Volume 06, Issue 01 (January-February2023), PP 38-42 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

Clinical Evaluation of Retreatment of Endodonticaly Treated Teeth with two Different Rotary File System

Anil K Tomer[1], Ruchi Gupta[2], Martina George[3], A Pritish Kumar Reddy[4], Priyansh Saxena[5], Shaik Muzammil Taj[6], Anooja V Chandaran[7], Swati Saurabh[8]

1Professor and Head, Dept of Conservative Dentistry and Endodontics, Divya Jyoti College of Dental Sciences and Research, Modinagar, Ghaziabad

2 Professor, Dept of Conservative Dentistry and Endodontics, Divya Jyoti College of Dental Sciences and Research, Modinagar, Ghaziabad

3,4,5,6,7,8 PG Student, Dept of Conservative Dentistry and Endodontics, Divya Jyoti College of Dental Sciences and Research, Modinagar, Ghaziabad

Corresponding Author:

Dr. Martina George

PG Student, Dept of Conservative Dentistry and Endodontics, Divya Jyoti College of Dental Sciences and Research, Modinagar, Ghaziabad

Abstract

Aim: The aim of this clinical study was to evaluate and compare the intensity of postoperative pain after root canal retreatment with two different rotary file systems.

Methodology: Patients for root canal retreatment were assigned to one of the two retreatment file system groups (HyflexEDM and Neoendo retreatment file). The gutta percha from obturated canal was removed. The working length was determined to be 1 mm shorterthan the '0.0' mark of the apex locator. Root canals were filled with gutta-percha and an epoxy resin-based root canal sealer using a lateral compaction technique. The teeth were restored using a resin composite material. A single operator performed the retreatments in a single visit.Participants were asked to rate the incidence and intensity of the postoperative pain on a verbal rating scale 24, 48, and 72 hours after treatment. Also,if any analgesic tablets were taken, the number is noted.

Conclusion: Both the retreatment file system performed similarly after retreatment in endodontically treated teeth.

Keywords: Retreatment, Hyflex EDM, Neo endo retreatment file, Post operative pain.

I. Introduction

According to the Glossary of Endodontic Terms of the American Association of Endodontists, retreatment is defined as the procedure to remove root canal filling materials from the tooth, followed by cleaning, shaping and obturation of the root canals.Carr proposed an updated and comprehensive definition of reintervention: Endodontic retreatment is a procedure performed on a tooth that underwent a previous attempt at definitive treatment resulting in a condition that requires further endodontic intervention to achieve a successful outcome. The indications for root canal retreatment given by the European Society of Endodontology are teeth with inadequate root canal filling with radiological findings of developing persisting apical periodontitis and teeth with inadequate root canal filling when the coronal restoration requires replacement or the coronal dental tissue is to be bleached.

Endodontic success and failure are significantly influenced by the anatomy of the root canal system. It has branches that connect to the periodontal attachment apparatus laterally and furcally; these branches frequently end apically in a number of portals of exit.There can be various causes for endodontic failures such as, missed canals, pathological or iatrogenic perforations, inadequate obturations, inadequacies in shaping, cleaning and obturation, iatrogenic events, or reinfection of the root canal system when the coronal seal is lost after completion of root canal treatment.Regardless of all the causative factors, the final cause for failure is leakage and bacterial contamination due to inadequate debridement, disinfection or sealing of the root canal system.

Retreatment can be divided into two categories: non-surgical retreatment or traditional retreatment, which involves performing the retreatment operation through the root canals. Used when the original course of treatment is insufficient or when there are failing treatments present. The second option is surgical retreatment, in which the apical region of the tooth is surgically exposed before the treatment is carried out.

Postoperative pain and discomfort following endodontic treatment is a displeasing occasion for the patients and clinicians. Although postoperative discomfort related with the use of root canal therapy is a poor predictor of long-term success; endodontics is interested in the occurrence and management of pain. The location of the tooth, the number of appointments, the use of intracanal medications, and preoperative pain may all be risk factors for postoperative pain and flare-ups.

Root canal retreatment procedures may result in postoperative discomfort, periapical inflammation, and a delay in periapical healing. Inflammation in the periapical region is directly correlated with extruded debris volume. During root canal retreatment, any instruments or systems may produce apical extrusion of debris, and a number of variables may affect the amount extruded. The efficiency of cutting and shaping is directly impacted by file system design variations, and as a result, apically extruded debris production may also be impacted.When combined with a reciprocating motion, better cutting ability can increase apically extruded debris but is typically linked to increased cleaning effectiveness. Additionally, variations in the cross-section of the instruments may influence how much postoperative pain patients experience by increasing levels of the neuropeptides and other proteins. For these reasons, while selecting an instrument for mechanical root canal operations, it could be advantageous to take into account their potential to induce postoperative pain.

The aim of this study is to compare the post operative pain after using two different rotary retreatment file system.The null hypothesis tested was that there is no difference in postoperative pain following the removal of gutta-percha among the two systems used.

II. MATERIALS AND METHODS

Patients came to the department for retreatment were selected for this study.All patients included in this study had given an informed consent about the procedure, risks and benefits, as well as their right to decide whether to participate or not.Patients were excluded from the study if one or more of the following conditions were observed: complicating systemic disease, having severe pain and/or acute apical abscesses, being under 18 years of age,using antibiotics or corticosteroids, having multiple teeth that required retreatment to eliminate the

possibility of pain referral , teeth with open apices, an intraradicular post, a sinus tract, an overfilled canal, severe periodontal defect or deep periodontal pocket (probing depth >4 mm) and poor oral hygiene. The inclusion criteria were as follows: patients over 18 years old, who had read, accepted, and signed the informed consent form and patients who had been scheduled for an endodontic retreatment considered as the best treatment plan choice.

