

The elusive MB 2 canal in maxillary molar- A Case Report

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Abstract: Maxillary first molar can have a mesio-buccal-2 (MB2) orifice located palatally, but adjacent to the mesio buccal orifice. An awareness and understanding of this root canal morphology can contribute to the successful outcome of root canal treatment. This report discusses endodontic treatment of a maxillary first molar with unusual location of second mesio buccal orifice. Conventional diagnostic aids such as radiographs play an important role in assessment of complex root canal morphologies. This paper presents a case report on the occurrence of a second mesiobuccal canal or the MB2 in the maxillary first molar.

Keywords : Anatomical variations, Maxillary first molar, second mesiobuccal canal, MB2

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I. Introduction

The maxillary first molar is one of the largest tooth having the most complex root and canal anatomy .It is important to have adequate knowledge of the root canal anatomy and its variations¹. It is been always suggested that the maxillary molars have an additional canal (MB2) in the mesio buccal root. Developmentally , there is presence of dental cornicle or rounded growth of dentin which is found near the middle of mesial surface of the pulp chamber .Thus the failure to detect a missed canal influences the prognosis of the treatment because of the accumulation of debris, bacteria which contaminates the canal which affects the periodontal condition of the tooth . Weine et al in 1969 has published an article on mesiobuccal² canal , prior to this article virtually all dentists thought the mesiobuccal root of the maxillary first molar had only one canal and the missed canal contributes to the failure of the treatment . The incidence of a second root canal in the mesiobuccal root (MB2) is 56.8%².Complex root canal anatomies have been conventionally diagnosed by radiographs, which provide sufficient information to the clinician. Although periapical and panoramic radiography produce acceptable details in the mesio-distal direction, the observation of details in the bucco-lingual dimension is inadequate. Hence it is important to take additional radiographs with different angulations³. Elusive “second mesiobuccal” (MB2) canal is one of the biggest mysteries in endodontics. Because it has been found that endodontically retreated teeth contain more undetected MB2 canals than 1st time treated teeth, suggesting that failure to locate, debride, and fill existing MB2 canals leads to a poorer prognosis⁴.

II. Case Report

A 16 year old girl reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of spontaneous toothache in her left back tooth region for 7 days and on elaborating the chief complaint the pain was intermittent in nature, aggravated during mastication and during sleep. The patient's medical history was non-contributory. On clinical examination it revealed the presence of deep carious lesion of the left maxillary second molar tooth number 26 and there was tenderness on percussion , no fistula and sinus tract was seen . On radiographic investigation , the tooth revealed the presence of radiolucency involving enamel, dentin and approximating the pulp .Hence a diagnosis of symptomatic irreversible pulpitis with apical periodontitis was made (fig 1). The tooth was anesthetized using 2 % lignocaine with adrenaline and was isolated using a rubber dam. Access cavity is prepared using an endo access bur. Once the pulp chamber was deroofed, a shaped access opening was obtained and the cavity was extended to a trapezoidal form . On careful visualization of the floor of the pulp chamber, the dentinal map showed a groove between the palatal and the

mesiobuccal orifices. Careful examination and exploration of the groove with a DG 16 explorer which resulted in the detection of an extra mesiobuccal canal which was roughly about 2-3 mm away from the MB1 orifice and with the help of small sized instruments (6, 8, 10 Mani K-files) the canal was negotiated and The working length was determined with the help of an apex locator and later confirmed using a radiograph, palatal – 23.5 mm , MB 1 – 19.5mm, MB 2 – 19.5 mm , Distobuccal – 19 mm(FIG .2), Cleaning and shaping was done using rotary instruments (Protaper next SX,S1,S2 ,F1,F2) with 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 . and Gates Glidden drills (sizes 3, 2, 1) (fig.3). The canals were dried with absorbent points and the canals were obturated using AH plus sealer and cold lateral compaction of gutta-percha the tooth was subsequently restored (fig 4) .



Fig. 1 Preoperative radiograph of 26

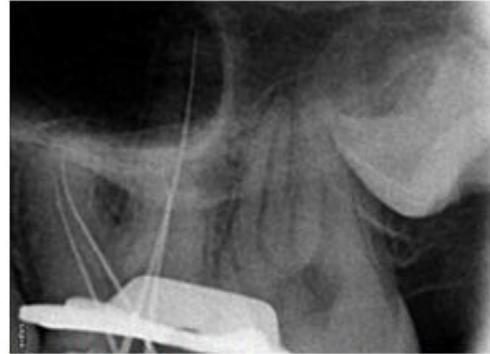


Fig.2 Working length determination radiograph



Fig.3 Master cone fit radiograph.



Fig.4 Post operative radiograph.

III. Discussion

Variations in the root and root canal morphology, especially in multi-rooted teeth, are a constant challenge for diagnosis and management and a more clinically relevant classification of the root canal anatomy was described by Weine. However, there are many individual tooth variations and hence each case should be evaluated separately. Thus all the canals should be cleaned and shaped for a successful treatment .It is generally accepted that the maxillary first molar has 3 roots and 3 canals with an MB2 canal seen in 56.8%–80.9% of the cases⁵ . Owing to its proximity to the MB1, it is often difficult to locate the MB2 orifice. Root canal treatment should be performed under microscopy with the help of an ultrasonic tip. The microscope provides good visibility and the ultrasonic tip can create a deeper trough in the dentin. Use of these devices increases the likelihood of finding MB2 orifice⁶ . The more common use of operating microscope or loupes in recent clinical studies has resulted in an increased prevalence of the clinical detection of the MB2 canal. 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. A rhomboidal access preparation should be made in contrast to the triangular form⁷ . This will allow access to the area just mesial to an imaginary line drawn from the MB orifice to the palatal orifice and will allow the necessary mesially-directed shaping. Often, sub-pulpal grooves, or developmental grooves on the pulpal floor, will provide a roadmap between the funnel-shaped entries to the canals⁸ .Other aids to enhance visualize the missed canals is by using sodium hypochlorite , staining the chamber with methylene blue dye, transillumination, the use of sharp explorers, location of bleeding points known as Red test , White line test in cases of necrotic pulp , dentin dust frequently moves into the anatomical spaces like orifice , fins , isthmus

when performing ultrasonic procedures without water which serves as a road mapping detecting MB 2 canals and horizontally angulated preoperative radiographs⁹. An indication of the MB2 orifice may also be a discolored dot lingual to the MB canal. Once this dot is identified, careful planing of the mesial wall of the chamber may reveal the mesial course of the MB2 canal just before it courses apically¹⁰. After locating the MB2 orifice, use of long-shanked small round burs or different sizes ultrasonic ditching tips inclined mesially will allow an “unroofing” of the overlying calcified tissue¹¹.

IV. Conclusion

It is generally accepted that a major cause for failure of root canal therapy is an inability to recognize the presence of, and to adequately treat, all of the canals in the root canal system. Therefore, it is worthwhile to put the time and effort into properly locating and treating these canals in an attempt to increase the prognosis of endodontic therapy in maxillary molars.

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