

A RARE CLINICAL PHENOMENON OF THREE ROOTED MAXILLARY SECOND PREMOLAR: A CASE REPORT

Gupta B,¹ Gupta N,² Thakur S,³ Gupta P,⁴ Jindal S⁵

1. Post Graduate Student, Department of Public Health Dentistry, Swami Devi Dyal Dental College, Barwala, Haryana.
2. Professor & Head, Department of Public Health Dentistry, Swami Devi Dyal Dental College, Barwala, Haryana.
3. Senior Lecturer, Department of Public Health Dentistry, Swami Devi Dyal Dental College, Barwala, Haryana.
4. Reader, Department of Public Health Dentistry, Swami Devi Dyal Dental College, Barwala, Haryana.
5. Senior Lecturer, Department of Public Health Dentistry, Swami Devi Dyal Dental College, Barwala, Haryana.

Abstract

For successful root canal treatment thorough knowledge of anatomical variations in root canal morphology should be known to the clinician and be able to locate all the canals cleaned and shaped and obturated three dimensionally. Even rarer are reported clinical case reports of maxillary second premolar with three separate roots and three canals. This case report describes the endodontic management of maxillary second premolar root having three roots and root canals

Keywords: Maxillary second pre-molar, Root canal treatment, Three canaled

Introduction

For the success of an endodontic treatment, the clinician should have a thorough knowledge of the dental anatomy ie. Morphology of a root canal and its variations. Insufficient knowledge of the morphology of root canal is directly proportional to the challenges faced while carrying out endodontic therapy. One of the primary factors for endodontic treatment failure is iatrogenic missing of extra root and canal and this can start as well as prolong periapical infection. Three rooted maxillary premolars have similar root canal anatomy as that of maxillary molars. The terms mini-molars and radicular have been used to describe three rooted premolars.^{1,2} For second premolar, laboratory studies have verified a lower incidence of three root canals which is between 0.3% and 2%.^{3,4,5} The incidence of three canals in maxillary first and second premolars were 5% and 1%, respectively by Vertucci.⁴

Thus the aim of this paper is to present a clinical case reporting a rare anatomical variation of premolar with 3 roots and 3 root canals.

Case report

A 40-year-old male patient referred from camp came to Department of Public health Dentistry in Swami Devi Dyal Hospital and Dental College with chief complaint of pain upon chewing, hot and cold sensation in his upper back left region tooth. On clinical examination, the tooth 25 was carious and tender on percussion. A Periapical radiograph in relation to the same tooth showed that the tooth 25 was having 3 roots with irreversible pulpitis and also there was widening of periodontal ligament. [Figure 1]

A complete medical and past dental history was taken. Before treatment informed consent of the patient was obtained. Local anaesthesia was given and the tooth was isolated using a rubber dam and coronal access cavity was done, two buccal canals and one palatal canal was located. The pulp was extirpated, working length of all three canals were determined using radiograph. [Figure 2]

All three canals were prepared upto 35 no. file using hand on instrument (k-files) with copious irrigation with 2.5% sodium hypochlorite and saline. Chlorohexidine 0.2% was used as a final irrigation material.



Figure 1: Pre-operative intraoral periapical view of tooth number 25.

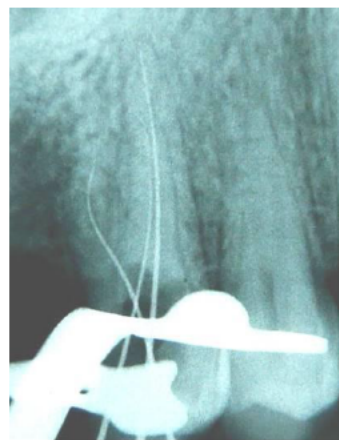


Figure 2: Working length of all the three canals

The root canals were properly dried with absorbent paper points and appropriate gutta percha (GP) mastercones (Dentsply Maillefer, Ballaigues, Switzerland) were selected. Obturation of the root canals were carried out by the cold lateral condensation technique with GP cones along with endomethasone sealer. Restoration of the tooth was carried out using amalgam restoration and patient was advised for crown in the same tooth. [Figure 3]



