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Abstracts of the last three years

Hanan K. A. El-Seoud, Mohammed E. Atif and Randa M Hafez, 2008. **Proper timing of bonding composite resin to bleached enamel. Cairo Dental Journal, September 2008.**

Hanan K. A. El-Seoud, Mohammed E. Atif and Randa M. Hafez, 2008. **Nanocomposite resin restoration, its Color stability and surface characteristics, Egyptian Dental Journal, October 2008, 54, *2939:2950,* Oct. 2008.**

Hanan K. A. El-Seoud and Hossam A. Kandil, 2008. **Tracing of biochemical activity of resin modified glass ionomer versus glass ionomer. Egyptian Dental Journal, October 2008, *54, 2627:2638,* Oct 2008.**

Hanan K. A. El-Seoud and Ahmed M. Hamdy, 2008. **Adhesively retained fiber reinforced composite post and core versus traditional posts and cores: Its fracture resistance, stiffness and failure characteristics modes. Egyptian Dental Journal, October 2008, 54, 2951:2964, Oct. 2008.**

Hanan K. A. El-Seoud, Randa M. El-Boghdadi and Randa N. El-Slawi, 2009. **Enhancement of the Compromised Bond of Coronal Access Restorations to Bleached Dentin. Egyptian Dental Journal, Vol. 55, 341:353, January, 2009.**

Hanan K. A. El-Seoud, Abeer Abo.El Naga and Heba M. Taher, 2009. **The influence of PH-challenge of swimming pool water on aesthetic properties of Novel Dental colored restorations, Egyptian Dental Journal, January 2009, Vol. 55, 197:207.**

Mohammed E. Atif, Shereen Bader and Hanan K. A. El-Seoud, 2009. **Silorane based adhesive resin system versus Methacrylate bonded to primary and permanent teeth. A micro morphological study. Accepted for publication in Egyptian Dental Journal, January 2009.**

PROPER TIMING OF BONDING COMPOSITE RESIN TO BLEACHED ENAMEL.

Hanan K. A. El-Seoud[*] and Mohammed A. Ibrahim[**]

Abstract:

Studies have shown that bleaching treatment of enamel tooth surface interferes with bonding and adhesion of composite resin placed immediately after bleaching. The aim of this study was to evaluate the influence of bleaching agent on micro shear bond strength of composite resin to bleached enamel after different intervals of time (control, immediate , one week) using two different based adhesive system of bonding (single bonding and self etch adhesive). Sixty human molar teeth were assigned into six groups (n=10) according to time elapsed between bleaching and bonding and type of bonding used. Group 1: Control group, no bleaching treatment – composite resin bonded using single bond. Group 2: Bleached 38% Hydrogen peroxide – composite resin bonded immediately after bleaching using single bond. Group 3: Bleached 38% Hydrogen peroxide – composite resin bonded one week using single bond. Group 4: No bleaching – control group composite bonded using self etch adhesive system. Group 5: Bleached 38% Hydrogen peroxide – composite resin bond immediately after bleaching using self etch adhesive system. Group 6: Bleached 38% Hydrogen peroxide – composite bonded using self etch one week later.

The micro shear bond strength test was performed using Nexygen MT Lloyd instrument at across head of 0.5 mm/min. The data in MPA were subjected to analysis of variance ANOVA and Tukey's test as significant difference at $P<0.05$ – data showed that control group without bleaching using both single bond and self etch adhesive system in bonding composite resin to enamel attained statistically significant highest micro shear bond strength followed by one week group while group bonded immediately after bleaching using self etchant adhesive showed the lowest bond strength. The micro shear bond strength value of composite resin to bleached enamel is time and adhesive system dependant, seven days delay in bonding procedure for composite resin post bleaching to enamel is recommended.

