International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 18-09-2018; Accepted: 21-10-2018
www.medicalsciencejournal.com
Volume 4; Issue 11; November 2018; Page No. 86-87

Mechanical causes for endodontic flare-up

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Abstract
A flare-up is defined as the occurrence of severe pain and swelling following an endodontic treatment appointment. Pain or swelling is a common finding in teeth undergoing root canal treatment. One of the reason for pain after Bio-Mechanical Preparation (BMP) is over instrumentation. The paper is designed to investigate cause of pain and tenderness in teeth undergoing endodontic treatment after BMP.

Keywords: pain, tenderness, weeping canal

Introduction
The main aim of Bio-Mechanical Preparation (BMP) in root canal treatment is cleaning, shaping and disinfection. The main reason of tenderness after BMP is passage of endodontic file beyond apical foramina (over instrumentation), because of repeated passage of instrument into periapex, there is inflammation of peri-radicular areas resulting in pain [4]. This process may also result in bleeding in periapex due to which there is pressure building, resulting in pain and tenderness. After complete extirpation of pulp from root canal, establishment of proper working length is of utmost importance. Working length is taken from occlusal reference point. Any change in occlusal reference point results in over instrumentation [3, 4, 7].
Displacement and enlargement of the apical foramen may occur as a result of incorrect determination of working length, straightening of curved root canals, over- extension and over-preparation. As a consequence irritation of the peri-radicular tissues by extruded irrigants or filling materials may occur because of the loss of an apical stop [5, 7].
Here we are going to discuss few cases where over instrumentation have resulted in pain and tenderness.

Case Report 1
Female patient aged 40 years visited our clinic for endodontic treatment in mandibular second premolar tooth (35). After extirpation of pulp, working length was established and BMP was completed, calcium hydroxide closed dressing was given to patient and sent back home. In the next visit calcium hydroxide was removed from canal. The canal was washed with 5.25% sodium hypochlorite and normal saline. No further calcium hydroxide was used, canal was closed with temporary cement. In the next visit patient complained of pain and tenderness in (35). Temporary cement was removed and canal was opened, it was found that blood oozes out of canal (Weeping Canal). Canal was washed with normal saline. As soon as blood flow stopped, patient developed relief. There was no more pain. Root canal was thoroughly checked for any pulpal remnant, nothing was found as such. Radiograph was taken where it was found there is over instrumentation due to change in occlusal reference point. Hence it was decided to place paper point dipped in formocresol (excess wiped out) in the canal and patient was recalled after 3 days. Patient didn't give any history of pain or tenderness, canal was again washed with 5.25% sodium hypochlorite and normal saline, root canal was left empty and patient was sent back. After few days patient again gives history of pain and tenderness, blood again oozes out on opening of canal. Calcium hydroxide was placed into the canal and patient was sent back home. After weeks time on recall visit, she didn't give any history of pain and it was decided to obturate the tooth (35). After 1 year recall visit patient didn't give any history of pain or tenderness.

Case Report 2
A male patient aged 55 years visited our clinic for pain in mandibular second molar tooth (47). After thorough examination it was found that there is caries in Buccal aspect of teeth (47). Patient was informed about the finding and endodontic treatment was planned. In the next visit after formal consent 2% Xylocaine with 1:100000 Adrenaline was given endodontic treatment was initiated, extirpation of pulp was done, working length was established by Apex locator which was further confirmed by radiograph. Calcium hydroxide dressing was given and patient was sent back home. In the next sitting BMP was initiated. Unfortunately due to change in occlusal reference point over instrumentation was carried out which resulted in extreme pain after BMP was finished. Pain lasted for a week and there was little relief only after the prescription of antibiotics and analgesics.

Discussion
Teeth undergoing endodontic treatment may flare-up during inter appointment treatment. The inflammation of the periodontal tissues and post-operation pain can be even by extrusion of #10 k–file through apex. Once the anatomy of apical foramina has changed because of over instrumentation

[7], the dentinal debris passes through it resulting in pain. As it is not known to which degree the extruded material is infected and which amount is tolerated by periapical tissues, the clinical relevance of such data must remain questionable. Phagocytosis of small amounts of debris has been reported [1, 3]. However, extruded material has been held responsible for post-operative flare-up and bacteraemia. Intra canal medicament or canal irrigants also result in irritation of peri-radicular tissues. Irrigation solutions, intracanal medicaments, root fillings and substances, that are in their composition, used in endodontic treatment might be toxin therefore, they cause chemical irritation and post-operation pain and sensitivity after entering the peri-radicular tissues [6]. Pastes that are used with gutta percha for filling the root canal have different level of toxicity by the time they consolidate. The more filling from the root canal is extruded to periodontal tissues, the more intense inflammatory reaction is [6]. Some researches show that flare-ups are often after endodontic retreatment of teeth filled with formaldehyde. Moreover, pastes containing formaldehyde are cytotoxic, it can cause tissue necrosis after contacting live tissue and the same extruded into apical periodontal tissues may initiate inflammation which causes pain and swelling. If formaldehyde is exuded as by-product during consolidation, periodontal tissues are damaged temporarily, though it is insoluble and might be only surgically eliminated.

Conclusion

Thus it can be concluded that exact establishment of working length is a key and a consequential step in endodontic treatment as inaccurate length determination may lead to failure.

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