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Case Report

Endodontic management of maxillary first molar having five root canals- A case report

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***ABSTRACT*:**
The accomplishment of endodontic treatment is enormously subjected to the fastidiousness of the biomechanical preparation and the obturation providing a tight seal. The capacity of the clinician to comprehend and explore through the exceptionally distinct root canal anatomy assumes a conspicuous job. Incapacity to identify any extra canals in teeth having unique morphological variations would result in an unforeseeable result. The present case report portrays effective endodontic treatment of a maxillary first molar having a profoundly exceptional morphological variation with two palatal canals.
Keywords- Anatomic variations, maxillary first molar, two palatal canals

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INTRODUCTION

Sufficient information about the external and internal morphology of tooth is of central significance for clinicians working in the various specialties of dentistry so as to keep up great oral wellbeing. Tragically, tooth morphology shows an elevated level of intricacy and fluctuation. A number of anatomical variation have been accounted for to be identified with numerous components including age, sexual orientation and nationality.[1]

The accomplishment of endodontic treatment is enormously subject to the fastidiousness of the biomechanical preparation and the obturation providing a tight seal. The capacity of the clinician to comprehend and explore through the exceptionally distinct root canal anatomy assumes a conspicuous job. Inability to recognize and hence disinfect a root canal appropriately in teeth with canal variation is one of the primary reasons for failure of endodontic treatment.[2]

Considering the early eruption of the maxillary permanent first molars and primary role in mastication, they are considered to be more susceptible against caries along with other pulpal and peri-apical diseases.[1] Hence, maxillary first molar is one of the most well-known teeth necessitating endodontic treatment.

An ampleness of writing depicting its morphology along with anatomical variations in canals are available.[3] The most well-known arrangement portrayed is the presence of three separate canals in three roots, a second mesio-buccal canal (MB2) is a typical variation spotted in mesio-buccal root.[4]

Rarely, notwithstanding, it has been accounted for that the distal root may have two canals; finding a subsequent palatal canal is unique.[5] Variation of having eight canals in maxillary molars has been broadcasted in the literature till now.[6] Failure of endodontic treatment can be ascribed to various reasons and among

all, recognizing and negotiating missed canals stays an essential explanation for retreatment.[7]

The present case report portrays effective endodontic treatment of a maxillary first molar having a profoundly exceptional morphological variation with two palatal canals.

CASE REPORT

A 27 years old male patient reported in the Department of Conservative Dentistry and Endodontics, Saraswati Dental College, Lucknow, with the chief complain of pain and food lodgment in his right upper back tooth region since one month. Patient gave the history of dull, continuous, throbbing and radiating pain to his right side of mouth which intensified due to thermal stimuli for the past 10 days. A deep cavitated proximal lesion was evident on the mesial aspect of permanent right maxillary first molar (#16) after clinical examination. Tooth was tender on percussion. Radiographic examination of the #16 revealed a coronal radiolucency involving pulp with evident widening of periodontal ligament space. (Fig. 1) Medical history of the patient was found to be non-significant.

A diagnosis was made as symptomatic irreversible pulpitis followed by symptomatic apical periodontitis in tooth #16 and a treatment plan was designed involving endodontic treatment followed by post-endodontic restoration to retain the tooth and regain its normal form and function in oral cavity.

Treatment plan and its outcome were discussed with the patient. After taking patient's consent, local anesthetic agent (2% lignocaine, 1:80,000 adrenaline) (Indoco Remedies, Gujarat, India) was administered and root canal treatment was carried under rubber dam (Coltene Whaledent, Switzerland) isolation. Conventional access cavity was prepared using Endo-Access and Endo-Z (Dentsply Maillefer, Tulsa, US) bur and then, straight line access was established and coronal pulp was removed successively.

Fig. - 1

Fig. - 2

Fig. - 3

Fig - 4

Fig- 5

Fig. 1:- Preclinical intraoral peri-apical radiograph of right maxillary first molar #16.
Fig. 2:- Working length radiograph with k file w.r.t #16.
Fig. 3:- Master cone radiograph w.r.t #16.
Fig. 4:- Radiograph showing five root canals obturated with gutta-percha w.r.t #16.
Fig. 5:- Post-obturation clinical picture of pulp chamber with sealed 5 canal orifices w.r.t #16.

Succeeding the identification of three principle canals i.e.; mesio-buccal (MB1), disto-buccal (DB) and palatal (P1), MB2 and one extra palatal (P2) canal was also successfully negotiated using DG-16 endodontic explorer (Dentsply Maillefer, Ballaigues, Switzerland). Glide path was established using K file of sizes 6, 8 and 10 (Dentsply Maillefer, Ballaigues, Switzerland) and EDTA (Ethylenediaminetetraacetic acid) gel (AvuePrep EDTA gel, Dental Avenue) lubricating agent. Working length measurement was done with the help of apex locator (Root ZX, J Morita Corp; Kyoto, Japan) which was later confirmed radiographically. (Figure. 2)

Hand instrumentation of all the canals was done up to size 20K file (Dentsply Maillefer, Ballaigues, Switzerland). Further biomechanical preparation was completed using rotary files (Neoendo Flex, Orikam) size 25/4% (MB1), size 30/4% (MB2), size 25/6% (Distobuccal and P1) and size 25/4% (P2). After each file, the canals were irrigated with 3% sodium hypochlorite and 17% ethylene diaminetetraacetic acid (EDTA). After completion of chemo-mechanical preparation, the root canals were dried with sterile paper points, and a water soluble calcium hydroxide (AvueCal by Dental Avenue) was placed inside the canal as an intracanal medicament, followed by temporary restoration of access cavity with Cavitemp (Ammdent, India). Patient was recalled after two-weeks; canals were irrigated with 3% sodium hypochlorite and dried using sterile paper points. Pre-obturation radiograph was taken with the master cones (Fig.3) and finally obturation was done with gutta-percha using cold lateral condensation technique. (Fig.4 and Fig.5) Tooth was restored using Z350 composite resin (3MESPE AG, Germany).

