

# POST OPERATIVE PAIN COMPARISON IN SINGLE VERSUS TWO VISIT ENDODONTIC TREATMENT

<sup>1</sup>OMER YOUSAF

<sup>2</sup>KASHMALA AZIZ KHAN

<sup>3</sup>FARIHA NAZ

## ABSTRACT

*Postoperative pain is one of the major complication after initiation of root canal treatment (RCT). It has multiple causes including patient anxiety, preoperative pain, individual pain threshold, residual pulp tissue, mechanical and chemical irritation of the periapical tissues. The purpose of this study was to compare the post operative pain following root canal treatment in single versus two visits. The study was conducted at department of operative dentistry, Sharif Medical and Dental College, Lahore from April 2013 to June 2014. Hundred patients recommended for endodontic treatment were sampled by convenience. Patients between the ages of 18-50 years and teeth with vital and necrotic pulps were included. Patients with chronic pulpal disease were excluded.*

*Patients were divided in to equal groups of fifty patients each. Group 1 underwent treatment in one visit while in group 2 treatment was completed in two visits. Patients were asked to record their pain on a Visual Analogue Scale (VAS) from 0-9 at 6, 12, 24, and 48 hours interval after treatment on a VAS pain proforma. SPSS version 19 was used for analysis. Independent samples t-test was applied to study post operative-pain in patients undergoing root canal treatment in one visit versus patients undergoing root canal treatment in two visits.*

*It was observed that the patients undergoing two visit endodontic treatment experienced more pain as compared to the ones receiving single visit treatment and it was significant at 12 and 24 hours post operatively. It is concluded that single visit endodontic treatment evokes less pain as compared to 2 visit treatment.*

**Key Words:** Endodontic treatment, Post operative pain.

## INTRODUCTION

Postoperative pain is one of the major complication after initiation of root canal treatment (RCT). It has multiple causes including patient anxiety, preoperative pain, individual pain threshold, residual pulp tissue, mechanical and chemical irritation of the periapical tissues.<sup>1</sup> In a survey conducted showed that only 12.8% of the dentists questioned thought that teeth with necrotic pulp could be treated successfully in one visit. They were of the opinion that one visit root canal

therapy should be reserved for vital pulp and immediate peri-radicular surgery cases only.<sup>2</sup> However in another survey, 86% of the directors of post graduate endodontic programs reported that non-surgical one visit treatment was part of their program based on favorable reports that showed no difference in treatment complications or success rates when compared with teeth treated in multiple visits.<sup>3</sup> Furthermore they expected the attitude towards one visit therapy to improve.

It is obvious that one visit endodontic treatment carries many advantages as compared to the few disadvantages. However, it has been observed that most of the endodontists prefer to complete the treatment in multiple appointments. This could be because of the general belief that one visit endodontics leads to greater post operative pain.<sup>4</sup> Though studies have shown that pain associated with root canal therapy is a poor indicator of pathosis and an even more unreliable predictor of long term success, the occurrence and control of pain remains an important issue to be considered by all endodontists undertaking any procedure.<sup>5</sup>

<sup>1</sup> Omer Yousaf, BDS, FCPS, Assistant Professor of Operative Dentistry, LMDC, Lahore **Postal Address:** Lahore Medical and Dental College, Lahore, North Canal Bank, Lahore, Pakistan. Email: dr.omerusaf@gmail.com Cell: 0300-9448018 **For Correspondence:** House-64, Street-2, Phase-2, DHA, Lahore

<sup>2</sup> Kashmala Aziz Khan, BDS, D119, 2911 Bayview Avenue, M2K1E8, Toronto, Ontario, Canada  
Email: kashmalaakbar@live.com

<sup>3</sup> Fariha Naz, BDS, FCPS, Assistant Professor Restorative Dental Sciences, College of Dentistry, King Khalid University, Abha, KSA Email: farihashakeel@hotmail.com

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A study conducted in 2008 reported the incidence of postoperative pain after root canal treatment to be between 3% and 58%.<sup>6</sup> Numerous studies have been carried out to compare the incidence and severity of post-operative pain after one and two-visit endodontic therapy of both vital and non vital, single and multiple rooted teeth. Roane who found that the frequency of pain was lower in the single visit group (15.2%) when compared to the two visit group (31.2%).<sup>7</sup> Soltanoff reported a post obturation pain incidence of 64% in one visit and 38% in two visit endodontics.<sup>8</sup>

