



IJCRR

Section: Healthcare

ISI Impact Factor  
(2019-20): 1.628

IC Value (2019): 90.81  
SJIF (2020) = 7.893



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# Evaluation of Post-Obturation Pain after Single-Visit Versus Multiple-Visit Non-Surgical Endodontic Treatments

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## ABSTRACT

**Introduction:** The literature to date has failed to establish a consensus concerning the relationship between postoperative pain and the number of treatment appointments. Some authors, support single-visit treatments, while others indicate that the use of such procedures can produce more discomfort for the patient and would therefore be less desirable under most circumstances.

**Objectives:** This study aims to compare the incidence of post-obturation pain at one, two and seven days after single-visit and multiple-visit non-surgical endodontic treatments.

**Methods:** 198 subjects have participated in the present study from the total sample size of 346. The sample was divided into two groups i.e Group-I with 93 subjects underwent the single sitting endodontic procedure and Group-II with 105 subjects underwent two sitting endodontic procedure, who reported back with the VAS reporting form. Pain score was recorded by using a Heft-Parker visual analogue scale (VAS) method. Each patient was assigned a value between 0 and 170 on the VAS scale. Statistical analysis was done using SPSS 20 for Windows (SPSS Inc., Chicago, IL, USA) using Chisquare test at  $p < 0.005$ .

**Results:** There was no change in postoperative pain among subjects treated in one appointment and those treated in two appointments. Most of the patients in both groups conveyed no pain or only slight pain within 24 to 48 hours of treatment.

**Conclusion:** Post-obturation pain after non-surgical endodontic therapy was not uncommon after one day, the second day but there was less pain or no pain after seven days. Among the teeth with post-obturation pain, the single-visit group had lower-intensity pain, after one day, two days and after seven days, then the multiple-visit group had.

**Key Words:** Non-surgical endodontic treatment, Post-obturation pain, Single-visit root canal

## INTRODUCTION

Pain is a complex, personal experience and attempts to make valid assessments of it have been faced with difficulties. The visual analogue scale (VAS) is extensively used to the investigative method for assessing pain experience. The method has also been useful to attentiveness after sleep, anxiety, quality of life, nausea, breathlessness, and attitudes concerning the environment.<sup>1</sup> Patient usually complain of post-obturation distress and pain after endodontic (root canal) procedure. The pain severity can range from mild to severe, and it is extensively described as occurring in flare-ups. The

duration of the pain can range from one day to some weeks and can be a major cause of patient dissatisfaction.<sup>2</sup>

Postoperative pain after nonsurgical root canal treatment has been reported to range from approximately 3% to more than 50%.<sup>3</sup> Pain-related with root canal therapy is a poor display of pathosis and an even more variable predictor of long-term success.<sup>4</sup>

One-appointment root canal treatment is usually measured to be effective, but the incidence of postoperative pain and long-term healing continue unreturned. The majority of the investigation to date has exposed either no significant

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ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 10.10.2020

Revised: 14.11.2020

Accepted: 16.12.2020

Published: 10.03.2021

change in postoperative pain when 1-visit root canal treatment is compared with multiple-visit treatment or less pain with 1-visit treatment. Nevertheless, several of these researches were prospective or retrospective studies without satisfactory controls or randomization. Prospective, randomized studies are usually thought to offer the maximum level of support for evidence-based clinical practice.<sup>1</sup> Wong et al. from their study observed no difference in pain with single or multiple visit endodontics after one day and seven-day postoperatively.<sup>2</sup>

The present study was done to associate the incidence of post-obturation pain at 1, 2 and 7 days after single-visit and multiple-visit non-surgical endodontic procedure.

## MATERIALS AND METHODS

The present study was conducted in the department of conservative dentistry and endodontics, DY Patil Dental School. It included those patients who visited the department for their endodontic treatment. Ethical clearance before the conduct of the study was taken from the concerned ethical committee of the institute. This study was conducted within a time frame of approximately 1 year i.e from November 2016 till October 2017. Inclusion criteria in the study included all cases which presented with preoperative clinical signs like the presence of apical periodontitis, chronic periapical abscess with or without the sinus tract formation, tender on percussion, presence of pain and tooth mobility (1 mm in the horizontal plane). According to the exclusion criteria, those teeth which have already undergone pulpotomy were excluded from our study. Apart from this, pregnant women, patients using antibiotics or corticosteroids at the time of treatment, immune-compromised patients, patients with systemic problems, psychological disorder or some Temporomandibular Joint (TMJ) problems were also excluded from the study. 198 subjects have participated in the present study from the total sample size of 346. The sample was divided into two groups i.e Group-I with 99 subjects underwent the single sitting endodontic procedure and Group-II with 99 subjects underwent two sitting endodontic procedure, who reported back with the VAS reporting form. Pain score was recorded by using a Heft- Parker visual analogue scale (VAS) method.<sup>5,6</sup>

