

Case Report

Unusual Two Palatal Canal in Maxillary First Molar ‘Diagnosis and Management’- A Case Report

Harakh Chand Baranwal, Amrita Kumari, Nidhi Singh, Neeraj Kumar

Department of Conservative Dentistry and Endodontics , Faculty of Dental Science, IMS, BHU , Uttar Pradesh, India

ABSTRACT:

The internal canal morphology of maxillary molar is highly variable. Presence of missed canal and/or failure to identify additional root are one of the main causes for failure in endodontic therapy. For the successful endodontic therapy, thorough knowledge of root canal morphology is essential. There are variations in root canal configuration in maxillary molars, which could affect treatment outcome. This paper presents the endodontic management of a cariously exposed maxillary left first molar with two palatal canals (Vertucci type IV) and a single buccal canal. Aim of this case report is to reinforce clinician’s awareness of the rare morphology of root canals.

Key words: Maxillary first molar, palatal canal, extra canal.

Received: 13 May, 2019

Revised: 12 June 2019

Accepted: 14 June 2019

Corresponding author: Dr. Amrita Kumari, Department of Conservative Dentistry and Endodontics , Faculty of Dental Science, IMS, BHU , Uttar Pradesh, India

This article may be cited as: Baranwal HC, Kumari A, Singh N, Kumar N. Unusual Two Palatal Canal in Maxillary First Molar ‘Diagnosis and Management’- A Case Report. J Adv Med Dent Scie Res 2019;7(7): 106-108.

INTRODUCTION

Due to the complexity of the root canal system, missed canals are not uncommon. The complexity of the root canal anatomy with maxillary molars presents a constant challenge to dentist to perform a successful root canal treatment (1). It is vital for the clinician to have a deep knowledge of the internal anatomy of the root canal system in order to increase the effectiveness of endodontic treatments, and thereby increase the success rate of the same (2). A correct access cavity preparation is at most important in localizing the orifices of the root canals. The access cavity outline form should be modified, if there is suspicious of any extra root and/or canal (4). The clinician must know the more usual anatomy, but also must know how to diagnose and identify the most common derivations, the frequency which they occur and how to approach (5). The maxillary molars have one of the most challenging anatomies for endodontist, and their morphology is extensively revised (6-8). The literature shows that this tooth has an average of 95% of three roots and an incidence of around 55% to 70% of four root canals, two of which are usually present in the mesiobuccal root(2). The prevalence of two palatal canals is described ranging from 0.4% to 5.1 % (9).

CASE REPORT

A 28 year old male patient reported to the department of Conservative dentistry and Endodontics with a chief complaint of pain and sensitivity to cold and hot in upper left back tooth region for the past 3 months. Patient gave history of pain that is gradual in onset, moderate in intensity and intermittent in nature. There was no relevant medical history. On clinical examination there were no palpable lymph nodes extra-orally and intra-orally. There was dental caries in maxillary left first molar. A preoperative radiograph was taken. Pulp sensibility test was done in #26 and increased response was observed. A diagnosis of acute irreversible pulpitis in #26 was made and the treatment plan was root canal treatment in #26. Administration of local anesthesia was done and the tooth was isolated using rubber dam. Access cavity preparation was done by initially using endo-access bur then by complete deroofing pulp chamber, main canals were located. A small hemorrhagic point was noted adjacent to the palatal orifice. The usual rhomboid access preparation was done. The negotiation of second palatal canal was done using DG16 to assess the second canal. Smaller k file #10 (21mm) was used to check for canal patency and the canal was negotiated and enlarged till k file #15. K File #15 was passed in all the canals for WL determination. Working length determination was done

with MB 18.5mm; DB 18.5mm, P1-21mm and P2-19.5mm. Orifices were enlarged using GG drills and sodium hypochlorite was used to clear off debris and necrosed tissue. Biomechanical preparation was done using Protaper sequences as SX, S1, S2, F1, F2 to the WL. In between change of file copious amount of irrigation (saline) was used. Final irrigation was done using EDTA. Master cone radiograph was taken. Canals were dried with paper points and the tooth was obturated using sealapex sealer.



