

## PERCEPTION OF SINGLE-VISIT ROOT CANAL TREATMENT-A CROSS-SECTIONAL SURVEY

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### ABSTRACT

**Background:**The idea of doing single-visit root canal treatment is not new, however most accepted approaches in current use emphasize on multi-visit systems.

**Aim:** To evaluate the perception of Single-visit Root Canal Treatment among the dental practitioners in southern Indian region.

**Methodology:** This was a descriptive cross-sectional survey which include 210 dental practitioners regardless of their specialty in southern Indian region. Data collection was done by sending structured self-administered questionnaire to the dental practitioners by different means of social media (WhatsApp, Email, Facebook etc.). All data was recorded and evaluated by using SPSS software.

**Results:** A total of 210 dental practitioners responded to the survey, the response rate was 84%. Majority 101 (48.1%) of the dental practitioners responded vitality of pulp was the reason for choosing the single-visit RCT. When the dental practitioners were asked about the reason for choosing multiple-visit RCT, most of them responded that the tooth with periapical lesion/Retreatment 63 (30%) was the reason.

**Conclusion:** Most dental practitioners of southern Indian region perform single-visit root canal treatment in cases of vital pulp, but most of the dental practitioners perform multiple-visit root canal treatment in cases of necrotic pulp.

**Keyword:**Dental practitioners; Root Canal Treatment; Endodontics, single visit.

### INTRODUCTION

The idea of doing single-visit root canal treatment is not new, however most accepted approaches in current use emphasize on multi-visit systems [1]. In endodontic procedure, progress is based on three main concepts i) Comprehensive debridement ii) sterilization and iii) complete obturation of the root canal system. However, a success rate ranging from 70 to 95 percent was recorded by adhering to the basic principles [2]. Root canal obturation is one of the most important procedures among the endodontic treatment and an

important factor is the timing of root canal obturation, root canal medication, and drainage of the root canal [3]. Several researchers have tested single-visit endodontic treatment. The level of discomfort and the success rate between single- and multiple-visit procedures were their main areas of concern. The result was that single-visit therapy was not unpleasant and equally beneficial. For the multiple visits endodontics, the key areas of concern were the pain intensity and the success rate between single and multiple-visit therapies. The result was that there was no more uncomfortable and equally effective single-visit therapy than multiple-visit therapy [2, 4, 5].

In recent years, single-visit endodontic treatment has gained increased popularity as an appropriate procedure in the United States for most cases. There are several benefits to single-visit endodontic treatment, e.g. (a) it decreases the number of patient appointments; (b) it removes the risk of microbial contamination during appointments; (c) it allows for the instant use of canal room to retain a post [6]. However, there are a few drawbacks of single-visit endodontic treatment, the degree of single-visit endodontic practice and the frequency of root canal flare-ups vary from report to report [5, 7]. The big concern with any endodontic procedure is the health of pulp and peri-radicular tissue. Infected tooth retention is often preserved by root canal surgery, which may have been extracted due to more serious endodontic issues [8]. As root canal treatment is a highly skilled procedure, a dentist requires comprehensive expertise to perform such therapy [9]. The dentist may encounter problems such as high-speed burs, indirect vision and vigorous use of endodontic instruments during tooth preparation [10]. Due to the lower number of visits and to prevent postoperative pain, single visit endodontics may be a best choice of care among patients [11]. The way root canal therapies have been conducted has improved over the past 10-15 years. Advances in rotary engine nickel-titanium files and newer versions of apex locators have resulted in improved care results and less procedural errors [12]. All these advances increase the incidence of single-visit endodontics in dental clinics and the reason for this treatment regime is less stressful and only one anesthesia is needed, making it very well tolerated by the patient, less time-consuming, reducing the risk of infection between visits, less costly and more profitable for the clinician [13]. Regardless of these developments, the question appears today whether that dentists are incorporating these in their regular endodontic practice or not [14].

The purpose of this study is to evaluate the perception of single-visit root canal treatment and the reasons for taking the decision among the dental practitioners in southern Indian region based on their answers to a questionnaire relating to the timing of different endodontic procedures.

## **METHODOLOGY**

This was a descriptive cross-sectional survey which include 210 dental practitioners regardless of their specialty in southern Indian region. The questionnaire consists of three sections i) Reasons for choosing single-visit or multiple-visit RCT ii) Number of root canal treatment done in a month iii) Number of visits for completing the RCT depending on the conditions of periapical area of the tooth. The sample size was done by taking reference

from a previous study done by Jurcak, Bellizzi [2]. The inclusion criteria include regardless of their specialty working in different sectors like government sector, private sector and in academics. The exclusion criteria were dental practitioners who don't wanted to be the part of the survey. The study duration was from November 2020 to January 2021.

