The Effect of Different Bleaching Techniques on the Physical Properties of Intentionally Discolored Teeth (An in vitro study)

Thesis

Submitted to the Faculty of Oral and Dental Medicine, Cairo University, in partial fulfillment of the requirements for the Master degree in Endodontics

By

Noha Ezz El Din Mohamed El Wardany

B.D.S

Faculty of Oral and Dental Medicine,

Alexandria University

2002

2008

Supervisors

Prof. Dr. Medhat Abd El Rahman Kataya

Professor & Chairman of Endodontics
Faculty of Oral and Dental Medicine
Cairo University

Ass. Prof. Dr. Hebattalla El Far

Assistant Professor of Endodontics
Faculty of Oral and Dental Medicine
Cairo University

بسم الله الرحمن الرحيم

Acknowledgement

Before all, Thanks to "**ALLAH**" who granted me the ability to perform the work of this thesis.

I would like to express my deep gratitude and grateful appreciation to Prof. Dr. **Medhat Abd El Rahman Kataya**, Professor of Endodontics, Faculty of Oral and Dental Medicine, Cairo University, for his supervision, valuable expert guidance and unlimited support during the entire course of the study.

My gratitude to Dr. **Hebattalah El Far**, Assistant Professor of Endodontics, Faculty of Oral and Dental medicine, Cairo University, for her supervision, constant encouragement, and unlimited help.

I am also grateful to Dr. **Doaa Atef Ghoneim,** Area Manager of Al Mokhtabar lab, for her unlimited help and advice in applying the teeth staining technique.

I would like to express my sincere thanks to the **National Institute for Standards**, the **Conservation and Researching Center of Antiquities** at the **Great Council of Antiquities** and **Production Department, Faculty of engineering, Alexandria University**.

Dedication

To my mum that is always encouraging me and pushing me forward

To my father with his endless love, support and knowledge

To my younger sister for her kind support

To my beautiful son and daughter

To my beloved husband for his great assistance and endless support. Without his help I would have never accomplished this work

Table of Contents

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

INTRODUCTION

The new philosophy of dental therapy, greatly, focuses on esthetics. Discoloration of permanent anterior teeth impairs the esthetic appearance and causes emotional trauma to patients. By obtaining white teeth, a person becomes much more confident in his smile, which in turn, will positively affect his attitude and behavior.

Dental stains can either be intrinsic or extrinsic. Intrinsic stains refer to color changes of the internal tissues of the teeth. They can either be local (tetracycline and flourosis) in origin or due to genetics or aging process. While extrinsic stains, refer to color changes of the external tooth surfaces due to deposition of stains or pigments on the teeth surfaces such as tobacco, tea, coffee,…etc.

Dental bleaching contributes significantly to the field of cosmetic dentistry, providing an invaluable resource for clinicians who perform different types of esthetic procedures. Literature suggests that the mechanisms of tooth whitening by peroxide occur by the diffusion of peroxide through enamel to cause oxidation and hence lightening of colored species, particularly within the dentinal regions. The most common oxidizing agents used are hydrogen peroxide or carbamide peroxide.

There has been a dramatic increase in the number of products and procedures over recent years, with a concomitant rise in publications on this topic. A number of approaches are available for evaluating such products.

Bleaching techniques can either be [Take Home or Over the Counter] bleaching or [In-office bleaching]. The key factors that affect tooth whitening efficacy by peroxide containing products are concentration and time. In general, higher concentrations are faster than lower concentrations. However, lower concentrations can approach the efficacy of higher concentrations with extended treatment times. Alternative bleach systems to peroxide have received only minor attention. The mode of activation varies with the bleaching technique. The bleaching material can be activated chemically, by blue light (plasma light), by laser or using the ultrasonic technology called Supersonic tooth whitening system (Soni-white system).The efficacy of light activated systems versus non-light activated controls in clinical studies is limited and conflicting.

Therefore, throwing more light on bleaching materials, procedures and their effect on color changes, surface roughness, and microhardness is recommended to eliminate the drawbacks of the reuse.

REVIEW OF LITERATURE