

COMPARING SINGLE VISIT OR MULTIPLE VISIT ROOT CANAL TREATMENT: PREFERENCES AMONG THE ENDODONTISTS' IN THEIR PRACTICE

¹JAZIB PERVEZ, ²HAFIZ MUHAMMAD ADIL, ³SUFFIYAN SALEEM, ⁴SYED MIDHAT BATOOL, ⁵AMARA NAZIR, ⁶SYEDA AFSHAN MANZOOR

ABSTRACT

Introduction: *Single visit or multiple visit approach are considered in treatment planning for root canal treatment RCT. The technique, Operators' choice, number of roots, complexity of root canal anatomy, treatment time available, patient compliance, clinician's skills and Pre-Treatment Symptoms are among the factors to be considered. The objective of our study is to evaluate Endodontists' perspectives on single and multiple visit RCT, analyzing the factors that influence their treatment choices, including operator preference, biological factors, and patient-related factors. Additionally, the study aims to establish treatment goals, aiding clinicians in effectively organizing the treatment process.*

Methods: *This descriptive Cross-sectional study involved 81 dentists in Multan, Pakistan, who had post-graduate training or a fellowship in Operative dentistry & Endodontics. A self-administered questionnaire was used to collect data on dentists' preferences for single or multiple visit root canal treatment in various aspects of Endodontics. The data was analyzed using SPSS-26 software with descriptive statistics and chi-square testing.*

Results: *The study found that 64.2% of endodontists preferred single visit root canal treatment, while 35.8% preferred multiple visit treatment based on operator choice. Preferences varied depending on factors such as technique, tooth type, acute or chronic conditions, elective endodontics, retreatment cases, patient compliance, complex root anatomy, and traumatic dental injuries.*

Conclusions: *There were statistically significant differences in preferences for single or multiple visit RCT in various aspects, but long-term evaluation outcome did not significantly differ between the two approaches.*

Keywords: *Endodontics, Multiple visit RCT, Rotary endodontics, Root canal treatment, Single Visit RCT.*

This article may be cited as: Pervez J, Adil MH, Saleem S, Batool MS, Nazir A, Manzoor AS. Comparing Single Visit or Multiple Visit Root canal treatment: Preferences among the Endodontists' in their Practice. Pak Oral Dent J 2023; 43(4):194-198.

¹ Dr Jazib Pervez, BDS, FCPS (Operative Dentistry & Endodontics) Assistant Professor, Department of Endodontics, Contact: 03115066698 Email: jazibpervez@gmail.com

² Dr Hafiz Muhammad Adil, BDS, FCPS (Operative Dentistry & Endodontics), Senior Registrar Department of Operative Dentistry, Email: Adilghauri8@gmail.com Cell: 03343425035

³ Dr Suffiyan Saleem, BDS, FCPS (Operative Dentistry & Endodontics), Assistant Professor Department of Operative Dentistry, Shahida Islam Dental College Bahawalpur Email: Suffiyan_saleem_u2@gmail.com Cell: 03216827792

⁴ Dr Syed Midhat Batool, BDS, MSc (Periodontology), Assistant Professor, Department of Periodontology, Email: syedmidhatbatool@gmail.com Cell: 03078935351

⁵ Dr Amara Nazir, BDS, FCPS (Operative Dentistry) Assistant Professor Department of Operative Dentistry, Email: dramaranazir@gmail.com Cell: 03347071608

⁶ Dr Syeda Afshan Manzoor, BDS, FCPS (Operative Dentistry & Endodontics) Assistant Professor Department of Paedodontics, Email: afshanmanzoor@yahoo.com Cell: 03226173687 (Author number 1,2,4,5 and 6 are from Bakhtawar Amin Dental College, BAMDC Multan)

Received for Publication: April 28, 2023
First Revision: Aug 21, 2023
Second Revision: Sept 12, 2023
Approved: Oct 14, 2023

