

# Academy of Microscope Enhanced Dentistry

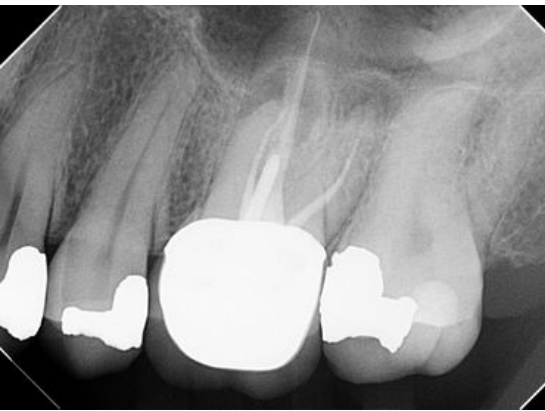
## Techniques for Discovery of the MB2 Canal

Mark Dreyer, DMD, PA

**Dr. Mark Dreyer** is a general dentist whose practice is limited to endodontics, with a career spanning nearly four decades. A 1986 graduate of the University of Florida College of Dentistry, Dr. Dreyer practiced as a general dentist until 2000, when he transitioned to a referral-based endodontic practice. Since then, he has completed more than 25,000 endodontic procedures, all performed using the dental operating microscope. He is a founding member of the International Academy of Endodontics and maintains active membership in the American Dental Association, Florida Dental Association, Central District Dental Association, and the Dental Society of Greater Orlando. Dr. Dreyer currently practices in Winter Garden, Florida. Learn more at [www.drmarkdreyer.com](http://www.drmarkdreyer.com).



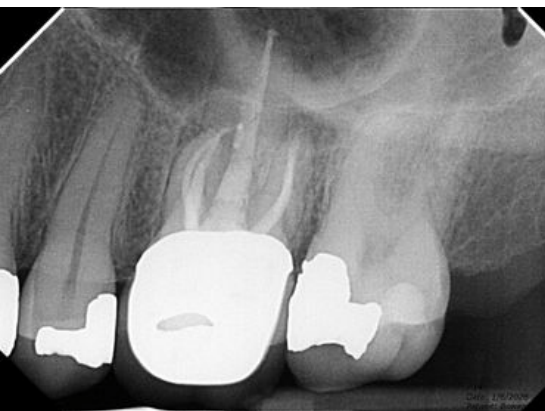
The elusive mesiobuccal second canal (MB2) is a small, frequently missed canal located in the mesiobuccal root of maxillary molars. While notoriously difficult to locate, its discovery is critical for successful root canal treatment. Failure to identify and treat this canal often leads to endodontic failure and the need for retreatment, resulting in additional cost and inconvenience for the patient.



Research has demonstrated that the MB2 canal is present in a high percentage of maxillary first molars and in a slightly lower, yet still significant, percentage of maxillary second molars. This article outlines practical tactics that can be used to locate this elusive canal.

### Prevalence of the MB2 Canal

The most frequently cited classic study is that of Dr. John Stropko, who reported identification of the MB2 canal in 93% of maxillary first molars and up to 60% of maxillary second molars.<sup>1</sup> Since then, numerous studies have been published with varying reported rates of occurrence.<sup>2,3,4</sup>



The author trained under Dr. Stropko, among other clinically astute, microscope-proficient endodontists, and has found that Dr. Stropko's reported 93% incidence closely mirrors his own

