

Case Report

Management of maxillary first molar with 2 palatal canals: A case report

¹Jenish Barochia, ²Kinjal Kher, ³Divisha Jain, ⁴Sunil Choudhary, ⁵Shashank Singh, ⁶Darshit Vadhel, ⁷Tanya Sharma

^{1,2,3,4,5,6,7}Post Graduate, Department of Conservative Dentistry and Endodontics, Pacific Dental College and Hospital, Udaipur, Rajasthan, India

ABSTRACT:

Understanding the anatomical variations in the roots and root canal systems of a tooth is important for the success of root canal treatment. The palatal roots of the maxillary molars have fewer anatomical variations than the other roots, and fewer variations occur in the first molars than in the second molars. This case report describes a case of maxillary first molar with two palatal canals. Knowledge of the anatomical variations in the palatal roots of maxillary first molars will help to increase the success rate of root canal treatments.

Key words: Palatal canals, Maxillary first molar, access cavity

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Corresponding author: Jenish Barochia, Post Graduate, Department of Conservative Dentistry and Endodontics, Pacific Dental College and Hospital, Udaipur, Rajasthan, India

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INTRODUCTION

The main goal of endodontic treatment is to prevent apical periodontitis or in cases of existing lesion, to promote its healing. The complexity of the root canal system of maxillary molars presents a constant challenge, as the dentist must have a thorough knowledge of root canal morphology to provide successful endodontic treatment. The form, configuration, and number of root canals present in maxillary first molars have been discussed for more than half a century.¹ Differences between studies may be attributed to variations in the technique used to study the morphology.

One of the main causes of endodontic treatment failure is the inability to negotiate, clean or obturate all the existing root canals.² Understanding the anatomical variations of the root canal system is essential in the success of endodontic treatment. The permanent maxillary molars are generally described as a group of teeth with three roots including two buccal roots and one palatal root. The second mesiobuccal canal is a common finding^{3,4}. However, Shahi *et al*⁴ reported 0.73% of the first molars with two palatal canals and Zheng *et al*.⁵ reported a prevalence rate of 1.12 and 1.17% for presence of an extra canal in the distobuccal and palatal roots, respectively. Slowey reported a maxillary second

molar with two palatal roots for the first time.⁶ Unusual roots and root canal morphologies in the molars have been recorded in several studies.⁷⁻⁹

Christie *et al*. reported 16 cases of maxillary molars and six extracted teeth with two palatal roots and classified them into three types as follows: *type I*; the buccal roots are often similar to cow horns and less divergent, the two palatal roots are very divergent and often long and tortuous, which can be observed radiographically, *type II*; the palatal roots are shorter and parallel and root apices are blunt, with mesial and distal divergence on the buccolingual radiographic view and *type III*; the roots have a constricted morphology with mesiobuccal, mesiopalatal and distopalatal roots engaged in a web-like radiographic view similar to *type II*. The distobuccal root remains isolated and may diverge in distobuccal direction.¹⁰

This case report describes the nonsurgical root canal treatment of maxillary first molars with five root canals with 2 mesiobuccal canals, 2 palatal canals & 1 distobuccal canal.

CASE REPORT

A 35 yearold male patient reported to department of conservative dentistry and endodontics with a chief complaint of pain in upper right back teeth region. After extensive clinical and radiographic examination,

the maxillary right first molar was prepared for radiograph was obtained. nonsurgical endodontic therapy. A preoperative

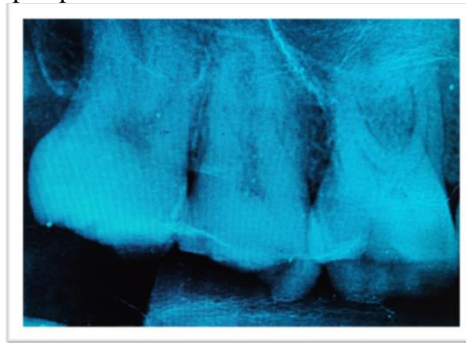


Fig: 1 PRE-OP RADIOGRAPH

The patient received local anesthesia of 2% lidocaine with 1:100,000 epinephrine. A rubber dam was placed, and a conventional endodontic access opening was made. In the pulp chamber floor, the 3 principal root canal systems were identified: MB, DB, and palatal. K-type files were used for gross removal of pulp tissue in the 3 main canals. The pulp chamber floor was then explored to find the fourth canal in the MB root. After probing with a Hu-Friedy DG 16 endodontic explorer and scraping calcifications with a spoon excavator, a small hemorrhagic point was noted in a groove approximately 2 mm from the MB orifice in a palatal direction. At the same time a similar hemorrhagic point was noted near the orifice of the main palatal canal. A small amount of dentin that was occluding the orifice of the second palatal canal was removed. The conventional triangular access was modified to a trapezoidal shape to improve access to the additional canals. The palatal and mesial root had 2 orifices, fairly well separated, exiting from the floor of the pulp chamber.

