

SINGLE VISIT ROOT CANAL TREATMENT: OPINIONS OF A POPULATION OF YOUNG NIGERIAN DENTISTS.

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ABSTRACT

AIM: To evaluate the opinions and practices of fresh graduate dentists in Nigeria with regards to single-visit root canal treatment.

METHODS: A questionnaire-based cross-sectional study of House Officers, information on the frequency of undertaking root canal treatment in the course of the posting, the average number of appointments needed to complete single-rooted teeth with single canals, teeth with two canals and teeth with three or more canals, their performance of single-visit root canal treatment in the course of their postings, and the factors influencing undertaking single-visit root canals was sought.

RESULTS: A total of 60 house officers agreed to participate in this study. For single-rooted teeth and teeth with two root canals, 48.3% and 55.0% of the respondents respectively stated that 3 visits were required while for teeth with three or more root canals, 43.3% of the respondents specified that 3 or more visits were required to complete the root canal treatment. Less than half (43.3%) of the respondents reported that they performed single-visit root canal treatment. The most commonly reported factor influencing the choice of performing single visit root canal treatment was the vitality of the tooth (34.6%), followed by the electiveness of the root canal treatment (30.8%) and the tooth with a single canal (23.1%) while the least reported factor was the cost of treatment (7.7%).

CONCLUSION: Single visit root canal treatment, though an acceptable alternative treatment procedure for endodontic problems, tends to be dependent on the pre-operative condition of a tooth. Fresh graduates who are conversant with this concept as part of their undergraduate curriculum are disposed to undertaking single visit root canal treatment in well-selected cases.

KEYWORDS: Root canal, Single visits, Young graduate dentist

INTRODUCTION

Single-visit endodontic treatment is defined as 'the conservative non-surgical treatment of an endodontically involved tooth consisting of complete biological cleansing, shaping and

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obturation of the canal system in one visit.¹ The concept of a single-visit root canal treatment was described as early as the 1880s.² The treatment techniques used at that time were very primitive and the success rates were poor. The single-visit treatment was reintroduced in the 1950s by Ferranti,³ who emphasized the proper shaping and cleaning of the canals as the prerequisite for success.

Single-visit endodontic treatment, though an old concept in clinical practice, is now considered as

an acceptable alternative treatment procedure for endodontic problems especially with the advent of new instrumentation techniques and materials.⁴⁻⁷ These advances include the use of rotary endodontics which has been demonstrated to achieve satisfactory canal disinfection.^{8,9}

Single-visit Root Canal Treatment (RCT) has many advantages among which are the reduction in the number of appointments, which is more convenient for patients, the reduction in both treatment costs and the risk of contamination of the root canals.^{10,11} It also reduces the need for repeated courses of antibiotics in patients requiring prophylactic cover for endodontic treatment. The reduced number of appointments allows clinicians to manage office time efficiently, by reducing the time wasted on missed appointments and rescheduling. Single-visit RCT reduces patient discomfort and risks associated with the administration of local anesthetic agents as well as reducing the episodes of pain and anxiety that may be associated with each appointment. There is also less chance of making iatrogenic errors like perforation, ledging, stripping, and the extrusion of antimicrobial irrigants out of the canal(s) and it also allows the clinician to obturate the canals that are well-oriented and with which the operator is familiar. It eliminates the chance of inter-appointment microbial contamination as there is no need for a provisional restoration between appointments and thus no bacterial contamination through the leakage beneath^{1,12,13} or when the provisional restoration is lost. Multiple visits will tend to increase the chances of iatrogenic canal damage through over-preparation of the canal(s).

A number of clinical research studies have shown favorable results with single-visit protocols^{14,15} with a definite trend towards single-visit root canal treatment in the USA.^{16,17} Root canal treatment of teeth with normal peri-apices and even those with apical periodontitis have been provided in a single visit.¹⁶ It has been demonstrated that endodontists prefer single-visit root canal treatment while general dental practitioners prefer multiple visits.^{17,18}

Since its introduction, single-visit endodontic treatment has attracted controversy. Although single-visit root canal treatment has some advantages, dental practitioners tend to be weary of providing this form of root canal treatment.^{11,18,19} Single-visit root canal treatment is believed not to be routinely carried out by undergraduate students and fresh graduates due to insufficient skills and expertise²⁰ with calls for it to be included in undergraduate curriculum.^{20,21} Confidence in achieving a predictably successful treatment using the single-visit technique may be lacking in these groups of clinicians. Studies have been extensively done on single-visit root canal treatment procedure but there remains a paucity of knowledge in this regard in Nigeria. Hence, this study sought to evaluate the opinions and practices of fresh graduate dentists in Nigeria with regards to single-visit root canal treatment.