Data collection was done by sending structured self-administered questionnaire to the dental practitioners by different means of social media (WhatsApp, Email, Facebook etc.). The purpose of study was explained to the participants. The questionnaire used for our study was a valid and reliable tool [14] for evaluating the perception of single-visit root canal treatment among the dental practitioners in southern Indian region. The questionnaire describing the reasons for choosing single-visit or multiple-visit were vitality of pulp, choice of the patients, patent or normal roots, non-vital tooth with sinus, retreatment or tooth with periapical lesion, tooth with acute pain, tooth with ledge, calcification and extra root, uncooperative patients and other reasons.

### **Statistical Analysis**

All data was recorded and evaluated by using SPSS software (IBM, Chicago, IL, USA software version 26.0). Descriptive analysis was done and conveyed as percentage (%) and frequency.

### **RESULTS**

A total of 250 dental practitioners were contacted initially by different mean of social media (Facebook, Email, WhatsApp etc.), 210 dental practitioners responded to the survey, the response rate was 84%.

Table 1 demonstrate the socio-demographic characteristics of the dental practitioners with gender and qualifications. 62.9% were males and 37.1% females. 109 (51.9%) of respondents were endodontist, 81 (38.6%) were general dentist and 20 (9.5%) were from the other dental specialties. The average number of RCT's done in a month by the dental practitioners were more than 30 teeth 120 (57.1), 20-30 teeth 73 (34.8) and 15-30 teeth were 17 (8.1) respectively.

Table 2 demonstrate the distribution of reasons for choosing single-visit and multiple visit RCT. Majority 101 (48.1%) of the dental practitioners responded vitality of pulp was the reason for choosing the single-visit RCT followed by patient's choice 55 (26.2%), patent and normal roots 22 (10.5%), non-vital tooth with sinus 20 (9.5%) and other reasons 12 (5.7%) respectively. When the dental practitioners were asked about the reason for choosing multiple-visit RCT, most of them responded that the tooth with periapical lesion/Retreatment 63 (30%) was the reason followed by tooth with acute pain 55 (26.2%), uncooperative patients 47 (22.4%), other reasons 23 (11%) and tooth with ledge, calcification and extra roots 22 (10.5%) respectively.

Table 3 demonstrate the descriptive statistics of number of visits for completing the RCT based on the conditions of periapical area of the tooth. Depending on the condition of tooth without periapical lesion 52 dental practitioners reported that the RCT's were done in single visit followed by 19 in two visits and 10 in more

than three visits respectively. Among the tooth with periapical lesion 80 dental practitioners reported that they performed RCT in three or more visits followed by 40 in two visits and 9 in single visit respectively.

## DISCUSSION

The purpose of the present study was to explore the perception of dental practitioners on single and multiple visit root canal treatment. The response rate of this survey was 84%. A high response rate has been noted in the present survey, this agrees with the survey conducted among the Hong Kong population [15]. The reason might be the distribution of questionnaire was done multiple times by different means of social media (WhatsApp, Email, Facebook etc.) to the dental practitioners. Also, the questionnaire was simple, short, easy and less expensive to apply. With respect to gender, male (62.9%) dental practitioners had high participation when compare to female (37.1%) similar results were seen in the studies conducted among Brazilian [16] and Saudi Arabian dental practitioners [17]. The reason might be frequency of male dental practitioners in southern India is more than the females. Further, the dental practitioners with master's degree in endodontics (51.9%) had responded well when compare to general dentist (38.6%) and other specialties (9.5%) respectively. This agrees with the study conducted among dental practitioners of Japan [3]. The dental practitioners who performed 30+ root canal treatments (57.1%) were more when compare to another groups, similar finding was seen among the study conducted in India [14].

