

FREQUENCY OF 2ND ROOT CANAL IN THE MAXILLARY SECOND PREMOLAR IN PATIENTS VISITING TERTIARY CARE HOSPITAL KHYBER COLLEGE OF DENTISTRY (KCD) PESHAWAR

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Abstract

Objective: The aim of this study is to increase awareness among dental surgeons of the possibility of two canals in maxillary second premolar teeth during endodontic treatment that helps to avoid failure of root canal therapy caused by missing one of the main root canal. To determine the frequency of two canals in maxillary second premolar teeth.

Materials & Methods: Study Design: descriptive cross sectional. Study Settings: This study was conducted at the department of Endodontic in tertiary care hospital Khyber college of dentistry (KCD) Peshawar. Total of 149 patients participated in the study between the age 12 to 60 years.

Results: Out of 149 patients 30 (20.13%) have single orifice and single canal, 111 (74.50%) have two orifices and two canals and 8 (5.37%) have single orifice with two canals. In these patients (149) 107 (71.81%) have buccal canal which is very high, and 9 (6.04) have palatal canal and 33 (22.15%) have central canal.

Conclusion: The study concluded that there is a need to increase the practitioners' awareness of the possibility of two canals in maxillary second premolar teeth during endodontic treatment that helps to avoid failure of root canal therapy caused by missing one of the main canal.

Keywords: Frequency, Maxillary, Premolar, Root canal.

INTRODUCTION

Root canal therapy (RCT) is a sequence of treatment in which infected coronal and radicular pulp from a tooth is removed and hermetically sealed to protect from the attack of microorganisms in the future.¹ For the success of root canal treatment, one of the basic requisites is the accurate knowledge of anatomy and morphology of tooth, roots along with number and configuration of canals.² Lack of enough knowledge and improper shaping and cleaning of the canal are major causes of the root canal treatment

failure.³ It is necessary to detect all canals and treat properly because the missing canals go ahead to malfunction of root canal treatment.⁴

The canals system of a tooth root is so complicated especially in premolar and molar that the presence of root and extra canals is a risk factor of missing them and thus failure of treatment.⁵ The second premolar teeth of maxilla have many variations in the morphology, number and configuration of the canal.⁶ It is familiar that some variation in maxillary second premolar is related according to the ethnicity of origin.² The apical portion in the 2nd premolar of the maxilla has many large curvatures when sinus is near to the root.⁷ Beside enough knowledge, there

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are some factors that are necessary for the treatment of endodontic treatment. These factors are root canal anatomy, proper instrumentation skill and use of standard antiseptic solution.⁸ In 38-48% of 2nd maxillary premolar has a single root and canal. In 22% there is a double canal in the single root. In some cases (5-10%) single canal split into two canals which again join in the area of the apical third. Double canals found in double roots in a round about 20% cases.⁹

Various studies on a different population like North American Indian,⁷ Turkish,⁹ and Chinese,¹⁰ with different races and geographical areas showed different canals morphology and number.¹⁰ Some studied demonstrated that 2nd premolar of the maxilla may have one to three canals which may complicate the treatment process.¹¹ In this study, we evaluated the anatomy of 149 patients at the Department of Operative dentistry of Khyber college of Dentistry Peshawar to know the variation in anatomy and number of canals of maxillary second premolars by clinical and radiographical examination.

MATERIALS AND METHODS

2.1 Study Settings:

This study will be conducted in the department of Operative Dentistry in tertiary care hospital Khyber college of dentistry (KCD) Peshawar.

2.2 Study Duration: 4 months (May 2018 to September 2018)

2.3 Study Design: The study was a descriptive cross-sectional study

2.4 Sampling:

2.4.1 Sample Technique: Non probability convenience sampling was used for this study

2.4.2 Sampling Size: the total number of sample sizes was 149 which is calculated by the formula.

$$n=p(1-p)(Z/e)^2$$

Sample Selection

2.4.3 Inclusion Criteria: Those patients were included where endodontic treatment of maxillary second premolars was necessary.

2.4.4 Exclusion Criteria: Patients who were not willing to give consent, were excluded.

2.5 Data Collection Procedure:

The study was conducted at the department of Operative dentistry in Khyber College Of dentistry Peshawar after approval is obtained from the research and ethics committee of the hospital. Consent from all the patients was taken and detailed history along with thorough clinical examinations were carried out while filling in their respective Performa. Necessary radiographs like periapical and orthopantomogram (OPG) were taken.