MATERIAL AND METHODS

This was a questionnaire-based, cross-sectional study of House Officers who had completed their mandatory 3-month Housemanship rotations in the Department of Restorative Dentistry of the University of Benin Teaching Hospital between January 2018 and June 2019.

The questionnaire consisted of 11 items consisting of 7 closed-ended and 4 open-ended questions which was administered at the end of the clinical posting. The questionnaire was pre-tested on five house officers who were subsequently excluded from the study. The questionnaires obtained information on the frequency of undertaking root canal treatment in the course of the posting, the average number of appointments needed to complete root treatment of single-rooted teeth with single canals, teeth with two canals and teeth with three or more canals, their performance of single-visit root canal treatment in the course of the posting, and factors influencing their undertaking single-visit root canal treatment procedures.

All the data collated were screened for completeness and analyzed using IBM SPSS version 21.0. The statistical tools employed were

descriptive analysis in the forms of frequency counts, percentages and cross-tabulations. Chi square was used to determine association between variables with p set at 0.05.

RESULTS

A total of 60 House Officers agreed to participate in this study. The study population consisted of 60% males and 40% females with majority (63.3%) belonging to the 26-30 years age group (Table 1). During the course of the Restorative Dentistry postings, 13.3% claimed they performed root canal treatment on patients daily, 60.0% reported performing root canal treatment weekly while the remaining 26.7% were not certain of the frequency of performing root canal treatment.

The number of visits itemized for a tooth with a single canal ranged from 1-4 with a mean of 2.42 ± 0.98 visits. The number of visits for a tooth with two root canals ranged from 1-5 with a mean of 2.93 ± 1.07 visits while the number of visits for a tooth with 3 or more canals ranged from 2-6 with a mean of 3.28 ± 1.21 visits.

Table 2 shows the average number of appointments needed to complete root canal treatment among the respondents. For single rooted teeth and teeth with two root canals 48.3% and 55.0% of the respondents respectively stated that 3 visits were required while for teeth with three or more root canals 43.3% of the respondents each specified that 3 or more visits were required to complete the root canal treatment. Less than half (43.3%) of the respondents reported that they performed single-visit root canal treatment (Figure 1).

Table 3 depicts the various factors that influenced the choice of performing single visit root canal treatment among the respondents. The most commonly reported factor was the vitality of the tooth (34.6%), followed by the electiveness of the root canal treatment (30.8%) and the singleness of canals in the tooth (23.1%) while the least reported factor was the cost of treatment (7.7%).

There was no statistically significant association between performing single-visit root canal treatment and the age group, gender and frequency of performance of root canal treatment among the respondents (Table 4).

Table 1: Gender and age distribution of the respondents

Characteristics	Frequency	Percent
Age group (years)		
21-25	14	23.3
26-30	38	63.3
>30	8	13.4
Gender		
Male	36	60.0
Female	24	40.0
Total	60	100.0

Table 2: Average number of visits for completing root canal treatment among the respondents

Number of visits	Number of root canals in the teeth		
	Single	Two	3 or more
1	2 (3.3)	1 (1.7)	0 (0.0)
2	20 (33.3)	7 (11.7)	4 (6.7)
3	29 (48.3)	33 (55.0)	26 (43.3)
>3	5 (8.3)	15 (25.0)	26 (43.3)
Not specific	4 (6.7)	4 (6.7)	4 (6.7)

Table 3: Factors influencing choice of single visit root canal treatment among the respondents

Factors	Frequency	Percent
Vitality of the tooth	9	34.6
Single canal	6	23.1
Expediency	3	11.5
Cost	2	7.7
Elective root canal treatment	8	30.8
Large pulpal exposure following iatrogenic or other causes of tooth fracture	5	19.2

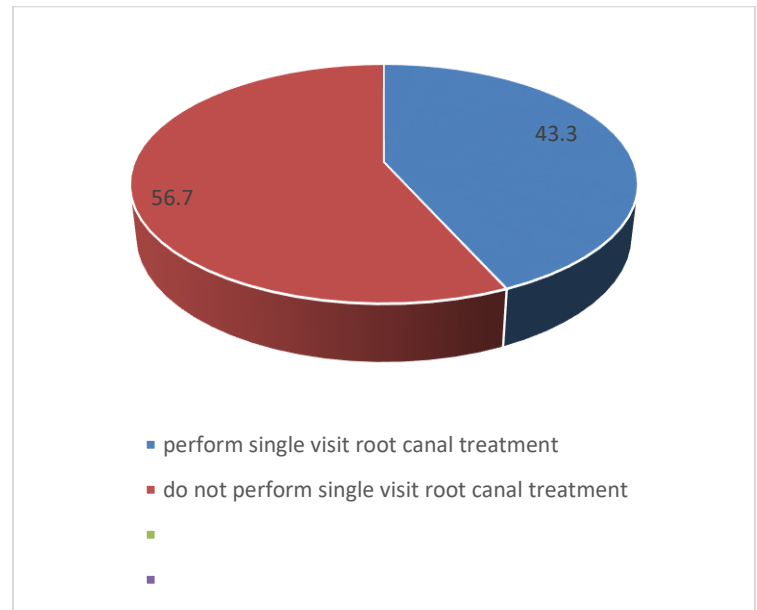
Table 4: Association between performing single visit root canal treatment and age, gender and frequency of performing root canal treatment

