

DECISION-MAKING OF PATIENTS TOWARDS TREATMENT MODALITIES OF FAILED ROOT CANAL THERAPY

Muhammad Saqib¹, Rizwan Jouhar², Sabeen Masood³, Sara Saeed⁴, Afifa Hemani⁵, Syeda Alina Zehra⁶, Zeeshan Zahid Warraich⁷

Correspondence

³Sabeen Masood, BDS, FCPS
Resident(Operative Dentistry and
Endodontics), Altamash Institute of
Dental Medicine, Karachi

☎: +92-314-2127933

✉: sabeen_786@live.com

¹BDS, FCPS (Operative Dentistry and
Endodontics), Assistant Professor,
Altamash Institute of Dental Medicine,
Karachi

²BDS, FCPS (Operative Dentistry and
Endodontics), Assistant Professor,
Department of Restorative Dental
Sciences, College of Dentistry, King
Faisal Univeristy, Al Ahsa, Saudi
Arabia

⁴BDS, Altamash Institute of Dental
Medicine, Karachi

⁵BDS, Registrar (Operative Dentistry
and Endodontics), Alta mash Institute
of Dental Medicine, Karachi

⁶BDS Final Year, Altamash Institute
of Dental Medicine, Karachi

⁷BDS Final Year, Altamash Institute
of Dental Medicine, Karachi

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ABSTRACT**OBJECTIVES**

To determine the awareness and perception of patients towards treatment modalities of failed root canal therapy.

METHODOLOGY

A cross-sectional study was conducted at the department of Operative Dentistry and Endodontics, Altamash Institute of Dental Medicine, Karachi, from 15 August'2021 to 14 October'2021. A total of 292 participants, 155(63%) female and 104(37%) males, were selected for the study. All the participants included had at least one root canal-treated tooth. A well-constructed and validated performa was used to evaluate the patient's decision for different treatment modalities against a tooth with failed root canal treatment.

RESULTS

Among the subjects, most patients opted for endodontic re-treatment (60%) in case of root canal treatment failure, whereas the remaining opted for extraction (40%). Out of this, 40% (8%) choose removal of partial denture, (12%) bridge, and implant (20%).

CONCLUSION

Re-treatment is the first-line treatment option for the previously failed root canal. Our study concluded that most patients would opt for an endodontic re-treatment. The patient's education and awareness level affected the treatment options.

KEYWORDS: Dental Implants, Root Canal Treatment, Failed Root Canal Treatment, Re Root Canal Treatment

INTRODUCTION

In endodontics, a root canal treatment is designed to eliminate bacteria from the infected root canal, prevent reinfection of the tooth and save the natural tooth.¹ In root canal treatment, the inflamed or infected pulp is removed, cleaning and shaping are performed, followed by obturation and restoration. This procedure is done whenever the pulp cavity is exposed, the reasons being trauma injury, caries or endodontic or periodontic lesions.² As this procedure is both intrusive and extensive, along with its cost depending primarily on which tooth happens to be infected, it is something patients often find risky. In situations of endodontic failure where root canal treatment shows fault, a re-root canal treatment becomes a common practice. The common reasons for root canal treatment failure are the persistence of bacteria, either the extra canal or intracanal, underfilling or over extrusion of obturation, missed canals, improper coronal or apical seal, iatrogenic procedural errors and complications of instrumentation.³ Re root canal treatment is done the

same way as an initial root canal treatment although this procedure has its risks and often has more chances of failure than the previous root canal treatment.⁴ However, there are more ways to combat endodontic failures, such as tooth extraction and surgical endodontics.⁵ For an Endodontist, it is of high priority to first protect the present tooth structure and exhaust all possible procedures before removing it completely. A lack of oral hygiene education amongst most of the Pakistani population makes it highly probable to have one or more than one tooth that is diseased under such circumstances.^{6,7} A diseased natural tooth is rightly perceived as a general health issue as it hinders the patient's mastication, aesthetic, and overall systemic robustness immensely.⁸ Restoration of natural oral structures has numerous treatment choices for rehabilitating the masticatory and aesthetic ability that form an integral component of operative dental medicine. Overall aspiration for improved oral health-related quality of life has become a truth after the arrival of dental implants. Replacement of missing teeth with a dental implant is

an increasingly popular treatment option with a high success rate and is rated as a positive experienced option by patients who have undergone implant treatment.⁹ Many studies have been carried out in different parts of the world regarding the awareness and perception of patients towards treatment modalities after the failure of previous root canal treatment. Therefore, this study aims to determine patients awareness and perception towards treatment modalities for re-treatment of failed root canal therapy in the tertiary care hospital of Karachi.