INTRODUCTION

Root canal treatment, RCT is the chemo-mechanical instrumentation of the root canal system which may be done in a single visit or in multiple visits. Single visit RCT has grown in popularity recently, as more effective method for the majority of endodontic cases. Single visit endodontics is the treatment modality of choice due to advancements in the field of dentistry, i.e. Rotary endodontics, Digital radiography, CBCT, Apex locator, Ultrasonic irrigation, Single cone obturation technique etc. Irrespective of those advances, the question still appears whether the endodontists are incorporating these modifications in their regular dental practice or not.¹ The most powerful factor of influencing dental practice change is the inter-communication of dental practitioner. Articles in academic journals have very less impact in bringing change of practice among the specialist and general dentists, working in Pakistan.

To learn the endodontist's perspective on single-visit or multiple-visit root canal treatments, including their treatment philosophy, preferences, and to understand the factors that influenced their decision, the evidence based knowledge is necessary for the choice is acquired.

Although single-appointment therapy is most convenient, the patients mostly follow their dentist recommendation², so it is important for Endodontist to decide the single vs. multiple visit strategy for the treatment plan. Skill of the operator is very important, in order to perform good standard RCT in an efficient manner. Patient's compliance, acute or chronic conditions, complexity of root morphology, and clinician's preferences are all the factors that must be considered. The time required to execute all the steps required for single visit RCT has been decreased. Multiple-visit treatment is indicated, if the patient is unable to tolerate more time in the dental chair, or if the dentist doesn't have enough time to finish the entire treatment, or if the canal continue to be filled with blood and cannot be efficiently dried.³ In single visit root canal treatment, operator and patient fatigue are often high.⁴ Rotary endodontics have increased the efficacy of chemo-mechanical preparation technique. However, there is no effective known biologic method to determine the effectiveness of cleaning and shaping procedures.⁵

The preoperative state of the tooth, as well as a variety of variables, affect the outcome success of RCT. Nevertheless, there is no clinical evidence that one strategy (single or multiple visit RCT) is more effective than the other.⁶ Before determining the specific goals for each visit, it is important to take the biologic relevance of various conditions into account. Multiple visits to the dentist may be advised in certain teeth with periapical lesions due to the potential increased risk of flare-ups.⁷ The rationale for conducting this study is the ongoing debate and variation in practice regarding the choice between single-visit or multiple-visit root canal treatment. Single-visit treatment has gained popularity due to advancements in endodontic techniques and technology. However, there is a need to understand whether these advancements are being incorporated into regular endodontic practice and to explore the factors influencing treatment decisions.

The objective of this study is to observe the perceptions and preferences of endodontists based on their answers to a questionnaire regarding single-visit vs. multiple-visit root canal treatment and ascertain the basis on which these choices are made, including the acquisition of evidence-based knowledge. The purpose is to compare Developing goals for each visit which helps the clinician to organize the treatment.

MATERIALS AND METHODS

Study Design

Descriptive Cross-Sectional Study: to survey the preferences of dentists in the Multan area of Pakistan who are undergoing or have received post-graduate training or a fellowship in Operative dentistry & Endodontics, for single-visit RCT or multiple-visit RCT for various endodontic procedures based on their knowledge of Evidence based dentistry.

Inclusion criteria

- Dentists with Fellowship / Masters' degree in Operative Dentistry & Endodontics
- Dentists have done or undergoing Post-Graduate training in Operative Dentistry & Endodontics

For this study, a self-administered questionnaire was developed to collect data on dentists' preferences for single or multiple visit RCT for various aspects of endodontics. A survey of the evidence based literature and expert assistance from experienced endodontists were used to create the questionnaire. To participate in this survey, 81 dentists who practice in the Multan region of Pakistan and have a Fellowship degree or post-graduate training in operative dentistry & endodontics were sought out through professional networks, participants were located, and were sent an email invitation to participate in the online survey. The survey took time duration of 2 months, from 1st Jan 2023 to 1st march 2023.

