

COMPARATIVE STUDY BETWEEN THE EFFECT OF TWO DIFFERENT BLEACHING SYSTEMS ON TOOTH COLOR AND SURFACE TOPOGRAPHY

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Dedication

To:

*My beloved parents and my
precious sons.*

List of Contents

	Page
List of tables	i
List of figures	ii
Introduction	1
Review of literature	4
Aim of the study	37
Materials and methods	38
Results	50
Discussion	56
Summary and Conclusions	74
Reference	76
Appendix	A
Arabic Summary	---

List of Tables

No		Page
Table 1	The means, standard deviation (SD) values and results of ANOVA and Tukey's test for the comparison between the mean values for the grey scale measurements before staining , after teeth staining and after bleaching with different bleaching methods.	50
Table 2	The mean differences, standard deviation (SD) values and results of paired t-test for the changes of mean scale value after staining and after bleaching in each group.	52
Table 3	The mean % change, standard deviation (SD) values and results of ANOVA and Tukey's tests for comparison between % change in Ra of the four groups.	54
Table 4	The mean, standard deviation (SD) values and results of ANOVA and Tukey's test for comparison between the means Ra in the four groups.	56
Table 5	The mean differences, standard deviation (SD) values and results of paired t-test for the changes of the mean Ra after staining and after bleaching in each group.	58
Table 6	The mean % change, standard deviation (SD) values and results of ANOVA and Tukey's tests for comparison between % change in Ra of the four groups.	59

List of Figures

No		Page
Figure: 1	Opalescence X-tra Boost, chemically-activated bleaching gel.	45
Figure: 2	Zoom 2 (25% Hydrogen peroxide whitening gel), photo activated bleaching gel.	45
Figure: 3	Photo-activated bleaching agent Zoom 2 kit.	46
Figure: 4	Zoom 2 whitening lamp.	46
Figure: 5	Teeth stored in tea solution for staining.	47
Figure: 6	Teeth after six days staining mounted in wax blocks.	47
Figure: 7	Application of Opalescence X-tra Boost gel.	48
Figure: 8	Application of starter swap before zoom2 gel application.	48
Figure: 9	Application of Zoom2 gel.	48
Figure: 10	Zoom2 lamp directed to teeth.	49
Figure: 11	stereomicroscope with a charge-couple device (CCD) digital camera connected to the computer for image analysis.	49
Figure: 12	Bar chart comparing mean gray scale of the four groups before staining, after staining procedure and after bleaching with different bleaching methods.	51
Figure: 13	Line chart representing changes in the gray scale value after stain and after bleaching in the four groups.	53

Figure: 14	Bar chart comparing the mean % change in the gray scale measurements between the four groups.	55
Figure: 15	Bar chart comparing between the mean (Ra) measurements of teeth before staining, after staining procedure and after bleaching with different bleaching methods.	57
Figure: 16	line chart representing changes i(Ra)measurements after staining and after bleaching in four groups.	58
Figure: 17	Bar chart comparing the mean % change in (Ra) measurements between the four groups.	59
Figure: 18	Photomicrograph of enamel tooth surface before staining with tea solution (at baseline).	61
Figure: 19	Photomicrograph of enamel tooth surface after staining with tea solution, before bleaching with Opalescence X-tra Boost, chemically activated bleaching gel.	61
Figure: 20	Photomicrograph of enamel tooth surface after bleaching with Opalescence X-tra Boost, chemically activated bleaching gel.	61
Figure: 21	Photomicrograph of enamel tooth surface before staining with tea solution (at baseline).	62
Figure: 22	Photomicrograph of enamel tooth surface after staining with tea solution, before bleaching with Zoom2 (gel & light) a photo-activated bleaching system.	62
Figure: 23	Photomicrograph of enamel tooth surface after bleaching with Zoom2 (gel & light) a photo-activated bleaching system.	62

Figure:24	Photomicrograph of enamel surface Before staining with tea solution (at baseline).	63
Figure:25	Photomicrograph of enamel tooth surface after staining with tea solution, before bleaching with Zoom2 gel.	63
Figure:26	Photomicrograph of enamel tooth surface after bleaching with Zoom2 gel.	63
Figure: 27	Photomicrograph of enamel tooth surface before staining with tea solution (at baseline).	64
Figure:28	Photomicrograph of enamel tooth surface after staining with tea solution, before bleaching with Zoom2 lamp.	64
Figure:29	Photomicrograph of enamel tooth surface after bleaching with Zoom2 lamp.	64

Introduction

Cosmetic dentistry has become an important part of restorative dental practice in the recent years. The appearance of teeth is very important to patients of all ages and is often associated with a perception of health and fitment. **Zekonis et al, 2003**⁽⁵⁷⁾.

