

Endodontic Spotlight

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Introduction

Happy New Year! In this issue we have our third installment of our series on classic articles on endodontic anatomy. These two studies look at mandibular premolars and incisors. As we will see, although most people think of these teeth as having a single canal, there are frequently multiple canals present. That makes it especially critical to take preoperative radiographs at multiple angles as well as to use small files intraoperatively to explore the lingual and buccal walls to identify if a second canal is present. Depending on the number of canals present, mandibular premolars can be some of the easiest or some of the most challenging teeth to perform root canal therapy. Mandibular incisors are consistently difficult to treat due to the small access and frequency of multiple canals.

Zillich R, Dowson J. Root canal morphology of mandibular first and second premolars. Oral Surg 1973;36:738-44.

The purpose of this laboratory study was to evaluate the root canal anatomy of mandibular first and second premolars. Mandibular premolars were randomly selected from a collection of extracted teeth based on their occlusal anatomy. A total of 1,393 first and 938 second mandibular bicuspid were analyzed by radiographing and sectioning the teeth, and then classified by the number of root canals present or if the apex was open.

Number of Canals	Mandibular First Premolar	Mandibular Second Premolar
1	69.3%	84.5%
2	22.7%	11.7%
3	0.4%	0.4%
Open apex	7.6%	3.2%

They also noted that there is no correlation between the occlusal anatomy and the number of canals found the tooth. Thus it is extremely important to analyze both a straight and angled radiograph to determine if multiple canals exists in mandibular premolars as it can be extremely difficult to find and clean the extra canal. *SUMMARY: Two canals are present in 23% of mandibular first premolars and in 12% in mandibular second premolars.*

Benjamin KA, Dowson J. Incidence of two root canals in human mandibular incisor teeth. Oral Surg 1974;38:122-6.

The purpose of this laboratory study was to determine the percent of mandibular incisors that have two canals. 364 mandibular incisors were evaluated by removing the crown and radiographing the teeth with files in the canals. The number of canals and apical foramen were determined for each tooth and the results tabulated.

Number of Canals/Foramen	Mandibular Incisors
1 canal / 1 foramen	58.6%
2 canals / 1 foramen	40.1%
2 canals / 2 foramen	1.3%

Due to their small size and tendency to frequently have multiple canals, mandibular incisors are consistently some of the most difficult teeth to do. As with mandibular premolars, it is very important to take angled films to evaluate for an additional canal. Additionally, the clinician should carefully explore the lingual wall with a bent file as the lingual canal is usually the one that is missed in this tooth. *SUMMARY: Two canals are found in mandibular incisors 41% of the time.*

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