Outcome Measures

The questionnaire included questions about various aspects of endodontics, such as operators preferences, technique involved, the complexity of the root canal morphology, the existence of acute or chronic periapical pathology, and patient compliance, elective endodontics etc. participants were asked to give their preference for single visit or multiple visit RCT.

Ethical Considerations

The research was carried out in conformity with the ethical guidelines in accordance with Helsinki declaration. All participants provided informed consent, and their responses were kept anonymous.

Data Analysis

The survey data, including frequencies and percentages, was analyzed using SPSS-26 software by using descriptive statistics. Using chi-square testing, the preferences for single or multiple visit RCT for various features of endodontics were compared. P-value <0.05 is considered as statistically significant.

RESULTS

The study found that 64.2% of Endodontists pre-

ferred single visit root canal treatment, while 35.8% preferred multiple visits (Table1). When using rotary endodontics, 88.9% preferred single visit, while 11.1% preferred multiple visits. In cases of single rooted teeth, 92.6% preferred single visit, and in cases of multiple rooted teeth, 50.6% preferred multiple visits. Regarding acute endodontic conditions, 66.7% preferred multiple visits, while 61.7% preferred single visit for chronic conditions. In elective endodontics cases, 86.4% preferred single visit, and in retreatment cases, 92.6% preferred multiple visits. For patients with poor compliance, 63.0% preferred multiple visits, and for complex root anatomy, 61.7% preferred multiple visits. For traumatic dental injuries, 53.1% preferred multiple visits, and 46.9% preferred single visit root canal treatment (fig 1). All p-values of less than <0.001 suggest There is a statistically significant difference between single and multiple visit RCT. (table 1) & (table 2).

DISCUSSION

Differences in research findings concerning single or multiple visits might be due to variations in research methods, sample size, social bias, and localization of the survey. Several studies have been conducted worldwide: In one study, survey was conducted on 103 endodontists perspective in Brazil, results showed that 60.0% of endodontists would prefer single-visit RCT in case of vital pulp, and in case of pulp necrosis without peri-apical lesion 53.4% of endodontists would perform single visit treatment.⁸ In another survey conducted on 52 Australian endodontists, the results showed that they prefer multiple-visit over single-visit RCT.

Operator preference appears to be the main factor in determining treatment decision, not the biological factors.⁹

In another study in Hong Kong, 8 specialist endodontists and 429 General dental practitioners participated in a questionnaire to give their preferences for choosing single-visit or multiple-visit root canal treatment for their patients. 7 specialist endodontists and 375 General dental practitioners would prefer multiple-visit treatment, due to therapeutic effects of inter-appointment medications and that the teeth with questionable prognosis. The reason for selecting single-visit treatment was that the complete treatment could be completed in one visit. This study concluded

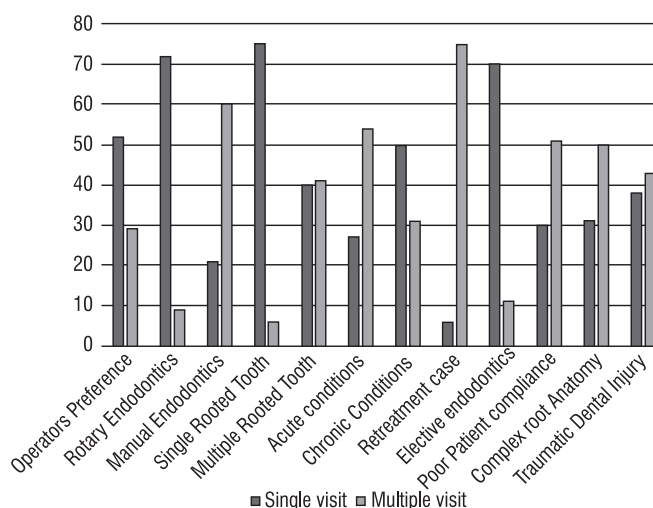


Fig 1: Single visit or multiple visit RCT for various treatment aspects.

