ORIGINAL ARTICLE

An Analysis of Root Canal Treatments in Student Clinics of a Saudi University

Mohammad Mustafa[1] **BDS, MDS**

Shahid Mahmood[2] **BDS, MDS**

Zaid A. Al Jeaidi[3] **BDS, SBARD**

ABSTRACT:

OBJECTIVE: To determine the reasons for root canal treatment (RCT) done in the students' clinics of Prince Sattam Bin AbdulAziz University, Alkharj, Saudi Arabia (PSAU).

METHODOLOGY: Information about Root Canal Treatments (RCT) was collected through specially designed forms. The forms were distributed to the 4th year students of the campus of PSAU. The participants were asked to record details of all root canal treatments carried out by them during a period of one academic year (2015-16), counter-checked by the faculty. The data were entered and analyzed using Statistical Package for Statistical Package for the Social Sciences (SPSS), version 22. Frequencies were calculated using simple arithmetical methods.

RESULTS: The data were collected for 202root canal treatments. Irreversible pulpitis (59.9%), necrosis of pulp (22.8%), and previously initiated root canal treatments (13.8%) were the major reasons for RCT.67.6% of the cases had carious exposure.

Only 1% of RCT were carried out due to failed RCT, a majority (60%) of which failed because of short obturation. Pre-Operative Radiographic examinations revealed that in 62.9% of the cases, the periapical tissues were normal, while 22.8% of the radiographs showed an evidence of chronic apical periodontitis.

CONCLUSIONS: Irreversible pulpitis and Necrosed pulp were the most common reasons for initial root canal treatment while short obturation was the predominant reason for failed root canal treatment.

KEY WORDS: Failed RCT, Irreversible pulpitis, Necrosed pulp, Root canal treatment.

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INTRODUCTION

Information on reasons for a treatment in a community is necessary to understand the disease pattern. This information is also useful to determine cost effectiveness of the treatments. In terms of root canal treatment (RCT), several studies have been conducted in developed countries concerning reasons for root canal treatment[1-3]. Some studies are available from developing countries as well[4-8]. However, only two studies have been reported from Saudi Arabia, and these too were reported from King Saud University, Riyadh.[4,6]In recent years, many new dental institutions have been launched in Saudi Arabia. Prince Sattam Bin AbdulAziz University (PSAU), Alkharj is one of the new institutions; only three batches have graduated so far. It is necessary that studies be conducted in new institutions to understand the disease pattern in different areas of Saudi Arabia, as well as the demands for treatments. These studies will help in planning of health facilities in future.

1. Assistant Professor & Head of Endodontic Division, Prince Sattam Bin AbdulAziz University, Alkharj, Saudi Arabia

2. Professor of Restorative Dentistry, Department of Preventive Dental Sciences, Prince Sattam Bin AbdulAziz University, Alkharj, Saudi Arabia

3. Assistant Professor& Chairman, Department of Conservative Dental Sciences, Prince Sattam Bin AbdulAziz University, Alkharj, Saudi Arabia

Corresponding author: "Dr. Shahid Mahmood" < arslan9@hotmail.com >

According to the prescribed dental curricula of Saudi Arabia, endodontic training must be provided to all dental students within five years. A preclinical course is started in the third year requiring students to perform root canals on extracted teeth. Clinical courses follow, with fourth year dental students undertaking education in endodontic treatment tailored to specific requirements. In the fifth year, students are required to complete endodontic procedures as part of a comprehensive dentistry course. In the internship period, students undertake routine root canal therapy as part of their duty.

As there is no study available on reasons for root canal treatment at PSAU; the present study was undertaken. The objective of the study was to carry out an analysis of root canal treatments done in the students' clinics of the 4th year dentistry course to understand the reasons of root canal treatment at PSAU.

METHODOLOGY

Information on root canal treatments (RCT) was obtained through a specially designed form. Information regarding patient age, gender, tooth number, and reasons of the RCT or those of failures was required. The criteria for reasons for RCT were those derived from Saad and Clem, [3]as shown in Table **1**.

Table 1. The criteria used for reasons of root canal treatments.