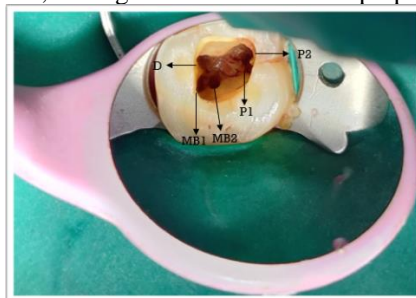


Fig: 2 Access Opening

WORKING LENGTH DETERMINATION

After scouting of the root canals, radiographic length-determination was completed by means of radiograph and verified the working lengths, using an electronic apex locator.

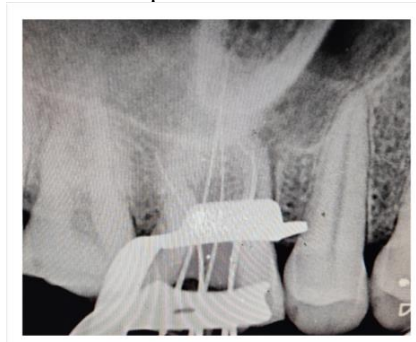


Fig: 3 working length determination

MASTER CONE DETERMINATION

At the next appointment, the root canals were irrigated with 5.25% sodium hypochlorite and dried with paper points. The canals were obturated using F1 Gutta percha in all canals. During root canal negotiation it became apparent that both canals in mesio-buccal root were joining together in apical third of root. The same was happening in the palatal root.

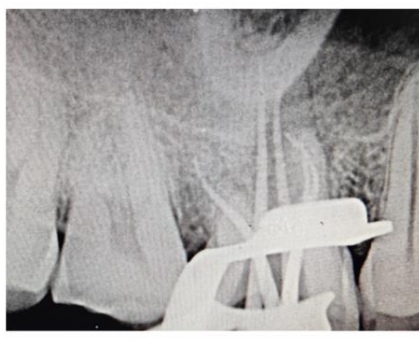


Fig: 4 master cone



Fig: 5 obturation

DISCUSSION

This case report emphasizes the importance of looking for canals and of ensuring adequate access to improve the likelihood that additional canals will be located. The conservation of tooth structure must be kept in mind when establishing an endodontic access to allow for successful restoration of the tooth after root canal therapy. Endodontic access should be designed to provide direct access to the apical third of the root canal system, not merely to locate the canal orifice. The dentist should be able to visualize all aspects of the coronal third of the root canal system, and all tooth structure or restorative material that interferes with straight-line access should be removed.

It is important for the access cavity to have smooth externally diverging walls to improve visibility and prevent debris from migrating into the canal system. The traditional triangular access opening — the MB, DB, and palatal root representing the apex of each point of the triangle — is often too constricted to allow straight-line access in maxillary molars. Thomas and others¹¹ showed that 81% of the teeth they studied had a trapezoidal pulp chamber and that the use of a trapezoidal access cavity was warranted.

Christie and Thompson have recommended modifying the outline to an ovoid shape, so that the roof of the chamber when opened up is more parallel to the mesial marginal ridge.¹² They believe that this outline provides better access for searching for additional canals, therefore improving endodontic success.

To investigate properly the possibility of additional canals, the dentist should:

- Understand the complexity of the morphology of the tooth involved.
- Take additional off-angle radiographs.
- Ensure adequate “straight-line” access to improve visibility.
- Examine the pulpal floor for “lines” to areas where additional canals may be located.
- Remove a small amount of tooth structure that often may occlude a canal orifice.

The dentist should be suspicious of additional canals if endodontic files are not well centred in the canal on the radiograph or if endodontic files are not well centred in the canal clinically. It must be assumed that most maxillary first molars will have 4 canals. The second MB canal is usually found 0.5-5 mm palatal to the main MB canal, often hidden under a cervical

ledge.19 Cutting around the first orifice, cutting a trough in a straight line toward the palatal canal, or both, will usually allow the dentist to find it.

CONCLUSION

This case report contributes to our understanding of the complexity of the root canal morphology found in maxillary first molars. Although such cases occur infrequently, dentists should be aware of them when considering endodontic treatment of a maxillary first molar.

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