

# Prevalence of Flare Up in Vital and Non Vital Teeth Undergoing Root Canal Treatment and Its Relationship with Preoperative Pain

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## ABSTRACT

Root canal treatment has been considered a safe alternative in retaining natural teeth. Although done with high clinical acumen and strict adherence to sterilization protocol, clinicians face bouts of flareup, putting both the clinician and the patient in a state of confusion. Flare up can lead to an unintended visit to the dentist due to pain or swelling after initiation of root canal treatment. This prospective study was designed to examine the prevalence of flare up and its relationship with pre-operative pain. A total of 500 patients were included in the study, according to the developed selection criteria. All patients received routine root canal treatment. The presence or absence of pain/discomfort were recorded pre-operatively as well as post-operatively. We found no relationship between pre-operative pain and flare up. Flare up rate in our study was 1.6% overall. Better understanding of factors causing flare up would greatly assist clinicians and patients.

**Keywords:** Flare up, Periapical lesion, Preoperative pain, Root canal treatment

## INTRODUCTION

Root canal treatment aims at removing pulp tissue, normal or infected, from its canal space and creating an environment conducive to healing by sealing the space three dimensionally. Root canal treatment has been an ever increasing treatment of choice due to awareness of the patient and will to retain their natural teeth. Incorporation of new technologies by the dentist has made the treatment less painful and successful. In spite of adhering to accurate acumen and strict protocol clinicians still face problems of flare up. Flare up can be the cause for an unintended visit to the dentist due to pain or swelling after initiation of the root canal treatment.<sup>1</sup> There are a variety of risk factors that have been analyzed regarding the prevalence of flare up, which include age, gender, use of analgesics and antibiotics, pulpal status, preoperative pain, presence of periapical radiolucency and presence of a sinus tract.<sup>2-8</sup> The reasons for identifying the risk factors are to improve results of treatment rendered to the patient. If perioperative indicators of flare up are identified properly combined with the clinicians experience it can result in better patient care post-operatively. This study intends to find the prevalence of flare ups in vital and non vital teeth, undergoing root canal treatment and to examine if it is related to pre-operative pain.

## MATERIALS AND METHODS

This is a prospective clinical study carried out from August 2013 to August 2015 in which a total of five hundred patients were included among which, 250 were non vital and 250 were vital cases. Patients visiting private dental clinics for root canal treatment were selected. Since this was a routine procedure, routine protocol was followed.

Ethical clearance was obtained from the Ethical Review Board. The following were the selection criteria:

1. The patients of age 18-70 years.
2. If bleeding was observed on access opening, the tooth was considered to be in the vital group and if there was no bleeding on access opening, then they were considered in the non vital group.
3. Multiple deep caries were not included.
4. Patients who reported pain on normally scheduled second appointments were not categorized as flare-ups.
5. Traumatic injury cases were not considered.
6. Previously initiated root canal treatments were not included
7. Previously treated root canal treatments were not included.

All selected patients were asked to record their pain experience according to the following criteria:<sup>9</sup>

1. No pain: The treated tooth felt normal.
2. Slight pain: Teeth involved was slightly painful for a time, regardless of the duration, but there was no need to take analgesics.
3. Moderate pain: The tooth involved caused discomfort and or pain, which was either tolerable or was rendered tolerable by analgesics
4. Severe pain: Pain caused by the treated tooth disturbed normal activity or sleep and analgesics had little or no effect.

After grading the pain, the tooth in question was isolated and access opening was done. The canal/s were initially negotiated with hand files followed by ProTaper rotary files (Dentsply) with copious irrigation with 3% sodium hypochlorite (Septodont) and 17% EDTA (Ultradent). In the first visit, the pulp tissue/necrotic pulp tissue were extirpated and copiously irrigated, working length was determined with the help of radiographs after which, apical preparation was done then with the help of number 25 K file. All the patients were advised to take analgesics on day one. In the second visit (after one week), patients were asked to record the pain after which the canals were prepared with ProTaper rotary file and the master apical file of at least number 25/F2 size was used, followed by obturation done with Ah Plus sealer (Dentsply) and gutta percha (Dentsply). The orifice was sealed with temporary cement. Patients were recalled after one week to receive permanent restoration. In case of flare up, when the patient arrived, data pertaining to initiation of pain or swelling were recorded and the patients were asked to categorize pain as described above. Then the temporary restorations were removed and the canals were irrigated with normal saline. In case of added systemic signs like rise in temperature and continued increase of swelling size, the patients were prescribed antibiotics. Obturation in these cases were done after the symptoms subsided as described above.

