ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

RARE CASE OF 2 PALATAL ROOTS IN MAXILLARY 1ST MOLAR: A CASE REPORT

Vandekar Mansi
MDS, Professor & HOD, D.Y. Patil University School of Dentistry, Nerul, Navi Mumbai.
Mansi.vandekar@dypati.edu

Kulkarni Radhika Navare, MDS
(MDS,PrivatePractitioner)[D.YPatil University,School of Dentistry,Navi Mumbai]
Radhika_navare@yahoo.co.in

Toprani Nikita,MDS,
Department of Conservative Dentistry and Endodontics
D.Y Patil School of Dentistry, Navi Mumbai
Nikita.toprani@dypatil.edu

Chaudhari Sayali, MDS
Post-graduate, Department of Conservative Dentistry and Endodontics, D. Y Patil School of Dentistry, Navi Mumbai, Maharashtra, India
chaudharisayali06@gmail.com

Pawar Hitesh, MDS.
Senior Lecturer Department of Conservative Dentistry and Endodontics D.Y Patil School of Dentistry, Navi Mumbai
Hitesh.pawar@dypatil.edu

Sharma Shivangi, MDS
Lecturer Department of Conservative Dentistry and Endodontics D.Y Patil School of Dentistry, Navi Mumbai
Shivangi.sharma@dypatil.edu

ABSTRACT

Maxillary molars are surmise to have three roots with three canals but this is not always the case, aberrations in root canal morphology common incidents. Along with primary knowledge of root canal anatomy, a clinician should also have an awareness and understanding of its variations. It is also a requisite for successful endodontic treatment and reduces the chances of failures that

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

might occur in other ways. This is a case report of a rare case of two palatal roots in maxillary first molar.

Keywords: Anatomical variations, two palatal roots, maxillary molar morphology.

INTRODUCTION

According to American Dental Association (ADA) and American Association of Endodontists (AAE) the primary objective of endodontic treatment is to prevent and intercept pulpal/periradicular pathosis and to preserve the natural dentition when affected by pathosis.[(1)] The success of treatment depends on proper cleaning, shaping and filling of the root canal system. However the internal morphology of the tooth is often tricky which greatly influences the endodontic treatment. Hence, inability to detect, debride and obturate all the existing canals is a major cause of endodontic failure. [(2)(3)]

In maxillary first molars, more than 95% of the teeth have three roots—mesiobuccal, distobuccal, and palatal. The most common variation is observed with mesiobuccal root with two or more canals in 56.8% of cases. The palatal root has the lowest occurrence of variation, with a single canal in 99% and a single apical foramen in 98.8% of cases. [(4)] In 1981, Stone and Stroner studied 500 extracted maxillary molars, excluding third molars, and concluded that the palatal root had additional root canals in only <2% of maxillary molars cases. [(5)]

This case report describes the nonsurgical root canal treatment of maxillary first molar with two palatal root canals.

CASE REPORT

A 27-year-old female patient was referred to the Department of Conservative Dentistry and Endodontics with a chief complaint of pain with tooth 16, medical history was non-contributory. No pervious dental history was noted.

Based on clinical, radiographic examination and pulp sensibility test,tooth was diagnosed with symptomatic irreversible pulpitis and endodontic treatment was planned.

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

The patient was given a local anesthetic infiltration with tooth 16 using 2% lidocaine with 1:50,000 epinephrine. Isolation was done with rubber dam. Conventional endodontic access opening was done.

After excavating the coronal pulp and exploring with a DG16 endodontic explorer, three principal root canal orifices - mesiobuccal, distobuccal, palatal and, in addition, a small haemorrhagic point were noted adjacent to the palatal orifice. The conventional triangular access was modified to a trapezoidal shape to improve access to additional canal.

[Figure1].

Based on radiography examination this tooth was categorized according to Christie classification into: Type I

The working length of each canal was estimated by means of an apex locator (Root ZX: Morita, Tokyo, Japan), and confirmed with intra oral periapical radiograph [Figure 2 and 3].

