



ENDODONTIC MANAGEMENT OF MANDIBULAR FIRST PREMOLAR WITH TRIFURCATION : A CASE REPORT

Endodontic

Dr. Jayeeta Verma* MDS Endodontics, Lecturer, MGMDCH, Mumbai, *Corresponding Author

Dr. Tanvi Satpute MDS Endodontics, Lecturer, MGMDCH, Mumbai,

Dr. Jimish Shah MDS Endodontics, Lecturer, MGMDCH, Mumbai,

Dr. Aditya Shinde MDS Endodontics, Lecturer, MGMDCH, Mumbai,

ABSTRACT

The internal and external anatomy of any tooth must be clearly understood by the clinician for successful endodontic treatment. The mandibular first premolar may pose as an enigma for the clinician. It is generally a single rooted tooth with single canal. However, variations may be seen which should be understood clearly for predictable outcome. This case report highlights a mandibular first premolar with single root canal and three root canals. Thermoplasticized technique of obturation has been used in this case to achieve a 3 dimensional obturation.

KEYWORDS

trifurcation, E & Q Plus obturating system, root canal treatment

INTRODUCTION:

The root canal anatomy plays a significant importance in the successful outcome root canal treatment. Every tooth may be different as regards to the pulpal anatomy and configuration. As a clinician, one must be aware of the various anatomical variations and decide treatment plan accordingly. Various studies done over the years have shown that Mandibular premolars have a deviant anatomy. (1-3) Mandibular premolars may be one of the most difficult teeth in the mouth to treat due to the number of root and root canals and also the small size of the access cavity preparation and visibility.

Several reports have shown that the incidence of one root canal system in mandibular first premolar varies from 69.3% to 86% and two canals varies from 14% to 25.5%.(4-7) The occurrence of three canals has been reported by Vertucci and Zillich et al. to be 0.5% and 0.4%, respectively. (6,7)

The following case report explains the treatment of mandibular first premolar with three root canals.

Case report:

A 25 year old male reported to the Department of conservative dentistry and endodontics with dull pain in the lower left back region of the jaw since one week. The patient reported visiting another private dentist for treatment with the same tooth one month ago. Clinical examination revealed a temporary restoration in relation to #34. The tooth was sensitive to percussion and palpation. There was no mobility and the periodontal status was normal. Radiographic examination revealed a previous access opening done with the tooth.

Following the delivery of local anaesthesia (2% lidocaine and 1:100,000 epinephrine), Temporary restoration was removed and access cavity was modified. The canal orifice was widened using Gates Glidden drill no 1-3.(Mani, Japan).

The mesio – buccal and lingual canals were identified using 10 no. k file (Mani, Japan) and working length was determined using Root ZX II (J. Morita, Tokyo, Japan) electronic apex locator and confirmed radiographically. Cleaning and shaping was done using protaper files. (Maillefer Dentsply, USA) in a crown – down method to enlarge the main orifice to the level of the bifurcation to achieve a straight line access. While negotiating the lingual canal, a third disto – buccal was identified. Straight – line access to the disto – buccal was achieved and working length was determined. Complete cleaning and shaping was then completed using the protaper file system. Copious irrigation was done alternately using 5% NaOCl (Vishal Dental Products, Mumbai, India) and normal saline between each instrument. Master cone using gutta percha points (Dentsply, USA) that fit snugly was selected for each canal and tug back was also checked. Since three separate master cones could not be placed in the canal simultaneously, it was decided to

obturate the canals separately. E and Q plus system (Meta Dental Corp., Cheongju, Korea) was used for obturation. the stopper was adjusted to 4 mm short of the working length. The master cone was coated with AH-Plus sealer (Dentsply, USA) and inserted into the canal. The excess gutta-percha was cut using the pen at 1800c. After down packing the three canals, the canals were back-filled with thermoplasticized gutta percha using the E & Q plus gun at 200o C and Down packing of the warm gutta-percha was done with appropriate cold pluggers to obturate the root canal three-dimensionally (3D). Finally the access cavity was sealed by composite restoration and the patient was referred to the Department of Prosthodontics for further treatment.

