Comparison of the Efficacy of Three Different Techniques in the Removal of Gutta-percha and Two Types of Sealers during Endodontic Retreatment

(An in vitro study)

A thesis

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ABSTRACT

Endodontic retreatment of failed endodontically treated teeth is a common procedure to save teeth. This study aimed to assess the efficacy of ProTaper rotary re-treatment files, D-RaCe rotary desobturation files and gates glidden drills in combination with hedstrom files for removal of gutta-percha and sealer from root canals and measuring the time required for each removal technique. The palatal roots of sixty extracted maxillary first molars teeth were instrumented with ProTaper rotary files to size $\mathbf{F_2}$ following manufacturer instructions, then samples were randomly divided into two main groups (30 specimens each) according to the sealer used (Apexit Plus for group A and TubliSeal sealer for group B). The teeth were obturated with lateral compaction of Gutta-Percha points and placed in incubator for a period of one week. After that each group was subdivided into three groups (10 samples each) according to the removal techniques: ProTaper rotary re-treatment files, D-RaCe rotary desobturation files and gates glidden drills in combination with hedstrom files. The time of filling material removal was calculated in minutes using a digital stop watch. The roots were grooved longitudinally and split into halves with a hand chisel. The root half with the greater amount of filling debris was examined. Images were captured with a digital camera and analyzed with adobe Photoshop CS2 software. The percentage of root filling material area remained for all of the samples were calculated. Data were analyzed statistically by ANOVA and Student t-test at 5% significant level.

The results showed that all retreatment techniques left filling material inside the canal, The mean percentage of remaining root filling material areas with $Ca(OH)_2$ based sealer groups were less than ZOE-based sealer groups with a highly significant difference. Gutta-Percha removal with D-RaCe rotary desobturation files was better than other techniques and the group that showed better results is group $\mathbf{A_2}$ (removal with D-RaCe rotary desobturation files in canals obturated with GP and Calcium hydroxide-based sealer). The time of removal with D-RaCe rotary desobturation files was significantly faster than other

techniques (ProTaper rotary re-treatment files and gates glidden drills in combination with hedstrom files). Within the limitation of present study removal of gutta-percha can be achieved without the aid of solvent. D-RaCe desobturation system for re-treatment is more effective and faster in removing Gutta-Percha than other techniques.