INDICATIONS FOR CONVENTIONAL ROOT CANAL THERAPY IN PATIENTS EXAMINED AT RAS AL KHAIMAH COLLEGE OF DENTAL SCIENCES HOSPITAL

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ABSTRACT

The purpose of this study was to identify various causes and factors necessitating root canal therapy (RCT) in people examined at RAK College of dental sciences hospital.

The study was carried out on 382 patients who reported to RAK College of Dental Sciences hospital from September 2011 to June, 2012. Diagnostic criteria used were complete dental history, thorough clinical examination and other investigative procedures such as radiographs and thermal tests. Irreversible pulpitis (43.5 %, n = 166) was the most common indication for conventional root canal therapy followed by Necrosis (28.5%, n= 109), Fractured teeth (20.2%, n=77), Intentional/Prosthodontic reasons (4.7%, n=18) and post conventional root canal therapy failure (3.2%, n=12). People who smoked had higher percentage irreversible pulpitis (24%, n=90) and necrotic tooth (19%, n=73) as indication of conventional RCT than those who did not. The most common post endodontic failures were seen in maxillary first molars (50%, n=6).

Key words: Root canal treatment, Ras Al Khaimah.

INTRODUCTION

The aim of endodontic treatment is to treat or prevent apical periodontitis.1 In 1960s investigations confirmed that infection within the tooth is essential for apical periodontitis to occur.2 In 1970s and 1980s the understanding regarding the microbiology of the infected root canals was increased and improved.3-5 It also highlighted different ways in which irrigants, agitation of irrigants, and medicaments can disinfect the root canal.6-10 Every single tooth starting from the central incisor to the third molar is a potential candidate for root canal therapy. The whole concept in retaining the roots of a tooth even that which is periodontally comprised is to have equal distribution of masticatory forces rather than compromising it by extracting the tooth.

Today, many pulpless teeth, once condemned to extraction, are saved by root canal therapy: teeth with large periradicular lesions or apical cysts11-14 teeth with perforations or internal or external resorption teeth badly broken down by caries or horizontal fracture, pulpless teeth with tortuous or apparently obstructed canals or broken instruments within,15 teeth with flaring open apices, teeth that are hopelessly discolored and even teeth that are wholly or partially luxated. Apart from the various intra oral factors root canal therapy is also a suitable alternative to extraction in patients suffering from severe diabetes, heart diseases or radiation necrosis.16 Even for terminal cases of cancer, leukemia, or AIDS, endodontics is preferred over extraction.

According to the treatment point of view, 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 success.\textsuperscript{17}

Out of various etiological factors, caries was found to be the most common etiological factor to carry out a root canal treatment\textsuperscript{18}, followed by trauma\textsuperscript{19}. Other causes include pathological reasons varying significantly from superficial pulpal inflammation to pulp necrosis.\textsuperscript{20}

Boykin et al found that the most common self-reported reasons for dental visit in which a root canal treatment occurred were tooth ache, abscess and dental sensitivity while dental abscesses or tooth aches were the main reason(s) for root canal treatment.\textsuperscript{21} Many a times many teeth appear to progress to pulp necrosis without the patient experiencing pain attributable to the pulp.\textsuperscript{22} In a general public survey made by the Opinion Research Institute in 1984 and 1986 it was noted that the perception of younger population (<25 years age) were disappointing. 70% described root canal therapy as “painful” and 58% thought it would be less expensive to extract the tooth and place a bridge.\textsuperscript{23}

It is generally known that people with low socio economic status are neglected from any form of endodontic surgery or procedure including simple conventional root canal therapy due to high costs involved. The main aim and purpose of this study was to identify the common etiological factors in people with low socio-economic status requiring conventional root canal therapy and NON-surgical root canal therapy for already treated tooth with conventional therapy. The level of awareness regarding endodontic procedures among the patients with low socio economic status indicated for conventional or Non-Surgical root canal therapy was also assessed. Finally the person requiring the conventional root canal therapy was educated and asked whether he wants to have an extraction done or a conventional root canal therapy performed without considering the cost of the treatment.

METHODOLOGY

A total of 546 people were screened and evaluated clinically for indications of root canal treatment by three different observers to minimize observer bias. Once the patient was diagnosed and indicated clinically for root canal treatment, pulp vitality test, percussion test and radiographic investigations were then performed to confirm the diagnoses. The final diagnosis was based on patient’s chief complaint, medical history, clinical evaluation and the outcome of the investigations.

Out of 546 subjects, 382 subjects had indications for conventional root canal therapy. Diagnosis for irreversible pulpitis was confirmed through history of pain on drinking cold water lingering for more than 5 minutes, clinical examination and outcome cold test using Endo Ice (Tetra. Fractured teeth were diagnosed through history of trauma to offending tooth. Necrotic teeth were diagnosed through radiographs and clinical examination. Tooth necessitating intentional endodontics was diagnosed after careful evaluation by a Prosthodontist to use it as over denture abutment in patient requiring dentures. Apart from this, patient’s age, gender, social habits such as smoking, alcoholism, chewing betel quid and oral snuff were also recorded.