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

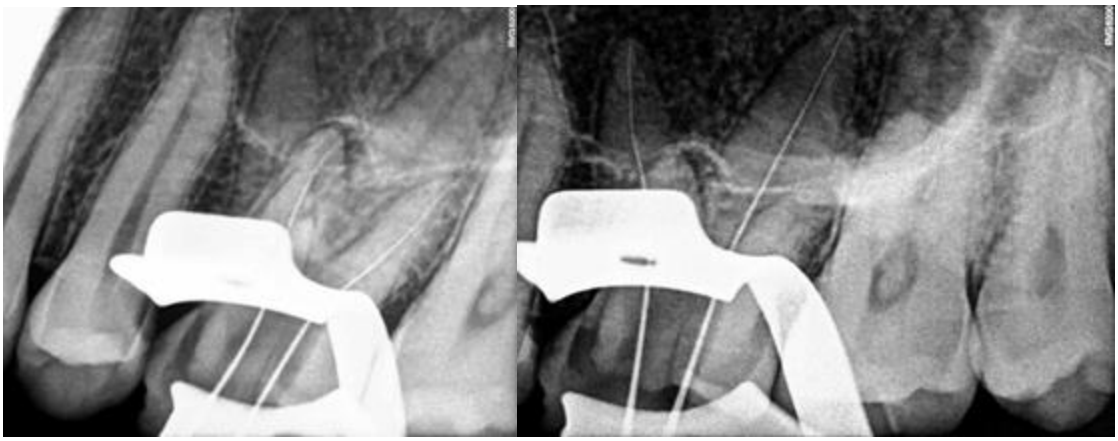

FIGURE 2 AND 3

Biomechanical preparation was performed using the crown down technique with nickel-titanium rotary instruments (Protaper Gold Dentsply Maillefer). Canal was flushed with 3% sodium hypochlorite and saline inbetween instruments. Disinfection was performed by sonic activation of sodium hypochlorite using endoactivator.

All canals were enlarged upto F3 Rotary Protaper Gold. Master cone radiograph was taken [Figure 4 and 5].

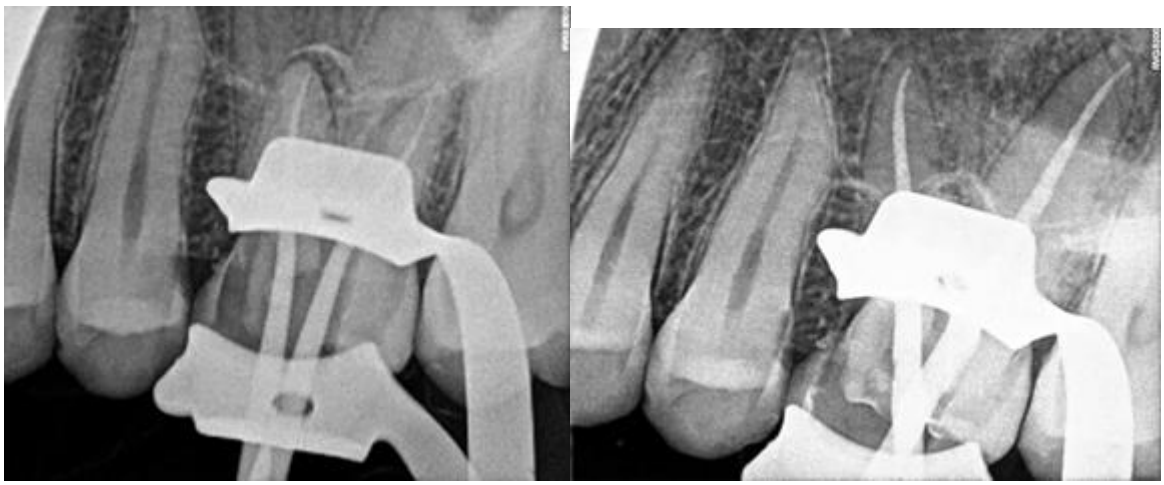

FIGURE 4 AND 5

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

Final irrigation was done with 17% EDTA followed by saline.

Obturation was done with gutta-percha and AH plus resin sealer using lateral condensation technique and tooth was restored with a posterior composite filling [Figure 6 and 7].

