Review Article

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# Endodontic Flare Ups and Their Management

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**Abstract**

Endodontic flare ups may occur despite taking all the precaution during the treatment. The cause of flare ups can be biological or mechanical. Flare up does not mean failure or unmanageable condition but it should be treated at the right time to prevent worsening of the situation. Proper diagnosis is vital for treating the flare up. All the relevant causes should be weighed and most appropriate treatment should be done.

Keywords: Flare Ups; Classification; Etiology.

## Introduction

Pain is the most common reason for patient seeking dental treatment. Pain is mainly due to caries reaching the pulp, and the tooth eventually has to undergo root canal treatment. The dentist must treat the patient so that the existing pain is alleviated and there is no pain either during the course of the treatment or after treatment.

A flare up can be defined as "symptoms of pain and discomfort either during or after the completion of endodontic treatment". The severity of flare up can vary from mild pain to swelling and sinus formation. This is the body's adaptation to the change in the environment surrounding the tooth undergoing treatment. The factors that govern the occurrence of flare up are plenty [1].

"A flare-up is an acute exacerbation of an asymptomatic and/or periapical pathosis after the initiation or continuation of the root canal treatment."(American Association of Endodontics)

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## Classification

*Microbial factors*

*Pathogenic bacteria and host defense mechanism*

In case of asymptomatic apical peridotitis, there is balance between the microorganisms and the host immune mechanism, this balance is called "local adaptation syndrome" in dental literature. After cleaning and shaping in case of apical extrusion of debris: dilatation of vessels, increases in the permeability of vessels and inflammatory cells, chemotaxis begins this balance is disturbed and when the virulence of microbes is more than the host defense mechanism there will be a flare up [2,1].

*Virulent clonal types*

Parvimonas micra, Eubacterium, Porphyromonas (P. endodontalis, P. gingivalis) and Prevotella are the most commonly found strains in case of symptomatic periapical periodontitis.

*Microbial cells concentration*

The low virulence is offset by the increase in quantity by growth and multiplication and the initial endodontic infection being due to multiple microbial causative agents. The simultaneous protuberance of bacteria through apical foramen reaching periradicular tissues cannot be stopped as the bacteria multiplying actively, occasionally even provoked by host factors like blood components and serum.

Even though fungi, archaea, and viruses are present in endodontic infections, bacteria are the most prevalent micro-organisms in these infections[3].

**Environmental factor**

*Resistance of the host*

When the intra canal host microbe balance is altered due to canal preparation, irrigants, the virulent clonal types which are more pathogenic can cause inflammation and post operative pain.

*Mechanical factors*

*1. Instrumentation beyond the apex*

All the techniques available to measure the working length including radiographic and apex locators should be used to avoid instrumentation beyond the apex which can lead to inflammation, forcing debris into apical tissues and causing pain.

*2. Forcing debris beyond the apex*

Fragments of debris, necrotic pulpal tissue, irrigants and microorbes from root canal gain access into periapical tissues and leads to inûammation and postoperative pain. Crown down technique causes less extrusion of debris beyond the apex compare to step back technique.

*3. Overfilling (filling beyond the apex)*

Any material that goes beyond the apex is an irritant. It can be a mechanical or chemical irritant. The obturation materials or the irrigants should be confined to the root canal. Any gutta percha that goes beyond the apex can act as a physical irritant and can cause post operative pain.

*Chemical factors [4, 1]*

*1. Intra canal irrigants*

The irrigants should not be taken beyond the apex. Especially, sodium hypochlorite, which when reaches periapical tissue can cause severe pain and swelling. Every precaution must be taken to avoid such untoward incidents.

*2. Intra canal medicaments*

Formaldehyde based medicaments are potent necrotic agents which can cause necrosis of the tissues. Studies have proven that these chemical can cause necrosis to the extent of bone degeneration. In cases where these agents have gone beyond the apex, surgery may be needed to completely remove the etiology.

*3. Root canal sealers*

All measures should be taken to avoid extrusion of sealer material into periapical region.

*4. Obturation materials*

All measures should be taken to avoid extrusion of obturation material beyond the apex as these can e potential irritant as they are non resorbable in large quantity.

Changes in the root canal environment can make previously dormant bacteria to become virulent in cases where inadequate chemomechanical preparation is done. When growth of these organisms increase, and are virulent, they may cause periradicular inflammation followed by pain and swelling. Secondary infection of the root canal system can occur by organisms that were not initially present during the primary infection. New organisms gain entry into the root canal by contamination of irrigants, endodontic instruments. Microorganisms can also gain access into root canal through contaminated temporary restorative materials and post obturation in case of leakage, tooth fracture or a delay in placing a permanent restoration [5, 2].

Matusow et al, stated that a change in oxidation-reduction potential within root canal environment can cause exacerbation of symptoms after endodontic treatment. When the access cavity is prepared and tooth is open to oral cavity, oxygen enters into the root canal and the microbial concentration shifts from anaerobic to aerobic. In an aerobic environment, the energy yield and growth rate are rapid. But, there is no scientific evidence supporting this theory.

**Incidence of flare ups**

Different studies have used different methods to analyze flare ups and everyone have varying results. Commonly a visual analog scale is used to measure flare ups. Walton and Fouad reported 3.2% incidence, Imura and Zoulo reported 1.8% and Siqueira et al. reported 1.92%. However, studies have not shown any difference in the incidence between single and multiple visits RCT [5].