DISCUSSION

To a substantial extent, the accomplishment of endodontic treatment prerequisite an accurate diagnosis that involves exhaustive information about detailed root canal morphology along with possible variations reported previously in literatures.[8]

Despite proper endodontic treatment in the event that an extra canal is missed, a number of challenges and disappointment in treatment outcome could result. Concerning the recurrence of variation in terms of root canal number and morphology among various races as well in various people inside a similar populace, it has been reported everywhere in the literature.[9]

Reports showing presence of second mesio-buccal canal in maxillary molars has been presented widely. An occurrence running between 48.0%–97.6%, with an overall worldwide pervasiveness of 73.8% has been accounted for.[10] An incidence of 60.5% for having two canals in the mesiobuccal root has been documented by Cleghorn BM *et al*.[5] in their literature review. Weine FS *et al.*[11] endowed the presence of four canal more frequently (51.4%) when compared with the three canals (48.5%). There is less announced instances available of presence of two palatal canals in maxillary molars. Tripathi R *et al.*[12] reported in their study 0.49% of cases having an extra palatal canal among the Nepalese population. An incidence of 2.05% (ex-vivo), 0.62% (clinical) and 4.55% (CBCT) for having a frequency of additional roots and root canals has been reported by BarattoFilho F *et al.*[13]

As of late, this rate has been startled on the ascent, primarily because of advancement in diagnostic adjuncts with improved cognition about the anatomy and the administrator's insight in recognizing these minor variables.

The present case report exhibit the effective endodontic management of maxillary first molar with five root canals including two palatal canals. It likewise features the necessity of searching the anatomical variations among otherwise ordinary appearing teeth.

CONCLUSION

Despite the fact that the frequency is low, potential variations in the most well-known root canal morphologies might be available and ought to be traversed. Considering the complexity of the maxillary first molar, rigorous information about the additional roots and canals is very essential. Dentists should be keen and attentive for exploring these variations to avoid endodontic treatment failures.

REFERENCES

1. Mufadhal AA, Aldawla MA, Madfa AA. External and Internal Anatomy of Maxillary Permanent First Molars. Human Teeth Key Skills and Clinical Illustrations. IntechOpen 2019; DOI: 10.5772/intechopen.84518
2. Shetty K, Yadav A, Babu VM. Endodontic management of maxillary first molar having five root canals with the aid of spiral computed tomography. Saudi Endod J. 2014;4:149–53.
3. Umer F. Maxillary first molar with five canals. BMJ Case Rep. 2014; 2014:bcr2014205757.
4. Kulid JC, Peters DD. Incidence and configuration of canal systems in the mesiobuccal root of maxillary first and second molars. J Endod. 1990;16(7):311-7.
5. Cleghorn BM, Christie WH, Dong CC. Root and root canal morphology of the human permanent maxillary first molar: a literature review. J Endod. 2006;32(9):813-21.
6. Kottoor J, Velmurugan N, Surendran S. Endodontic management of a maxillary first molar with eight root canal systems evaluated using cone-beam computed tomography scanning: a case report. J Endod. 2011;37(5):715-9.
7. Song M, Kim HC, Lee W, Kim E. Analysis of the cause of failure in nonsurgical endodontic treatment by microscopic inspection during endodontic microsurgery. J Endod. 2011;37(11):1516-9.
8. Anand P, Mahalaxmi S. Maxillary first molar with five canals. SRM J Res Dent Sci. 2016;7(1):45.

9. Chakradhar Raju RV, Chandrasekhar V, Singh CV, Pasari S. Maxillary molar with two palatal roots: Two case reports. J Conserv Dent.2010;13:58–61.
10. Martins JNR, Gu Y, Marques D, Francisco H, Caramês J. Differences on the root and root canal morphologies between Asian and Caucasian ethnic groups analyzed by cone beam computed tomography. J Endod. 2018;44(7):1096–104.
11. Weine FS, Healey HJ, Gerstein H, Evanson L. Canal configuration in the mesiobuccal root of the maxillary first molar and its endodontic significance. Oral Surg Oral Med Oral Pathol 1969;28:419 –25.
12. Rupam T, Nilotpol K, Nitin K, Sandeep G, Sankalp R, Manisha U. Prevalence of additional canals in maxillary first molar in a Nepalese population: A Clinical Study. Am J Biomed Sci & Res. 2019; 1(1):29-31
13. BarattoFilho F, Zaitter S, Haragushiku GA, de Campos EA, Abuabara A, Correr GM. Analysis of the internal anatomy of maxillary first molars by using different methods. J Endod. 2009;35(3):337-42.