

Endodontic Management of Maxillary Third Molar with MB2- A Case Report

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Abstract:

The endodontic treatment of maxillary third molar often poses a challenge even to an experienced endodontist because of their most posterior location in the dental arch, aberrant occlusal anatomy and abnormal root canal configuration and eruption patterns. Owing to these anatomical limitations, their extraction remains the treatment of choice for many clinicians. As we know, retaining every functional component of the dental arch is of prime importance in contemporary dental practice. This clinical case report aims to discuss the endodontic treatment of maxillary third molar with MB2 root canal.

Keywords: Endodontic treatment, Maxillary third molar.

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INTRODUCTION

Despite the increased awareness amongst the patients, maxillary third molars always are prone to develop tooth decay owing to their most inaccessible location in the arch and wrinkled occlusal anatomy which would favour the accumulation of the plaque and interfere with optimum cleaning. Besides, they usually have the abnormal eruption patterns, which also make them susceptible to dental decay. Owing to these complications, the extraction of the third molar is the usual choice for all practitioners unless the tooth is strategically important. Retaining every functional component of the dental arch, including the third molars, is the principal goal of contemporary dental practice. In certain clinical situations retaining such teeth is even more important if they are to serve as the convenient abutment for fixed prosthesis.

The root and root canal morphology of maxillary third molars show an increased likelihood for aberrations either in number of roots or the canal

configuration. The number of roots in maxillary third molar teeth ranges from one to five and number of encased root canal has been reported from one to six. However, the single, double and three rooted variants, either separate or fused, encasing one to four root canals are considered most common. The internal anatomy of the mesiobuccal (MB) root in maxillary third molars has been investigated more than any other root. However, few studies examined the occurrence of second mesiobuccal canal (MB2) in third molar teeth. In 1999, Stropko evaluated the endodontic treatment of 20 maxillary third molar teeth, and found only 20% of the study subjects having a MB2 in which all of them were joined and ended in a single foramen [1].

CASE REPORT

A 40-year-old female reported to the department of conservative dentistry and Endodontics at MIDSR Dental College and Hospital, with a chief complaint of food impaction and pain in the last right upper molar region. The pain started a month ago and was dull, gnawing in nature with moderate intensity. On

clinical examination, it was observed that the maxillary right third molar had a deep mesioproximal and occlusal caries with an exposed pulp. The tooth was severely tender on percussion and had moderate pain on palpation. Pulp testing with electric pulp tester (Parkell Inc. Edgewood, NY, USA) elicited non-responsiveness from the suspect tooth.

By evaluating the tooth clinically, radiographically and a diagnosis of pulpal necrosis with an acute apical periodontitis was made and an endodontic approach was planned for this tooth. Rhomboidal shape access was made to gain entry to the pulp chamber after administration of local anaesthesia (2% lignocaine with 1:1, 00000 epinephrine). Placement of rubber dam for isolation was not possible owing to poor accessibility. The mesial marginal ridge was infringed upon to achieve enough access to reveal the mesially positioned and mesially inclined MB2 canal. Slow-speed Mueller burs (Brasseler, Savannah, GA, USA) was used with a brushing motion between the MB and the palatal canal orifice to remove the dentinal shelves that overlay the anticipated MB2 canal orifice using intermittent irrigation with 5.2% sodium hypochlorite (NaOCl) solution.

An ultrasonic nonactive tip with active lateral part Start-XTM #2 (Dentsply Maillefer) was introduced at medium speed and with light force along the MB sub-pulpal groove extending palatally from the main MB canal orifice, with continuous water irrigation. MB2 orifice was located. After locating the MB2 orifices, the patency of all the four root canals was checked with #10 K file (Kerr USA). The working length was determined by Root ZX II (J. Morita, Kyoto, Japan) apex locator for all the four root canals and confirmed by a radiograph. The root canals were cleaned and shaped by rotary nickel-titanium ProTaper instruments (Dentsply, Maillefer). The canals were sequentially irrigated using



Figure 1. preop radiograph

5.2% NaOCl and 17% ethylene diamine tetraacetic acid (EDTA) during the cleaning and shaping procedure. Selected master GP were placed in all the canals and a radiograph was taken to evaluate the fit (Fig. 3). The canals were thoroughly dried and were coated with resin-based sealer (Dentsply Maillefer). Obturation was carried out using the ProTaper GP points. Immediate post obturation radiograph showed well obturated root canals. (Fig. 4)