When the questionnaire responses were analyzed, it was found that with respect to the reason for choosing the single-visit RCT, 48.1% of dental practitioners select the vital pulp. The single-visit RCT is well accepted when the pulp is vital. Normally, the dental practitioners prefer to carry out RCT of vital teeth in a single-visit [18]. Concern about the possibility of inter-appointment contamination, especially in vital pulp teeth, has also been reported as one of the major causes of single-visit RCT [19]. These findings are in accordance with the study conducted in Turkey and Brazil [16, 20]. Single-visit RCT has many benefits for both the clinician and the patient. It takes less time, resulting in a lower patient cost, less uncomfortable and less stressful treatment than multi-visit treatment. And the chances of infection or recontamination of the root canal system can also be avoided. In addition, several studies have shown that postoperative pain is lower when single-visit RCT is done [1, 21, 22]. With the advancement in the field of dentistry, more sophisticated rotary NiTi files, dental operative microscopes with new generations of apex locators and digitally improved radiography are used, all these factors make single visit endodontics more appropriate treatment modality [23]. The second reason for choosing the single-visit RCT was found to be the patient's choice (26.2%). This finding is supported by similar results from a study [14]. The reason may be because the patients prefers less appointments and the fear of post-operative pain. With respect to the RCT of necrotic pulp teeth, most clinicians also favor multiple visit therapy. In these cases, only a small number of cases are preferred to a single-visit therapy. Such findings are similar in the prior research done by Araújo Filho and Sendra [24]. Most dental practitioners did not conduct the single-visit RCT, many have successfully carried out the treatment of necrotic teeth with periapical

lesion, explaining the findings by removing bacterial contamination in the root canal by sufficient instrumentation, irrigation and filling [24-26]. The other reasons for choosing multiple visit RCT was tooth with acute pain 26.2% and uncooperative patients 22.4%. This is because, majority of the patients become apprehensive and uncooperative during the acute pain conditions which make the dental practitioners to postpone the appointment for the next visit. When the dental practitioners were asked about the number of visits scheduled for the patients, it was seen that the visits were arranged based on the status of periapical lesion. For a tooth without periapical disease, single-visit RCT 64.19% were well tolerated but at the same time 23.45% of dental practitioners opted for 2 visits due to fear of postoperative discomfort or inevitable flare-ups. 62.01% of the patients were treated with necrotic pulp with periapical lesion at 3 or more visits due to the use of intra-canal medications to prevent recurrence of the disease. Such findings were reported in a study conducted by Araújo Filho and Sendra [24]. In the literature, there is no strong reason to prohibit single-visit endodontic treatment. On the opposite, there could be chances of bacterial growth leading to mid-treatment flare-ups if the root canal space is left open between appointments [19]. A systematic review also reported that, relative to single-visit RCT, post-operational pain was more after multi-visit RCT [11]. While it is found from the above results that no pattern of treatment preference is seen during the root canal procedure. Single-visit RCT or multi-visit RCT both rely on the preference of clinicians and the choice of patients.

## CONCLUSION

According to the findings of this survey, it can be concluded that most dental practitioners of southern Indian region perform single-visit root canal treatment in cases of vital pulp, but most of the dental practitioners perform multiple-visit root canal treatment in cases of necrotic pulp. The vitality of pulp is the primary and most significant reason for choosing the single-visit endodontic therapy.

## CONFLICT OF INTEREST

The authors state no conflict of interest.

**Table 1: Socio-demographic profile and number of RCT done in a month by the dental practitioners**

<b>Variables</b>	<b>n= (%)</b>
<b>Gender</b>	
Male	132 (62.9)
Female	78 (37.1)
<b>Qualifications</b>	
General dentist	81 (38.6)
Endodontists	109 (51.9)
Other specialties	20 (9.5)

<b>Number of RCT done in a month</b>	
15-20 Teeth	17 (8.1)
20-30 Teeth	73 (34.8)
30+ Teeth	120 (57.1)

**Table 2: Reasons for choosing single-visit and multiple visit RCT)**

<b>Reasons for choosing single-visit RCT</b>	<i>n= (%)</i>	<b>Reasons for choosing multiple-visit RCT</b>	<i>n= (%)</i>
Vitality of pulp	101(48.1)	Retreatment or tooth with periapical lesion	63 (30)
Choice of the patients	55 (26.2)	Tooth with acute pain	55 (26.2)
Patent or normal roots	22 (10.5)	Tooth with ledge, calcification and extra root	22 (10.5)
Non-vital tooth with sinus	20 (9.5)	Uncooperative patients	47 (22.4)
Other reasons	12 (5.7)	Other reasons	23 (11)
Total	210(100)		210(100)

**Table 3: Number of visits for completing the RCT based on the conditions of periapical area of the tooth**

<b>Condition of pulp</b>	<b>Number of visits</b>			
	<b>1 visit</b>	<b>2 visits</b>	<b>3 or more visits</b>	<b>Total</b>
Tooth without periapical lesion	52	19	10	81
Tooth with periapical lesion	09	40	80	129
Total	61	59	90	120

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