METHODOLOGY

A cross-sectional, questionnaire-based study was conducted from 15 August 2021 to 14 October 2021 on the patients visiting the outpatient department (OPD) of Altamash Institute of Dental Medicine. The questions assessed the awareness and perception of patients towards treatment modalities for re-treatment of failed root canal therapy. A well-constructed and validated proforma was used for data collection. The simple random sampling technique was used in this study. Simple random sampling was executed by asking the patients who came to AIDM operatives dentistry OPD for their dental treatments. The patients were continuously recruited until the required sample size was achieved within the period allowed for the data collection by the ethical committee of AIDM. Data were analyzed by using SPSS version 20. Following approval from the institutional review board of Altamash Institute of Dental Medicine, Karachi. The sample size of 292 patients was calculated using OpenEpi software. A total of 292 cases were included in the study, of which 37% were males and 63% were females. The participants were informed about the study's anonymous, voluntary, and non-compulsory nature, and prior consent was taken before their participation. The questions were presented in the form of multiple-choice questions. The proforma was divided into two sections; the First section addressed the demographic details, including age, gender, and education level. The second section consisted of responses related to treatment options for failed root canal treatment.

RESULT

The current cross-sectional study was conducted on 292 participants, with 63% female and 37% male aged 15-25 and 25% above 40, and 21% between those age brackets. Most participants were well educated, having completed their A levels/Fsc and high-income status. All the participants selected were those with at least one root canal-treated tooth. Among the subjects, most would opt for endodontic re-treatment (60%) in case

of root canal treatment failure, whereas the remaining opted for extraction (40%), as shown in Figure 1. Out of this, 40% (8%) choose removal of partial denture, (12%) bridge, and implant (20%). In the case of endodontic re-treatment, the most unpleasant aspect of it leading to it being an unfavourable choice was the associated pain (25%) and the fear (24%), admitting that the major cause for their endodontic failure was a lack of care (40%). Meanwhile, the most widely chosen reason for opting for endodontic re-treatment was that it preserves the natural tooth structure (21%), as shown in Table 1. Most subjects were also poorly informed about dental implants (42%), unanimously admitting that the biggest disadvantage of dental implants is their high cost, as mentioned in Table 2. Furthermore, 46% of the participants could not decide on a more feasible long-term investment between implants and re-root canal treatment.

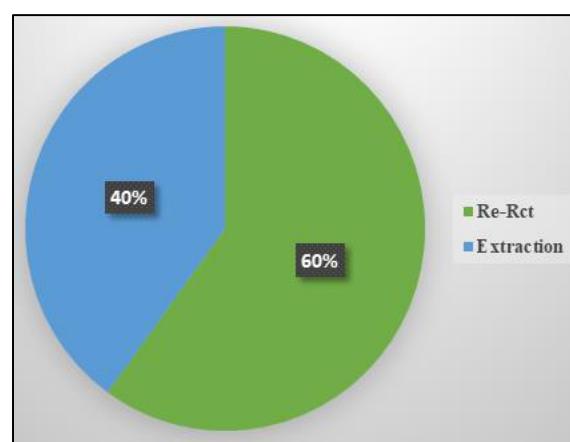


Figure 1: Preferred Treatment Modalities

Table 1: Factors Affecting Endodontic Re-treatment as a Treatment Option

Reasons for Not Choosing Endodontic Re-Treatment as a Treatment Option	%
Pain	24.6%
Fear	23.6%
Length of treatment	22.6%
Difficult in maintaining hygiene	12.3%
Number of visits	18.04%

Table 2: Factors Affecting Implant as a Treatment Option

Reasons for Not Choosing Implant as a Treatment Option	%
High cost	39%
Need of surgery	24%
Loss of natural tooth	25%
Treatment time	10%

DISCUSSION

Several treatment modalities are present for failed root canal-treated teeth, each with advantages and