DISCUSSION

Incidence:

Commensurately few studies have been conducted on palatal root anatomy, which exhibits less variability. In 1974 Slowey reported maxillary molar with two palatal roots.[6] In 1989 Libfield and Rostein examined 1200 molars and found 0.4% incidence of maxillary molar with four roots.[7] Later in 1994 Benenati reported a maxillary second molar with two palatal roots and groove located in this side of the tooth.[8] Koreans showed only 1.82% of prevalence of two root canals.[9] Mohara et al. reported that in the maxillary first molars, palatal roots had additional root canals in 0.31% of cases and in maxillary second molars, additional root canals in the palatal roots were 0.34% of cases.[10]

Etiology:

Aetiopathogenesis behind formation is unclear. Presence of supernumerary roots and its formation could be related to external factors during odontogenesis. According to study done

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

Curzon et al high prevalence of genetic factor is found to be in linked with presence of additional roots in molar [(11)]

Classification

Two palatal roots are commonly referred to as mesiopalatal root (MP) and distopalatal root (DP). [(12)(13)(14)(15)] Other authors used different terminology including first and second palatal roots. [(16)(17)]

Christie et al in 1991 reported 16 cases of maxillary molar with two palatal roots and classified maxillary molars with two palatal roots, based on the shape and degree of root fusion.[(18)]

According to this classification,

Type I – Buccal roots are often cow-horn shaped and less divergent. It has two widely divergent palatal roots, often long and tortuous.

Type II – Four separate roots, which roots are shorter run parallel and have blunt root apices.

Type III – Root morphology is constricted with mesiobuccal, mesiopalatal, distopalatal canal engaged in one web of root dentin. The distobuccal root seems to stand alone and may diverge to distobuccal.

Types II and type III molars is difficult to differentiate based on radiographic assessment alone and therefore they are usually grouped together. [(19)]

Later in 2002,Baratto-Filho et al. proposed an additional Type IV-Mesiobuccal and palatal roots may be fused in the coronal two-thirds.[(20)]

Carlsen and Alexandersen [(21)] studied 23 second molars and proposed a classification based on side of the crown with which the accessory palatal root is associated:

Radix mesiolingualis: The accessory root has affinity to the pronounced MP part of the crown.

Radix distolingualis: The accessory root has affinity to the pronounced DP part of the crown.

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

Radix mesiolingualis/distolingualis: Both MP and DP roots have affinity to the pronounced MP and DP parts of the crown, respectively

Morphological features:

According to Yang et al the mean distance between palatal canals orifices was significantly larger (2.84 ± 0.50 mm) than that between the orifices of buccal canals' (2.15 ± 0.82 mm).[22] Hence, these teeth usually have a square or trapezoidal access cavity instead of the conventional triangular outline.[23][24]

External radicular aberrations such as palate-gingival groove [14] and cervical enamel pearls [25] have also been reported. Multiple studies states that maxillary molars with two palatal roots show prominent palatal cusps, hence size of crown is relatively larger than normal. [21][27]

Radiographic evaluation is not always reliable as it produces only a 2-dimensional image and results in superimposition. Hence, it is important to use all of the armamentaria to diagnose and treat the entire root canal system. [28] According to previous studies [4] [29] computerized tomography (CT) can be considered as a definitive diagnosis of morphologic abnormalities in the root canal anatomy.

CONCLUSION

Although the prevalence of two palatal roots is not high, it is beneficial to take these variation into consideration during root canal therapy of maxillary molars in order to prevent failures and establish a long-term success.

REFERENCES:

1. Treatment Standards. American association of Endodontists. 2018.
2. Schilder H. Filling root canals in three dimensions. Dent Clin North Am. 1967:723–44.
3. Schilder H. Cleaning and shaping the root canal. Dent Clin North Am. 1974;18(2):269–96.