DISCUSSION:

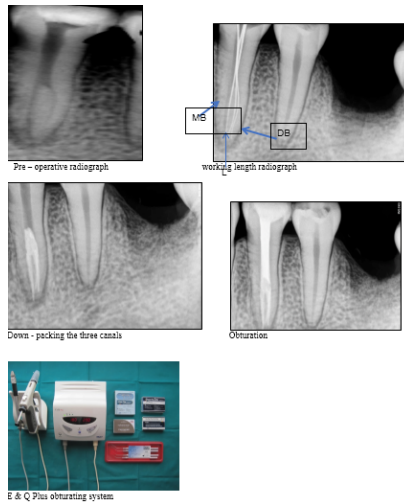
To achieve endodontic success, the entire Root canal complexities must be debrided, disinfected and obturated. Iyer et al (8) reported an incidence of vertucci class V canal configuration in 2.4% of Indian population (Chennai). As a group, mandibular premolars are very difficult to treat; they have a high flare up and failure rate. The root canal system is wider buccolingually than mesio distally. (9) Mesial and distal angled views will often reveal the presence of a bi/trifurcation of the root canal. Optimum opening of the access cavity is absolutely necessary. While scouting the root canal, any obstruction or deflection of the file may indicate the presence of more canals. Thus, it is very important for the clinician to develop a sense of tactile feel and direction with appropriately precurving of the files to detect any aberration.

Despite the existence of complicated dental anatomy, shaping outcomes with nickel-titanium instruments are mostly predictable. Cautious use of rotary or hand nickel-titanium files prepares the canals to a predetermined shape. Use of sodium hypochlorite is considered as the golden standard for irrigation.

The E & Q system (Meta Dental Corp.) is one of the more recent thermoplasticized systems in the market. It takes the best of the other two commercially available and popular thermoplasticized systems, namely SYSTEM B which employs a continuous wave of obturation, and OBTURA II. (10). Thermoplasticized gutta percha technique shows better obturation as compared to single cone lateral condensation technique.

CONCLUSION:

Pre- operative radiographs are essential before initiating any treatment. Though rotary instrumentation has made the treatment protocols easier and quicker for the clinician, the importance of tactile sensation and adequate knowledge of the clinician is of utmost importance. Use of thermoplasticized gutta percha also increases the chances of a more probable outcome.



REFERENCES:

1. Amos ER. Incidence of bifurcated root canals in mandibular bicuspid. J Am Dent Assoc. 1955;50:70-71.
2. England MC Jr, Hartwell GR, Lance JR. Detection and treatment of multiple canals in mandibular premolars. J Endod. 1991;17:174-178.
3. Baisden MK, Kulild JC, Weller RN. Root canal configuration of the mandibular first premolar. J Endod. 1992;18:505-508.
4. Pineda F, Kuttler Y. Mesiodistal and buccolingual roentgenographic investigation of 7,275 root canals. Oral Surg Oral Med Oral Pathol 1972;33:101-10.
5. Green D. Double canals in single roots. Oral Surg Oral Med Oral Pathol 1973;35:689-96.
6. Zillich R, Dowson J. Root canal morphology of mandibular first and second premolars. Oral Surg Oral Med Oral Pathol 1973;36:738-44.
7. Vertucci FJ. Root canal morphology of mandibular premolars. J Am Dent Assoc 1978;97:47-50.
8. Iyer Vidyaa Hari, Indira R, Ramchandran S, Srinivas R. Anatomical variations of mandibular premolars in Chennai population. Ind J Dent Res 17(1): 7-10, 2006
9. Desai L, Vijaykumar L, Shiraguppi S, Jaggi S. Mandibular second premolar with three canals: A Case Report. Journal of the International Clinical Dental Research Organization 2011; 3(2): 68-70
10. Kapoor v, Singh H, Bansal R, Paul S. Qualitative and Quantitative Comparative Evaluation of Sealing Ability of Guttaflow, Thermoplasticized Gutta Percha and Lateral Compaction for Root Canal Obturation: A Cohort, Controlled, Ex-Vivo Study OHDM - Vol. 12 - No. 3 - September, 2013