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Assessment of Pain in Single-Visit Versus Multi-Visit Root Canal Treatment

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KEYWORDS
root, canal, filling

ABSTRACT:

Aim- To compare and evaluate the levels of pain experienced by patients who underwent single-visit versus multi-visit root canal treatment, to determine which approach resulted in less postoperative discomfort and improved overall patient outcomes.

Materials and methods- This was a prospective study involving 50 patients who underwent single-visit and multiple-visit root canal treatments (RCT) in teeth with irreversible pulpitis. The participants were divided into two groups: Group A, consisting of 25 patients who received single-sitting RCT, and Group B, with 25 patients who underwent multiple-sitting RCT. Inclusion criteria included premolar teeth and patients aged 18–50 years, while exclusion criteria were swelling, purulence, and antibiotic use during the initial treatment. Within 24 hours of treatment, patients were asked to rate their pain at 6 and 18 hours post-treatment using a 1–5 point scale. The primary indication for treatment in all cases was a confirmed diagnosis of irreversible pulpitis, as evidenced by periapical radiographs. This approach ensured a consistent and focused examination of the treatment outcomes for this specific condition. Data analysis was done using SSPS software.

Results- Group A consisted of 25 patients, with a gender distribution of 10 males and 15 females, and an average age of 25 years, while Group B also included 25 patients, with 12 males and 13 females, and a slightly higher average age of 29 years. Group A reported an average post-endodontic pain (PEP) score of 1.01, whereas Group B exhibited a higher average PEP score of 1.37. Further analysis showed that in Group A, the average PEP score was 1.45 for males and 1.98 for females, while in Group B, males had an average PEP score of 1.90 and females 1.31. Despite these differences in PEP intensity between genders and treatment groups, there was no statistically significant difference overall. However, patients undergoing multiple-sitting root canal treatments experienced higher post-treatment pain compared to those who had single-sitting procedures.

Conclusion- The study revealed no significant difference between the groups, indicating that single-sitting root canal treatment could be promoted, provided that appropriate case selection is made for the comfort of both the patient and the clinician.

Introduction

In the health professions, long-standing treatment procedures are often slow to change due to the reliance on predictable outcomes. There is hesitancy to adopt new methods because of the uncertainty surrounding their efficacy compared to established practices. However, as new research emerges, traditional concepts must evolve to incorporate updated information. Studies on intracanal preparation, medicaments, and root canal filling techniques have significantly influenced clinical practices, leading to revised approaches in endodontics.[1,2]

Historically, root canal treatments were conducted over multiple visits to ensure the sterility of the canal system, using intracanal medicaments to eliminate bacteria. These compounds, although effective, were irritating to

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periradicular tissues, often causing complications misattributed to infections. This led to an overuse of antibiotics until the adverse effects of these medicaments were recognized, prompting a shift towards either single-visit treatments or safer intracanal medications. Research has shown that single-visit treatments offer comparable outcomes in terms of postoperative pain and healing rates, while reducing operative procedures, patient costs, and the risk of interappointment contamination.[3,4]

Advocates of multiple-visit procedures argue for the necessity of antimicrobial agents like calcium hydroxide to ensure periradicular healing, although modern techniques in single-visit procedures can achieve similar bacterial reduction. Single-visit treatments are especially advantageous in cases with isolation and sealing challenges, anterior aesthetic concerns, and specific restorative needs.[5,6] They offer immediate sealing, reduce the risk of contamination, and provide aesthetic solutions for traumatic cases. Conversely, multiple-visit treatments allow for managing flare-ups before obturation, a consideration less feasible in single-visit regimens.[7]

Hence, the study aimed to compare and evaluate the levels of pain experienced by patients who underwent single-visit versus multi-visit root canal treatment, to determine which approach resulted in less postoperative discomfort and improved overall patient outcomes.

Materials and methods

This was a prospective study involving 50 patients who underwent single-visit and multiple-visit root canal treatments (RCT) in teeth with irreversible pulpitis. The participants were divided into two groups: Group A, consisting of 25 patients who received single-sitting RCT, and Group B, with 25 patients who underwent multiple-sitting RCT. Inclusion criteria included premolar teeth and patients aged 18–50 years, while exclusion criteria were swelling, purulence, and antibiotic use during the initial treatment. Within 24 hours of treatment, patients were asked to rate their pain at 6 and 18 hours post-treatment using a 1–5 point scale.

Participants were assessed using a structured questionnaire that collected demographic information such as age and gender, along with details about tooth location and pulpal diagnosis. Periapical radiographs were utilized to confirm the diagnosis of irreversible pulpitis. Informed consent was obtained from all patients prior to their participation in the study.

