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Cross –Sectional Analysis for Reasons of Failure in Endodontic Treatment

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Abstract: *The aim of this study was to determine the frequencies of various reasons for carrying out root canal treatment at Department of Conservative Dentistry, School of Dentistry, University of Sulaimani. A total number of 250 patients who reported in were selected for the study irrespective of their gender. Teeth needing root canal treatment were carefully evaluated on the basis of their vitality, any traumatic injury, previous treatment (if any) and/or intentional requirement of treatment because of some restorative procedure. Out of the 595 patients who were included in the study, necrosed pulp (38.31%) was the most common reason for root canal treatment followed by irreversible pulpitis (34.28%), intentional root canal treatment (3.36%), trauma (8.40%), failed root canal treatment (10.92%) and other reasons (4.70%).*

Key words: *Root Canal Treatment (RCT), Necrosed pulp, Irreversible pulpitis, Failed root canal treatment.*

I. Introduction

Operative causes that influence the prognosis of RCT can be divided into two categories: mechanical and biological. Mechanical considerations include: cavity preparation/access, cleaning and shaping, instrument separation, perforation, missed canal(s), and obturation quality (under-/overfill). Biological objectives involve removal or reduction of existing and potential irritants from the pulp space, sealing of the space, microbial control, and management of periapical inflammation. [1]

Four factors determine the decision to do or not to do a root canal treatment namely accessibility, restorability, strategic value of the tooth and general resistance of the patient which ensures successful. [2]Most common diagnosis for doing a root canal treatment (56.4%) was found to be dental caries. [3]Various studies proved that 28% of the traumatized teeth required root canal treatment. [4]

The failure of conventional root canal treatment maybe apparent either by the patient's complaint of pain, swelling, tooth mobility or a discharging sinus or maybe symptom less or becomes evident on radiographic investigation. Patients gave a more positive attitude to endodontic treatment mentioning relief of pain, appreciation of better food and self-esteem. [5]

Recent changes have made it possible to perform root canal treatment more efficiently, with improved precision and greater patient acceptance. [6]

Segura- Egea et al in their study showed that follow up clinical trials of root canal treatments applying modern principles yielded favorable results with healing rates well above 90%. [7]Success of root canal treatment is a public health problem that has medical, economic and ethical repercussions. [8]Few studies have been carried out in the developing countries as well to determine the reasons and patterns of root canal treatment. [9]

II. Methodology

The study was conducted in the Department of ConservativeDentistry,University of Sulaimani. A total number of 250 patients were selected irrespective of their age and gender. Necrosed teeth, traumatic teeth in which the trauma had resulted in pulp exposure, teeth with irreversible puplitis, teeth requiring re root canal treatment and teeth requiring intentional root canal treatment for restorative procedure were included in the study. Periodontally compromised teeth, non strategic teeth and teeth that can be saved through alternate restorative procedure e.g. pulp capping were excluded from the study.

The patients were asked to give a detailed history. The chief complaint with which the patient came was noted. The onset, duration, intensity, aggravating factors of the pain was noted down. A thorough clinical examination was carried out. The suspected teeth were examined clinically for any carious activity. Periapical

and bitewing radiographs were done to examine the extent of the carious activity and the proximity to the pulp tissue.

Pulp vitality tests such as hot test, cold test and electric pulp test were performed to check vitality of the suspected tooth. Percussion tests were also carried out on the suspected tooth. In cases of trauma or fractures, the history of trauma and duration since the trauma occurred were noted down. Radiographs were done to identify any fracture lines along with clinical examination and the results were noted down.

For re root canal cases a thorough history of the previous treatment was noted. Radiographs were taken to assess the condition of the tooth. If the prognosis was not very good the cases were referred for extractions. Teeth with good prognosis were advised re root canal treatment. Teeth that require root canal treatment for fabrication of different prosthesis were examined and root canal treatment was advised as per requirement.

The number of the tooth which was indicated for root canal treatment was entered on the specified proformas. The teeth was divided into four quadrants and designated as upper left (UL) and upper right (UR) for the maxillary left and right quadrants while the mandibular left and right quadrants were designated as lower left (LL) and lower right (LR). Each quadrant represented teeth from central incisor to the third molar numerically from 1 to 8.

