

ORIGINAL RESEARCH

Evaluation of Pain in Single Versus Multiple Sitting Root Canal Treatment

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ABSTRACT

Aim: The aim of the study was to evaluate the incidence and severity of post-endodontic pain (PEP) subsequent to single visit and multiple visit root canal treatment (RCT) in teeth with irreversible pulpitis.

Materials and Methods: This was a prospective study. Participants were all patients (100) who underwent single and multiple visit RCT in teeth with irreversible pulpitis, by one clinician, during 5-month period. Patients were divided into two groups; Group A consist of 50 patients in which single sitting RCT was done while in Group B 50 patients were selected in which multiple sitting RCT was done. Inclusion criteria were all mandibular molar teeth and patients between the age group of 18–35 years. Exclusion criteria were swelling, purulence, and antibiotic use during initial treatment. A structured questionnaire accessed age, gender. Within 24 h of treatment, patients were asked to grade their pain at 6 and 18 h post-treatment, using a 1–5 point scale.

Results: There was no statically significant difference between both groups. However, the post-treatment pain was higher in Group B than Group A.

Conclusion: RCT of teeth with single or multiple sitting statically does not create any difference.

Keywords: Endodontic flare up, Multiple sitting, Root canal treatment, Single sitting.

How to cite this article: Batra R, Kapoor S, Patel A, Vaghamshi D, Lakhani J, Daveswar S. Evaluation of Pain in Single Versus Multiple Sitting Root Canal Treatment. *Int J Prev Clin Dent Res* 2018;5(1):S41-43.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Endodontic treatment requires multiple sitting root canal treatment (RCT) which prolong the treatment time and increases the chance of inter-appointment microbial

contamination from external factors. However, with improvement in science and technique, this has become possible to finish RCT in a single sitting. Microscope, rotary NiTi files, and apex locators have made the complex endodontic treatment easier and smooth with decreasing the treatment time. However, many previous histological studies have proved that intracranial medicaments improve the microbiological status of the root canal system when compared with a single visit protocol.^[1]

Single and multiple visit RCT has been the subject of controversy for a long time. Not only from biological and efficacy point but also it should also be on operator and patient comfort.^[2] Both single sitting and multiple sitting RCT have their advantages and disadvantages. Single sitting root canal has advantage that it requires less time and it allows endodontist to perform root canal filling when they are more familiar with the root canal anatomy. However, multiple sitting RCT allows endodontist to apply intracanal medicaments which are alkaline based and thus help in eliminating bacterial infection from a canal in much better way. Previous studies have demonstrated that there is no difference between single and multiple sitting RCT.^[3-5]

The following study was done to evaluate the endodontic flare-up post single sitting and multiple sitting RCT.

MATERIALS AND METHODS

Study Population

This is a prospective study of individuals who underwent RCT in teeth with irreversible pulpitis, by one endodontic clinician in the 5 month period.

A structured questionnaire accessed age, gender, tooth location, and pulpal diagnosis using periapical radiograph. Signed informed consent from all patients was taken.

Inclusion Criteria

Inclusion criteria were the treatment of only one tooth, completion of treatment in one session for single sitting and three sitting for multiple sitting, and the absence of preoperative pain. An indication for treatment was irreversible pulpitis as evidenced by a periapical radiograph.

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Exclusion Criteria

Exclusion criteria were the presence of teeth with symptomatic, pre-operative pain, or necrotic pulp associated with clinical symptoms such as swelling or purulence. In addition, patients who were being treated with antibiotics were also excluded from the present study.

Operative Endodontic Treatment

All mandibular teeth were anaesthetized using inferior alveolar nerve block using one cartridge of lidocaine 2% with 1:80000, using 27 gauze long middle. Local anesthesia was delivered to all teeth that candidate for the treatment of root canals, to prevent the evocation of pain from the pressure of rubber dam clamps on the gingiva or from over instrumentation, leakage of root canal irritants, or overfilling material.

In all operative procedures, a rubber dam was applied immediately after delivery of local anesthesia. The endodontic treatment included accessing the root canal(s), hand instrumentation for extirpation, debridement, and shaping the canals, as necessary. The working length was determined by Root ZX apex locator (J. Morita, California, USA). Ethylenediaminetetraacetic acid (EDTA) was used as a chelating agent. Canals were irrigated with 5 mL of 3.5% NaOCl and sterile saline and obturated with laterally condensed gutta-percha and AH26 sealer (the obturation length was determined by the working length and was 0.5–1 mm short of the radiographic apex). The duration of treatment ranged between 45 and 60 min.

Determination of Pulp Status

The pulp status was determined and recorded as vital only when the tooth responded immediately before treatment to a cold stimulus (CO₂ snow) and/or there was evidence of hemorrhage on opening the pulp chamber. The pulp status was recorded as nonvital if there was no response to cold and no evidence of hemorrhage on opening. Periapical pathology status was determined by a periapical radiographic evaluation.

