Radiographic evaluation of the anatomy of endodntically treated maxillary premolars in Iraqi group

Majidah K. Walx Al-Hashimi, B.D.S., M.Sc.*
Kolood N. Safar, B.D.S. , H.D.D., M.Sc.**
Souad. M. Al-Douri, B.D.S., M.P.H.**

Abstract:

In order to determine the number of root canals and the number of apical foramens, 1528 endodontically treated. Teeth were examined. Out of 777 maxillary first premolars 9.1% had one canal, (8.6% of them had one apical foramen and 0.5% had two foramens) and 89.7% had two canals (8.5% had one apical foramen and 81.2% had two apical foramens). Only 1.2% of examined teeth had three canals and three foramens. Out of 751 maxillary second premolars 68.6% had one canal (65.1% of them had one apical foramen and 3.5% had two apical foramens) and 31.4% of teeth had two canals (11.9% of them had one apical foramen and 19.6% had two apical foramens).

Keywords:

Root canal, apical foramens, maxillary premolars.

Introduction:

Before starting any case of successful root canal therapy, the dentist must have a clear idea about the pulp anatomy. It is very important that the dentist should know how many roots, root canals, and possible unusual morphologic features are present in each tooth. Since there are marked variations in the anatomy of human teeth, the literatures show different opinions about the anatomical characteristics of root canal morphology of human first and second premolars (Table 1 and 2).

Table (1): Comparison of Findings: Maxillary First Premolar

Author	No. of Teeth	One Canal %	Two Canal s%	Three Canals %
Hess(1)	260	19.5	79.3	1.2
Mueller (2)	130	1.5	98.5	0
Pinedia & Kuuttler (3)	259	26.2	73.3	0.5
Carns & Skidmore(4)	100	9.0	85.0	6
Green (5)	50	8.0	92.0	0
Vertucci Gegauff (6)	400	26.0	69.0	5.0
Bellizzi & Hartwell (7)	514	6.2	90.5	3.3

*Professor in the Department of Conservative, College of Dentistry, Baghdad University.
**Assistant Professor in the Department of Conservative, College of Dentistry, Baghdad University.

Different percentages of one, two, and three canalled maxillary premolars have been reported [1-9]. In an attempt to report more accurate results, previous studies had used different methods for determining root canal anatomy. This is why the results of most reports cannot be compared with one another.

The purpose of this study is to investigate radio-graphically the root canal anatomy of human maxillary first and second premolars in Iraqi group.

Table (2): Comparison of Findings: Maxillary Second Premolar

Auther	No. of Teeth	One Canal %	Two Canal s%	Three Canals %
Pinedia & Kuuttler (3)	282	55	45	0
Green (5)	50	72	28	0
Bellizzi & Hartwell (7)	360	40.3	58.6	1.1
Vertucci et al. (8)	200	48	51	1

Materials and method:

The material for this study consisted-of 1460 radiographic films, collected randomly from different dental clinics in Baghdad, Iraq. The films were taken for maxillary first and/or second, premolars. A total of 1528 endodontically treated teeth were viewed. There were 777 maxillary first premolars and 751 maxillary second premolars. The age, sex, and race of the subjects were not recorded, however, all of them had completed roots. The radiographs were mounted on an X-ray film viewer and with the aid of magnifying lenses, the root canal systems were evaluated. The number of root canals and the number of apical foramens for each root canal were recorded.

Results:

The radiographs of 1528 maxillary first and second premolars were examined carefully. The summary of the results are shown in Table 3 and 4 which present the sample size, number of root canals, and number of apical foramens for each root canal.

Discussion:

For maxillary first premolars the data revealed. Five morphologic categories of combinations of canals and foramens: 1.1 (8.6%); 1.2 (0.5%); 2.1 (8.5%); 2.2 (81.2 %); and 3.3 (1.2%). Previous studies [1-8] reported that the percentage of single- canalled maxillary first premolars ranged from 1.5 to 26.2%. The present study indicated that 9.1% of endodontically treated maxillary first premolars had a single canal (8.6% of them had one apical foramen and 0.5% had two foramens apical). This percent is comparable to the percentage recorded, by previous studies [4,5] and is much lower than others [3,6]. Overall 697 of 777 (89.7%) maxillary first premolars had two canals (8.5% had one apical foramen and 81.2% had two apical

foramens). Concerning this result many studies [4,5,7] support the findings in this study. Three canals were found in 1.2% of the upper first premolars. It was interesting that, the same percentage was recorded by Hess[1].

Table (3): Maxillary First premolar

	No.	%
Sample size	777	
Teeth with one canal	71	9.1
One foramen	67	8.6
Two foramens	4	0.5
Teeth with two canals	697	89.7
One foramen	66	8.5
Two foramens	631	81.2
Teeth with three canals Three foramen	9	1.2

Table (4): Maxillary Second premolar

	No.	%
Sample size	751	
Teeth with one canal	515	68.6
One foramen	489	65.1
Tow foramens	26	3.5
Teeth with two canals	236	31.4
One foramen	89	11.9
Tow foramens	147	19.6

Bellizzi and Hartwell [7] claimed that 3.3% of maxillary first premolars had 3 canals, which is much higher then 1.2% and they attributed their results to the large sample size they evaluated. Although the sample size in this study was much higher than that of Bellizzi and Hartwell [7] yet a percentage of 1.2 of 3 canalled first premolars was recorded,

For maxillary second premolars the data of this study revealed four morphologic categories of combinations of canals and foramens:1,1(65.1%);1,2(3.5%); 2,1(11.9%); and 2,2 (19.6%).

Overall 515 of 751 (68.6%) maxillary second premolars had a single canal (65.1% had one apical foramen and 3.5% had two foramen). Green[5] indicated that a 72% of the maxillary second, premolars had a single canal which is close to our study result. In the present study two canals were reported in 31% of maxillary second premolars examined (11.9% had one foramen and 19.6% had two foramens apically). Green[5] also reported that 28% of maxillary second premolars had two canals, which is comparable to our findings. On the other hand many studied[3,7,8] reported a much higher incidence of two canals in maxillary

second premolars. The results of this study showed that non of the maxillary second premolars had 3 canals, which is a similar finding to previous studies[3,5].

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