Evaluation of Single File Concept in Retreatment of Endodontically Treated Teeth

(An In Vitro Study)

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By

Mostafa Ahmed Anwar Salama

B.D.S (2009) Ain Shams University

Department of Endodontics

Faculty of Dentistry

Ain Shams University

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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم
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Supervisors

Associate Prof. Dr. Karim Mostafa El-Batouty

Asst. Professor of Endodontic

Faculty of Dentistry

Ain Shams University

Dr. Maram Farouk Obeid

Lecturer of Endodontic

Faculty of Dentistry

Ain Shams University

Dedication

I would like to dedicate my Master thesis to my Mother, who taught me everything and raised me to be a good man.

I dedicate it also to my Father, Sisters and friends who have given me day by day support when progress was slow and morale was flagging and when there was much disappointment to overcome.

Acknowledgement

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Mostafa Ahmed Anwar Salama

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Introduction

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Root canal therapy, despite having a high degree of success, may not lead to the desired response, and failure may occur. When root canal therapy fails, treatment options include conventional retreatment, periradicular surgery, or extraction. Whenever possible, the nonsurgical retreatment option is preferred because it is the most conservative method to solve the problem . The main goal of retreatment is to regain access to the apical foramen by complete removal of the root canal filling material, thereby facilitating sufficient cleaning and shaping of the root canal system and final proper obturation .

Today it has not been proven that removing all obturation material will ensure success of endodontic retreatment and that remaining gutta-percha or sealer will cause the retreatment to fail. However, removing as much sealer and core as possible from inadequately prepared and obturated root canal systems is critical in order to uncover remnants of necrotic tissue or bacteria that may be responsible for periapical inflammation and failure .

Many materials are being used for the filling of root canals, of which gutta-percha with a variety of sealers is the most common. However, lately, various resin-based root canal filling materials have been developed to establish a core-

sealer-dentin continuum to the end of preventing microleakage and improving the fracture resistance of root-filled teeth.

A variety of techniques have been advocated for the removal of gutta-percha from the root canal system including manual endodontic hand instruments facilitated by solvents such as chloroform, xylol, eucalyptol, halothane, orange oil, or ultrasonics , lasers, heat carrying instruments , as well as nickel-titanium (Ni-Ti) rotary instruments, and in recent years, a number of retreatment file systems were developed.

Several studies have evaluated the efficacy of different engine-driven nickel-titanium (Ni-Ti) file systems in the removal of root canal filling materials, whereby these systems promised reduced working time. Therefore it was thought that investigation of the applicability of Ni-Ti rotary instruments with and without solvent in the removal of different resin-based root canal filling materials, in comparison to conventional gutta-percha is of great value.

Review of literature

Review Of Literature

The interest in endodontic retreatment has been seen increasingly growing recently, due to an increasing demand to preserve teeth, including those cases where endodontic therapy had failed. The preferred treatment of failing endodontic cases is nonsurgical retreatment. The procedure requires the removal of the original root canal filling, further cleaning, and refilling. Removing as much sealer and core as possible from inadequately prepared and obturated root canal systems is critical in order to uncover remnants of necrotic tissue or bacteria that may be responsible for periapical inflammation and failure.

In this section, literature was reviewed regarding three aspects; removal ability of different root canal filling materials , efficiency of different retreatment rotary Ni-Ti instruments (Protaper Universal retreatment system and R-Endo, etc).

1. Removal ability of different root canal filling materials:

A recent trend in endodontics has been the development of bonded obturating materials via the use of dentin adhesive technology transferred from restorative dentistry. Gutta-percha has been the most commonly used obturating