Figure 3: After completion of obturation

Discussion

The complete knowledge of dental anatomy is far important for the completion of endodontic treatment.⁶⁻¹⁰ Over the years, literature has reported the several teeth with most varied anatomical changes, including premolars.⁶ The difference in anatomy (the number of root canal, its size, shape, divisions) may occur during tooth development stages. Premolars are a group of permanent dentition, and their predecessor are the first deciduous molars. In addition to helping the speech and aesthetics, they also have the basic function of crushing and grinding food. The 2nd premolar has an average length of 21.5 mm, ranging from 17 to 25.5 mm.⁷ In most cases, they feature one root with one canal. A general guideline for the identification of a three-rooted maxillary premolar on preoperative radiograph is that if the mesial-distal width of the mid-root image appears equal to or greater than the mesial-distal width of the crown image, then the tooth most likely has three canals.¹¹ This guideline may act as a good visual clue but is not necessarily absolute. The access cavity for maxillary second premolars is usually oval¹² in the bucco-palatal direction. In three rooted maxillary premolar, the buccal orifices are usually close to each other and are hard to locate. Balleri *et al.*, suggested a T-shaped access outline for three rooted maxillary premolars.¹³ This modification allows good access to the two buccal canals. In such case, these premolar may be called as mini premolar. In the case reported, it could be seen that during coronal access opening, due care has been taken regarding the location of the canals, which was more difficult due to the great loss of coronal structure, in particular at the distal aspect of the tooth.

Conclusion

In today's endodontic practice change in anatomy like changes in shape and number of roots and root canals have become more common than before and occasionally, in a rare form as in a premolar with three roots and three canals. Thus the clinicians should constantly pay attention for variations in tooth anatomy during the course of endodontic treatment so that alterations do not affect any prognosis.

References

1. Bellizzi R, Hartwell G. Radiographic evaluation of root canal anatomy of in vivo endodontically treated maxillary premolars. *J Endod* 1985;11(1):37-9.
2. Carns EJ, Skidmore AE. Configurations and deviations of root canals of maxillary first premolars. *Oral Surg Oral Med Oral Pathol* 1973;36(6):880-6.
3. Hess W, Zürcher E, Dolamore WH. The anatomy of the root-canals of the teeth of the permanent dentition. J. Bale, Sons & Danielsson, Ltd. 1925
4. Vertucci FJ, Gegauff A. Root canal morphology of the maxillary first premolar. *J Am Dent Assoc* 1979;99(2):194-8.
5. Pécora JD, Sousa Neto MD, Saquy PC, Woelfel JB. In vitro study of root canal anatomy of maxillary second premolars. *Braz Dent J* 1992;3(2):81-5.
6. Atieh MA. Root and canal morphology of maxillary first premolars in a Saudi population. *J Contemp Dent Pract* 2008;9(1):46-53.
7. Leonardo MR. Endodontia: tratamento de canais radiculares: princípios técnicos e biológicos. Sao Paulo: Artes Medicas; 2005. 1491 p.
8. Lopes HP, Siqueira Jr JF. Endodontia, Biologia e técnica. Rio de Janeiro: Guanabara Koogan; 2004. 964 p.
9. Soares JA, Leonardo RT. Root canal treatment of three-rooted maxillary first and second premolars – a case report. *Int Endod J* 2003;36(10):705-10.
10. Woodmansey KF. Endodontic treatment of three-rooted maxillary first premolar: A case report. *Gen Dent* 2006;54(6):420-4.
11. Sieraski SM, Taylor GN, Kohn RA. Identification and endodontic management of three canalled maxillary premolars. *J Endod* 1989;15(1):29-32
12. Krapež J, Fidler A. Location and dimensions of access cavity in permanent incisors, canines, and premolars. *J Conserv Dent* 2013;16(5):404-7
13. Nahmias Y, Rampado ME. Root-canal treatment of trifid crown premolar. *Int Endod J* 2002;35(4):390-4.

Corresponding Author

Dr. Bhavna Gupta

Post Graduate Student,
Department of Public Health Dentistry,
Swami Devi Dyal Dental College,
Barwala, Haryana, INDIA.
Email Id – bhavnagupta801@gmail.com