Effect of Different Disinfecting Solutions on the Surface Topography and Elasticity of Gutta percha and Resilon Cones

A Thesis Submitted to
The department of Endodontics
Faculty of Oral and Dental Medicine,
Cairo University
In partial Fulfillment of the Requirements of the
Master degree in
Endodontics

By
Ahmed Yousef Banat
B.D.S 2005
Faculty of Dentistry
6October University

Faculty of Oral and Dental Medicine
Cairo University
2010

Supervisors

Dr.Medhat Abdul Rahman Qataya

Professor of Endodontics

Faculty of Oral and Dental Medicine

Cairo University

Dr.Ghada ElhilalyMohamed Eid

Associate Professor of Endodontics

Faculty of Oral and Dental Medicine

Cairo University

بِسْمِ اللهِ الرَّحْمنِ الرَّحِيمِ

(قَالُواْ سُبْحَانَكَ لاَعِلْمَ لَنَا إِلاَّ مَاعَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ)

صدق الله العظيم

البقرة (آية ٣٢)

Acknowledgment

First and forever I am grateful for Who was all the time with me, inspiring me and guiding me. He was the first reason to accomplish this thesis, thanks to ALLAH.

*My great thanks are extended to Dr.**MedhatAbdulRahman kataya.***

*Professor and former chairman **department of Endodontic,** Faculty of Oral and Dental Medicine, Cairo University for his encouragement and support during the work.*

*I take the opportunity to send my honest thanks to Dr.**Ghada ElhilalyMohamed Eid** Associate Professor of **Endodontics,** Faculty of Oral and Dental Medicine, Cairo University for her kind suggestions, counseling, cooperation and scientific supervision during this study.*

Finally I would like to thank all staff members of the department of Endodontics and my colleagues who helped in making this work possible.

Dedication to

My dear *Father* and dear *Mother*

For their prayer for me, encouragement and support

For my *Brother* and *Sisters*

Lists of contents

List of Figures

List of Tables

Introduction

I-Introduction

Endodontic procedures involve considerable effort devoted to the removal of microorganisms from within canals. These procedures should be accepted as a link of an aseptic chain. Preparing an access cavity, isolation, root canal instrumentation, irrigation, interappointment medication, using intracanal medicaments, obturation, and finally, coronal restoration are all parts of this chain. The practitioner must be concerned not only with endogenous oral microbial flora, but with exogenous bacterial contamination as well; that, which may occur by the introduction of contaminated Gutta-percha cones into the root canal.

Since its introduction in endodontics, Gutta-percha has been widely used and accepted as a core root canal filling material. Commercial Gutta-percha cones are basically composed of organic (Gutta-percha polymer and wax/resins) and inorganic components (zinc oxide and barium sulfate). Gutta-percha cones are produced under aseptic conditions and present potential antimicrobial properties, especially owing to their zinc oxide component. However, Gutta-percha points taken from sealed packages may be contaminated by a variety of microorganisms, after exposure to the dental operatory environment. Recently, a new thermoplastic, filled polymer (Resilon) that has the potential to challenge Gutta-percha as a root filling material has-been introduced. The thermo plasticity of Resilon is provided by polycaprolactone, biodegradable polyester with a moderately low melting point, although its bond ability is derived from the inclusion of resin with methacryloxy groups. This filling

Materials, which contains glass fillers and barium chloride as filters, is also coupling to resin sealers.

Although most instruments used in endodontic treatment can be sterilized by autoclaving or dry heat before treatment, Gutta-percha cones cannot be sterilized by conventional autoclaving or in hot-air oven; because of its thermoplastic characteristic. Therefore, a rapid chair side chemical disinfection is needed, before use to maintain the aseptic chain, an essential factor in successful endodontic therapy. Cold chemical disinfectants such as alcohol, povidone-iodine, foraldehyde gas, quaternary of ammonium, glutrdehyde, chlorohexidine and sodium hypochloride (NaOCl) are utilized in clinical practice to disinfecting Gutta-percha cones to avoid this possible source of exogenous contamination.

The time for these substances to kill microorganisms ranges from a few seconds to substance periods of time. Several disinfectants solutions have been reported to be a suitable means for disinfectant solutions have been reported to be a suitable means for disinfection of Gutta-percha and Resilon cones. Sodium hypochloride (NaOCl) is the most widely used disinfecting agent in endodontic therapy for irrigation as well as cone disinfection. It is an effective anitimicrobial agents, but its effectiveness is related to concentration and exposure time. Another rapid disinfectant solution is chlorohexidine (CHX). This agent has inhibitory effects on bacteria and yeasts that are commonly found in endodontic infections. Anew irrigant, BioPure MTAD has showen promise as antimicrobial. New formation MTAD formulation of doxycycline, Tween-80, and citric acid. Both doxycycline and citric acid exhibit antimicrobial and acid etching properties.