Necrotic pulp	No response to thermal and electric test
Irreversible pulpitis	Lingering pain and sensitivity after removal of stimulus.
Intentional RCT	For restorative procedures
Retreatment	Failed RCT (requiring retreatment)
Trauma	History of physical injury
Other	reasons other than the above

The forms were distributed to the 4th year students of the PSAU attending during the academic year 2015-16. The participants were asked to register all root canal treatments carried out during a period of one academic year using their routine methods of diagnosis and treatment planning. The faculty was requested to examine the forms submitted by the students to verify the records. Data from the case records were collected and then coded for entry into a database using the Statistical Package for Social Sciences (SPSS), version 22. Frequencies were calculated using routine arithmetical methods.

RESULTS

Information was recorded on 202 RCTs. The majority (98%) of the patients were males while 2% were females. The average age of the patients was 36.9 years (±15.1).

The percentage distribution of reasons and the diagnosis of the pulpal conditions are given in Table **2** and **3** respectively. Irreversible pulpitis (59.9%) was the most common reason followed by necrosed pulp (22.8%). Exposure because of dental caries (67.3%) was the major reason for RCT. The other major reasons were intentional RCT for trauma (5.9 %) and overdentures (4%).

Table 2. Frequency distribution of pulpal diagnosis.

Pulpal Status	Number (Percentage)
Irreversible pulpitis	121 (59.9)
Necrosis of pulp	46 (22.8)
Normal pulp	8 (4)
Root canal previously initiated	28 (13.8)
RCT failure and Recall	3 (1.5%)

Table 3. Frequency Distribution of Reasons for RCT

Reasons	Number (Percentage)
Carious Exposure	136 (67.3)
Pain	7 (3.5)
Trauma	12 (5.9)
Overdenture	8(4)
Failed RCT	3 (1.5)
Short obturation	2 (1)
Overobturation	1(0.5)
RCT previously initiated	28 (13.9)
Recall	2 (1)
Periodontal reasons	2 (1)
Mechanical exposure	1 (0.5)

As shown in **Table 4,** most (54.5%) of the RCTs were carried out in maxillary teeth. The most frequently treated teeth were maxillary Ist and IInd premolars (7.4% each).

In pre-operative radiographs (Table **5**), 62.9% had normal periapical area, while 22.8% showed evidence of

widening of periodontal ligament and were diagnosed as with chronic apical periodontitis. Only 1 case (0.5%) was reported with internal resorption.

Table 4. Distribution of root canal treatments in different sets of teeth.

Teeth	Nos. (percentage)
Maxillary anterior teeth	48 (23.8)
Maxillary premolars (Tooth #15 and 24 most commonly treated; (7.4% each)	46 (22.8)
Maxillary molars	16 (7.9)
Mandibular molars	29 (14.4)
Mandibular premolars	42 (20.8)
Mandibular anterior teeth	21 (10.4)

In pre-operative radiographs (Table **5**), 62.9% had normal periapical area, while 22.8% showed evidence of widening of periodontal ligament and were diagnosed as with chronic apical periodontitis. Only 1 case (0.5%) was reported with internal resorption.

Table 5. Pre-Operative Radiographs (Periapical Status).

Feature	Frequency	Percent
Normal	127	62.9
Chronic apical periodontitis	46	22.8
acute apical periodontitis	28	13.9
internal resorption	1	.5
Total	202	100.0

DISCUSSION

The study has provided a useful information for root canal treatment pattern in the undergraduate clinical program at PSAU. It is hoped that more representative studies would be undertaken in Saudi Arabian the future, which will help in future planning for dental care.

In terms of the gender of the patients, the number of male patients exceeded the number of female patients. In some previous studies,[1,3] the percentage of female patients was higher. PSAU campus caters for male dental students, and therefore is mainly meant for the male patients. Our results matched with a previous study in another Saudi University, where the number of male patients was also higher.[6] It is also important to understand the social setup of Saudi Arabia, where female patients prefer to be treated by the female dentists.

