

Endodontic Spotlight

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Introduction

It certainly has been a beautiful summer here in Seattle! I hope you all have gotten outside to enjoy the sunshine. In the next few Endodontic Spotlight publications, we will highlight some classic articles on endodontic anatomy. Having a better understanding of what to expect in the root canal system can help the practitioner ensure that he or she finds all the canals in a tooth. Although we'd love to see referrals for all your patients, we recognize that the majority of root canal therapies are performed by general dentists. Hopefully this series will help you find all the canals more efficiently in the teeth you do decide to treat. We'll start with maxillary teeth first. While maxillary anterior teeth rarely have multiple canals, these two classic studies show that there are often two canals in maxillary premolars and the MB2 is usually present in maxillary molars.

Bellizzi, R, Hartwell, G. Radiographic evaluation of root canal anatomy of in vivo endodontically treated maxillary premolars. J Endod 1985; 11:37-39.

The purpose of this study was to analyze the number of canals in maxillary first and second premolars using an in vivo radiographic approach. Maxillary premolars (514 first and 630 second) that were treated over a period of 13 years were analyzed using the postoperative radiograph and chart notes. The number of canals was determined for each tooth type. The authors found the following distribution of canals:

Number of Canals	Maxillary First Premolar	Maxillary Second Premolar
1	6.2%	40.3%
2	90.5%	58.6%
3	3.3%	1.1%

SUMMARY: Maxillary first premolars have two canals 90% of the time and maxillary second premolars have two canals 60% of the time. Three canals are possible and are more frequently located in first premolars.

Kulild JC, Peters DD. Incidence and configuration of canal systems in the mesiobuccal root of maxillary first and second molars. J Endod 1990;16:311-17.

This laboratory study evaluated maxillary molars to determine the presence and nature of a second mesiobuccal (MB2) canal in the mesiobuccal root. The authors looked at 83 maxillary molars (51 first and 32 second) and attempted to find the MB2 canal via three methods: first the tooth was accessed and only an endodontic explorer was used; next a bur was carefully used to remove the dentinal overgrowth; and finally the teeth were mounted, sectioned and examined with a microscope. MB2 canals were found in 95.2% of teeth, with no significant difference

seen between 1st and 2nd molars (96.1% and 93.7%, respectively). While normal access preparation located the MB2 in just 54.2% of teeth, the use of a bur uncovered another 31.3%, and a microscope illuminated the final 9.6%. Approximately half the time the MB2 canal merged with the main MB (MB1) canal. On average, the MB2 canal was found 1.82 mm lingual to the MB1 canal. Although the MB2 may not always be present or negotiable clinically, this study shows the importance of carefully looking for it by troughing with a bur under high magnification. *SUMMARY: A MB2 canal is present in about 95% of maxillary molars, and is typically located 1.82 mm lingual to the main MB canal.*

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