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

4. B. M. Cleghorn, W. H. Christie, and C. C. Dong, "Root and root canal morphology of the human permanent maxillary first molar: a literature review," Journal of Endodontics, vol. 32, no. 9, pp. 813–821, 2006.
5. L. H. Stone and W. F. Stroner, "Maxillary molars demonstrating more than one palatal root canal," *Oral Surgery, Oral Medicine, and Oral Pathology*, vol. 51, no. 6, pp. 649–652, 1981.
6. Slowey R. Radiographic aids in the detection of extra root canal. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1974; 28:419–25.
7. Libfield H, Rostein I. Incidence of four rooted maxillary second molar: Literature review and radiographic survey of 1200 teeth. *J Endod.* 1989; 15:129–31.
8. Benenanti Maxillary second molar with two palatal canals and a palatogingival groove. *J Endod.* 1994; 11:308–10.
9. Y. Kim, S. J. Lee, and J. Woo, "Morphology of maxillary first and second molars analysed by cone-beam computed tomography in a Korean population: variations in the number of roots and canals and the incidence of fusion," *Journal of Endodontics*, vol. 38, no. 8, pp. 1063–1068, 2012.
10. N. T. Mohara, M. S. Coelho, N. V. de Queiroz et al., "Root anatomy and canal configuration of maxillary molars in a Brazilian subpopulation: a 125-μm cone-beam computed tomographic study," *European Journal of Dentistry*, vol. 13, no. 1, pp. 82–87, 2019.
11. Curzon ME. Miscegenation and the prevalence of three-rooted mandibular first molars in the Baffin Eskimo. *Community Dent Oral Epidemiol.* 1974; 2:130–1.
12. Scarparo RK, Pereira L, Moro D, Grundling G, Gomes M, Grecca FS. Morphologic variations of maxillary molars palatal root and the importance of its knowledge for endodontic practice: A case series. J Contemp Dent Pract 2011;12:138-42
13. Jacobsen EL, Nii C. Unusual palatal root canal morphology in maxillary molars. Endod Dent Traumatol 1994; 10:19-22.
14. Friedman S, Stabholz A, Rotstein I. Endodontic management of molars with developmental anomalies. Int Endod J 1986; 19:267-76.
15. Barker BC, Parsons KC, Mills PR, Williams GL. Anatomy of root canals. II. Permanent maxillary molars. Aust Dent J 1974; 19:46-50.

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

16. Ulusoy OI, Gorgul G. Endodontic treatment of a maxillary second molar with 2 palatal roots: A case report. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007; 104:e95-7.
17. Qun L, Longing N, Qing Y, Yuan L, Jun W, Qingyue D. A case of asymmetric maxillary second molar with double palatal roots. Quintessence Int 2009; 40:275-6.
18. W. H. Christie, M. D. Peikoff, and H. M. Fogel, "Maxillary molars with two palatal roots: a retrospective clinical study," *Journal of Endodontics*, vol. 17, no. 2, pp. 80–84, 1991.
19. Peikoff MD, Christie WH, Fogel HM. The maxillary second molar: Variations in the number of roots and canals. Int Endod J 1996; 29:365-9.
20. Baratto-Filho F, Fariniuk LF, Ferreira EL, Pecora JD, Cruz-Filho AM, Sousa-Neto MD. Clinical and macroscopic study of maxillary molars with two palatal roots. Int Endod J 2002; 35:796-801.
21. Carlsen O, Alexandersen V. Radix mesiolingualis and radix distolingualis in a collection of permanent maxillary molars. Acta Odontol Scand 2000; 58:229-36.
22. Yang B, Lu Q, Bai QX, Zhang Y, Liu XJ, Liu ZJ. Evaluation of the prevalence of the maxillary molars with two palatal roots by cone-beam CT. Zhonghua Kou Qiang Yi Xue Za Zhi 2013; 48:359-62.
23. Alani AH. Endodontic treatment of bilaterally occurring 4-rooted maxillary second molars: Case report. J Can Dent Assoc 2003;69:733-5
24. Ghoddusi J, Mesgarani A, Gharagozloo S. Endodontic re-treatment of maxillary second molar with two separate palatal roots: A case report. Iran Endod J 2008; 3:83-5.
25. Christie WH, Peikoff MD, Fogel HM. Maxillary molars with two palatal roots: A retrospective clinical study. J Endod 1991; 17:80-4.
26. Nakagawa K, Waniishi H, Sugiyama M, Suyama M. On the supernumerary root of human teeth. J Kyushu Dent Soc 1969; 23:498-505.
27. Scarfe WC, Levin MD, Gane D, Farman AG. Use of cone beam computed tomography in endodontics. Int J Dent 2009; 2009:634567.
28. F. J. Vertucci, "Root canal morphology and its relationship to endodontic procedures," *Endodontic Topics*, vol. 10, no. 1, pp. 3–29, 2005.

ISSN:0975-3583,0976-2833 VOL12,ISSUE07,2021

29. F. Baratto Filho, S. Zaitter, G. A. Haragushiku, E. A. de Campos, A. Abuabara, and G. M. Correr, “Analysis of the internal anatomy of maxillary first molars by using different methods,” *Journal of Endodontics*, vol. 35, no. 3, pp. 337–342, 2009.