

## Original Article

# A STUDY OF FLARE-UPS FOLLOWING SINGLE-VISIT ROOT CANAL TREATMENT IN ENDODONTIC PATIENTS

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### ABSTRACT

**Objective:** To determine the frequency of flare-ups in single-visit endodontic treatment and the associated factors. **Study Design:** Observational. **Place and Duration of Study:** Swami devi dyal dental college and hospital, barwala. **Methodology:** One hundred patients were assigned for single-visit root canal treatment. Patients that defaulted after the first appointment (incomplete treatment) were excluded from the study. For each tooth treated, the clinical factors and conditions existing before and after the completion of treatment were recorded. This data included patient's age, gender, type of tooth, pre-operative status of pulp and periapical tissues and recording pain and swelling (flare-ups) postoperatively after 1 day, 7 days and 1 month. The significance of results was obtained by applying paired-sample t-test and Pearson X2 test. **Results:** Three of one hundred cases showed flare-ups after treated in single appointment. On the other hand, a marked number (n=97) of cases did not show flare-ups during the study period. None of the studied variables showed any statistically significant bearing on rate of flare-ups in single appointment root canal treatment. **Conclusion:** The single-visit root canal treatment was safe in terms of endodontic flare-ups as far as results of this study are concerned. It was safer in both vital and non-vital teeth, and even in teeth with periapical pathosis.

**Key words:** Periapical pathosis, Flare up root canals, Endodontic treatment.

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### INTRODUCTION

In the early two to three decades of modern endodontic treatment, timing of root canal treatment completion was a concern and performing endodontic treatment in one step was considered an inappropriate treatment protocol. It was assumed that patients would have a higher incidence of postoperative pain generally known as endodontic flare-ups.<sup>1</sup> However, current studies demonstrated that the incidence of pain was not increased in patients who were treated in one sitting versus those treated in multiple appointments.<sup>2-5</sup> Furthermore, recent advancement in technology especially rotary and Ni Ti instrument made it possible to complete the root canal treatment in single sitting without compromising the quality of the treatment.<sup>6</sup> Traditionally, multiple-visits endodontic treatment protocol is based on the philosophy that only chemico-mechanical canal

preparation is not sufficient enough to disinfect the canal. It needs intra-canal medicaments like calcium hydroxide for few days to withstand the canal microorganisms.<sup>7,8</sup> However, recently published studies described the role of instrumentation and irrigation of canal with sodium hypochlorite as being more important than dressing of the canals with calcium hydroxide in case of multiple-visit treatment.<sup>9,10</sup> The chemico-mechanical canal preparations reduced the canal microorganisms to sub-clinical level and further intra-canal medicaments did not show further decontamination of canal.<sup>11</sup> Most of the patients prefer extraction of their teeth rather than undergoing endodontic treatment to avoid multiple visits. Also some patients do not return to complete the treatment after the first appointment at which pain is relieved. Hence, more dentists are embracing the single-visit procedure particularly in teaching hospitals.<sup>12</sup> It was, therefore,

the aim of the present study to find the frequency of post-obturation flare-ups following single-visit root canal treatment so that this kind of endodontic treatment protocol can be used safely, especially in a teaching hospital.<sup>13</sup>

**METHODOLOGY**

This was an observational study conducted at dental hospital (Teaching Hospital) Swami devi dyal dental college and hospital, Barwala, from february 2013 to july 2014. A consent form was filled for each patient referred to endodontic department within a period of 6 months. All the patients were assigned for single-visit root canal treatment regardless of their age, gender, type of tooth and status of pulp or periradicular tissues. Patients that defaulted after the first appointment (incomplete treatment) were excluded from the study. For each tooth treated, the clinical factors and conditions existing before and after the completion of treatment were recorded. The data included patient’s age, gender, type of tooth, pre-operative status of pulp and periapical tissues and recording pain and swelling (flare-ups) postoperatively after 1 day, 7 days and 1 month. A local anaesthesia was performed prior to access opening. Rubber dam was employed to isolate each tooth. The canals were prepared by crown-down technique with Ni Ti manual proTaper files (Maillifars/ Dentsply). The canals were irrigated by

2.5% sodium hypochloride solution. Finally, canals were obturated by lateral condensation technique with zinc-oxide based sealer (endo-fill). Endodontic flare-ups were defined as either patient's report of pain not controlled with over the counter medication and or increasing swelling. The analysis was undertaken in SPSS 10 for window and significance of results was obtained by applying paired-sample t-test and Pearson X2.

**RESULTS**

Total number of cases was 100. Out of these, 3 cases showed flare-ups after treated in single appointment. Marked number (97) of cases did not show flare-ups during the study period. The age, gender, type of tooth, pre-operative status of pulp and pre-operative status of periapical tissues were variables of the study. However, none of these showed any significant bearing on rate of flare-ups in single appointment root canal treatment with p-values of 0.083, 0.379, 0.363, 0.159 and 0.280 respectively (Table I). On the other hand, high rate of flare-ups was found in younger groups 6% compared to older groups 0%, higher in non-vital teeth 4.9% compared to vital and higher in teeth with periapical radiolucency 3.2% than without radiolucency 1.6%, however, those were not statistically significant so far.