Nanocomposite resin restoration, its Color stability and surface characteristics

Hanan K. A. El-seoud*, Mohammed A. Ibrahim and R. Hafez*****

ABSTRACT

In modern research, development of new composite remains an ongoing challenge. New nanocomposite restorative material invading dental market showing promising properties as a result of blending both nanotechnology and hybrid technology. Studying esthetic color stability and surface characteristic of new version of nanocompositeis and compare it with microhybrid composite is of great value. Dis coloration of composite resin restoration by different staining agents is a serious common problem, which may result in patient dissatisfaction and additional time and expenses for replacement. However the effect of different staining and bleaching agents on color properties and surface characteristics of nanocomposite material has not been well clarified and compared with microhybrid composite. So main purpose of this study was to assess color properties regarding stability using computerized image analysis and surface characteristics and quality by scanning electron microscope of nanocomposite compared to microhybrid composite resins after exposure to three staining solutions (coffee, chlorohexidine mouth wash, and nicotine smoke) and effect of a bleaching agent. The data was interpreted and performed with one way analysis of variance ANOVA followed by Tukeys test. This study showed nanocomposite restorative material tested was found significantly more color and esthetically stable than conventional microhybrid.Cholorohexidine and coffee staining produced the greatest color change. Color of stained micro hybrid composite was significantly affected by 38% hydrogen peroxide bleaching agent than nanocomposite and surface characteristic and quality was severely altered showing more surface scratches ,roughness and irregularities after bleaching

Tracing of Biochemical Activity of Resin Modified Glass Ionomer Versus Glass Ionomer

Hanan K.A. El-Seoud* and Hossam Kandil**

Abstract

The biochemical activity of resin modified glass ionomer regarding the extent of remineralization capability for enamel and dentin at three different levels (distance tracing) either near to cavity walls (100 µm), intermediate (400 µm), and remote faraway from cavity walls (700 µm) was mapped using direct microdensitometric digital analysis and indirect technique. The assessment was quantitatively using chemical analysis by EDX unit and qualitatively through physical digital analysis. All data was compared to those of glass ionomers and control material (wax). This study showed that the mineral distribution of dentin tissue differed from that of enamel, and its was a location dependant. Glass ionomers showed significantly higher biochemical activity in remote areas than that of resin modified glass ionomer. Both chemical analysis and physical digitized imaging gived a full map and was very informative about mineral distribution around cavity margins of both restorations.

Adhesively retained Fiber reinforced composite post and core versus traditional posts and cores: Its fracture resistance, stiffness and failure characteristics modes

Hanan K. A. El-seoud*, Ahmed M. Hamdy[1]**

Abstract

Statement of Problem: Post and core foundation restoration are often required as it provided retention and resistance for endodontically treated teeth against potentiality for risk of distortion and fracture.

Purpose: This in vitro study examined the effect of post and core build up material type and properties on stiffness, fracture resistance, fatigue loading and failure characteristic modes of endodonticlly treated teeth under mechanical aging by cyclic loading.

Material and Methods: Forty human mandibular molars teeth were decoronated at cementoenamel junction, endodontically treated then their distal canals were prepared for post fixation. The prepared teeth were divided equally into 4 groups according to type of post system as follows (n=10):

Group 1: casted post and core build up.

Group 2: Prefabricated threaded titanium post and amalgam core.

Group 3: Fiber reinforced composite post and composite resin core.

Group 4: control group-endodontically treated teeth with no post and core.

A continuous cyclic load (5000 N) was applied at a cross head of 5 mm/min until failure happened; collected data were subjected to 1–way analysis of variance and Tukey multiple comparison test was also performed to establish which groups were statistically different from the others at alpha equal to 0.05. The pattern mode of failure was classified as repairable or nonrepairable.

Results: The highest fracture resistance load was observed in traditional casted post and core which was 1850 N while for titanium post with amalgam core it was 1211 N. Adhesively retained fiber post with composite core shows lower values of fracture resistance at 1151 N in comparison to control group which showed least values at 779 N. For stiffness the casted group shows highest values 1970 N mm, amalgam group shows intermediate stiffness of 1748 N mm ,followed by prepared natural group of 1626 N mm while composite exhibited the lowest stiffness value 1602 N mm.

