

Original Research Article

Endodontists perceptions of single and multiple visit root canal treatment: a survey in Florianópolis – Brazil

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Abstract

Introduction: One of the main debates that have occurred in Endodontics is about the amount of sessions required to complete an appropriate treatment. There are very different philosophies regarding this matter. **Objective:** to the aim of this study was to investigate the Endodontists' point of view regarding single and multiple visit root canal treatment, identifying the basis on which the choice is made and how the information necessary for the choice is acquired. **Material and methods:** Endodontists registered in the dental practice board of Florianópolis/SC were contacted, and if they agreed to participate, they were interviewed using a questionnaire. The following topics were addressed: demographics, current clinical procedures, treatment rationales and preferences. Forty-three endodontists agreed to participate in the study. **Results:** Single visit endodontic treatment is carried out in 59.5% of biopulpectomy cases, 31.0% of necropulpectomy cases without lesion and only 11.9% in necropulpectomy cases with periapical lesion. The presence of vital pulp (81.4%) and a canal

without exudate (93.0%) are the most important criteria for carrying out single visit endodontic treatment. The most used intracanal medication was calcium hydroxide. The lack of studies comparing long-term success on single visit endodontic treatment is considered an important issue to determine this therapy. **Conclusion:** It can be concluded that Florianópolis-Brazil endodontists prefer multiple visit over single visit root canal treatment in pulp necrosis cases. When pulp vitality is not compromised there is an increase in the number of endodontists who choose single visit root canal treatment.

Introduction

Single and multiple visit root canal treatment has been the subject of long-standing debate in the endodontic community, not only on the biological and efficiency point of view, but also on the operator and patient's comfort, satisfaction and preferences [29]. Both options of treatment, single and multiple visits, are based on solid studies, but the number of different opinions is still significant [12, 14, 16, 18, 24, 26, 30, 33, 39].

Single visit endodontic therapy has many advantage, e.g. (a) it reduces the number of patient appointments; (b) it eliminates the chance for interappointment microbial contamination; (c) it allows for the immediate use of the canal space retention of a post; and (d) it allows the endodontists perform the root canal filling when they are more familiar with the canal anatomy [4, 22, 32, 40]. However, two concerns regarding single visit root canal treatment still make many endodontists do not use this therapy: (a) the incidence of flare-ups and (b) the long-term success [9, 36]. Recent studies demonstrated no differences between single and multiple visit treatment regarding to postoperative complications [1, 5, 31]; however, there is a lack of conclusive studies demonstrating the long-term success of single visit treatment in necrotic pulp teeth [14, 26, 39].

The aim of the present study was to investigate endodontists' point of view regarding single and multiple visit root canal treatment, identifying the basis on which the choice is made and how the information necessary for the choice is acquired.

Material and methods

A questionnaire was sent to 103 endodontists, resident in Florianópolis/SC, Brazil and listed in the Brazilian Federal Board of Dentists. It was e mailed with wording briefly explaining the purpose of the study. The questionnaires were divided in

two sections: (i) The first one was about age, gender, place of work, time since graduation and level of academic degree; (ii) The second one consisted in questions about current clinical procedures, treatment options, preferences and opinion about single and multiple visit canal treatment. The answers were recorded and entered into spread sheet software for analysis. Descriptive statistics were used.

Results

Profile of the Endodontists and clinical preferences and procedures

Forty-three endodontists agreed to participate in the study. 53.5% were male and 46.5% were female. Of these, 88.4% had neither a master nor doctorate degree. Most of them have more than ten years of specialist practice (60.5%). Almost 80% of all participants used hand files for canal preparation, mostly in a crown-down technique. The sodium hypochlorite is the preferential irrigation substance for 86% endodontists.

Opinion about single and multiple visit canal treatment

Concerning to the time to complete a single visit treatment, most part of the professionals reported taking more than 90 minutes to complete the treatment of a molar both for vital and necrotic pulp (44% and 60%, respectively). Single visit therapy is usually practiced by almost 60.0% of all endodontists interviewed in cases of vital pulp, but when the biological status of the pulp becomes necrotic very few still choose this treatment type (table I). However, most of participants were willing to provide single visit treatment in cases of necrotic pulp without periapical lesion (53.4%) rather than in cases with periapical lesion (79.0%).

Table I - Number of sessions until root canal obturation

Status of the pulp/ Number of sessions	1 (%)	2 (%)	3 or + (%)
Vital	25 (59.5%)	15 (35.7%)	2 (4.8%)
Necrotic with lesion	13 (31.0%)	19 (45.2%)	10 (23.8%)
Necrotic without lesion	5 (11.9%)	19 (45.2%)	18 (42.9%)

When questioned about what were the most commonly volunteered reasons for not performing a single visit therapy in teeth with pulp necrosis with or without periapical lesion, 60.5% of the participants answered the “importance of the intracanal medication”. On the other hand, when asked about the main reason to perform a single visit treatment, 81.4% of the professionals answered that vital pulp is the most important aspect (table II). The most important reason to allow this treatment type was the absence of exudate for 93.0% of them. Other reasons are shown in table III.