Bleaching can be used for teeth which are discolored due to intrinsic and extrinsic staining, examples of intrinsic staining are, endodontic staining and tetracycline induced discoloration while extrinsic staining of the enamel includes, fluorosis, yellowing due to aging, hypoplastic enamel, caries demineralization, smoking and ingested food and beverage. **Strassler, 2006**⁽⁴⁸⁾, moreover, internalized discoloration formed due to taking up of the stains into the body of enamel or dentine ,these stains are those causing the extrinsic discoloration ,including in particular the dietary chromogens such as tea, coffee ,beverages and the byproduct of tobacco smoking. **Watts and Addy, 2001**⁽⁵⁹⁾.

Esthetic restorative dentistry includes many treatments ranges from the routine placement of resin composite restorations, porcelain veneers, tooth whitening, all ceramic, full and partial coverage restorations and implants. With the increase of knowledge and interest of patients in having the appearance of their teeth changed with esthetic dentistry, the more conservation technique of tooth whitening with vital bleaching has gained wider acceptance. **Strassler, 2006**⁽⁴⁸⁾.

Tooth bleaching was first described in 1848 using oxalic acid, later, ranges of peroxides such as hydrogen peroxide, were used. **Sulieman etal , 2005**⁽⁵²⁾.

The mechanism by which teeth are bleached by hydrogen peroxide is not completely understood, It is thought that the peroxide diffuse into the tooth structure may react with organic colored materials found within the tooth structure leading to reduction in color **Luk et al, 2004** ⁽³⁰⁾.

Bleaching agents can be applied externally to the teeth (vital bleaching) or internally within the pulp chamber (non-vital bleaching) **Sulieman et al, 2003**⁽⁴⁹⁾.

Three fundamental vital tooth bleaching regimens exist namely, dentist-supervised night guard bleaching, in-office or power bleaching and over the counter (OTC) bleaching products. Night guard beaching typically uses a relatively low level of whitening agent applied to the teeth via a custom fabricated mouth guard and is worn at night for at least two weeks. In office bleaching generally uses relatively high levels of whitening agents for example 25-35% hydrogen peroxide or 35% carbamide peroxide containing products, for shorter time periods, while over the counter (OTC) products typically contain low levels of whitening agent (e.g. 3-6% hydrogen peroxide) that are self-applied to the teeth via gum shields, strips or paint on products which require twice application for up to two weeks. **Joiner, 2007**⁽²⁰⁾.

“Power bleaching” is an in – office whitening technique developed to bleach teeth in single office visit with a combination of a whitening agent such as peroxide and an auxiliary such as light, characteristics include rapid lightening, lower concentration peroxide gels for shorter periods, less pain- inducing application and

protection of the gingival with barrier material. **Tavares et al, 2003⁽⁵⁴⁾**.

But unfortunately improvement in tooth color may, however, be at the expense of tooth strength, The mechanism of action of hydrogen peroxide in tooth bleaching is considered to be oxidation, it is felt that the oxidizers remove some unattached organic matter from the tooth with out dissolving the enamel matrix, but also may change the discolored portion to a colorless state **Haywood, 1992⁽¹⁵⁾**.

Thus, it was thought that a study evaluating the effect of different bleaching regimens on the color change and enamel surface topography might be of value.

Review of Literature

I-Effect of tea solution on enamel color:

Suleiman et al., in 2003⁽⁴⁹⁾, evaluated an in vitro study to evaluate the effectiveness of tooth bleaching. Extracted human permanent third molar were collected and stained in tea solution for six days period by immersion of specimens in a standardized tea solution. The tea solution was produced by boiling two grams of tea in 100 ml of distilled water, for five minutes and filtered through gauze to remove tea from the infusion. Thirty- five samples were divided into seven groups. The first group of five samples were immersed in tea solution for one day. The second group for two days and the final group was immersed in tea solution for six days, color assessment were made at baseline, post staining and post whitening using a standard clinical shade guide, shade vision clinical colorimeter system and a reflectance chromometer .Groups of stained specimens were exposed to water (placebo control), Enamel polished, Enamel polished and bleached through enamel, Bleached through enamel, Bleached through dentine, Bleached though enamel and dentine and Gel without hydrogen peroxide was applied on enamel .The results revealed that control and polish treatments had no or little effect respectively on tooth shade but all bleach treatments produced marked and statistically significant whitening effects and the model could be used to study many aspects of vital tooth bleaching.

Sulieman et al., in 2004⁽⁵⁰⁾, evaluated an in vitro study on the effect of hydrogen peroxide concentration on the out come of tooth whitening. Extracted human third molar were selected and stained