicular anatomy abnormality is extremely low, dentists must consider the possibility that a tooth has extra root canals or even extra roots.

CONCLUSION:

Root canal anatomy of each tooth in human dentition has certain common characteristics as well as numerous atypical or unusual ones that can be a road map to successful endodontic treatment. The possibility of an extra root canal should also be considered and looked for carefully. Access preparation in this case (In maxillary first molar) is modified into rectangular shape in order to better locate and access the second palatal canal (P2), present 2mm distal to the first palatal (P1) and its thorough cleaning, shaping and obturation would contribute significantly towards success of endodontic treatment. Good illumination and use of accessories like magnifying loupes, microscopes etc are valuable in managing these types of unusual cases.

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