Table II - Reasons to not perform and to perform single visit treatments

Reasons to not perform single visit treatments	n (%)	Reasons to perform single visit treatments	n (%)
Intracanal medication	26 (60.5%)	Vital pulp	35 (81.4%)
Post-operative pain	14 (32.5%)	Inter-appointment contamination	23 (53.5%)
Doubts about biological healing	13 (30.2%)	Absence of lesion	14 (32.5%)
Flare-up	11 (25.6%)	Patient preference	13 (30.2%)
Others	3 (7.0%)	Others	10 (23.3%)

Table III - Most important signs to enable single visit treatments

Most important signs to enable single visit treatments	n (%)
Absence of exudate	40 (93.0%)
Absence of pain	28 (65.1%)
Absence of edema	27 (63.0%)
Time	26 (60.5%)
Absence of sinus track	19 (44.2%)
Absence of severe pain	17 (39.5%)
Others	3 (7.0%)

Discussion

The aim of the present study was to investigate the endodontists' point of view regarding to single and multiple visit root canal treatment. When the answers of the questionnaire were analyzed, we realized that the single visit therapy is well-accepted in cases of vital pulp. The concern about the chance of inter-appointment contamination, especially in vital pulp teeth, was also named as one of the important causes to perform a single visit treatment. These results are in agreement with the endodontic literature. Several studies have

recognized the great importance of coronal seal for the long-term success of endodontic therapy [19, 20, 32, 35]. With regard to the endodontic treatment in teeth with necrotic pulp, the most of specialists still prefer to perform multiple visit therapy. Only a small amount of them prioritize a single visit therapy in these cases. These results are similar to previous studies, such as Araujo Filho *et al.* [3] who also found that single visits are widely accepted by the Endodontists from Rio de Janeiro, mainly in teeth with vital pulp. In contrast, the percentage of participants that performed single visit treatments decreases broadly in cases of necrosis with and without periapical lesion, which can probably be justified by another data from this research that shows the value of intracanal medication on the biological healing for these Brazilian endodontists, even though the current best available evidence does not support such notion [28].

Although single visit treatment was not performed by most of the endodontists, the treatment of necrotic teeth with periapical lesion has been done successfully by many authors who justify the results by the elimination of bacterial contamination in the root canal through adequate instrumentation, irrigation and filling [2, 7, 41].

Despite the large refusal, the treatment of teeth with pulp necrosis, with or without periapical lesion, has been successfully established and approved by many authors. Field *et al.* [11] retrospectively assessed the success rate of single visit root canal therapy. Both vital and necrotic cases, as well as those with and without periradicular disease were included. They found that 199 teeth had clinical and radiographic success over 223 available cases.

The major listed problem to not perform root canal treatment in single visit is the importance of using an intracanal medication to promote a better disinfection process. The most reported intracanal medication was calcium hydroxide for the time of seven days. Several studies highlighted the benefits of the use of calcium hydroxide during endodontic therapy [33, 34]. Trope [36] demonstrated that the use of intracanal medication with calcium hydroxide can improve healing when compared to single visit therapy. Despite of the well-known disinfection properties of this medication, several studies demonstrate its inability to completely eliminate microorganisms from the root canal system [18, 25, 26]. Vivacqua-Gomes *et al.* [37] demonstrated that calcium hydroxide was unable to eliminate *Enterococcus faecalis* completely from dentinal tubules after seven or fourteen days.

In this present study, dry root canal without exudates, was pointed out as one of the important factors during the decision-making to perform a single visit appointment. These results are in agreement with previous studies [38, 41] which confirm that the moisture condition of root canal is an important issue in the decision to perform this approach. Moisture and liquids can negatively affect the sealing ability. It may inhibit, prolong or accelerate the setting process of root canal sealers, which may result in higher leakage [27].

In this present study, most interviewed endodontists reported the use of hand files and the Crown-Down technique. It has been shown that this technique can reduce the chance of accumulation of smear-layer in the apical area, improving the prognosis of immediate obturation [10]. Also, some studies demonstrated that shaping the canal by using Crown-Down philosophy provides a cleaner apical third of the root canals [6]. The use of hand files instead of mechanical Ni-Ti files could be explained by the late popularization of these instruments and the discontinuous in the education of the endodontists in Brazil. 60.5% of all specialists have more than 10 years of experience, and at the time they were studying, Ni-Ti mechanical files were not so popular. Also, almost 90% of

them have neither master's degree nor doctorate choosing to keep on a private practice career, which among Brazilian's endodontists almost always results in lack of updating on clinical and scientific knowledge.

Concerning to the irrigation solution, sodium hypochlorite and the EDTA were the most used ones. These results are in agreement with the literature, which confirms the bactericidal, organic tissue dissolution potential and low surface tension of the former [17, 23], associate to the ability to remove smear-layer of EDTA [15].

Although there is a paradigm about single visit on the Brazilian endodontic community, it is important to highlight that regarding single versus multiple visit therapy, there is very few or no difference between its quality, post operative complication incidence, success and failure clinical indexes, which reinforce the practical of single session therapy [8, 13, 21].

Conclusion

Within the results of this study, it can be concluded that most of Florianópolis' Endodontists perform single-visit root canal treatment in cases of vital pulp endodontic therapy, but in cases of necrotic pulp, most of the participants perform multiple-visit endodontic treatment. The main and most important reason to perform a single-visit endodontic treatment is pulp vitality.

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