TABLE 1. PREFERENCE FOR SINGLE OR MULTIPLE VISIT FOR TREATMENT ASPECTS

Treatment Aspects	PREFERENCE		P value* (Pearson's Chi-Sq)
	Single Visit	Multiple Visits	
Operator Preference	52 (64.2%)	29 (35.8%)	<0.001
Rotary Endodontics	72 (88.9%)	9 (11.1%)	<0.001
Manual Endodontics	21 (25.9%)	60 (74.1%)	<0.001
RCT of Single Rooted Teeth	75 (92.6%)	6 (7.4%)	<0.001
RCT of Multi-Rooted Teeth	40 (49.4%)	41 (50.6%)	<0.001
Acute Endodontic Conditions	27 (33.3%)	54 (66.7%)	<0.001
Chronic Endodontic Conditions	50 (61.7%)	31 (38.3%)	<0.001
Elective Endodontics	70 (86.4%)	11 (13.6%)	<0.001
Retreatment Cases	6 (7.4%)	75 (92.6%)	<0.001
poor Patient Compliance	30 (37.0%)	51 (63.0%)	<0.001
Complex Anatomy	31 (38.3%)	50 (61.7%)	<0.001
Traumatic Injuries	38 (46.9%)	43 (53.1%)	<0.001

TABLE 2: CHI-SQUARE TEST; P-VALUE FOR TREATMENT ASPECTS (SINGLE VS MULTIPLE VISITS)

Treatment Aspects (Single VS Multiple Visits)	Pearson's Chi-Square Test*		
	Value	df	p-value*
Operator Preference	81.000	1	<0.001
Rotary Endodontics	81.000	1	<0.001
Manual Endodontics	81.000	1	<0.001
RCT of Single Rooted Teeth	81.000	1	<0.001
RCT of Multi-Rooted Teeth	81.000	1	<0.001
Acute Endodontic Conditions	81.000	1	<0.001
Chronic Endodontic Conditions	81.000	1	<0.001
Elective Endodontics	81.000	1	<0.001
Retreatment Cases	81.000	1	<0.001
Poor Patient Compliance	81.000	1	<0.001
Complex Anatomy	81.000	1	<0.001
Traumatic Injuries	81.000	1	<0.001

that specialist endodontists and GDPs in Hong Kong strongly preferred offering multiple-visit endodontic treatment to their patients.¹⁰ In another survey of 210 dental practitioners of southern India, majority would do single-visit RCT in cases of vital pulp, but most would perform multiple-visit RCT in cases of necrotic pulp. The Pulp vitality is the main reason for choosing the single-visit endodontic treatment.¹¹ Currently, the consensus is that single visit treatment is preferred when the tooth has a complete or partial vital pulp.¹²

Numerous studies have compared single and multiple visit cases and reached different conclusions about the outcomes of each approach. Treatment strategy for an endodontic case should be based on biologic basis. One of the most important aspects of clinical endodontic practice is considered to be reducing postoperative pain experience of the patients.¹³ The dentist spends more treatment time during single visit procedure, particularly in anxious patients, which can be unpleasant experience for both the patient and the dentist.¹⁴ Moreover, the post-operative endodontic pain can affect the patient's oral cavity and overall health after the procedure.¹⁵ Various studies has shown that the effect of the number of visits on post-endodontic pain is an important factor, however; the results of these studies are not consistent.¹⁶ One study concluded that single-visit RCT resulted in 21% less post-obturation pain, which favors the single visit RCT to be adopted as novel approach in dental practice, to give more access and dental care to the patient.¹⁷

