|| Print ISSN: 2589-7837 || Online ISSN: 2581-3935 ||
International Journal of Medical Science and Diagnosis Research (IJMSDR)
Available Online at www.ijmsdr.com
PubMed (National Library of Medicine ID: 101738825)
Volume 3, Issue 7; July: 2019; Page No. 130-132
Original Research Article
crossref DOI: https://dx.doi.org/10.32553/IJMSDR/v3i7.29

ROOT CANAL TREATMENT OF MAXILLARY FIRST MOLAR WITH FOUR CANALS- A CASE REPORT

Dr. Anil K Tomer[1], Dr. Artika Gupta[2], Dr. Anila Krishna Saxena[3], Dr. Akankshita Behera[4], Dr. Nitish Mittal[5], Dr. Hysum Mushtaq[6]

[1]Professor and Head, Department of Conservative Dentistry and Endodontics, Divya Jyoti, College of Dental Sciences and Research, Modinagar, Ghaziabad

[2,3,4,5,6] Post Graduate Students Department of Conservative Dentistry and Endodontics, Divya Jyoti, College of Dental Sciences and Research, Modinagar, Ghaziabad

Conflicts of Interest: Nil

Corresponding author: Dr. Anil K Tomer

Abstract:

Purpose of this case report was to emphasize the importance of understanding the root canal anatomy and its variations for successful endodontic treatment. Occurrence of second mesio buccal canal (MB2) is a frequent finding in maxillary molar. Maxillary first molar have mesiobuccal (MB2) orifice located palatally but adjacent to mesiobuccal orifice. Failure to locate these extra canals will result in endodontic failure. This case report presents the detection of eccentrically placed mesiobuccal canal (MB2) canal in the maxillary first molar. Conventional diagnostic aids like radiographs play an important role in detecting the complex root canal morphology.

Keywords: Anatomical variations, Maxillary first molar, Mesiobuccal canal.

Introduction:

Knowledge about normal root anatomy and its aberrations is essential to achieve success in endodontics. Maxillary first molar show considerable anatomic variation and abnormalities with respect to the number of roots and root canals. Maxillary first molar usually have three roots and three root canals and are one of the most commonly treated teeth in endodontics.

Maxillary molars are known to have a fourth canal (Mesiobuccal second) located in the mesiobuccal root. Failure to detect a missed canal influences the prognosis of the treatment because of the accumulation of debris, bacteria which contaminate the canal which affects the periodontal condition of the tooth.

Weine et al. observed that failures related to the mesiobuccal root of maxillary molars affect the success of endodontic therapy and also found that teeth with a fourth canal occurred more frequently that those with three canals (51.5% versus 48.5%).

Endodontically retreated teeth were found to contain more undetected MB2 canals than first-time treated teeth suggest that failure to treat existing MB2 canals leads to a poorer prognosis. The purpose of this article is to present a case report of maxillary first molar, in which an extra canal in the mesiobuccal root were located using visual and magnifying devices, followed by endodontic treatment.

CASE REPORT

A 21 year old male patient reported to the department of conservative dentistry and endodontics with a chief complaint of continuous pain in upper left back tooth region for past 1week. Patient also complained of episodes of sensitivity to cold in the involved tooth.

Upon intraoral examination, it revealed the presence of deep carious lesion of the left first maxillary molar. Tender on percussion was present. No fistula and sinus tract was seen. Radiographic examination showed radiolucency involving enamel, dentin and pulp. Hence a diagnosis of symptomatic irreversible pulpitis with apical periodontitis was made (Figure1).