The study's inclusion criteria specified that only one tooth per participant would be treated, with the RCT completed in either a single session for single-sitting procedures or across three sessions for multi-sitting treatments. Importantly, patients were only included if they had no preoperative pain. The primary indication for treatment in all cases was a confirmed diagnosis of irreversible pulpitis, as evidenced by periapical radiographs. This approach ensured a consistent and focused examination of the treatment outcomes for this specific condition. Data analysis was done using SSPS software.

Results

Table 1: Demographic Distribution of Patients by Treatment Group.

Type of treatment	Number of patients	Gender M/F	Age (mean)
Group A	25	10/15	25
Group B	25	12/13	29

Table 1 presents the demographic distribution of patients by treatment group. Group A consisted of 25 patients, with a gender distribution of 10 males and 15 females, and an average age of 25 years. Group B also included 25 patients, with 12 males and 13 females, and a slightly higher average age of 29 years.

Table 2: Incidence and Intensity of Post-Endodontic Pain (PEP) at 6 and 18 Hours Post-Treatment

Type of treatment	Number of patients	Gender M/F	PEP
Group A	25	10/15	1.01
Group B	25	12/13	1.37

PEP: Post-endodontic pain

Table 2 outlines the incidence and intensity of post-endodontic pain (PEP) at 6 and 18 hours post-treatment for both groups. Group A, consisting of 25 patients (10 males and 15 females), reported an average PEP score of 1.01. Similarly, Group B, also with 25 patients (12

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males and 13 females), exhibited a higher average PEP score of 1.37.

Table 3: Impact of Gender on Post-Endodontic Pain (PEP).

Type of treatment	Gender M	Gender F	PEP (mean) Gender M	PEP (mean) Gender F
Group A	10	15	1.45	1.98
Group B	12	13	1.90	1.31

PEP: Post-endodontic pain

Table 3 illustrates the impact of gender on post-endodontic pain (PEP) across both treatment groups. In Group A, which included 10 males and 15 females, the average PEP score was 1.45 for males and 1.98 for females. In Group B, with 12 males and 13 females, the average PEP score was 1.90 for males and 1.31 for females

There was no statistically significant difference between the two groups. However, patients who underwent multiple-sitting root canal treatments experienced higher post-treatment pain compared to those who had single-sitting procedures.

Discussion

The management of postoperative pain is a critical aspect of endodontic treatment, influencing both patient satisfaction and clinical outcomes. Root canal treatment (RCT) can be performed in either a single visit or multiple visits, with ongoing debate regarding the impact of each approach on patient comfort and pain levels. Single-visit RCT is often preferred for its convenience and reduced treatment time, while multi-visit RCT is traditionally believed to ensure better infection control through the use of intracanal medicaments. This study explores and compares the levels of pain associated with single-visit versus multi-visit RCT, aiming to provide insights into the optimal approach for minimizing postoperative discomfort.[8,9]

In our study, Group A consisted of 25 patients, with a gender distribution of 10 males and 15 females, and an average age of 25 years, while Group B also included 25 patients, with 12 males and 13 females, and a slightly higher average age of 29 years. Group A reported an average post-endodontic pain (PEP) score of 1.01, whereas Group B exhibited a higher average PEP score of 1.37. Further analysis showed that in Group A, the average PEP score was 1.45 for males and 1.98 for females, while in Group B, males had an average PEP score of 1.90 and females 1.31. Despite these differences in PEP intensity between genders and treatment groups, there was no statistically significant difference overall. However, patients undergoing multiple-sitting root canal treatments experienced higher post-treatment pain compared to those who had single-sitting procedures.

In the study by Batra R et al.,[10] the objective was to assess the incidence and severity of post-endodontic pain (PEP) following single-visit and multiple-visit root canal treatments (RCT) in teeth with irreversible pulpitis. This prospective study included 100 patients treated by a single clinician over five months. Participants were divided into two groups: Group A, comprising 50 patients who underwent single-sitting RCT, and Group B, consisting of 50 patients who had multiple-sitting RCT. The inclusion criteria focused on mandibular molar teeth and patients aged 18–35 years, while exclusion criteria ruled out cases with swelling, purulence, or antibiotic use during the initial treatment. Demographic data, including age and gender, were collected through a structured questionnaire. Patients rated their pain on a 1–5 point scale at 6 and 18 hours post-treatment, within 24 hours of the procedure. The study found no statistically significant difference in post-treatment pain between the two groups, although Group B patients reported higher pain levels than those in Group A. Ultimately, the study concluded that the number of sittings for RCT did not statistically influence post-treatment pain outcomes.