Conclusion: Within the limitation of this investigation post and core build up material type affected the fracture resistance and failure mode of endodontically treated teeth. The traditional cast posts and cores were stronger than adhesively retained fiber –reinforced resin type regarding its significantly high fracture resistance but pattern mode of failure were unrepairable radicular or coronal radicular for traditional type which was not preferable , only adhesively fiber post with composite core exhibited repairable coronal failure fracture mode which considered as preferable one.

Clinical implication:

The dental clinician is now faced with a variety of choices when restoring an endodontically treated tooth with a substantial loss of enamel and coronal dentin. Does dental clinician go for traditional posts and cores or an adhesively retained fiber post and composite core? This study will answer this important question.

Enhancement of the Compromised Bond of Coronal Access Restorations to Bleached Dentin

Hanan K. A. ElSeoud[*], Randa M. El Boghdadi[**] and Randa N. Elsalawy[***]

Abstract

The purpose of this study was to investigate the effect of non vital tooth bleaching on the shear bond strength of three intracoronal restorations to bleached dentin and to evaluate the micromorphology of the hybrid layer produced. It was also the interest of this study to evaluate the ability of sodium ascorbate antioxidant to reverse the compromised bond strength. Resin composite, glass ionomer and polyacid modified resin composite were the restorative materials used. Ninety endodontically treated maxillary anterior teeth were divided according to the type of intracoronal restorations into three main groups (n = 30), group I: Resin composite restoration bonded with single total bond, group II: Glass ionomer cement restoration and group III: polyacid modified resin composite (Compomer). Each group was then subdivided into three subgroups (n = 10) according to the treatment regimen, subgroup A: consisted of the control specimens, which were not bleached. Subroup B: specimens were bonded immediately after bleaching, while subgroup C: specimens were bleached, treated with antioxidant agent (10% sodium ascorbate) then bonded. The specimens were subjected to the push out shear bond strength test until failure. The seal integrity of various intracoronal restorations bonded to dentin surface in all groups was evaluated using scanning electron microscope. The push out shear bond strength data was analyzed by one-way analysis of variance followed by Tukey's multiple comparison tests at a significance level of P < 0.05. Results: Tukey's pairwise test revealed that the control subgroup of the three tested intracoronal restorations recorded the highest mean bond strength (MPa) compared to the bleached subgroup which recorded the lowest mean bond strength values. The antioxidant subgroup recorded intermediate mean shear bond strength value. Two-way ANOVA revealed a significant influence of the type of the restorative materials tested ($F = 8.649$; $p<0.01$) and the surface treatment ($F = 20.02$; $p<0.001$) on the push out shear bond strength value. Conclusion: The following conclusions could be drawn

from the results of the present study: Non vital bleaching using sodium perborate adversely affects bonding to dentin, reducing the push out shear bond strength of all intracoronal restorations to bleached dentin. Treatment of the bleached dentin surface with 10% sodium ascorbate antioxidant for 10 minutes reverses the compromised bond strength and may be an alternative way to enhance bonding, especially when the restoration is to be completed immediately after bleaching. The type of the intracoronal restoration may affect the interfacial integrity and sealing ability to bleached dentin.

The influence of PH challenge of swimming pool water on aesthetic properties of Novel Dental Colored Restorations

HANAN K.A.EL SEOUD*, A. BO EL NAGA**, H. TAHER***

Abstract:

Objectives: Maintenance of aesthetic properties of tooth colored restorations is of primary importance especially when these restorations are subjected to challenge of PH in swimmers mouth who are exposed for long hours to chlorinated water during their work out, so the aim of this study was to evaluate the effect of pH-challenge of swimming pool water on the color changes of four new novel colored restorations: nanocomposite, resin modified glass ionomer, poly acid modified composite and new giomer glass ionomer for different interval periods.