The study was explained to the patient preoperatively and written informed consent was obtained from each patient. For recording the pain intensity, we used a 170 mm Heft-Parker visual analogue scale (VAS). The scale was explained to the patient properly. They could place a mark anywhere on the horizontal VAS scale and assign a value between 0 and 170. Using this scale initially a preoperative pain level was measured for each patient in front of the observer, to ensure that they understood the method of pain assessment. Later each patient was asked about their 1-day (24 hrs), 2 days

(48 hrs) and 7-days post-obturation pain, using this assessment scale. They were given printed forms of the scale with a questionnaire and asked to rate their pain at home on given intervals. These forms were collected from each patient on their 7<sup>th</sup>-day visit to the department. For all the cases a standard instrumentation and obturation technique was followed. All the treated teeth, including both single-rooted and multi-rooted teeth, received the same procedures. Analgesics were prescribed to the patients and permitted to take whenever required.<sup>7,8</sup>

Obtained data were statistically analysed using SPSS 20 for Windows (SPSS Inc., Chicago, IL, USA) using the Chisquare test to compare the results of the groups and get the levels of significance. For comparison of variables, multivariate analysis was done.  $p < 0.005$  was considered as significant.

## RESULTS

The present study included a total sample size of 198 patients which were further divided into 2 subgroups i.e Group 1 (n=99) and Group 2 (n=99). The general patient characteristics like gender difference, age-wise distribution, arch wise distribution and tooth positioning along with the tooth vitality status for each group was categorized and tabulated in table 1.

Table 2 indicates the pain scoring response. It was observed that 30.1% of cases in Group one and 60.9% cases in Group 2 presented with preoperative pain with a mean VAS score of 62.23 and 66.48 respectively. Post-operative pain after 1 day was observed in 29.03 % of group 1 and 31.4% of group 2 patients with a mean VAS score of 23.68 and 32.24 respectively. When compared with the variable characteristics used in the study it was observed that non-vital teeth, and with apical periodontitis showed a lower incidence of post-obturation pain after one day of the treatment. Another observation on comparison showed that those teeth which had lower preoperative pain showed a lower incidence of postoperative pain.

Later Post-operative pain recorded after 2 days was 12.9% in group 1 and 10.47% in group 2 patients with a mean VAS score of 14.12 and 16.18 respectively and after that 7 day was 5.3% for group 1 and 7.6% for group 2, with a mean VAS score of 10.25 and 10.34 respectively (Table-2).

## DISCUSSION

The incidence of postoperative pain is the major concern of the endodontist to evaluate the success of the procedure. Multiple visit endodontic treatment has been traditionally used by the endodontist. But with the success rate of single visit endodontics, this method has also become popular in

clinical practice. Postoperative pain is dependent on multiple factors and variables.<sup>2</sup>

As we know that Pain is a complex experience which is affected by many intrinsic and extrinsic factors, and the multiple aspects. Various methods have been used for assessment of pain till date by various researchers. The visual analogue scale (VAS) is one of such psychometric response pain assessment scale, which has been proven to show superior metrical characteristics than other discrete scales used for pain assessment. Thus due to its better results and reliability, this scale has been widely used by many researchers. In our study, we used a modified Heft-Parker VAS scale as used by Di Renzo *et al.* in their study for pain assessment.<sup>3</sup> In this scale word description of various pain levels are explained and mentioned along the axis in ascending order. 4 Values ranging from 0-170 can be recorded from the markings made by the patient on the scale according to his pain intensity.<sup>5</sup> Heft and Parker state that the unequal spacing of words on the scale represents an accurate reflection of how patients perceive spacing.<sup>6,7</sup>

Our results showed that there is no significant correlation between pulp vitality and the incidence of postoperative pain. In support of this similar finding were reported by Fox et al in their study.<sup>8</sup> Our results are consistent with those of the majority of the published reports on this topic that is, postoperative pain associated with 1-appointment root canal treatment is generally the same as postoperative pain associated with multiple-visit treatment.<sup>9-11</sup> The vast majority of our patients in both groups reported no pain or only minimal pain within 24 to 48 hours of treatment.