There is no relation to age, gender different arch / tooth groups and pulpal status or NSAID's.

Biologic mediators like histamine, serotonin, prostaglandins, leukotrienes, are the causative factors of pain. Histamine and serotonin are produced during inflammation act on the blood vessels leading to increased vascular permeability. Prostaglandins, found in exudates increase vascular permeability, promote chemotaxis, induce fever, and sensitize pain receptors to stimulation by other chemical mediators.

*Flare during the treatment (inter appointment)*

1. Incomplete removal of pulpal tissue during the first appointment
2. Phoenix abscess (acute exacerbation of chronic periapical abscess)
3. Recurrent periapical abscess

Pain can occur when instrumentation is done beyond the apex, which can cause extrusion of debris into periapical region causing inflammation. This occurs mainly when there is no proper reference point while cleaning and shaping. This can be managed by thorough cleaning and shaping using copious amount of irrigant confined to the canal length [6].

Pain can also occur in cases of vital pulp, when remnants of pulp remain within the canal between the appointments. These pulpal remnants have sufficient number of virulent clonal type of bacteria which can cause inflammation.

Non vital cases are the most common cases of flare up, as these canal harbor the highest number of bacteria within the dentinal tubules. Proper judgment of type of irrigant is imperative. It should be used in adequate quantity it should be used [7, 3]. Cases wherein there are large periapical lesions should be treated in multiple visits with intra-canal medicament placed between the appointments.

*Flare up after endodontic treatment [8, 4]*

Extrusion of the obturating material is one of the most common causes of flare up after treatment. Every precaution should be taken to avoid overextension of the obturating material. Proper reference points and rubber stops on the instruments can help in avoiding such iatrogenic mishaps.

Non vital cases, which were open to oral cavity and with large periapical lesions which were treated in single visit, are also more prone to flare ups after treatment. As adequate disinfection of the dentinal tubules is not possible, intra-canal medicament must be placed at least for one week in such cases.

Despite the fact that we can predict under what circumstances flare up occurs, we can't predict when and who will end up with a flare up.

*Management of flare ups [9, 5]*

*1. Cortical trephination*

A perforation is made in the alveolar bone to drain the intra alveolar exudate and relieve the pressure. Its benefit is questionable as there was no difference in the group where only total pulpectomy and cleaning and shaping were done.

*2. Incision and drainage*

Acute swelling cases can be managed by incising followed by drainage. But the canal must be thoroughly debrided with sufficient irrigation.

*3. Intracanal medicaments*

Few studies have proven that the type and frequency of use of these intracanal medicaments do not alter the frequency with which flare up occurs[10].

*4. Re-instrumentation*

This is a definitive approach, where in the canal is reopened and thorough debridement of the canal is done. All instrumentation should be confined to the working length. Copious amount of irrigants should be used[10,11].

*5. Occlusal reduction*

Its use is very limited as not much scientific literature supports this.

**Drugs**

Analgesics, anti-inflammatory and antibiotics**.** Antibiotics are of no use because the causative is an antigen(s) (immunologic) and bacteria involved are:

– Not accessible

– Bacterial susceptibility to antibiotic is doubtful. Also, the antibiotic does not reach the area. The local antibiotic is better than systemic antibiotic therapy.

## Conclusion

The success and failure of the endodontically treated tooth depends upon how thoroughly the canal has been prepared. Flare up can occur during any stage of treatment. The astute clinician must follow every single step meticulously to avoid them. Preventing them is more important than management. Flare ups are more common in multiple visit cases.

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## References

1. Building effective strategies for the management of endodontic pain, karl keiser & kenneth m. Hargreaves, Endodontic Topics 2002; 3: 93–105
2. Pain and û are-up after endodontic treatment procedures, Egle Sipaviciute, Rasmute Maneliene, Stomatologija, Baltic Dental and Maxillofacial Journal, 2014; 16: 25–30.
3. Mid treatment flareups in endodontics–a dilemma, Dr. Neeta Shetty .M.D.S, Endodontology.
4. Flare-Ups in Endodontics – A Review, Priyanka.S.R , Dr.Veronica, IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), Volume 9, Issue 4 (Sep.- Oct. 2013), PP 26-31.
5. Flare-ups after Endodontic Treatment: A Meta-analysis of Literature Igor Tsesis, DMD et al, JOE — Volume xx, Number xx, Month 2008.
6. Interappointment flare-ups: incidence, related factors, prevention, and management, Richard E. walton, Endodontic Topics 2002; 3: 67–76.
7. Microbial causes of endodotnic flare ups, J f Siqueira Jr, international endodotnic journal, 2003; 36: 453–463.
8. Building effective strategies for the management of endodontic pain, Karl Keiser & Kenneth M. Hargreaves, Endodontic Topics 2002; 3: 93–105
9. Clinical and pharmacological management of endodontic flare-up Harikaran Jayakodi et al, J Pharm Bioallied Sci. 2012 Aug; 4(Suppl 2): S294–S298.
10. Flare-ups in endodontics and their relationship to various medicaments, Ernest H. Ehrmann et al, Aust Endod J 2007; 33: 119–130
11. Gound TG, Marx D, Schwandt A. Incidence of û are - ups and evaluation of quality after retreatment of resorcinol - formaldehyde resin (“Russian Red Cement”) endodontic therapy. J Endod 2003; 10: 624–6.