



Electronic Shade-Matching Devices Differ in Accuracy

Reliability and Accuracy of Four Dental Shade-Matching Devices.

Kim-Pusateri S, Brewer JD, et al:

J Prosthet Dent 2009; 101 (March): 193-199

In this study, electronic shade-matching instruments had similarly high reliability, but differed substantially in accuracy.

Objective: To evaluate the reliability and accuracy of 4 electronic devices for determining dental shades.

Methods: The 4 devices evaluated were the SpectroShade (spectrophotometer), ShadeVision (digital camera with colorimeter), VITA Easyshade (spectrophotometer), and ShadeScan (digital camera with colorimeter). All of the devices were calibrated according to manufacturer instructions. Three types of shade guides were used in the study: Vitapan Classical, Vitapan 3-D Master, and Chromascop. Each shade tab from 10 shade guides of each type was measured using all 4 electronic devices. The measurements were done under simulated clinical conditions, ie, the shade tab was placed against a gingiva-colored matrix with identical shade tabs placed on each side of it. A measurement was considered to be accurate if the device selected a shade that was identical to the shade tab measured. Accuracy was expressed as a percentage of measurements made with the device that were an exact match. To measure reliability, each shade tab from 1 of each shade guide type was measured 10 non-consecutive times by each instrument. Repeated measurements were considered to be reliable if they were similar, even if they did not match the shade tab itself.

Results: Reliability percentages were 99.0 for the ShadeVision, 96.9 for the SpectroShade, 96.4 for the VITA Easyshade, and 87.4 for the ShadeScan. Accuracy percentages were 92.6 for the VITA Easyshade, 84.8 for the ShadeVision, 80.2 for the SpectroShade, and 66.8 for the ShadeScan.

Conclusions: The electronic shade-matching instruments had similarly high reliability, but differed substantially in accuracy.

Reviewer's Comments: The VITA Easyshade had the best combination of accuracy and reliability in this study. However, as the authors discuss, the Easyshade may have benefitted from instructions that differ from those for the other devices. The manufacturer recommends that shade measurements be repeated until 2 consecutive identical measurements are obtained. In other words, this device has more opportunities to correctly measure the target shade tab. This device also has a larger probe (5 mm) than the other devices (3 mm). This study considered only the average shade of each tab, not the shade in various regions. A larger probe would be more likely to correctly measure the average shade. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Shade Selection, Spectrophotometer, Colorimeter

Print Tag: Refer to original journal article

Composite Resin Restorations Prove Durable in Extended Class II Situations

Nanohybrid vs. Fine Hybrid Composite in Class II Cavities: Clinical Results and Margin Analysis After Four Years.

Krämer N, Rienelt C, et al:

Dent Mater 2009; 25 (June): 750-759

With appropriate technique, composite resin can be used on gingival floors extended below the CEJ.

Background: Direct composite resin restorations have become the most prevalent solution for Class II situations. Questions still persist relative to the clinical longevity of these restorations. Long-term clinical studies are relatively rare; particularly those that investigate restorations extended gingivally resulting in a box with no enamel on the gingival margin.

Objective: To evaluate the clinical performance of 2 different resin composite materials in Class II restorations over a 4-year period. A split-mouth design was used.

Design: Prospective clinical study.

Participants/Methods: 30 patients were selected that required at least 2 restorations in different quadrants; all restorations were replacements of previous restorations. In total, 85% of cavities had little or no enamel remaining at the floor of the proximal box. The teeth were asymptomatic and the patients demonstrated good oral hygiene compliance. Two different materials were used in each subject. Thirty-six restorations were completed with Grandio (a nanohybrid) bonded with Solobond M (Voco), and 32 restorations were done with Tetric Ceram (a fine hybrid) bonded with Syntac (Ivoclar Vivadent). Both adhesive systems are etch-and-rinse systems and all restorations were completed with the use of a rubber dam. A single operator placed all of the restorations. The restorations were evaluated according to the modified USPHS criteria by 2 independent investigators for surface roughness, color, marginal integrity, proximal contact, and tooth and restoration integrity at baseline, 1, 2, and 4 years. In addition to evaluation with mirrors, probes, and radiographs, impressions were obtained and the replicas subjected to light microscopic and scanning electron microscopic analysis of the marginal integrity.

Results: There was a 100% recall rate for the subjects and the success rate for the restorations was 100% after 4 years. All restorations exhibited some deterioration over time, with 66% showing bravo ratings after 4 years. Similar findings were noted with regard to restoration integrity. No significant difference was observed between the 2 restorative materials.

Conclusions: Both restorative materials performed in a clinically acceptable fashion in deep proximal cavities over a 4-year period. There were no differences noted based on material.