Irreversible pulpitis and necrotic pulp were the most common causes for seeking root canal treatment by the patients. These results are in agreement with the previous studies conducted in Saudi Arabia and elsewhere.[1,3,4,6-8]. However in our study, compared to a previous study in Saudi Arabia,[6] the necrotic pulp was outnumbered by irreversible pulpitis. It may be explained from the fact that the previous study was carried out at King Saud University, where there is a long waiting list. On the other hand, the patients at PSAU, it being a new campus with a lesser patient load, had an immediate access to endodontic clinics. Nevertheless, pulpitis and necrosis of pulp could be considered as is a natural sequelae of untreated dental caries. It is supported by the fact that 67.3% of the patients had carious exposure in this study. This fact is also evident from various epidemiological studies, which have shown that caries is a major dental problem in Saudi Arabia.[9-11]

Similar to the studies reported earlier,[1-3, 6] trauma was a less likely cause for root canal treatments. In addition to the fact that the patients treated in this study were not treated as emergencies, the average age of the patients was 36.9 years, and it has been shown previously that trauma is less likely to occur in this age group.[3]

The frequency of intentional root canal for the purpose of over-dentures was only 4%. It is understandable as every effort is made to maintain healthy teeth, even in the provision of over-dentures. Our results are similar to the previous studies. [3,6]

Very few cases were reported for failure of root canal treatments; it was mainly because of short-obturations, when compared with over obturations. It may be argued that in over-obturation, the canals are cleaned completely and that extruding material provides good apical seal and is well tolerated by periapical tissues.[11]Our sample of failed treatments was so small, so a generalized statement about RCT in Saudi Arabia could not be made. Further investigation is required in this regard.

One interesting feature of pre-operative radiographs worth-noting was absence of peripaical radiolucency in most cases despite carious exposure of the pulp. This presents a diagnostic dilemma. Therefore, the clinical and radiographic examinations may give conflicting results and definitive pulp and periapical diagnosis must be made with great care.

Endodontic treatments are likely to take a significant share of the workload of dentistry in Saudi Arabia, in future.

Therefore, prevention and an early treatment of carious lesions is essential to reduce the need for root canal treatments.

CONCLUSIONS

1) Necrotic pulp and irreversible pulpitis were the predominant reasons for root canal treatment in this study.
2) Most of the cases for necrotic pulp and irreversible pulpitis occurred because of carious exposure.

DISCLOSURE

None declared.

REFERENCES

1. Serene TP, Spolsky VW. Frequency of endodontic therapy in a dental school setting. J Endodon.1981; 7: 385-87.
2. Cyr G, Arvis L, Safavi K, Langeland K. Major etiologic factors leading to root canal procedures. J Endodon. (abstract No. 31) 1985; 11-145.
3. SaadAY, Clem WH. An evaluation of etiologic factors in382 .patients treated in a postgraduate endodontic program. Oral Surg. 1988; 65: 91-3.
4. Al-Yahya AS , SelimHA. The etiology and symptoms of endodontic cases treated in a university clinic in Saudi Arabia. Saudi Dent J.1990; 3: 86-90.
5. Al-Negrish AR. Incidence and distribution of root canal treatment in the dentition among a Jordanian sub population. Int Dent J. 2002; 52: 125-29.
6. Mahmood S, Al-Yahya A, Saad AH,Aha Hussain K. Reasons for root canal treatment in students' and interns' clinics in college of dentistry, King Saud University, Saudi Arabia.J Pak Dent Assoc. 2003; 12: 33-36
7. Lal U, Abidi SYA, Rashid S. Reasons for root canal treatment in the department of endodontics of Fatima Jinnah Dental College hospital, Karachi. Pak Oral Dent J. 23; 2003; 151-52
8. Faisal D, Shah S, Kumar N, Ali SA, Nadia N. Root canal treatment; frequency in department of endodonticin dental colleges of Karachi. Professional Med. 2012; 19: 739-741.
9. Al-Kateeb TL, Al-Marsafi A, O'Mullane DM. Caries prevalence and treatment need amongst children in an Arabian community. Community Dent Oral Epidemiol.1991; 19: 277-80.
10. Al-Mohammadi SM, Rugg-Gunn AJ, Butler TJ. Caries prevalence in boys aged, 2, 4, and 6 years· according to socio economic status in Riyadh, Saudi Arabia. Community Dent Oral Epidemiol. 1997; 25: 184-86
11. Wyne A, Darwish S, Adenubi J, Battata S, Khan N. The prevalence and pattern of nursing caries in Saudi preschool children. Int J Pediatr Dent. 201; 11: 361-64.