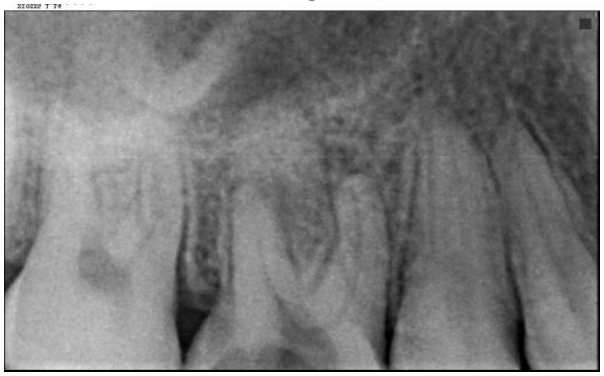

Figure 1: Pre-operative radiograph of 26

Tooth was anesthetized and root canal therapy was initiated under rubber dam isolation. The pulp chamber was deroofed, and a trapezoidal shaped access opening was obtained. Examination of the pulp floor with endodontic explorer revealed three canals mesiobuccal(MB), distobuccal(DB) and palatal(P). Exploration of the groove which was present between the mesiobuccal (MB) and palatal(P) canal resulted in the detection of the extra mesiobuccal canal approximatelty 1-1.5 mm away from the MB1 orifice ,with the help of small sized instruments (6, 8, 10 Mani K-files) the canal was negotiated. Working length was determined (Figure 2).

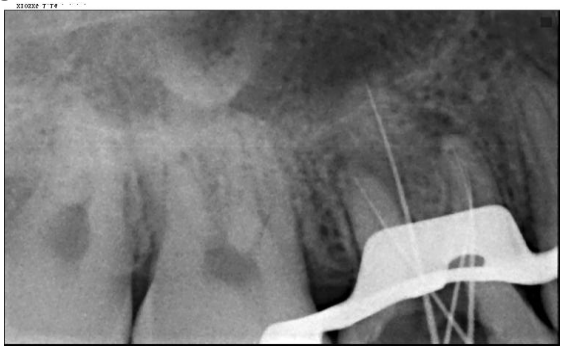

Figure 2: Working length determination

Cleaning and shaping was done using HYFLEX EDM, mesiobuccal (MB), distobuccal(DB), palatal (P) was prepared upto 25,0.06 while MB2 was prepared upto 25,0.04 using crown down technique. Irrigation was performed using normal saline, 2.5% sodium hypochlorite solution, and 17% EDTA , 2% chlorhexidine digluconate was used as the final irrigant . Canals were dried using absorbent paper points and master cone radiograph was taken to check the apical fit in all four canals (Figure3). Finally the canals were obturated with gutta percha and AH plus sealer (Dentsply, Detrey, Konstaz,Germany) using monocone obturating technique. Post endodontic restoration was done (Figure 4)

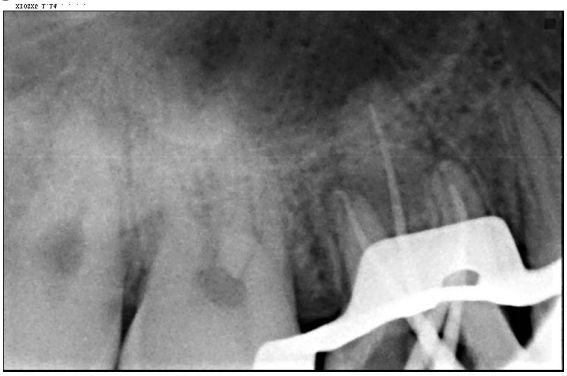

Figure 3: Master cone

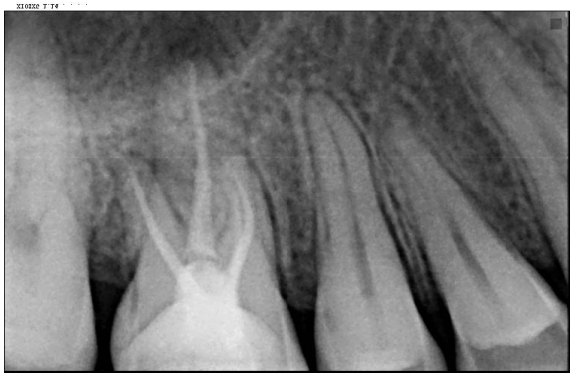

Figure 4: Post- Operative Radiograph

DISCUSSION

In today's clinical scenario a tooth is considered normal even if variation occurs in the anatomy of roots. It is therefore responsibility of endodontists to locate and treat the canals. An inability to locate canals may be a major cause of the failure of root canal treatment. The presence of patent furcal, lateral and accessory canals are the portals of entry and exit between the root canal space and periodontal ligament.

