بسم الله الرحمن الرحيم

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

صدق الله العظيم
سورة البقرة الآية (32)

Efficiency Of Diode Laser Use On Cleaning And Bonding To Root Canal Dentin

A thesis submitted to the Faculty of Dentistry, Ain Shams University, in partial fulfillment of requirements for Doctorate Degree in Endodontics

By

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Ain Shams University (2014)

2018

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Acknowledgement

First of all thanks to almighty Allah the most kind and most merciful.

I wish to express my deepest gratitude and sincere appreciation to Prof. Dr. Ehab Hassanien Professor of Endodontic Faculty of Dentistry Ain Shams University. Her guidance and collaboration helped me to overcome the obstacles and difficulties that arose along the way until my thesis got completed.

I would like to thank Prof. Dr. Abeer El-Gendy professor of Endodontic Faculty of Dentistry Ain Shams University for offering me much of her time, effort and support throughout the whole work. I can not believe how patient she was.

Nawar Muhammad Naguib

Dedication

I would like to dedicate my Doctorate thesis to my Wife, you were my motive .. my support .. a single word from you was always enough to refill my morale and revive my drained soul ..

I would like to dedicate it also to my Mother and my Father, thanks for everything

List of Contents:

Full form	Abbreviation
Cemento Enamel Junction	CEJ
Laser Activated Irrigation	LAI
Passive Ultrasonic Irrigation	PUI
Bioceramic Sealer	BC
Ethylenediaminetetraacetic acid	EDTA
Sodium hypochlorite	NaOCl
Colony Forming Unit	CFU
Scanning Electron Microscope	SEM

Introduction

Endodontic therapy is quite complex. Each clinical situation is unique, but the final objective remains identical: preserving the natural tooth in a functional, asymptomatic and aesthetic manner. This objective is not always easy to reach, and depends upon numerous factors among which the most important is probably the root canal disinfection.

The sequence of procedures may vary in complexity between cases but the aim remains eliminating pulp infection and preventing future microbial invasion.

Conventional procedures of endodontic treatment using mechanical tools and disinfectant agents. Even with the use of these conventional tools and agents, around 30% of the root canal's surface area remains covered in smear layer that protects bacteria in the dentinal tubules against intra-canal disinfection agent [(1)]. Also Intra-canal medicaments have a limited anti-bacterial spectrum and a limited ability to diffuse into the dentinal tubules. These all disadvantages can lead to failure of the endodontic treatment.

Different Lasers have shown promising results with many advantages over conventional methods. Results suggest that laser combines photothermal and photoablation effects and thus can be utilized as an effective tool for the