All the recorded data were then transferred to SPSS software version 19 and Statistical analysis was done by using Chi-square test and student t-test. The level of significance for all tests was set at p<0.1.

RESULTS

Out of 382 subjects 81.2 % (n=310) were Males and 18.8 % (n=72) were females. 52.4% (n=200) were people who smoked out of which 96% (n=192) were males and 4% (n=8) were females. Irreversible pulpitis (43.5 % “n = 166) was the most common indication for conventional root canal therapy followed by Necrosis (28.5%, “n= 109), Fractured tooth (20.2%, “n=77), Intentional/Prosthodontic reasons (4.7%, “n=18) and post conventional root canal therapy failure (3.2%, n=12).

People who smoked had higher percentage of irreversible pulpitis (24%, n=90) and necrotic tooth (19%, n=73) as indication of conventional RCT than those who did not. Irreversible pulpitis was most common in first molars (46.7%, n=78) followed by second molars (25.9%, n=43). Fractured tooth was most commonly found in maxillary anterior region (53.2%, n=41). Necrotic tooth was most commonly associated with first molars (37.6%, n=41). The most common post endodontic failures were seen in maxillary first molars (50%, n=6).
People between 18 years – 35 years had a greater percentage of irreversible pulpitis (55.4%, n=112) as indication for conventional root canal therapy. People between 35 – 55 years of age had necrotic tooth (38.4%, n=61) as indications for RCT.

**DISCUSSION**

This study provided valuable information about various reasons for undergoing root canal treatment. Irreversible pulpitis was found to be the most common reason for conventional root canal therapy (Figure 1.1) followed by necrosis. 25, 43.5% of people had irreversible as an etiological factor necessitating root

![Fig. 1.1: Indications for Conventional RCT](image)

![Fig. 1.2: Irreversible pulpitis](image)

![Fig. 1.3: Irreversible pulpitis according to age](image)

![Fig. 1.4: 18 years - 35 years](image)

![Fig. 1.6: 55 + years](image)

![Fig. 1.7: Indications in smokers VS non-smokers](image)

![Fig. 1.8: Percentage of smokers](image)
canal therapy. First molars including the uppers and lowers were most commonly affected by irreversible pulpitis followed by second molars (Figure 1.2). By definition, the pulp has been damaged beyond repair, and even with removal of the irritant it will not heal. Majority of people approaching this clinic belonged to low socio economic status which means they seldom pay a visit to dentist for regular checkup even if there is intermittent pain which results in progression of carious lesions and hence involves the pulp irreversibly. Oral hygiene of the shortlisted subjects was also not satisfactory which maybe another factor leading to irreversible pulpitis. There were deep deposits of calculus and most of them brushed their teeth once or twice a week while many did not brush at all.

On examination most of subjects were found suffering from gingival recession thereby exposing the cementum and increasing the chances of plaque accumulation on the root surface and leading to irreversible pulpitis. Irreversible pulpitis was most commonly seen in 18-35 years of age followed by 35 – 55 years (Figure 1.3). In 18 – 35 years irreversible pulpitis was more compared to other indicative factors (Figure 1.4). A possible explanation to this can be because in early age necrosis and other factors are less common. Reversible pulpitis mostly progresses to irreversible state and if not treated it may progress to necrosis. That is why in 35 – 55 years of age and above necrosis was most common compared to irreversible pulpitis (Figure 1.5). A possible explanation to this may be because the tooth undergoes chronic trauma over a period of time which may include micro-leakage, failed restorations, abrasion and excessive occlusal forces. In our study many subjects did not seek dental treatment for irreversible pulpitis in their early age when the tooth was symptomatic thereby progressing to necrosis. In people above 55 years of age intentional root canal treatment was performed most commonly due to prosthetic reasons to use the remaining teeth as abutments for over dentures (Figure 1.6).

People who smoked had higher percentage irreversible pulpitis (24%, n=90) and necrotic tooth (19%, n=73) as indication of RCT than those who did not (Figure 1.7). 50.3% of smokers were male and 2.1% were female (Figure 1.8). Smoking is a significant risk factor in inflammation of marginal periodontium. Therefore it may be hypothesized that it may have a similar effect on apical periodontium, possibly reflecting a general delayed bone healing process. Studies have also reported increased Calcitonin-gene related peptide (CGRP) concentration in pulp of smokers and are linked to significant changes in blood flow inflammation and pulpal pain. In another study the prevalence of apical periodontitis in smokers and non-smokers patients was studied. They concluded that smoking was significantly associated with a greater frequency of root canal treatment and with an increased prevalence of apical periodontitis.

Oral hygiene instructions were given to all the patients examined. Proper flossing and brushing techniques were demonstrated. The importance of regular dental visits was also reinforced.

CONCLUSION

After conducting the study it is clear that dental care should be expanded towards people with low socioeconomic status and adequate treatment should be provided. Caries preventive program strategies should also be strengthened especially among people with less education and awareness regarding dental health. Dental screening and regular awareness programs regarding caries and its prevention should also be held among such people. Further similar studies need to be carried where

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