**Table 1:** Flare-ups observed in different variables.

| Variables                | Flare-ups observed | Flare-ups not observed | Significance (P-values) | Total cases |
|--------------------------|--------------------|------------------------|-------------------------|-------------|
| <b>Type of teeth</b>     |                    |                        |                         |             |
| Anterior                 | 00                 | 31                     | .363                    | 31          |
| Premolars                | 02                 | 31                     |                         | 33          |
| Molars                   | 01                 | 35                     |                         | 36          |
| <b>Pulpal status</b>     |                    |                        |                         |             |
| Vital                    | 01                 | 38                     | .159                    | 39          |
| Non-vital                | 02                 | 59                     |                         | 61          |
| <b>Periapical status</b> |                    |                        |                         |             |
| Normal                   | 01                 | 61                     | .280                    | 63          |
| Apical pathosis          | 02                 | 35                     |                         | 37          |
| <b>Gender</b>            |                    |                        |                         |             |
| Male                     | 01                 | 57                     | .379                    | 58          |
| Female                   | 02                 | 40                     |                         | 42          |
| <b>Age</b>               |                    |                        |                         |             |
| 11-30 years              | 03                 | 47                     | .083                    | 50          |
| 31-60 years              | 00                 | 50                     |                         |             |

## DISCUSSION

Endodontic flare-up is characterized by the development of pain, swelling or both, following endodontic intervention.<sup>1</sup> The causative factors of flare-ups encompass mechanical, chemical and or microbial injury to the pulp or periradicular tissues. Of these factors, microorganisms are arguably the major causative agents of flare-ups.<sup>2,3</sup> Situations like apical extrusion of infected debris, changes in the root canal microbiota and/or in environmental conditions caused by incomplete chemo-mechanical preparation, secondary intra-radicular infections and perhaps the increase in the oxidation-reduction potential within the root canal and leaky inter-appointment restorations lead the overgrowth of the facultative bacteria.<sup>4</sup> Based on these situations, preventive measures against infective flare-ups are proposed, including selection of instrumentation techniques that extrude lesser amounts of debris apically; completion of the chemo-mechanical procedures in a single visit; use of an antimicrobial intracanal medicament between appointments in the treatment of infected cases; not leaving teeth open for drainage and maintenance of the aseptic chain throughout endodontic treatment.<sup>6</sup> Knowledge about the microbial causes of flare-ups and adoption of appropriate preventive measures can significantly reduce the incidence of this highly distressing and undesirable clinical phenomenon.<sup>9</sup> The present study was performed to evaluate the incidence of flare-ups in single-visit endodontic therapy. A significantly less flare-ups was observed in the single visit root canal treatment (3%), showing an advantage for single-visit treatment at a 95% confidence level in this hospital-based study. This is very close with the findings of Eleazer and Eleazer who reported fewer flare-ups for the single-visit group (3.0%) and (8.0%) for the multiple-visit group.<sup>5</sup> Other studies have also reported lower incidence figures for endodontic flareups.<sup>6-8</sup> Imura and Zuolo reported a further lower figure of 1.58%.<sup>4</sup> No significant correlation was found between pulp vitality and the reported incidence of postobturation pain. This finding is in agreement with others, who reported that tooth pulp vitality had little effect on post-obturation pain.<sup>4,5</sup> It is, however, in direct conflict with the traditional belief that only vital cases should be considered for single-visit endodontics. Although cases with non-vital pulps seemed to experience more pain than did the cases with vital pulps, the differences were not statistically significant. In relation to status of

periapical tissues to flare-ups, it was observed higher in cases with periapical radiolucency but again not significant. Sjogren *et al.* observed a 94% healing of periapical lesion, if the canals are well-decontaminated prior to obturation regardless of one or two-visit treatment regimen.<sup>7</sup> The other variables like age, gender and type of tooth, however, have no bearing on flare-ups rate in single-visit root canal treatment. The same correlation was observed by Imura and Zulo in their study.<sup>4</sup> In another study, Oldas *et al.*<sup>14</sup> found higher number of patients reported endodontic flare-up treated in single sitting (8 out of 218 cases) compared to that of only 2 cases in two-visit treatment. Although, the numbers were not so high but they found significant difference between the two kinds of treatment protocols. These results contradict with that of the performed study, however, the former researchers performed retreatment rather than initial treatment as in this study. Endodontic re-treatment has lower success rate than initial treatment because of some bacteria being resistant to mechanical preparation only so need intra canal calcium hydroxide medicaments for longer period.<sup>15,16</sup> As it is common with all hospital-based studies, the subjects in the present study may not be a true representation of the population and there is also difference in managing the patients in teaching hospital and private practices, therefore, the ability to generalize the results is weak. However, a careful case selection and adherence to the basic principles of endodontic therapy will reduce the incidence of flare-ups and postobturation pain and thus enhance a successful outcome.<sup>16</sup>

## CONCLUSION

The single-visit root canal treatment is safe in terms of endodontic flare-ups as far as results of this study are concerned. It is safer in both vital and non-vital teeth, and even teeth with periapical pathosis. A thorough understanding of the basic endodontic principles is important in considering each case on an individual basis before making a decision as to whether or not it can be completed in one visit.

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