Pre-op IOPA



Master Cone IOPA



Post op IOPA

DISCUSSION

For successful endodontic treatment, it is necessary to have knowledge of internal dental anatomy, recognize anatomical variations, either in normal situations or not, allowing a lower incidence of failures and mistakes during endodontic procedures (10). To investigate a possible additional canal, the operator must understand the complex anatomical variability of the tooth to be treated, perform radiographs with varying angles, ensuring adequate access and visualization of the canals and examine the lines of the pulp chamber floor that indicate the mouths of the canals(11). Among the anatomical variations of the system of root canals in maxillary molars, the less frequent seems to be the one in

palatal root (12, 13), in which, the incidence of more than one palatal canal was seen in less than 2% of the cases (14), collaborating with who observed, during 40 years of daily clinical practice, the presence of 16 maxillary molars with two palatal canals (15). According to majority of the clinical literature, usually the fourth canal in maxillary molars is reported to be of additional mesiobuccal canal (Vertucci FJ et al in 1974; Seidberg BH et al in 1973). But cases such as two palatal canals, in teeth are infrequently reported. In this case report, the palatal root canal system was characterized by a two separate canals (Vertucci type IV). Detection of extra canals during access cavity preparation can be done by proper analysis of dentinal map & colour changes on the floor of the pulp chamber (16) using endodontic explorer in dental operating microscope and loupes. Radiograph can be taken from different angulation. A mesial angulation of 40-degree of the x-ray beam can be used to identify additional canals (17).

CONCLUSION

The present case was endodontic management of a maxillary first molar with two palatal canals in one root and one buccal root canal. Although the incidence of two separate palatal canals instead of wide single palatal canal and even a single buccal root canal is not high. It is important to take these abnormalities into consideration during root canal therapy of maxillary molars in order to ensure successful long-term outcome. Thus, careful examination of radiographs as well as understanding the internal anatomy of teeth is vital for successful endodontic treatment.

REFERENCES:

1. Hess W. The anatomy of the root canals of the teeth of the permanent dentition. London: John Bale Sons and Danielsen, 1925.
2. Baratto Filho F, Fariniuk LF, Ferreira EL, et al. Clinical and macroscopic study of maxillary molars with two palatal roots. *Int Endod J.* 2002;35(9):796–801.
3. Martins JNR. First upper premolar with three canals: diagnosis and treatment- four case reports. *Revista Portuguesa de Estomatologia, Medicina Dentária e Cirurgia Maxilofacial.* 2011;52(1):43–51.
4. Peters OA. Accessing root canal systems: knowledge base and clinical techniques. *Endodontic Practice Today.* 2008;2(2)
5. Friedman S. Prognosis of initial endodontic therapy. *Endodontic Topics.* 2002;2(1):59–88.
6. Kulild JC, Peters DD. Incidence and configuration of canal systems in the mesiobuccal root of maxillary first and second molars. *J Endod.* 1990;16(7):311–317.
7. Buhley LJ, Barrows MJ, Begole EA, et al. Effect of magnification on locating the MB2 canal in maxillary molars. *J Endod* 2002;28(4):324–327.
8. Gopikrishna V, Bhargavi N, Kandaswamy D. Endodontic management of a maxillary first molar with a single root and a single canal diagnosed with the aid of spiral CT: a case report. *J Endod.* 2006;32(7):687–691.
9. Libfeld H, Rotstein I. Incidence of four-rooted maxillary second molars: literature review and radiographic survey of 1,200 teeth. *J Endod.* 1989;15(3):129–131.

10. Saler S, Goel BR. Frequency of fourth root canal in the maxillary first molar, an in-vitro study. Karnataka University [Dissertation], Dharwad, India;1995:67.
11. Rodighiero AS. The influence of clinical microscope in fourth root canals location in the first upper molars. Faculdade Ingá- UNINGA [Dissertation], Passo Fundo, Brazil; 2002. 51p.
12. Johal S. Unusual maxillary first molar with 2 palatal canals within a single root: a case report. J Can Dent Assoc. 2001;67(4):211–214.
13. Slowey RR. Root canal anatomy road map to successful endodontics. Dent Clin North Am. 1979;23(4):555–573.
14. Weng XL, Yu, SB, Zhao SL, et al. Root canal morphology of permanent maxillary teeth in the Han nationality in Chinese Guanzhong area: a new modified root canal staining technique. J Endod. 2009;35(5):651–656.
15. Stone LH, Stroner WF. Maxillary molars demonstrating more than one palatal root canal. Oral Surg Oral Med Oral Pathol. 1981;51(6):649–652.
16. Christie WH, Peikoff MD, Fogel HM. Maxillary molars with two palatal roots: a retrospective clinical study. J Endod. 1991;17(2):80–84.
17. Krasner P, Rankow HJ. Anatomy of the pulp-chamber floor. J Endod 2004;30:5-16.
18. Martínez-Lozano MA, Forner-Navarro L, Sánchez-Cortés JL. Analysis of radiologic factors in determining premolar root canal systems. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 1999;88:719-22.

Source of support: Nil

Conflict of interest: None declared

This work is licensed under CC BY: *Creative Commons Attribution 3.0 License*.