disadvantages. As in this study, patients were evaluated for endodontic re-treatment and implants against different influencing factors, namely cost, pain, duration, number of visits and need for surgery. Factors like high level of education, higher income and age can influence the patient knowledge.⁹ Most of the participants were well-educated having a high-income status. The results reported by other studies showed a high level of awareness at 77% and 70.1%, respectively.^{10,11} In our study, 40% of participants chose extraction after failed root canal treatment. Out of this, 40% (8%) chose the removable partial denture, (12%) bridge, and implant (20%) as a treatment modality following dental extraction. The same findings coincide with Kohli et al. as, besides being poorly informed by the dental practitioners, higher cost played a vital role in the lesser selection of implants as the sole dental replacement option.⁹ Similarly, postoperative pain of endodontic therapy is one experience that patients tend to avoid.¹² Besides being reported by many studies, a pain incidence of 40% was reported by Seltzer et al. following endodontic therapy in more than 650 patients.¹³ This study indicates similar results that pain (24.6%), fear (23.6%) as well as prolonged duration of re-endodontic treatment (22.6%) play a combined effect of patients picking dental extractions over re-endodontic treatments. Moreover, as shown by our study, Higher cost (39%), long treatment period (10%), and need for surgery (24%) are the main disadvantages of implant treatment according to patients. This is consistent with other studies.^{10,14} Worldwide, secondary dental caries is prevalent after the first root canal treatment if the re-root canal treatment was improperly done or if the patient lacked the motivation to follow hygiene instructions afterwards. According to a study conducted in India by Kunal Kumar, 100% of the subjects preferred dental implants if the cost was not a factor, but due to the high cost, only 10% finalized their choice of a dental implant.¹⁵ A similar study conducted by Dr Syed Ali Akbar, considering that both treatment modalities had a 95% overall survival rate and a 7.5-year follow-up, concluded that Re-RCT and Implant had similar results, with re-RCT being superior only due to its low cost and post-op-medications.¹⁶ It also concluded that compromised teeth that could otherwise be saved by re-RCTs and deemed restorable should not routinely be treatment planned for implants. Kunal Kumar also mentioned in his study in a similar socioeconomic status to Pakistan that besides the greater expenditure on cost, the other major disadvantage of choosing dental implants for patients was the postoperative care that greatly exceeds that of re-RCT.¹⁵ The study by Kohli et al.⁹ also reported similar findings regarding

the cost. The question of whether to take the higher-risk option of keeping the tooth by re-RCT or the lower-risk option of extraction followed by implant placement has been discussed extensively in previous studies, and most researchers are of the view that besides patient preference, evidence-based clinical guidelines must be set to make the decision.¹⁷ It is conjointly a matter of psyche as patients want their treatments to be associated with ease and convenience while choosing between RCT and an Implant. Many deciding factors go into treatment planning: for example, the value and energy involved, prosthetic restorations may veto Endodontic re-treatment in case of a future failure. According to our research, it can be assumed that patients do not prefer extracting their teeth but rather choose treatments that will defend the tooth first. As well as dental implants providing a definitive treatment risk is common knowledge which further shuns a patient away from that treatment option. Hence, widely used treatment choices for oral rehabilitation at intervals are deemed inconvenient. Pakistan, an underdeveloped country, continues to be miles behind in progressive dental treatments- with patients ignorant of the perfect outcome of the desired treatment.⁷ Therefore, the target of this survey was to work out a well-liked treatment for morbid tooth secondary to Endodontic treatment failure. An American study further compares "the outcome of nonsurgical root canal treatment (NSRCT) and single-tooth implants (STIs) provided to the same patient" to find the best suitable treatment amidst different treatments.¹⁸ On the one hand, having one answer to a significant common problem would make things considerably easy for the Endodontist. Having said treatment as a backup option would provide both the surgeon and patient with a fallback option. However, a one-size-fits-all method would be unideal because every patient is different, and every case should be treated like a new one. There can be no single conclusion for every patient coming in with RCT or Implant recommendation. To elaborate, a person suited for implants cannot be assumed unsuited for Re-RCTs and vice versa. Irrespective of how successful either option is, results will always vary from patient to patient, with multiple factors contributing to the success of a certain treatment. Hence the result of this study was unsurprisingly how "Both NSRCT and STI are highly successful treatments. Compromised teeth that could otherwise be saved by NSRCTs and deemed restorable".¹⁸ Adequate awareness and ironic, factual, and exhaustive data are the indispensable tools that project dental implant-retained prostheses as the best choice for the tooth.⁹ Satpathy et al.^{19,20} Mukatash et al.²¹ and Ravi Kumar et al.²² agree that dentists are one of the

leading personnel of information in spreading dental implant awareness. Therefore, in a nutshell, multiple decisive factors help select treatment options that must be considered during the treatment planning phase. In addition, patients knowledge, perception and awareness about the merits and demerits of different treatment options also play a significant role in treatment planning.

LIMITATIONS

This study is limited to one institutional data. It may be possible that the demographic factors of the patients coming to the dental outpatient department where this study was conducted are the same, which can create a bias as the results will lack the diversity of the patients demographically.

CONCLUSION

The treatment modalities for failed root canal-treated teeth depend on multiple factors amongst re-root canal treatment, implant, bridge and extraction. The results of our study concluded that most of the patients would opt for a re-root canal treatment. Additionally, the patient's education and awareness about available treatment options also play an important role in treatment planning.

CONFLICT OF INTEREST: None

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CONTRIBUTORS

- Muhammad Saqib** - Concept & Design; Critical Revision; Supervision; Final Approval
- Rizwan Jouhar** - Concept & Design; Supervision; Final Approval
- Sabeen Masood** - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript
- Sara Saeed** - Data Analysis/Interpretation; Drafting Manuscript
- Ajifa Hemani** - Concept & Design; Critical Revision
- Syeda Alina Zehra** - Drafting Manuscript
- Zeeshan Zahid Warraich** - Data Analysis/Interpretation; Drafting Manuscript



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