In contrary DiRenzo et al, reported that pulp extirpation alone is probably the most significant factor in the reduction of postoperative pain, regardless of other variables.<sup>12,13</sup> Other issues which play a significant role in postoperative pain comprise age, gender, the operator's experience, use of loupe, obturation method, tooth position (anterior or posterior), arch (upper or lower), presence of an opposing tooth, and tooth status (which includes tooth vitality, C-shaped canal, the presence of a periodontal pocket, percussion tenderness, apical periodontitis, hypermobility, and abscess or sinus tract.<sup>2</sup>

It is well recognized that pain awareness is a vastly subjective and variable experience moderated by multiple psychological and physical factors. Ali et al. concluded from their study that post obturation pain was 4% for the initial 48 hours and it reduces after 24 hours.<sup>14</sup> Similarly in our study we found the reduction of pain intensity with time in both the groups. Pain reporting is influenced by many factors other than the experimental procedure. Besides, the measurement of pain is fraught with hazards and opportunities for error. We selected a Heft-Parker VAS and a reporting form used in the previous study by McDowell et al.<sup>15</sup> This is a bounded

scale with absolute values at each end and word descriptors of pain levels placed in ascending order along the horizontal axis. The patient is instructed to place a mark on the scale corresponding to the current level of pain and has a visual reminder of previous reports for comparative purposes. The location of the mark is measured and assigned a value between 0 and 170. The Heft and Parker<sup>8</sup> state that the unequal spacing of words on the scale represents an accurate reflection of how patients perceive spacing between the different pain word descriptors. When properly designed and administered, a VAS is considered to be a valid and reliable ratio scale instrument for the measurement of human pain intensity and unpleasantness.<sup>16</sup> Lakshmi and Ravishankar evaluated the role of phytomedicine against *E. Faecalis* in root canal treatment and concluded that the use of traditional medicinal plants will boost against *E. faecalis*.<sup>17</sup>

It is often difficult to compare results from different studies because instrumentation and obturation techniques vary widely, especially in studies that are more than several years old. The number of visits taken to complete root canal therapy is only one of many variables. The incidence of postoperative pain is one of the major concerns when evaluating endodontic treatment alternatives.<sup>3</sup> Under the conditions of this prospective study, we found no difference in postoperative pain between patients treated in 1 appointment and patients treated in 2 appointments, regardless of preoperative diagnosis or tooth location.

Our results are helpful in the clinical management of the patients requiring endodontic treatment. Further clinical research is needed on a larger sample size in different population in a different geographic location to evaluate the pain perception.

## CONCLUSION

In the present study, post-obturation pain after nonsurgical endodontic procedure was common after one day, but there was less pain or no pain after seven days. There was no significant difference in the incidences of post obturation pain after 1 day, 2 day and 7 days amongst single-visit and multiple-visit endodontic procedure.

**Conflict of interest:** NIL

**Source of Funding:** Nil

**Author contribution**

1. Dr. Riya Patel- Manuscript preparation
2. Dr. Nandita Bansal - Investigation
3. Dr. Divya Gaurav Dudulwar- Data collection
4. Dr. Divya Gupta- Editing
5. Dr. Reshma Dodwad- Analysis
6. Dr. Saidath K- Investigation