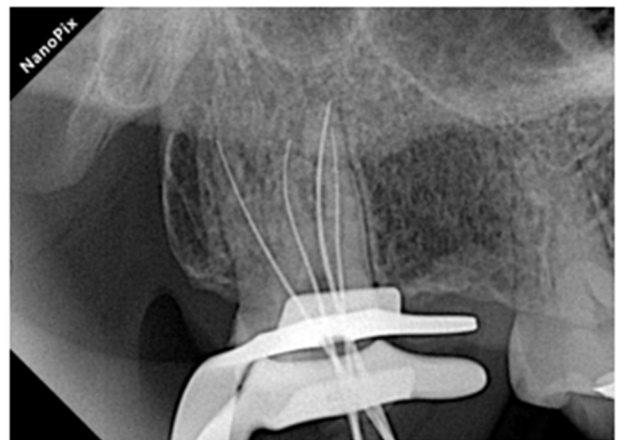


Figure 2. Working length determination

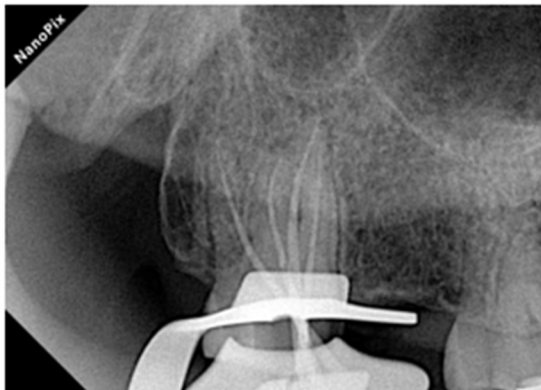


Figure 3. Master cone selection



Figure 4. Post obturation

DISCUSSION

The maxillary third molar has one of the most complex root and canal anatomy. The presence of a MB2 canal in the MB root of the maxillary third molars has been the subject of many discussions and studies. An inability to detect and treat MB2 canal is a reason for endodontic failure in maxillary molars. Endodontically retreated teeth were found to contain more undetected MB2 canals than first-time treated teeth, suggesting that failure to treat existing MB2 canals leads to a poorer prognosis [2]. John J. Stropko 1999 studied the incidence of MB2 in the MB root of

maxillary molars. There was a frequency of MB2 canals 20.0% in the maxillary third molars (U3M). [1]. In the present case report a troughing process was utilized as MB2 orifice was hidden under the thin shelves of the dentin. In middle-aged or older patients, the MB2 is typically located under a layer of dentin that sits on the pulp floor. This layer is called the “dentin shelf.” [3] It was essential to locate most MB2 canals, and this can be accomplished either with burs or ultrasonic instruments. With the advent of newer sets of ultrasonic, the troughing process has become faster and cleaner. In the presented case report specific Mueller burs were used followed by the ultrasonic Start X tip # 2, an MB2 canal scouter for locating the orifice of hidden MB2 canal.

The MB2 orifice were usually found mesial to an imaginary line between the MB1 and palatal orifices and about 2 to 3 mm palatal to the MB 1 orifice. This imaginary line is more appropriately described as an arc with an apogee toward the mesial, following the contours of the mesial surface of the root. In the presented case report the MB2 orifice was located mesial to an imaginary line between the MB I and palatal orifices, and about 2 mm palatal to the MB1 orifice.

The MB2 canal can be very challenging to negotiate even for an experienced endodontist. The MB2 canal usually has a remarkable mesial incline just apical to its orifice in the coronal 1 to 3 mm. When the instrumentation is done for MB2, the tip of the file tends to catch against the mesial wall of the canal, preventing its apical progress. Since the MB2 canal is smaller and usually more calcified than MB1, the problem is accentuated [1]. To facilitate its location and instrumentation, the access has to be rhomboidal in shape to allow the necessary mesially directed shaping in the presented case since the MB2 was hidden and finer as compared to MB1, proper care has been taken to negotiate it with fine 10# K file.

CONCLUSION

The maxillary third molar has one of the most complex root and canal anatomy. It is important that the clinician should have a strong conviction for the presence of an additional MB2 canal in 100% cases until it is proven otherwise.

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