Evaluation of postendodontic pain (PEP) and use of analgesic drugs 24 h postoperatively.

The treating endodontist informed the patients that PEP may develop and suggested they take acetaminophen to relieve severe pain. A student, unaware of the treatments performed, telephoned patients within 24 h postoperatively. She asked them to grade the level of pain they felt 6 and 18h after treatment, using a continuous 1–5 point scale (1: No pain, 2: Mild pain, 3: Moderate pain, 4: Severe pain, and 5: Very severe/unbearable pain), which they had seen when they signed the consent form [Tables 1-3]. Patients were also asked to

Table 1: Patient distribution according to number, gender, and age for each of the treatment groups

Type of treatment	Number of patients	Gender M/F	Age (mean)
Group A	50	22/28	26
Group B	50	20/30	29

Table 2: Incidence and intensity of PEP (scale 1–5), 6 and 18 h after treatment

Type of treatment	Number of patients	Gender M/F	PEP (mean)
Group A	50	22/28	1.88
Group B	50	20/30	1.92

PEP: Post-endodontic pain

Table 3: Effect of gender on PEP

Type of treatment	Gender F	Gender M	PEP (mean) Gender M	PEP (mean) Gender F
Group A	28	22	1.85	1.90
Group B	30	20	2.85	1.3

PEP: Post-endodontic pain

specify the type of pain from which they suffered (spontaneous or stimulated by mastication or palpation). Additional explanations about the scale were provided by the student, as necessary, until clarity was reached. Patients were asked about their use of analgesic drugs following the treatment.

RESULTS

There was no significant difference statically between both the groups. However multiple sitting had higher post-treatment pain than single sitting root canal treatment.

DISCUSSION

The aim of successful endodontic treatment is to disinfect the canal by chemico-mechanical means. It is believed that intracanal medicaments have alkaline properties and thus helpful in disinfecting root canal.^[6] With changing the era of dentistry and recent advancements such as rubber dam, apex locators, and rotary NiTi file systems it is now possible to disinfect the canal and eliminate biofilm in single sitting therapy. In an infected vital pulp due to carious exposure, the infection is normally found only at the wound surface, which results to localized inflammatory response. In such cases, periapical infection is not present. RCT in such cases is carried out to prevent periapical infection and sequences.^[6] It is been proved in previous studies that in crown down technique the chances of smear layer accumulation in the periapical area is drastically reduced thus leading to less chances of an endodontic flare up and improving

the quality of treatment.^[7] In the following study, EDTA and sodium hypochlorite solutions were used to disinfect and remove smear layer from the root canal as they are bactericidal and has tissue dissolving properties.^[8,9]

Endodontic flare-up is characterized by the development of pain, swelling or both, following the endodontic intervention. In the present study, we evaluated PEP using visual analog scale which revealed that there is no statistical difference in term of single and multiple sitting RCT when case selection is done in limited criteria.

CONCLUSION

Conceding to the limit of this study, we found that there is no significant difference between both the groups. Single sitting root canal should be encouraged in practice considering the patient and doctors comfort with proper case selection.

REFERENCES

1. Vera J, Jose F, Siqueira Jr., Ricucci D, Loghin S, Fernandez N, *et al.* One-versus two-visit endodontic treatment of teeth with apical periodontitis: A histobacteriologic study. J Endod 2012;38:1040-52.
2. Sathorn C, Parashos P, Messer H. Australian endodontists perceptions of single and multiple visit root canal treatment. Int Endod J 2009;42:811-8.
3. Albashaireh ZS, Alnegrish AS. Postobturation pain after single and multiple visit endodontic therapy. A prospective study. J Dent 1998;26:222-32.
4. Bhagwat S, Mehta D. Incidence of post-operative pain following single visit endodontics in vital and non-vital teeth: An *in vivo* study. Contemp Clin Dent 2013;4:295-302.
5. Singh S, Garg A. Incidence of post-operative pain after single visit and multiple visit root canal treatment: A randomized controlled trial. J Conserv Dent 2012;15:323-7.
6. Trope M, Bergenholtz G. Microbiological basis for endodontic treatment: Can a maximal outcome be achieved in one visit? Endod Topics 2002;1:40-53.
7. Fava LR. A comparison of one versus two appointment endodontic therapy in teeth with nonvital pulps. Int Endod J 1989;22:179-83.
8. Murad C, Sassone L, Souza M, Fidel R, Fidel S, Hirata R. Antimicrobial activity of sodium hypochlorite, chlorhexidine and MTAD against *Enterococcus faecalis* biofilm on human dentin matrix *in vitro*. RSBO 2012;9:143-50.
9. Hulsmann M, Heckendorff M, Lennon A. Chelating agents in root canal treatment: Mode of action and indications for their use. Int Endod J 2003;36:810-30.