Characteristics	Perform single visit root canal		Total
	Yes	No	
* Age (years)			P=0.79
21-25	7 (50.0)	7 (50.0)	14 (100.0)
26-30	16 (42.1)	22 (57.9)	38 (100.0)
>30	3 (37.5)	5 (62.5)	8 (100.0)
** Gender			P=0.20
Male	18 (50.0)	18 (50.0)	36 (100.0)
Female	8 (33.3)	16 (66.7)	24 (100.0)
*** Frequency of performance of root canal treatment			P=0.9
Daily	3 (37.5)	5 (62.5)	8 (100.0)
Weekly	16 (44.4)	20 (55.6)	36 (100.0)
Uncertain	7 (43.8)	9 (56.3)	16 (100.0)
Total	26 (43.3)	34 (56.7)	60 (100.0)

Chi-Square value *1.042 **1.629 ***0.130
Degree of freedom *3 **1 ***2

DISCUSSION

Endodontic training forms a vibrant part of undergraduate training in dentistry with dental students being expected to graduate with a working knowledge and competency in “uncomplicated” endodontic cases in spite of the disparities in the teaching methods.²² The participants of this study were fresh dental graduates from various dental schools who had just completed their 3-month postings in the department of Restorative dentistry as a part of their mandatory one-year housemanship training program.

Figure 1: Prevalence of performing single visit root canal treatment

The preponderance of male participants indicates that dentistry remains a male-dominated profession in Nigeria. The most represented age group (26-30years) is the usual age of graduation from dental school as seen from previous studies on final year dental students and House Officers.^{23,24}

Single visits were not advocated for teeth with 3 or more canals among the study participants. However, teeth with 1 or 2 canals were reported as possible candidates for single visit root canal treatment. In this study, single rooted teeth and teeth with two root canals, 3 visits were reported to be required while for teeth with three or more root canals, 3 or more visits were reported to be required to complete root canal treatment. This is slightly different from reports of a previous study where it was reported that 3 visits are required for teeth with 2 or more canals and 2 visits for teeth with single canals.¹⁹

Single-visit root canal treatment seems to have become more popular in America and Europe²⁵ and among Flemish dentists²⁶ with an inclination to perform single-visit root canal treatment especially in cases without apical periodontitis.¹⁶ However, the same cannot be said for developing

countries^{19,27} where majority of dentists do not practice single-visit root canal treatment. In this study, less than half (43.3%) of the respondents reported that they performed single-visit root canal treatment, a finding higher than that observed in a study in Saudi Arabia which reported that 2% of practitioners completed root canal treatment in one visit¹⁷ and another study in Sudan which observed that a vast majority of dental practitioners did not provide single-visit root canal treatment.¹⁹ This may be because single-visit endodontics is now being advocated as part of undergraduate curriculum in dental schools.²⁸

The pre-operative condition of a tooth tended to influence the choice of single visit root canal treatment among participants in this study, with the most commonly reported factors being the vitality of the tooth, electiveness of the root canal treatment and the tooth with a single canal. This is in consonance with recommendations of a previous study with regards to the selection of cases for single-visit root canal treatment.²⁹⁻³¹ However, another previous study showed no statistically significant relationship between preoperative condition of the tooth and the quality of the root canal treatment following single or multiple visit root canal treatment.²¹ Furthermore, it has been demonstrated that there is no significant difference in postoperative complications between single-visit and multiple-visit endodontic treatment.³²

In conclusion, single visit root canal treatment, though an acceptable alternative treatment procedure for endodontic problems tends to be dependent on the pre-operative condition of a tooth. It is becoming acceptable by fresh graduates, hence, fresh graduates who are conversant with this concept as part of their undergraduate curriculum are disposed to practicing single visit root canal treatment in well-selected cases. The advantages of the single-visit technique and the absence of demonstrably better prognosis using the multiple-visit technique will support the encouragement of younger doctors practicing the single-visit

technique to the benefit of the patients as well as the dental practitioners throughout their careers.

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