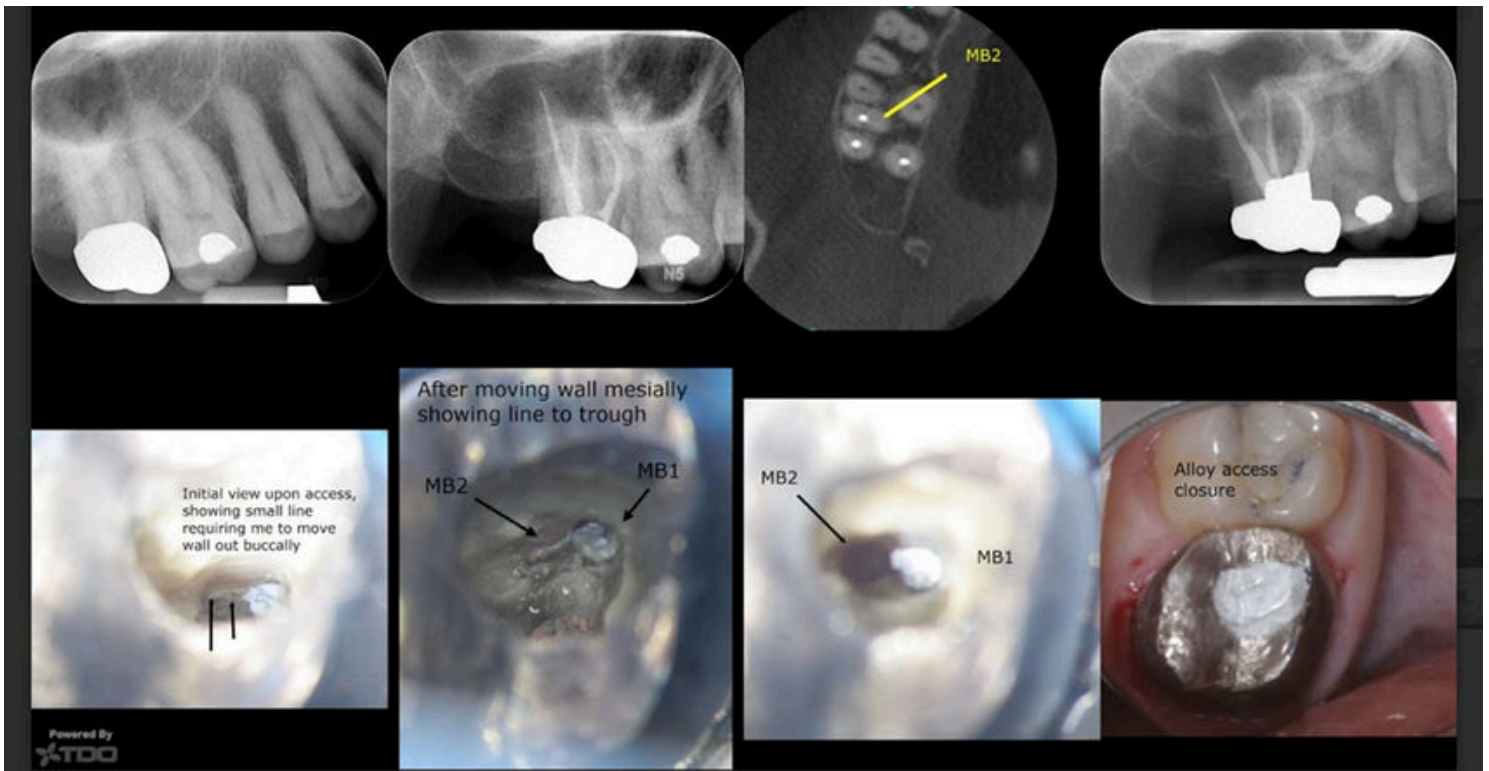
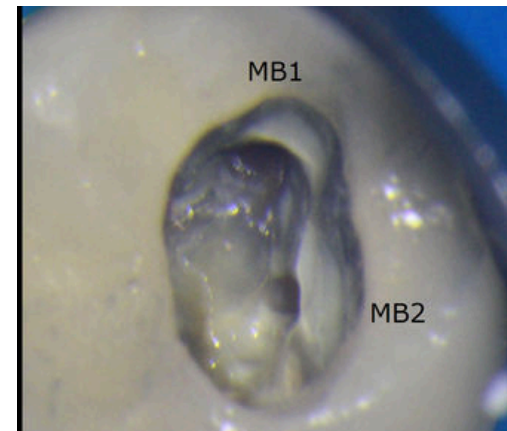
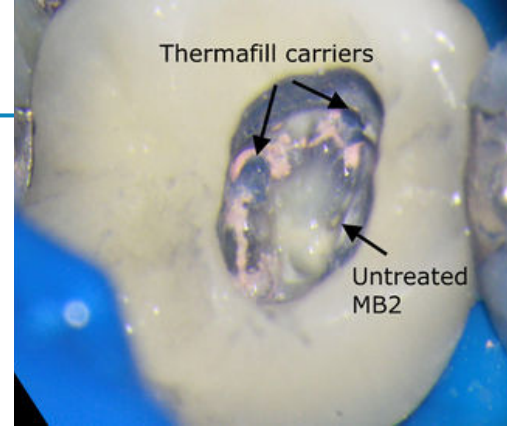
clinical experience. Having limited his practice to endodontics since the year 2000, the author routinely encounters MB2 canals at a similar frequency.

## Clinical Reference & Case Example

For the microscope-proficient dentist, retreatment of maxillary molars due to missed MB2 canals is a common feature of daily practice. The following case was completed only this week in the author's office. In this case, the previously untreated MB2 canal was identified and treated while the other three canal systems were retreated.

Upon removal of the prior core material and post, the untreated MB2 canal was readily evident, and no further expansion of the original access preparation was necessary. However, the author has found that in many cases, the initial access preparation must be judiciously expanded to uncover the MB2 orifice.

In this case presentation, a faint line extending in a palatal direction from the MB1 canal could be visualized. Initially, the MB2 canal was not located, so the other three canals were





obtured and a progress CBCT scan was obtained. The CBCT axial image confirmed an off-centered position of the MB1 canal, indicating the presence of an MB2 canal. Additional apical troughing was then performed, ultimately resulting in successful discovery of the MB2 canal.

