



MB2 CANALS A SCRUPLE IN ENDODONTICS: A CASE REPORT

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Conflicts of Interest: Nil

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Abstract:

The success of endodontic treatment depends on the dentist's knowledge about root canal morphology and its possible anatomic variations. According to Ingle, occurrence of accessory canals in the mesiobuccal root of maxillary first molar is (91.1%), more than that of maxillary second molars (71.1%). Failure to locate these extra canals may result in endodontic failure. This article presents case reports of maxillary first molar, in which an extra canal in the mesiobuccal root was located using visual, tactile and magnifying devices, followed by endodontic treatment of the same using single cone technique.

Introduction

An important prerequisite for successful endodontic treatment is the recognition of variations in the root canal morphology. Inadequate knowledge about the canal morphology and missing root canals results in failure of root canal treatment. The alterations in root canal morphology could be a result of ethnic background, age and gender of the population under study. A thorough knowledge of the root canal anatomy is a basic prerequisite for successful completion of the endodontic treatment. Awareness and understanding of the presence of unusual external and internal root canal morphology contributes to the successful outcome of the root canal treatment. Maxillary molars are known to have an additional canal (MB2) in the mesio buccal root. The occurrence of second mesiobuccal canal is a common variation. Weine (2004) stated that frequent failure of endodontic treatment in maxillary first permanent molar teeth was likely due to the failure to locate and fill the second mesiobuccal canal. Wolcott et al, have shown that failure to find and treat existing MB2 canal will decrease the long-term prognosis.

Stropko conducted a study on 1096 maxillary first molars over an 8-year period and concluded that MB2 canals were found in 93% and 73.2% of first molars with and without the use of surgical operating microscopes. Somma et al, studied the root canal morphology of 30 extracted human maxillary first molars with the aid of micro CT and concluded that

the mesio buccal root canal anatomy was complex, with incidence of MB2 root canals, isthmuses, accessory canals, apical delta and loops. 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.

CASE REPORT

A 23 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 first 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).

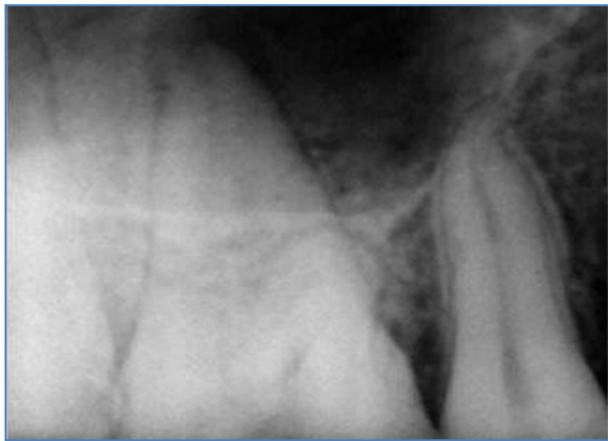


Figure 1: PREOPERATIVE RADIOGRAPH

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 – 22.5 mm, MB 1 – 19.5mm, MB 2 – 19.5 mm, Distobuccal – 20 mm. fig 2



Figure 2: WORKING LENGTH DETERMINATION RADIOGRAPH

Cleaning and shaping was done using rotary instruments Hyflex EDM 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. 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 done. (fig).3



Figure 3: MASTER CONE RADIOGRAPH



Figure 4: OBTURATION RADIOGRAPH



Figure 5: POST ENDORRESTORATION RADIOGRAPH

DISCUSSION

The MB2 canal is challenging to negotiate. The canal has a marked incline immediately apical to its orifice in the coronal 1-3 mm. 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 progress¹. This is because MB2 canal is smaller and usually narrower than MB1. After locating the MB2 orifice, inclining the dental handpiece to the distal, as far as the access preparation permits us to enter the first few millimeters of this overlying "roof" of calcified tissue to be safely eliminated. After this "refinement" of the access preparation, a more desired straight line access can be achieved. Sometimes, the MB2 lies in the same orifice as MB1². When there was a shared or common orifice, many times the opening was more oval in shape.

Stropko conducted a study on 1096 maxillary first molars over an 8-year period and concluded that MB2 canals were found in 93% and 73.2% of first molars with and without the use of surgical operating microscopes³. Somma et al, studied the root canal morphology of 30 extracted human maxillary first molars with the aid of micro CT and concluded that the mesio buccal root canal anatomy was complex, with incidence of MB2 root canals, isthmuses, accessory canals, apical delta and loops.

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 separately⁴. 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 cases. Owing to its proximity to the MB1, it is often difficult to locate the MB2 orifice⁵. 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 orifice. 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.

CONCLUSION

Apart from preoperative radiographs of varying horizontal angulations, various intraoperative

procedures of detecting extra canals are available. They may be adequate access widening for enhanced visualization, careful observation and exploration of the dentinal map, looking for bleeding spots and uncovering calcifications from the chamber floor. Few other investigations also help in identification of MB2. The Champagne / bubble test with warmed 2.6% NaOCl and observed under magnification, staining the chamber with 1% methylene blue and ophthalmic dyes are used to trace and locate canals. Fibre-optic transilluminations are used to locate the developmental line between the MB1 and MB2 orifices, a computed tomography can also help in identifying an extra canal MB2 canal.

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