## REFERENCES

- Biggs M, Closs JS. A Descriptive Study of the Use of Visual Analogue Scales and Verbal Rating Scales for the Assessment of Postoperative Pain in Orthopedic Patients. *J Pain Symp Manag* 1999;18(6):438-445.
- Wong WA, Zhang S, Li KS, Zhu X, Zhang C, Chu CH. Incidence of post-obturation pain after single-visit versus multiple visit non-surgical endodontic treatments. *Br Med Con Ora Heal* 2015;15:96.
- DiRenzo A, Gresla T, Johnson BR, Rogers M, Tucker D, BeGole EA. Postoperative pain after 1- and 2-visit root canal therapy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002;93(5):605-610.
- Taintor JF, Langeland K, Valle GF, Krasny RM. Pain: a poor parameter of evaluation in dentistry. *Oral Surg Oral Med Oral Pathol* 1981;52:299-303.
- Rogers MJ, Johnson BR, Remeikis NA, BeGole EA. Comparison of the effect of intracanal use of ketorolac tromethamine and dexamethasone with oral ibuprofen on post-treatment endodontic pain. *J Endod* 1999;25:381-384.
- Wewers ME, Lowe NK. A critical review of visual analogue scales in the measurement of clinical phenomena. *Res Nurs Heal* 1990;13:227-236.
- Heft MW, Parker SR. An experimental basis for revising the graphic rating scale for pain. *J Pain* 1984;19:153-161.
- Fox J, Atkinson JS, Dinin AP, Greenfield E, Hechtman E, Reeman CA. Incidence of Pain Following One Visit Endodontic Treatment. *Oral Surg Oral Med Oral Pathol* 1970;30(1):123-130.
- Lee K, Keickhefer GM. Measuring human responses using visual analogue scales. *West J Nurs Res* 1989;11:128-132.
- Raju TB, Seshadri A, Vamsipavani B, Abhilash K, Subhash AV, Kumari KV. Evaluation of pain in single and multi-rooted teeth treated in single-visit endodontic therapy. *J Int Oral Heal* 2014;6(1):27-32.
- Rao KN, Kandaswamy R, Umashetty G, Rathore VP, Hotkar C, Patil BS. Post-Obturation pain following one-visit and two-visit root canal treatment in necrotic anterior teeth. *J Int Oral Heal* 2014;6(2):28-32.
- Prashanth MB, Tavane PN, Abraham S, Chacko L. Comparative evaluation of pain, tenderness and swelling followed by radiographic evaluation of periapical changes at various intervals of time following single and multiple visits endodontic therapy: an in vivo study. *J Cont Dent Pract* 2011;12(3):187-191.
- Albashaireh ZS, Alnegrish AS. Postobturation pain after single- and multiple-visit endodontic therapy: A prospective study. *J Dent* 1998;26(3):227-232.
- Ali SG, Mulay S, Palekar A, Sejal D, Joshi A, Gufran H. Prevalence of and factors affecting post-obturation pain following single visit root canal treatment in Indian population: A prospective, randomized clinical trial. *Contemp Clin Dent* 2012;3(4):459-463.
- McDowell I, Newell CA. Guide to rating scales and questionnaires. New York, Oxford: Oxford University Press, 1987.
- Price DD, McGrath PA, Rafii A, Buckingham B. The validation of visual analogue scales as ratio scale measures for chronic and experimental pain. *J Pain* 1983;17:45-56.
- Lakshmi.T, Ravishankar.P. Role of phytomedicine against e.faecalis in root canal treatment -an update in dentistry. *Int J Cur Res Rev* 2011;3(12):57-58.

Table1: Showing general characteristics of variables in the study

VARIABLES	GROUP 1 (n=99)	GROUP 2 (n=99)
<b>GENDER:</b>		
Male	48.4 % (48)	44.4% (44)
Female	51.5 % (51)	55.5% (55)
AGE (mean)	48.5yrs	46.25yrs
<b>TOOTH:</b>		
Anterior	24.4% (25)	20.6% (24)
Posterior	74.7 % (74)	75.7% (75)
<b>ARCH:</b>		
Maxillary	45.09% (46)	49.13% (57)
Mandibular	54.9% (56)	50.86% (59)
<b>TOOTH VITALITY:</b>		
Vital	27.4% (28)	47.4% (55)
Non vital	72.5% (74)	52.5% (61)

Table 2: Showing means VAS intensity values recorded at different time intervals for both the study groups.

Time Interval	Patients in pain (%)		Mean VAS score (0-170)	
	GROUP 1 (n=99)	GROUP 2 (n=99)	GROUP 1	GROUP 2
Preoperative pain	30.1 %	60.9%	62.23	66.48
Post-operative (24 Hr)	29.03 %	31.4%	23.68	32.24
Post-operative (48 Hr)	12.9%	10.47%	14.12	16.18
Post-operative (7 days)	5.3%	7.6%	8.25	10.34

VAS-visual analogue scale n- number test used-chi square test