The MB2 canal is challenging to negotiate .Maxillary 1st molar usually contains 3 roots and three canals. Usual anatomical variation is presence of extra canal in mesiobuccal root. According to studies done by James Wolcott et al[5] more incidence of finding this accessory canal in retreatment cases compared to initial treatment indicating main reason of endodontic treatment failure. According to Weine one of the causes of endodontic failures in maxillary molars is the lack of locating the second mesiobuccal canal and the subsequent absence of its debridement and obturation. [7] The openings of MB2 canals are localized on an imaginary line between the MB1 and palatal orifice.

When an attempt is made to instrument MB2, the tip of the file tends to catch against the mesial wall of the canal, preventing apical progress. This is because MB2 canal is smaller and usually narrower than MB1.

Traditionally, the MB root of the maxillary first molar is most investigated root. In 1984, in his classic paper, Vertucci gave classification of root canal system. He found that maximum variations occurred in MB root of maxillary first molar which had two canals. The third canal in MB root is a rare phenomenon and is not reported much.

Apart from preoperative radiographs of varying horizontal angulations, various intraoperative

procedures of detecting extra canals are available. Stropko observed that by scheduling adequate clinical time, by using the recent magnification and detection instrumentation aids and by having thorough knowledge of how and where to search for MB2, the rate of location can approach 93% in maxillary first molars.

CONCLUSION

It is imperative for a dentist to have adequate knowledge of endodontic anatomy and its possible variants to avoid retreatment. Thorough knowledge of these variations is essential prior to initiation of endodontic therapy. Hence the endodontist must have an open mind to accept the possibilities of extra canals for better management and a successful treatment outcome.

REFERENCES

1. P, Rankow HJ. Anatomy of pulp chamber floor. J Endod 2004;30:5-16.
2. Weine FS. Initiating endodontic treatment. In: Weine FS, editor. Endodontic Therapy. 6th ed. St. Louis, MO, USA: Mosby; 2004. p. 106-10.
3. Shetty Aditya, Hegde Mithra, Tahiliani Divya, Joshi Aum, Devadiga Darshana: Study on the efficacy of Iodine based contrast media for interpretation of root canal anatomy. Int. Res. J. Pharm. 4(3), 2013, 207-210.
4. Somma F, Leoni D, Plotino G. Root canal morphology of the mesiobuccal root of maxillary first molars: A micro-computed tomographic analysis. Int Endod J 2009;42:165-74.
5. Wolcott J, Ishley D, Kennedy W, Johnson S, Minnich S, Meyers J. A 5 yr clinical investigation of second mesiobuccal canals in endodontically treated and retreated maxillary molars. J Endod 31, 2005, 262
6. Cleghorn BM, Christie WH, Dong CC. Root and root canal morphology of the human permanent maxillary first molar: A literature review. J Endod 2006;32:813-21.
7. Weine FS. Endodontic therapy. 5th ed. 1996.
8. Bhargavi N, Velmurugan N, Kandaswamy D. The hunt for elusive canals. Endodontology 2005;17:18-23.
9. Rudolf B, Michael AB. Color atlas of dental medicine. Endodontology 2000. p. 51-2.
10. Baratto-Filho F, Fariniuk LF, Ferreira EL, Pecora JD, Cruz-Filho M, Sousa-Neto MD. Clinical and macroscopic study of maxillary molars with two palatal roots. Int Endod J 35, 2002, 796-801.