In one study conducted in Pakistan showed that Single visit endodontics resulted in less post-obturation pain.¹⁸ However another study in Pakistan concluded that there is no significant difference in the incidence of post-operative endodontic pain in non-vital teeth,

regardless of the number of visits for endodontic treatment.¹⁹ Local anesthesia can cause complications, which make endodontic cases more challenging. In those cases, preference should be given to multiple-visit RCT. In particularly, tooth diagnosed with symptomatic irreversible pulpitis (i.e. "hot" tooth), providing effective pulpal anesthesia can be very difficult.²⁰ In endodontic cases with moderate to severe pain or swelling, a multiple-visit approach allows resolution of symptoms till the next visit.²¹ Other Complicating factors can be multiple rooted teeth, patient's level of compliance, acute or chronic peri-apical condition, history of trauma²² and complicated medical history, i.e. ASA physical status classification of class III or above.²³ Multiple-visit RCT allows clinicians to evaluate the outcome of treatment on peri-radicular tissues and to ensure remission of disease prior to obturation.²⁴

Currently, there is no evidence suggesting that one treatment regimen is more effective than the other. This study, highlights the influence of interpersonal contact with colleagues in practice change, as well as the potential impact of publications in academic journals on treatment decisions made by endodontists. It recognizes that the success of root canal treatment depends on various factors, including preoperative condition, operator preference, and the complexity of the root canal system. However, the study's limitations include the small sample size and cross-sectional methodology, which do not allow for causal inferences or generalization to other groups. Furthermore, the survey responses are prone to social desirability bias, as participants may have felt compelled to provide socially desirable responses. Although there is a paradigm shift for single visit root canal in endodontists' in their routine practice, it is necessary to highlight

that regarding single versus multiple visit treatment modality, there is no significant difference between its treatment quality, post-operative complications and clinical success outcome or failure.

CONCLUSION

In this study, endodontists were surveyed about their preferences for single or multiple visit root canal treatment (RCT). The study found a statistically significant difference in operator preference, technique choice, and treatment aspects such as acute and chronic conditions, single rooted teeth, retreatment cases, elective endodontics, poor patient compliance, and complex root anatomy. However, no significant difference was observed for multiple rooted teeth and traumatic dental injuries. The study suggests that the success rate and post-operative complications of both single and multiple visit RCT depend on various factors, including the clinician's skill set, preparation techniques, and biologic conditions of root canal systems. Long term study and larger group for sample size is needed.

Acknowledgement

I would like to thank those who have contributed and helped in this study and made this research possible.