**RESULTS**

Out of 500 patients 210 were male and 290 were female. Flare up occurred in 8 cases among which, 3 were vital and 5 were non vital cases. Preoperative pain was present in 175 patients among which, 85 were vital and 90 were non vital cases and in 3 vital cases and 5 non vital cases flare up occurred.(Table 1).

**Table 1:** Distribution of samples n=500

VARIABLE	TEETH		TOTAL
	VITAL	NON VITAL	
<b>Gender</b>	<b>n (%)</b>		
Male	100 (47.61)	110 (52.31)	210 (100)
Female	150 (51.72)	140 (48.28)	290 (100)
Pre Operative Pain	85 (48.57)	90 (51.43)	175 (100)
Flare up	3	5	8

**Table 2:** Presence of lesion and draining sinus in non vital teeth (n=250)

VARIABLE	Present
Lesion	185 (74%)
Draining sinus	50 (20%)

The relationship of flare up with periapical lesion is shown in Table 3.

**Table 3:** Flare up and periapical lesion(n=250)

Periapical Lesion/Flare up	Present	Absent
Present	4	181
Absent	1	64

In cases with draining sinus, no flare up occurred. Arch and tooth wise distribution is shown in table no.4. We found no relationship of preoperative pain with flare up in this study. Flare up rate in our study is 1.6%.

**Table 4:** Arch and tooth wise distribution of vitality (n=500)

VARIABLE	Maxillary		Mandibular	
	Vital	Non vital	Vital	Non vital
Anteriors	8	8	7	9
Premolars	31	23	26	22
Molars	80	85	98	103

**DISCUSSION**

Flare-up is one complication of endodontic treatment, defined as an acute exacerbation of asymptomatic pulp or periradicular pathosis, after the initiation or continuation of root canal treatment.<sup>10</sup> Other characteristics are occurrence of pain and/or swelling during endodontic treatment or pain and/or swelling that require non intentional treatment, including active interference from the dentist.<sup>11,12</sup> The proper definition of flare up varies due to multiple factors associated with its cause. The incidence of flare ups differs in studies ranging from 0.39-20%.<sup>9,13,14</sup> We found the flare up rate of 1.6% among individuals in our study, consistent with previous studies. A number of studies have also found statistically significant association between presence of periapical lesion and flare-up.<sup>4,7,15,16</sup> Some studies have revealed flare up in teeth even with an absence of periapical lesion.<sup>3,17</sup> In our study, flareup was seen more in teeth presenting with a periapical lesion than in those without periapical lesion. Several hypotheses have been put forward to explain the mechanism of flare up and the causative factors included microbiological, mechanical, chemical and /or mechanical injury to the pulp and periradicular complexes.<sup>18-19</sup> Thus, varied etiological factors make flareup a challenge to the clinician and an enigma to the patient who does not experience preoperative pain. The association of preoperative pain with flareup has been seen in many studies, which have identified pre-operative pain as a predictor of postoperative flare-ups.<sup>1,3,7,20</sup> Two studies did not find pre-operative pain to be associated with increased incidence of flare-up.<sup>13,21</sup> We, however,

found no significant level of flare ups in patient who presented with pre-operative pain. In our study, we also found no cases of flare ups in cases in teeth with draining sinuses. It is believed that a fistula helps to decrease or eradicate pressure by providing a path for drainage, thus, acting as a security against the exacerbations. There are different types of scales and methods to assess pain after endodontic therapy.<sup>9</sup> Among them, the visual analog scale (VAS) is considered to be a valid and reliable ratio scale for measurement of pain.<sup>9</sup> It is well known that pain perception is subjective and has lots of variation among individuals, which may be influenced by physical and psychological factors.<sup>22</sup> To simplify and make it easier for the patient, the level of discomfort was rated in four categories.<sup>9</sup> Within limitations of our study, we conclude that flare up was seen in cases with periapical lesion and we found no relationships between pre-operative pain and flare up, although, larger sample size and multiple risk factors could be considered in future studies to get more understanding on flare up. Knowledge of pre and peri-operative factors leading to flare up would greatly assist the clinician in adjusting the protocol in their routine procedure.

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