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Comparison of Postoperative Pain after Root Canal Shaping with Two Rotary Systems: A Clinical Trial

Thesis submitted to
Faculty of Dentistry, Ain Shams University, in partial Fulfillment of the requirements for Master Degree in Endodontics

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Dedication

To my beloved parents, thank you for supporting and guiding me throughout my life. Without your endless love, motivation, efforts and time, I would not have reached where I am today. I am so grateful for everything.

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According to the Dornald's medical dictionary, pain is defined as; a more or less localized sensation of discomfort, distress or agony resulting from stimulation of specialized nerve endings. Nociception is the phenomenon of sensation to tissue injury; so nociception is what you feel and pain is the sensation of what you feel. Therefore nociception could be present without pain in increased pain threshold and pain could be present without nociception due to an emotional state or past experience.

Postoperative pain is a common complication in endodontic treatment.

Age, gender, tooth type, pulp status, presence of sinus tracts and preoperative pain have been reported as risk factors that may affect the incidence of postoperative pain after root canal therapy[1].

There is some supportive evidence that one of the most important reasons for postoperative endodontic pain is the extrusion of infected debris from the root apex during chemomechanical debridement, which results in an acute inflammatory response. There are various claims about the ability of some rotary techniques to minimize the extrusion of debris in comparison to other techniques. Rotary instruments result in the extrusion of less debris compared to stainless steel hand files due to their rotational movements(Archimedes screw effect), leading to

less postoperative pain and discomfort when they are combined with copious irrigation[2].

Multiple rotary file systems have been introduced with different designs aiming at simplifying instrumentation procedures and minimizing debris extrusion.

EdgeEndo X3 file system is a fire wire heat treated Niti alloy that has a unique parabolic cross section claiming that this design enhances the clearance space of the file, and it has a 6% taper that holds at 1 mm then zeros out, resulting in less debris extrusion beyond the apex during preparation, the MPro file system is an x wire Niti alloy that has a convex triangle cross section and decreased number of flutes to increase the spacing between the flutes thus enhancing the clearance space.

Within the scope of our search it had not come to our knowledge any study evaluating the effects of EdgeEndo X3 or MPro file system on postoperative pain after single visit endodontic treatment of cases with acute irreversible pulpitis.

This study was designed to evaluate the incidence of postoperative pain after endodontic treatment in posterior vital teeth using two different continuous rotary instruments.

Pain is the most common reason why people would seek dental treatment, yet, postoperative pain after endodontic treatment can be considered as a major concern to the patient as well as to the dentist. Many factors affect the incidence and severity of postoperative pain, including: presence or absence of preoperative pain, instrumentation techniques, number of treatment visits (single- or multiple-visit), and apical extrusion of debris. Other factors that may be considered as prevalence factors for postoperative pain include: patient's demographic data (age, sex), tooth vitality, position indifferent arches, and tooth type[1–4].

I) Preoperative pain and other prevalence factors that may affect postoperative pain:

Preoperative pain is considered as an important prevalence factor for postoperative pain. In a study investigating the effect of analgesic intake on postoperative pain, **Wells et al**[5] concluded that postoperative pain is affected by the initial preoperative pain rather than by the type of the medication used to relieve it.

Walton et al. (1992)[2]assessed the incidence of flare-ups and its correlation with patient demographics (age and sex), signs and symptoms, diagnosis and operators skills. All patients undergoing root canal treatment were eligible and data were gathered on 946 patient visits. Routine endodontic procedures were carried out and