Methods: Four tooth colored restorations nanocomposite (TPH^3, DENTSPLY) giomer glass inomomer (Beautifil, SHOFU),resin modified glass ionomer (Photac Fil,3M/ ESPE) and polyacid modified composite (F2000,3M/ESPE) were used in this study. 25 disc-shaped specimens (5x3mm) of each tested material were prepared using split Teflon mould. Five specimens were used as control while the other 20 specimens were divided into two groups. The first group (10 specimens) were immersed in distilled water while the second group (10 specimens) were subjected to pH-challenge regimen, in which they were immersed in a swimming pool water prepared by dissolving 5.0mg chlorine powder in 1000 ml water with PH adjusted at 7.5 for 3/hours daily at room temperature, the specimens were immersed in distilled water for ten seconds to be washed after each pH exposure. Both groups were stored for one month and three months. After each storage period the specimens were tested for quantitative color changes using Quanta Environmental Scanning Electron Microscope. Data were statistically analyzed using Multivariate ANOVA and Tukeys test.

Results: Statistical analysis of change in color from the control value for all groups revealed a significant difference between water and PH exposure media as ($P < 0.001$).Statistical analysis of change in color between all groups revealed a significant difference due to material type ($P < 0.001$).

There was statistically significant difference between means of colour changes after storage for one month and three months in challenge of pH showing effect of exposure time. On the other hand four tested restorative materials were highly susceptible to colour changes after exposed to

challenge of PH, new Giomer glass ionomer showed the least susceptibility to colour change while F2000 polyacid modified composite showed the statistically significantly highest mean colour change.

Clinical Significance: Aesthetic colour stability and discoloration properties of new novel nanocomposite and new version of giomer glass ionomer are severely lacking and limited in dental literature which may provide guidance for selection of nanocomposite and other novel aesthetic restoration for clinical usage especially for swimmers who stayed for long time in chlorinated water with high PH.

Silorane based adhesive system versus methacrylate one bonded to primary and permanent teeth -A Micromorphological study

Hanan K. A. El-Seoud[*] and Shereen Bader [**]

Abstract

Despite the fact that dentin adhesive systems have become a common tool in the armamentarium of contemporary dentists, the literature comparing bonding to dentin of primary and permanent teeth is very limited. Self-etching adhesives have been developed to simplify the bonding procedures. However, little is known about the quality and quantity of hybrid layer of Silorane based low shrinkage (LS) resin composite with its dedicated two-step, self-etch adhesive (silorane-based adhesive system) compared to a recently introduced self-etch adhesive with zirconia bonded nanofiller in combination with methacrylate resin composite (methacrylate based adhesive system). Therefore, this study verified the quality and quantity of hybrid layer of two different based resin composite with two different self-etch adhesive bonded to dentin of primary and permanent teeth, verifying the impact of tooth type and resin based type on micro morphology of the resin-dentin interface. A total of 80 specimens were divided into two main groups, forty specimens each, according to the type of dentition then each group was furtherly subdivided according to type of tested adhesive and resin composite such that twenty teeth from each group were treated using methacrylate based adhesive system, while the others were treated using Silorane based adhesive system. All samples were analyzed using SEM quality wise while quantitative assessment was used to compare the resin tags area of hybrid layer generated by all tested groups. Methacrylate based adhesive system recorded significantly higher mean resin tags area than Silorane based adhesive system for both primary ($t = 138.4$, $P<0.003$) and permanent teeth ($t = 9.911$, $P<0.05$). Two-way ANOVA revealed a high significant influence of teeth tested (primary vs. permanent) ($F=15.41$; $p<0.001$), a high significant influence regarding the type of resin based composite used on resin tags area results as ($F =26.07$; $p<0.001$) The interaction of these two factors was statistically significant ($F = 22.23$; $p<0.001$).