Thepatients for root canal retreatment were assigned to one of the two retreatment file system groups (HyflexEDM and Neoendo retreatment file).

Root canal retreatment procedure

A single operator performed the retreatments in a single visit.Local anesthesia was administered with 2% lignocaine (1:80,000 epinephrine). After isolation with a rubber dam, coronal restorations and caries were removed using sterile high-speed burs under water cooling. After preparation of the cavity access canal filling material were removed and further canal preparation were done. The working length (WL) was determined with a size 15 K-file (Dentsply) and a ProPex Pixi apex locator (Dentsply). The file was gently inserted into the gutta-percha until the '0.0' mark was achieved. The WL was set 1-mm short of the '0.0' mark and was confirmed using a periapical radiograph.Group A (n=15): The canals were instrumented with Neo endo retreatment file with speed: 350 rpm and torque: 1.5 Ncm Group B (n=15): The canals were instrumented with HyflexEDM with speed 500 rpm and torque: 2.5 Ncm
During the root canal retreatment protocol, no solvent was used. The removal of the filling material was considered complete when no gutta-percha remnants were observed on the files, and root canal walls; a radiograph was taken for confirmation. A 2.5% NaOCl solution was used for irrigation after the use of each file during the root canal retreatment procedures. Root canals were dried with paper points (VDW) and filled with gutta-percha cones and an epoxy resin-based root canal sealer (AH Plus, Dentsply) using a lateral condensation technique. The access cavities were restored using a composite material[SingleBondUniversal(3MESPE) with a direct adhesive technique on the same visit.

Assessment of postoperative pain

A visual analog scale (VAS) was used to measure pain after endodontic therapy. The boundaries of the scales were marked ''no pain/intolerable pain''. Pain scoring based on the VAS questionnaire was recorded at 8, 24, and 48 h by telephone inquiry. Patients were also asked to record any intake of analgesics and to report if their discomfort resulted in any time ofwork.The numeric rating scale is a segmented numeric version of the visual analogue scale and consists of successive numbers from 0 to 10 on a horizontal line. The respondent selected a number that best represented the intensity of their pain. Number '0' represented 'no pain', whereas number '10' represented 'the worst pain imaginable'. Patient were called every day for three days to know about the postoperative pain. Analgesics were prescribed for severe pain with six-hour interval. Patient were asked to note the number of tablets in taken.

III. RESULTS

Both the retreatment file system performed similarly after retreatment in endodontically treated teeth.

IV. DISCUSSION

This study was conducted to clinically evaluate the post operative pain after root canal retreatment using two different types of file system. For this visual analog scale was taken to measure and compare pain.Each patient's threshold for a stimulus' minimal level of intensity required to elicit pain is unique. In assessing pain, we attempt to objectify a phenomenon that is primarily irrational and very variable between individuals.

Postoperative pain is complex and is influenced by both patient-related factors and dental characteristics or conditions.There are multiple studies regarding the relation of different variables that may influence postoperative endodontic related pain. Apical extrusion of contaminated debris, irrigants, intra canal medicaments, gender, pain tolerance level, number of visits for treatment,instruments used and over

instrumentation all these can lead to severity of post operative pain.Yaylali et al. claim that there are variations in postoperative discomfort depending on the amount of the apical enlargement.[1]But apical enlargement did not affect the perception of postoperative discomfort, according to Silva et al.[2]

An acute inflammatory response can be produced as a result of driving microorganisms and their products to the periradicular tissues as a result of iatrogenic causes like overinstrumentation or the extrusion of contaminated dentritus and result in a long-term failure.Although postoperative pain following endodontic operations is linked to the presence of bacteria, there may be other explanations. A significant quantity of debris has been found to be extruded through the apex by all retreatment processes. Reciproc has been shown to produce less debris than other crown-down methods utilising rotating multi-file systems, according to reports. According to Caviedes-Bucheli et al NiTi systems with a triangular cross- sectional design caused a greater amount of neuropeptides SP and CGRP than systems with a S shaped cross section.[3] These neuropeptides are linked with extrusion of debris and pain. Hyflex EDM file has a varying taper, negative rake angle and its scraping action. All this tends to adhere the root canal walls rather than pushing it coronally. Thus, a more considerable amount of debris extruded apically. According to Sagare et al in his in vitro study concluded that Wave One was significantly more effective than the Neo endo retreatment system.[4]The Neoendo files have a parallelogram cross section and a positive rake angle. This will reduce the screwing in and improve debris removal.

It has been proposed that gender may affect postoperative discomfort. In reaction to noxious thermal stimuli, Wise et al.discovered that men had a larger pain tolerance, reduced unpleasantness with pain, and higher pain threshold.[5] According to Youldas Oet al two-visit root canal treatment with interappointment calcium hydroxide dressing was more effective in eliminating pain than in single visit retreatment cases.[6]But DiRenzo et al reported no difference in pain for both single and multiple visits.[7]KvistT in his study concluded that post operative discomfortand indirect costs were more in surgical retreatment than in non-surgical retreatment.[8]Thus Hyflex EDM is a good alternative for biomechanical preparation of the root canal system after removing gutta percha.

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