2.6 Data Analysis Procedure

SPSS version 22 was used for the analysis of data. Results are presented in the form of a bar chart, pie chart and cross tabulation.

RESULTS

In this study, 149 patients were investigated for the frequency of the second canal in maxillary second premolar teeth at Khyber college of dentistry Peshawar. Among these patients 94(63.09%) were male and 55 (36.91%) were female demonstrated in table 3.1.

In this study age range was 15 to 60 in which from 15 to 25 was 64(42.95%), 25 to 40 years patients Were also 64(42.95%) and from 40 to 60 years was 21 (14.09%). Mentioned in table and graph 3.2

We divided the people into two categories I. e Rural and Urban from Rural areas the number of patients was 90(60.40%) and urban was 59(39.60%). It is clearly seen that rural area has less awareness about the treatment of root canal therapy illustrated in table 3.3.

Most of the patients who came for endodontic treatment was having severe pain as a which is 114 (76.51%), the proportion of patients with swelling as a chief complaint was 28(18.79%) then the percentage of patients with tenderness was less which is 7(4.70%) demonstrated in table 3.4.

We divided the canal into three categories that are Single orifice with a single canal, two orifices with canals and two orifices with a single canal. Our data shows that 30 patients (20.13%) have single orifice and single canal, 111(74.50%) have two orifices and two canals and 8(5.37%) have single orifice with two canals which is shown in table 3.5.

For finding and investigation, we divided the

canal into three positions which is Buccal, palatal and central. In the giving population or patients (149) 107 patients (71.81%) have buccal canal which is very high, 9 (6.04) have palatal canal and 33(22.15%) have central canal illustrated in table 3.6.

DISCUSSION

Variation in the morphology of the dental pulp is caused by genetic and environmental

Influence. The canal configuration has clinical as well as biological significance. Very few studies have been done related to the presence of an additional canal in the maxillary second premolar¹⁸ For frequency of the second canal in maxillary second premolar teeth 149 patients were investigated in Khyber college of dentistry Peshawar. Among these patients 94 (63.09%) were male and 55 (36.91%) were female similar to the study of Dr. Mohammad Rizwan nazeer and Rabia Gafoor from Aga Khan University in March 2018.¹¹ The similarity of results may be due to the same demography and ethnical backgrounds.

In this study age range was 15 to 60 in which from 15 to 25 was 64(42.95%), 25 to 40 years patients were also 64(42.95%) and from 40 to 60 years was 21 (14.09%). The age wise range, distribution patients on the living in urban and rural areas, patients chief complaint were not discussed in any study on configuration, number and morphology of root-canals in maxillary second premolar.

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In this study, we divided the root canal into three categories that are Single orifice with a single canal, two orifices and two canals and single orifice with two canals. From these patients, 30(20.13%) have single orifice and single canal, 111(74.50%) have two orifices and two canals and⁸ (5.37%) have single orifice with two canals. Al- Ghananeem et al

evaluated 217 maxillary second premolars for root canal number and configuration and found that 30 teeth (13.8%) were having one root-canal, 54 teeth (24.9%) had two root-canals with single apical foramen, 132 teeth (60.8%) had two root canals having two separate apical foramina, and one tooth (0.46%) had three root-canals with separate apical foramina.² The difference in results could be due to changes in demography and genetic makeup.

Weng et al studied different teeth for morphology and configuration of root canals in which out of 65 maxillary second premolars 18 (27.7 %) teeth had one canal while 47 (72.3 %) teeth had two canals.¹² The difference in results with the present study could be due to a difference in sample size and population because their study was done by the Chinese population.

For convenience, we divided the root canal into three positions which are Buccal, palatal and central. In our data (149) 107 patients (71.81%) have buccal canal which is very high, 9 (6.04) have palatal canal and 33(22.15%) have central canal. Distribution of root canals in maxillary second premolar on the basis of their mesial, buccal and central is not being studied yet.

CONCLUSION

Most of the dentists stated that the maxillary second premolar has one canal which is located centrally. But our study concluded that most of the Patients have two canals in maxillary second premolar. Therefore, the dentist should have basic knowledge of root canal anatomy and should always look for the second root canal when performing a root canal treatment of the maxillary second premolar teeth in order to ensure long term treatment success.⁰

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