REFERENCES

- Choudhary, D., A questionnaire-based survey on perception of single visit endodontics among dentists. *International Journal of Medical Science and Diagnosis Research*, 2020. 4(7).
- Vela KC, Walton RE, Trope M, et al. Patient preferences regarding 1-visit versus 2-visit root canal therapy. *J Endod*. 2012;38(10):1322-1325.
- Ørstavik D, Pitt Ford TR. Intracanal medicaments. In: Ørstavik D, Pitt Ford TR, editors. *Essential Endodontology. Prevention and Treatment of Apical Periodontitis*. 3rd edition. Oxford (UK): Wiley Blackwell; 2019. p. 299.
- Ikram O, Neal T, Mounce R. Endodontics: single versus multiple visit. *Clinical Dentistry*. 2021;1(6):57-63.
- Aminoshariae A, Kulild J. Master apical file size – smaller or larger: a systematic review of microbial reduction, *Int Endod J* 2015;48: 1007-1022.
- Mergoni G, Ganim M, Lodi G, Figini L, Gagliani M, Manfredi M. Single versus multiple visits for endodontic treatment of permanent teeth. *Cochrane Database of Systematic Reviews*. 2022(12).
- Schwendicke F, Göstemeyer G. Single-visit or multiple-visit root canal treatment: systematic review, meta-analysis and trial sequential analysis. *BMJ Open*. 2017 Feb 1;7(2):e013115.
- de Souza Netto M, Saavedra F, Simi Júnior J, Machado R, Leal Silva EJM, Vansan LP. Endodontists' perceptions of single and multiple visit root canal treatment: a survey in Florianópolis – Brazil. *RSBO (Online)*. 2014;11(1):Jan-Mar.
- Sathorn C, Parashos P, Messer H. Australian endodontists' perceptions of single and multiple visit root canal treatment. *Int Endod J*. 2009;42(9):811-818.
- Wong AW, Zhang S, Zhang CF, Chu CH. Perceptions of single-visit and multiple-visit endodontic treatment: a survey of endodontic specialists and general dentists in Hong Kong. *J Investig Clin Dent*. 2016;7(3):263-271.
- Abuelq omsan masa. Perception of single-visit root canal treatment: a cross-sectional survey. *European Journal of Molecular & Clinical Medicine*. 2020;7(11):5779. ISSN 2515-8260.
- Manfredi M, Figini L, Gagliani M, et al: Single versus multiple visits for endodontic treatment of permanent teeth, *Cochrane Database Systemic Rev* 2016; 12: Cd005296.
- M. J. Eghbal, A. Haeri, A. Shahravan, et al. Postendodontic pain after pulpotomy or root canal treatment in mature teeth with carious pulp exposure: a multicenter randomized controlled trial. *Pain Research and Management*. 2020;2020:5853412
- C. O. Brahm, J. Lundgren, S. G. Carlsson, P. Nilsson, J. Corbeil, C. Hägglin. Dentists' views on fearful patients. *Problems and promises*. *Swedish Dental Journal*. 2012;36(2):79-89.
- F. A. Alonazian, Y. F. AlFawaz. Is phototherapy effective in the management of post-operative endodontic pain? A systematic review of randomized controlled clinical trials. *Photodiagnosis and Photodynamic Therapy*. 2019;26:53-58.
- M. A. Alomaym, M. M. Aldohan, M. Alharbi, N. Alharbi. Single versus multiple sitting endodontic treatment: incidence of postoperative pain—a randomized controlled trial. *Journal of International Society of Preventive and Community Dentistry*. 2019;9(2):172.
- Almeida DO, Chaves SCL, Souza RA, Soares FF. Outcome of Single- vs Multiple-visit Endodontic Therapy of Nonvital Teeth: A Meta-analysis. *J Contemp Dent Pract* 2017;18(4):330-336.
- Dall AQ, Sheikh I, Khoso NA. Postobturation Pain After Single Visit Endodontics in Teeth with Pulpal Necrosis. *JPDA*. 2010;19(3):148-154.
- Waseem, R. F., Khan, K. I., Khan, M., Moiz, A., Jehan, N., & Zahir, H. (2022). Comparative Evaluation of Postoperative Pain Following Single Visit and Two Visit Endodontic Therapy in Non-vital Teeth: Postoperative Pain in Non-vital Teeth. *Pakistan Journal of Health Sciences*, 3(06).
- Nusstein JM, Reader A, Drum M. Local anesthesia strategies for the patient with a "hot" tooth. *Dent Clin North Am*. 2010;54(2):237-247.
- Figini L, Lodi G, Gorni F, et al. Single versus multiple visits for endodontic treatment of permanent teeth: a Cochrane systematic review. *J Endod*. 2008;34(9):1041-1047.
- American Association of Endodontists. AAE Endodontic Case Difficulty Assessment Form and Guidelines. https://www.aae.org/specialty/wp-content/uploads/sites/2/2017/06/2006casedifficultyassessmentformb_edited2010.pdf. Accessed July 30, 2018.
- Rajeswari K, Kandaswamy D, Karthick S. Endodontic management of patients with systemic complications. *J Pharm Biogallied Sci*. 2016;8(Suppl 1):S32-S35.
- Cohen S, Hargreaves, K. *Cohen's Pathways of the Pulp*. 10th ed. St. Louis, MI: Mosby; 2011.

1 Jazib Pervez:

CONTRIBUTIONS BY AUTHORS

Conceptualization, literature search, Article writing, Editing, statistical analysis.

2 Hafiz Muhammad Adil:

Data collection, Methodology, investigation, statistical analysis.

3 Suffiyan Saleem:

Investigation, Data collection, Methodology, Data interpretation.

4 Syed Midhat Batool:

Data interpretation, Data collection, Methodology.

5 Amara Nazir:

Investigation, Data collection, Methodology.

6 Syeda Afshan Manzoor:

Data collection, Data interpretation, Methodology.