The Effect of Two Different Bleaching Agents on the Micro-Hardness and Surface Roughness of two Resin Based Restoratives

Thesis

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BY

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تأثير استخدام نوعان مختلفان من المواد المبيضة للأسنان على صلابة وخشونة السطح لنوعين مختلفين من الحشوات الراتنجيه

مشروع رسالة

مقدم لكلية طب الأسنان بجامعة عين شمس توطئة للحصول على درجة الماجستير في العلاج التحفظي للأسنان

مقدمة من

الطبيبة/ **إيمان ناصر أحمد دياب**

بكالوريوس طب الأسنان – جامعة عين شمس٢٠٠٤

This study was conducted to evaluate the effect of two different bleaching agents on the micro- hardness and surface roughness of two resin based restoratives (micro-hybrid composite resin and resin modified glass ionomer). A total of 120 specimens of the resin based restoratives were prepared in the form of cylindrical discs obtained with standard splitted mold 6 mm in diameter and 2 mm in depth. Sixty specimens of each resin based material were randomly divided into two major groups before bleaching into: a1- storage in distilled water in a glass container at 37^0 C in an incubator for three months, a2- storage in distilled water in a glass container at37^0C in an incubator for one week. Samples in each major group were further sub grouped into b1- control samples, b2- samples bleached using (30 %carbamide peroxide agent once daily for thirty minutes for 3 days, b3- samples bleached using (6% carbamide peroxide once daily for twenty minutes for 14 days). The specimens then subjected to micro-hardness and surface roughness testing.

Results showed that the aging of samples for three months showed statistically significantly lower mean micro-hardness value and higher mean surface roughness value than one week. Bleaching with two different types of the bleaching agents significantly lowered the mean micro- hardness value

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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

صدق الله العظيم

سورة البقرة آية (٣٢)

Dedication

I wish to dedicate this work to

MY GREAT PARENTS,

MY LOVELY HUSBAND,

AND MY CUTE SON

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The use of bleaching techniques for improving of esthetics of natural dentition has become increasingly popular since 1989[37]. It is considered an economical and efficient method that preserves tooth structure [39]. The technique may be offered in the dental office or at home.

With the home bleaching technique, the patients apply bleaching solutions, most of which contain 10-15% carbamide peroxide. Over the past few years, in-office tooth bleaching systems employing the use of strong oxidizing agents have been re-introduced. The advantages are that treatment is totally under the dentist's control, the soft tissues are generally protected from the process and it has the potential for quick bleaching in situations in which it is effective [9,10].

Dental practitioners are seeking a single restorative material that can accommodate a wide range of applications for both anterior and posterior restorations. Composite resin materials demonstrate continual improvement in strength, wear resistance, handling, and esthetics. [19]

Resin-modified glass ionomers have the advantage of added toughness and flexibility to the relatively brittle

conventional glass ionomer. The modified cements claim to have improved esthetics and mechanical properties while maintaining the benefits of conventional products, such as localized fluoride release and adhesion to the tooth. [(70)]

Restorative filling materials used in dentistry require long-term durability in the oral cavity. One of the most important physical properties of restorative filling material is surface hardness. The hardness of a material is a relative measure of its resistance to indentation when a specific load is applied. It was reported micro hardness has been shown to be an adequate indicator of the degree of conversion or polymerization of composite resin. The degree of polymerization may be related to the clinical performance of resin restorative materials. [(94)]

Surface roughness of restorations is one of clinically important physical property that warrants investigation. The surface finish of restorations influences appearance, plaque retention, surface discoloration and gingival irritation. [(98)]

Although bleaching is safe from a procedure stand point, it may not be safe for dental materials that have high degradation characteristics. Peroxide-based agents provide