Pain perception is a highly subjective and variable experience modulated by multiple physical and psychological factors.<sup>9</sup> Pain reporting is influenced by many factors other than the experimental procedure. In addition, the measurement of pain is fraught with many hazards and opportunities for error.<sup>10</sup> In this study a Visual Analogue Scale (VAS) was used to evaluate pain. A properly designed VAS is considered to be a reliable ratio scale for the measurement of human pain and unpleasantness.<sup>5</sup> The rationale of this study is to compare the postoperative pain for one visit endodontic treatment with two visit treatment

## METHODOLOGY

A one year comparative study was carried out at the Operative Dentistry Department of Sharif Medical and Dental College, Lahore between April 2013-June 2014. Hundred patients recommended for endodontic treatment were sampled by convenience. Patients were divided in to equal groups of fifty patients each. Group 1 underwent treatment in one visit while in group 2 treatment was completed in two visits.

### Inclusion Criteria:

Patients between the ages of 18-50 years, mature permanent first and second molar teeth (maxillary and mandibular), and teeth with vital and necrotic pulps.

### Exclusion Criteria:

Presence of pre-treatment swelling or a visible sinus tract, pregnancy, patients taking corticosteroids, endodontic re-treatment cases, periodontally involved teeth, diabetics and any physical or mental condition that would prevent jaw opening for the time required to complete the treatment.

The procedure for both the groups at the first visit included an informed consent, detailed dental history and examination, a pre-operative radiograph, local anesthesia, caries excavation and standard access opening. The pulp status was recorded as vital if the tooth responded to cold (ethyl chloride). The pulp status was recorded as non vital or necrotic if the tooth did not respond to cold. The presence or absence of a peri-apical

radiolucency was assessed from the pre-operative radiograph. Percussion sensitivity was assessed by lightly tapping the tooth with the handle of a mouth mirror. All the relevant dental information was recorded on a proforma.

Each patient was given a Visual Analog Scale (VAS) for recording their post-operative pain level along with stamped return address envelop for returning the form after 48 hours. The VAS used in this study is a bounded scale with 0 signifying no pain at all and 9 the worst possible pain. The form was explained to each patient and they were asked to record their pre-operative pain level in the presence of the clinician to ensure that they understood the instructions. Each patient was given a prescription for 600 mg of ibuprofen with instructions to take only if needed for pain. Patients were instructed to report to the hospital if adequate pain relief was not obtained with the prescription.

SPSS version 19 was used for analysis. Independent samples t-test was applied to study post operative-pain in patients undergoing root canal treatment in one visit versus patients undergoing root canal treatment in two visits. The influence of the variables studied on post operative pain was also evaluated using the same test. The level of statistical significance was established at  $P$  value  $\leq 0.05$ .

## RESULTS

One hundred molar teeth of one hundred patients were included in the study out of which 54 were male and 44 were female patients. They were divided into two groups, one of which was treated in one visit and the other in two visits. Two patients in the two visit group who did not return the VAS form were dropped from the study. Ten patients in the one visit group and nine patients in the two visit group reported having taken ibuprofen for pain relief. In one single visit group the number of teeth with vital pulp was 35 whereas in two visit group it was 19. The VAS pain measurements were higher for the two visit patients (24%) as compared to the one visit patients (18%) but were statistically significant only at 12 and 24 hours post operatively (Fig 1).

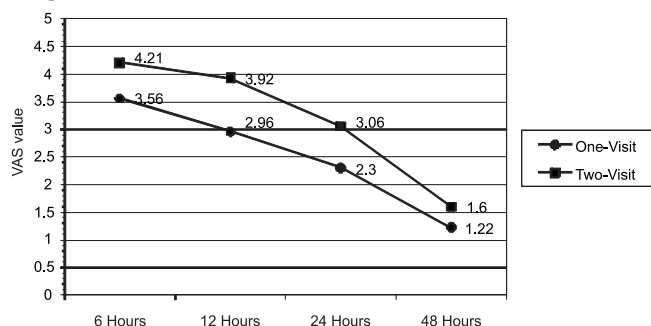


Fig 1: Mean VAS Pain Measurement for all cases one visit vs two visits patients

Female patients experienced a considerably higher degree of post operative pain as compared to males and this was statistically significant at 6, 12, 24, and 48 hours post operatively. The VAS pain measurements were higher for the two visit patients as compared to the one visit patients but were statistically significant only at 12 and 24 hours post operatively. Patients in the 18 to 34 years age group experienced less post operative pain as compared to the 35 to 50 years age group. These results were statistically significant at 12 hours post operatively. Maxillary Teeth had less post operative pain as compared to mandibular teeth and this result was statistically significant at six 6, 12 and 24 hours post operatively. Vital teeth experienced more post operative pain as compared to non vital teeth but this was not found to hold any statistical significance.