In the study by Alomaym MAA et al.,[11] the aim was to assess significant differences in the incidence and severity of post-obturation pain following single-visit and multiple-visit root canal treatments. The study involved 400 consecutive patients who were randomly assigned to either the single-visit group or the multiple-visit group, with 200 patients in each group. Pain levels were evaluated preoperatively and postoperatively at 6, 12, 24, and 48 hours after obturation using the Visual Analog Scale (VAS). Results showed a male predominance (60.26%), and among the 390 cases analyzed, 167 were vital and 223 were nonvital. There

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was no significant difference in pain levels between vital and nonvital teeth in both groups at different time intervals. However, the multiple-visit group reported a significantly lower incidence of pain compared to the single-visit group.

In the study by Singla R et al.,[12] the purpose was to determine the clinical success rate of single-visit versus multiple-visit root canal treatment in cariously exposed vital primary molars. The study involved 40 children aged 4 to 7 years, divided equally into two treatment groups. Recall visits were conducted at one week, one month, three months, and six months. The results showed no statistically significant difference between the two treatment approaches. The study concluded that both single-visit and multiple-visit root canal treatments demonstrated nearly equal success, emphasizing that the most important factor for success in pulpectomy cases is the appropriate indication for each case and its subsequent treatment, whether single or multiple visits.

The findings of our study are consistent with those of Batra R et al. and Alomaym MAA et al., both of which reported no statistically significant difference in post-endodontic pain between single-visit and multiple-visit root canal treatments. However, it is noteworthy that both studies observed elevated pain levels in the multiple-visit cohort. In contrast, Alomaym MAA et al. reported a lower incidence of pain in the multiple-visit group, which diverges from our conclusion that patients receiving multiple-sitting treatments experienced greater post-treatment pain. Additionally, the research conducted by Singla R et al. on primary molars indicated no significant difference in clinical success between single and multiple visits, underscoring the critical role of appropriate case selection. This aligns with our findings that single-sitting treatment may be advantageous when case selection is conducted judiciously, benefiting both patients and clinicians. In summary, while the overall results corroborate our observations of minimal differences in post-treatment pain, the discrepancies in pain levels across various studies underscore the necessity for further investigation into patient-specific factors that may influence pain outcomes.

One drawback of the study was the relatively small sample size, which may limit the generalizability of the findings and the ability to detect subtle differences between the treatment groups.

Conclusion

The study revealed no significant difference between the groups, indicating that single-sitting root canal treatment could be promoted, provided that appropriate case selection is made for the comfort of both the patient and the clinician.

References

1. Al-Negrish AR, Habahbeh R. Flare up rate related to root canal treatment of asymptomatic pulpally necrotic central incisor teeth in patients attending a military hospital. Journal of Dentistry 2006;34(9):635-40
2. Fox J, Atkinson JS, Dinin AP, Greenfield E, Hechtman E, Reeman CA, Salkind M, Todaro CJ. Incidence of pain following one-visit endodontic treatment. Oral Surg Oral Med Oral Pathol. 1970 Jul;30(1):123–130.
3. Mulhern JM, Patterson SS, Newton CW, Ringel AM. Incidence of postoperative pain after one appointment endodontic treatment of asymptomatic pulpal necrosis in single-rooted teeth. J Endod. 1982 Aug;8(8):370–375.
4. Oliet S. Single-visit endodontics: a clinical study. J Endod. 1983 Apr;9(4):147–152. doi: 10.1016/S0099-2399(83)80036-3.
5. Ghoddusi J, Javidi M, Zarrabi MH, Bagheri H. Flare-ups incidence and severity after using calcium hydroxide as intracanal dressing. New York State Dental Journal 2006;72(4):24-8.
6. Kvist T, Molander A, Dahlen G, Reit C. Microbiological evaluation of one- and two-visit endodontic treatment of teeth with periapical periodontitis: a randomized, clinical trial. Journal of Endodontics 2004;30(8):572-6.
7. Li S. Root canal therapy clinical study for patients with periapical infection. China Continuing Medical Education 2016;8(15):72-4.
8. 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.
9. 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.
10. Batra R, Kapoor S, Patel A, Vaghamshi D, Lakhani J, Daveshwar S. Evaluation of Pain in Single Versus Multiple Sitting Root Canal Treatment. Int J Prev Clin Dent Res 2018;5(1):S46-48
11. Alomaym MAA, Aldohan MFM, Alharbi MJ, Alharbi NA. Single versus Multiple Sitting Endodontic Treatment: Incidence of Postoperative Pain - A Randomized Controlled Trial. J Int Soc Prev Community Dent. 2019 Mar-Apr;9(2):172-177. Epub 2019 Feb 27. PMID: 31058068; PMCID: PMC6489520.
12. Singla R, Marwah N, Dutta S. Single Visit versus Multiple Visit Root Canal Therapy. Int J Clin Pediatr Dent. 2008 Sep;1(1):17-24. doi: 10.5005/jp-journals-10005-1004. Epub 2008 Dec 26. PMID: 25206084; PMCID: PMC4086535.