

The Chamber of Secret - Maxillary First Molar with Second Mesio Buccal Orifice: Case Report

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ABSTRACT

Aim: To present case of maxillary first molar with second mesio buccal orifice.

Case Description: The occurrence of second mesiobuccal canal is a common morphological variation. Failure to locate and treat the MB2 canal decreases the long term prognosis of the treatment. The clinician should be astute enough to identify the presence of unusual numbers of roots and their morphology for successful endodontic treatment.

Conclusion: Usually this additional canal is located adjacent to MB1. Adequate knowledge of morphological variations is essential for optimal treatment.

INTRODUCTION

Accurate diagnosis and successful endodontic therapy is always a challenge due to the complexity of the root canal morphology. Therefore a thorough knowledge of root canal anatomy is necessary [1]. Awareness and understanding of the presence of unusual root canal morphology contributes to the success of the root canal treatment. Maxillary molars are known to have an additional canal (MB2) in the mesio buccal root [2]. The occurrence of second mesiobuccal canal is a common morphological variation. Failure to locate and treat the MB2 canal decreases the long term prognosis of the treatment. 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 [3]. Wolcott et al, have shown that failure to find and treat existing MB2 canal will decrease the long-term prognosis [4,5].

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[6]. Corcoran et al reviewed MB2 location in clinical cases by three endodontic residents. The junior resident located the MB2 canal in 37% of 78 first molar and 46%, while senior residents located the MB2 in 62% of 82 first molar and 63%[7]. 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 [8].

The present case report describes a case of a maxillary first molar with MB2 orifice located adjacent to the mesiobuccal canal.

CASE REPORT

A 26-year-old female patient reported with a chief complaint of continuous and radiating pain in relation to right maxillary first molar for several days. On clinical examination, the patient's oral hygiene was good. Dental examination revealed a right maxillary first molar with a recurrent carious lesion beneath previously restored tooth. The patient also complained of episodes of sensitivity to hot and cold in the involved tooth. Clinical diagnosis was irreversible pulpitis. A preoperative radiograph was obtained [Figure 1]. After detailed clinical and radiographic examination, the right maxillary first molar

was prepared for endodontic therapy. After administration of local anesthesia, tooth was isolated with a rubber dam and a conventional endodontic access opening was made [Figure 2]. After removing pulp tissue located in the chamber, four orifices were observed – palatal, mesiobuccal and distobuccal located in regular locations and an extra orifice was located very close to the mesiobuccal orifice. The conventional triangular access was modified to a trapezoidal shape to locate the additional canal [Figure 3]. The working length of each canal was estimated by means of an electronic apex locator (Root ZX; Morita, Tokyo, Japan) and then confirmed by a radiograph [Figure 4].



Figure 1: Pre operative IOPA showing recurrent caries #26



Figure 2:-Intra oral photograph showing the access opening with four orifices with rubber dam in relation to #26



Figure 3:- Intra oral radiograph showing working length in relation to # 26



Figure 4:- Intra oral radiograph showing obturated canals in relation to # 26

Pre-operative radiograph and working length radiograph suggested that the instrument in the extra canal was an MB2.

At the next visit, the canals were initially instrumented with #15 nickel titanium files (Dentsply Maillefer) under irrigation with 5% sodium hypochlorite and 17% EDTA. Cleaning and shaping of the canals was done by using hand nickel titanium Protaper file system (Dentsply, Maillefer, USA), with a crown-down technique similar to that described by Saunders [9]. The canals were obturated with esin sealer (Dentsply Maillefer, Ballaigues, Switzerland) and gutta-percha points using lateral condensation technique. The access cavity was then restored with posterior composite filling (P60; 3M Dental Products, St. Paul, MN).

DISCUSSION

The root and root canal morphology of teeth varies greatly. Majority of endodontic literature describe the maxillary first molar as having three roots and four root canals, with two canals in mesiobuccal root. In most of the teeth, the location of MB2 orifice opening is usually found mesial to an imaginary line between the MB1 and palatal orifices, and at about 2 to 3 mm from the MB1 orifice. Tachibana concluded that applicability of computed tomography (CT) for endodontics allowed the observation of the morphology of the root canals, the roots, and the appearance of the tooth in every direction [10]. Gurmeet Singh et al, have used SCT for the confirmatory diagnosis of morphological aberrations in the root canal anatomy [11]. In the present case, working length radiograph revealed that the orifice was that of MB2 canal. Of all the canals in the maxillary first molar, the MB2 can be the most difficult to find and negotiate in a clinical situation. Instrumentation of this tooth, especially with respect to the mesiobuccal root, can be complicated. Failure to detect and treat the second MB2 canal system will result in a decreased long-term prognosis. 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 [12].

CONCLUSION

MB2 in maxillary first molar is a frequently encountered during root canal treatment. Usually this additional canal is located adjacent to MB1. Adequate knowledge of morphological variations is essential for optimal treatment. Such aberrant location and confirmation were possible with high quality radiographs and keen clinical examination. The use of non-invasive and advanced gadgets such as CBCT significantly increases the success rate.

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