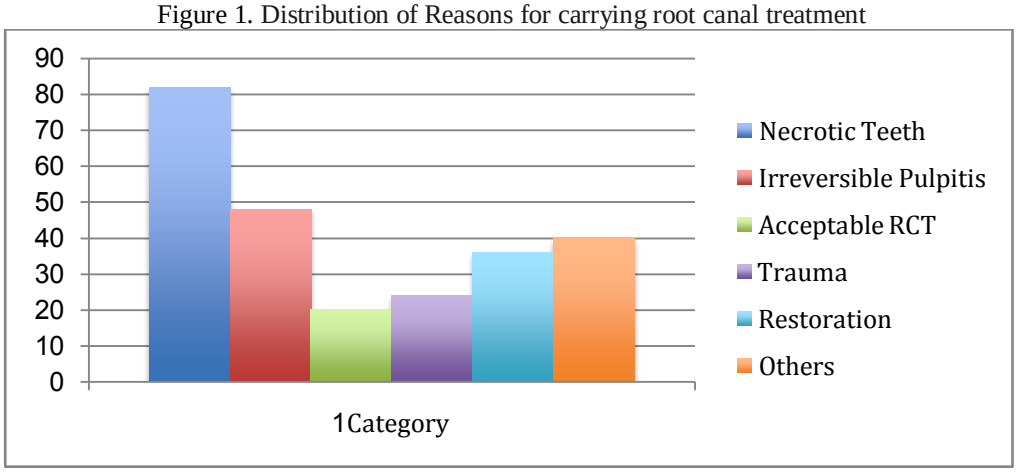
III. Results

Information was collected on 250 patients on specified proformas. Out of the 250 patients majority of the patients 164 (65.6%) were male while the rest 86 (34.4%) were female (Table 1). The age of the patients ranged from 16 years to 53 years with the mean age being 31.1 years.

Table 1: Gender Distribution

Gender	Frequency	Percent
Male	164	65.6%
Female	86	34.4%

Figure 1. Distribution of Reasons for carrying root canal treatment



The distribution of reasons for root canal treatment is shown in (Fig. 1)There were 65 cases which were indicated for re treatment in which the previously done root canal treatment had failed. Out of these 65 cases, 35 were due to short obturation, 15 due to over obturation and 15 were due to other causes. The other cause included incomplete root canal treatment and periapical abscess.

The most common tooth which was indicated for root canal treatment was mandibular first molar which was reported 71 times. Most of the root canals were indicated in the mandibular arch 160 (64%) while the rest 90 (36%) were in the maxillary arch.

IV. Discussion

This study has provided useful information on various reasons for undergoing root canal treatment.

The age of the patients fell between 16 years and 53 years. The mean age was 31.1 years. This showed that caries which was the most common reason leading to root canal treatment was more common in the younger age group and there were less reports from the higher age group.

This indicates towards the known fact that with increased age the resistance of the tooth to decay increases and the tooth becomes less prone to decay. This also indicates to the importance of caries control measures in the younger age group. Preventive measures for young teeth need to be emphasized. No gender impact was noted.

Necrotic pulp and irreversible pulpitis were the most frequent reasons for performing root canal treatment. Both are sequel of dental caries. Thus dental caries was found to be the most common cause for performing root canal treatment. However when we compare the results with other studies done else- where, the percentage of dental caries as a cause is much higher. Ridell and Sundin [10]in their studies found caries to be responsible for 56.4% of the root treated teeth.

The other fact which is evident is that dental awareness in our population is much less. Generally the concept of regular dental check ups is not very common. People come to the dental clinics or hospitals only when they start feeling symptoms for example pain or sensitivity. The idea of preventive dentistry for example prophylactic cleaning, fissure sealants or preventive resin restorations is not very common. This leads to the fact that many teeth which can be prevented from small restorations often go unnoticed and generally when they are close to the point of pulp exposure become symptomatic. It is then when the patient reports to the dentist for treatment.

The cases reported were mostly anterior teeth which required a post and core buildup due to extensive tooth decay and were advised for root canal treatment in other wise healthy teeth. There were some roots of teeth which were indicated for root canal treatment, as they were to be used under over dentures.

Trauma of teeth was a significant reason for carrying out root canal treatment. Failed root canal treatments comprised a significant number of teeth which were indicated for root canal treatment. Most root canal treatment failures were due to short obturation. A high success rate with over filling in the presence of pre existing peri apical radiolucency has been reported as well. [11]

The present study also showed that the most frequent tooth which was indicated for root canal treatment was the mandibular first molar. This was in agreement with previous studies done by Ridell and Sundin .[10]

The most probable reason for that was that it generally is the first tooth to erupt in the oral cavity, hence it was more prone to caries if preventive measures like fissure sealants were not undertaken. The results also showed that the mandibular teeth (64%) were more prone to dental caries and hence to root canal treatment as compared to maxillary teeth which were indicated for root canal treatment in (36%) of the cases. Mandibular teeth are more prone to food stagnation on occlusal surfaces as compared to maxillary teeth. Morphologically there does not seem to be much of a difference in the fissures and grooves of the teeth in both the arches but caries activity seems more pronounced in the mandibular teeth and the results of this study were similar to previous studies. This also indicates to the fact that preventive measures for the molars are extremely necessary. A careful monitoring of these teeth from early age group during routine dental check ups is extremely important.

V. Conclusion

With the results of the present study it is concluded that necrotic pulp and irreversible pulpitis are the predominant reasons for carrying out root canal treatment. Both are a sequel of dental caries. Hence dental caries is the main causative factor leading to root canal treatment. A significant proportion of the root canal treatments were retreatments mainly because of improper techniques employed during the procedure.

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