## Identifying the MB2 Location

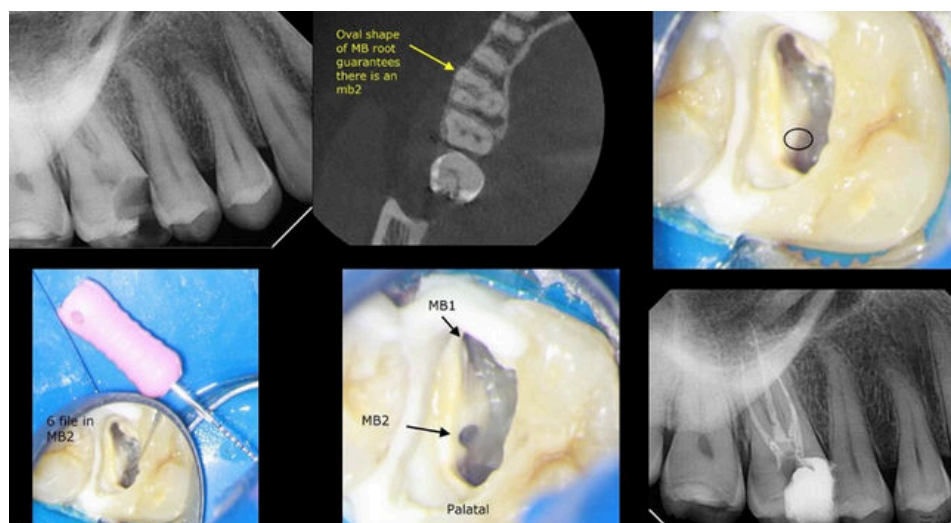
In nearly all maxillary first molars—and to a lesser extent, second molars—a line extending from the MB1 canal can be observed. This line may lead to a distinct MB2 orifice or, in some cases, represent a fin without a separate canal. Often, this line is subtle or not immediately evident, requiring careful removal of dentin from the mesial chamber wall to expose it.

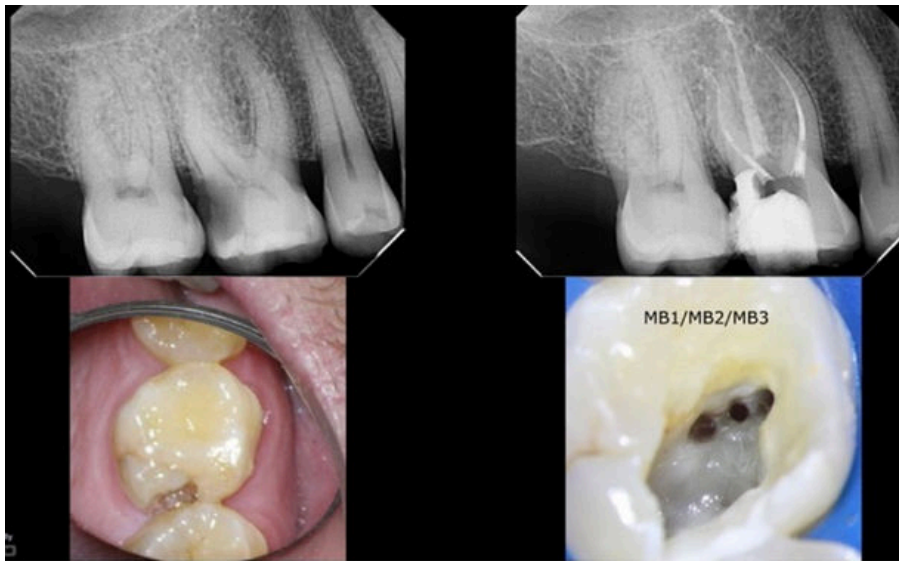
In the case illustrated, the initial photograph showed a faint suggestion of this line. The mesial wall was carefully moved further mesially, fully exposing the line and allowing direct access to the MB2 canal orifice.

## Instrumentation & Techniques

The tools used by the author to move the mesial wall and uncover this line include high-speed tapered diamond burs and ultrasonic (U/S) tips. While the high-speed diamond is efficient, it should only be used by experienced clinicians working under the operating microscope, as excessive dentin removal can occur if caution is not exercised.

An equally effective and often safer approach is the use of ultrasonic tips. Both techniques allow controlled mesial wall relocation and, when necessary, apical troughing to locate the MB2 orifice. The Carr pear tip referenced in this article can be sourced from [www.eie2.com](http://www.eie2.com).





## Role of CBCT Imaging

Careful evaluation of CBCT axial slices can greatly aid the clinical search for the MB2 canal. In rare cases, the MB2 orifice may be located closer to the palatal canal than to the MB1 canal. A clue to this unusual anatomy can be identified by an increased buccal-to-palatal dimension seen on axial CBCT images. The case shown below demonstrates such a presentation.

On occasion, when the MB1 and MB2 canals are separated by a significant distance, a Vertucci Type VIII configuration may be present, with three distinct canal orifices in the mesiobuccal root. Although uncommon, this anatomical variation will be encountered periodically by the careful and experienced clinician.

## Conclusion

Clinicians proficient in the use of the operating microscope are uniquely positioned to deliver the highest quality care to their patients. While this is true across many areas of dentistry, it is particularly critical in endodontics, where visualization directly impacts treatment outcomes.

The author has mentored younger general dentists and endodontists in the techniques required to locate elusive MB2 canals. This training has included co-observation through the microscope and hands-on practice using extracted teeth and the instrumentation described in this article.

It is the author's hope that this article provides practical benefit to clinicians seeking to improve their endodontic outcomes through more consistent identification and treatment of the elusive MB2 canal.

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## References

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