## DISCUSSION

Although post operative pain associated with root canal therapy is a poor indicator of long term success, the occurrence and control of pain are of clinical interest in endodontics. In this study the degree of post operative pain after one and two visit root canal therapy was determined by quantifying the pain experience with the help of a visual analogue scale. The effects of age, sex, status of the pulp on post operative pain were also determined.

Considerable difference of opinion exists over the question of whether it is preferable to complete endodontic treatment in one or multiple appointments with respect to post operative pain. Roane found that the frequency of pain was lower in the one visit group (15.2%) as compared to the two visit group (31.2%).<sup>7</sup> On the other hand a study reported a post obturation pain incidence of 64% in the one visit group and 38% in the two visit group.<sup>8</sup> These figures seem high when compared with other studies. One possible reason for this could be the use of normal saline by instead of sodium hypochlorite. The lack of an anti bacterial solution may have contributed to a higher incidence of post operative pain.

This study found a lower incidence of pain after one visit endodontics (18%) as compared to the two visit group (24%) that was statistically significant at 12 and 24 hours post operatively. These results are in agreement with those of Steinder<sup>11</sup> who observed that a significantly higher incidence of post obturation pain was found in the two visit group as compared to the one visit group. A study conducted in 2009 showed occurrence of postoperative pain in 107 (69.9%) and 106 (69.3%) teeth in the single- and multi-visit treatment groups, respectively.<sup>1</sup> Risso reported more pain in multiple visit endodontic treatment as compared to single visit treatment and hence concluded that single visit

endodontic therapy decidedly decreases the probability of the incidence of the pain reaction immediately after root canal obturation which is in agreement with the results of our study.<sup>12</sup> Other studies have reported no significant difference in post operative pain between single and multiple visit endodontic treatment.<sup>13-16</sup> A meta-analysis on the effect of the number of treatment visits on pain after root canal treatment reported that patients who had single-visit root canal treatment felt significantly less postoperative pain compared with 2-visit treatment.<sup>17</sup>

The results of many studies by different practitioners have shown that no statistically significant difference in post operative pain is present in patients of different age groups. Balaban<sup>18</sup> and Eleazer & Eleazer<sup>19</sup> treated necrotic teeth and found no difference in post obturation pain in different age groups. Matusow also discovered no relationship between post operative pain and age.<sup>20</sup> More recently the results of Kane have also indicated that post operative pain and exacerbation related to age is not statistically significant.<sup>21</sup> This study found more pain in patients in 35-50 years of age as compared to the 18-34 years age group. The reason could be a coronal transportation of the radiographic apex because of secondary cementum deposition with advancing age. This could have resulted in an error of working length determination which might have then caused an extrusion of the gutta-percha point and the sealant resulting in post obturation pain. The results of this study however, agree with those of Toosy<sup>22</sup> who also showed a positive correlation between post operative pain and advancing age.

Among the two groups for patients age 35-50 years there was no difference in pain between patients undergoing treatment in one or two visits. However, for patients aged 18-34 years there was less pain in the one visit group as compared to the two visit group. Matusow<sup>20</sup> and Eleazer & Eleazer<sup>19</sup> found no difference in post operative pain with regards to gender. Walton and Fouad<sup>23</sup> and Kane<sup>21</sup> also found the same to be true.

This study found a higher incidence of pain in females as compared to males that was statistically significant at 6, 12, 24 and 48 hours. This result is in disagreement with the above mentioned studies and with Toosy<sup>22</sup> who also found no gender difference for post operative pain. However, the results agree with those of Fox<sup>24</sup> and Morse<sup>25</sup> who independently found a greater incidence of post obturation pain for women. Numerous studies have been carried out to correlate the status of the pulp with the post obturation pain. The popular belief was that endodontic treatment of non vital cases where the pulp was almost certain to be infected led to greater post operative pain.



## CONCLUSION

Patients undergoing endodontic treatment in one visit experience less postoperative pain as compared to those undergoing it in two visits. A multitude of factors including the status of the pulp, age and gender, may contribute to some extent to the overall pain response after treatment.

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## CONTRIBUTIONS BY AUTHORS

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| <b>1 Omer Yousaf:</b>    | Literature review, proforma development, research design, discussion and manuscript review. |
| <b>2 Kashmala Aziz:</b>  | Study idea, data collection, result compilation and discussion.                             |
| <b>3 Fariha Shakeel:</b> | Result compilation, statistical analysis and manuscript review.                             |