Reviewer's Comments: This study provides some evidence that composite resin restorations can provide a durable restoration in Class II situations that involve gingival margins below the CEJ. Although the use of scanning electron microscope analysis to evaluate the marginal integrity is laudable, it is nearly impossible to use this technique in the area of greatest question, the gingival margin. At least through the use of independent evaluators, the restorations were clinically acceptable. It is also important to note that these restorations were meticulously placed using rubber dam, no doubt contributing to their success. Both adhesives were of the etch-and-rinse category; similar clinical studies investigating other classes of adhesives would be welcome. (Reviewer-Daniel E. Wilson, DDS).

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Keywords: Restoration, Longevity, Resin Composites, Gingival Seal

Print Tag: Refer to original journal article

Short Implants Are Available for Areas With Significant Bone Resorption

Short Implants: A Viable Treatment Option in the "Anatomically Challenged" Patient.

Toffler M:

Inside Dent 2009; 5 (1): 44-50

Shorter implants can help avoid surgery necessary to increase the bone height.

Objective: This article presents case reports demonstrating the benefits of short implants in an atrophied ridge. Five case reports illustrate the procedures. **Discussion:** Placement of implants in a fully or partially edentulous alveolar ridge with markedly reduced bone volume poses greater risk of complications, extended treatment time, and greater cost because of the proximity to the inferior alveolar nerve or maxillary sinus floor. This reduced bone volume contraindicates implants ≥ 10 mm unless ridge augmentation, a sinus lift, alveolar osseous distraction, and/or nerve transpositioning are performed. Although surgical procedures have been employed to lift the sinus floor, these procedures may have side effects. Recently, placement of short 9-mm implants has been successful, requiring less residual subantral bone height and minimal sinus floor elevation. Short implants allow placement without more invasive surgical procedures such as ridge and sinus grafts/sinus lifts. The quality of the bone-implant interface is determined by factors such as bone quality and length, implant diameter, implant surface properties, and implant shape and design. Adding a roughened surface to the machined threads of the implant enhances the clinical performance, especially in areas of reduced bone density. Etching and blasting the surface to increase the porosity of the implant improves the retention between implant and bone by enlarging the contact surface area and increasing the biomechanical interlocking. This reduces the length of the implant necessary for retention and posterior occlusal loading. Placement of short implants in a deficient alveolus minimizes or eliminates the need for vertical ridge augmentation, nerve transposition, and extensive sinus floor elevation. Postoperative morbidity and treatment duration are thus reduced.

Conclusions: Short implants allow a minimally invasive procedure. Use of these short implants in areas of decreased bone volume minimizes the duration of treatment, the cost of treatment, and the trauma the patient experiences. This may be especially important for elderly patients. This approach has been successfully applied in practice.

Reviewer's Comments: Short implants do offer a huge advantage in areas of decreased bone height in the same way that narrow diameter implants offer an advantage in areas of diminished bone width. However, these implants do raise the question of their long-term retention under significant occlusal loading. They can be used where long implants cannot be placed, albeit with a more guarded prognosis. (Reviewer-Thomas G. Berry, DDS, MA).

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Keywords: Short Implants, Limited Bone

Print Tag: Refer to original journal article

Sealing the Margins of Class II Composites: RMGI Is Your Best Bet

Effect of Dual Cure Composite as Dentin Substitute on Marginal Integrity of Class II Open-Sandwich Restorations.

Koubi S, Raskin A, et al:

Oper Dent 2009; 34 (March-April): 150-156

In "open sandwich" posterior composites, RMGI prevents leakage better than a dual-cure composite.

Objective: To compare the marginal adaptation of Class II "open sandwich" composite restorations using either a resin-modified glass-ionomer (RMGI) or dual-cure composite as dentin substitute.

Methods: As described in this paper, the open sandwich technique involves placement of some dentin substitute material between a Class II gingival margin in dentin and an occlusal layer of composite. Standardized Class II MO preparations were made in 50 extracted human third molars. The proximal box extended just apically to the CEJ. The prepared teeth were divided into 2 groups. In the experimental group, the etch-and-rinse adhesive system All Bond 2 (BISCO) was used. Two thirds of the proximal box was restored using a dual-cure composite, MultiCore Flow. The material was allowed to chemically cure for 4 minutes, then was light-activated for 40 seconds. The final coronal third was restored with a light-activated composite, Tetric EvoCeram (Ivoclar Vivadent). In the control group, the initial two thirds of the proximal box were restored using the RMGI Fuji II LC, and Tetric EvoCeram was used for the occlusal third. The restored teeth were subjected to thermal and mechanical load cycling using a fatigue cycling machine. They were then subjected to a standard silver nitrate dye penetration test, sectioned, and examined for microleakage at 25X magnification using a light microscope. Microleakage was scored along a 0 to 3 scale.

Results: Microleakage was significantly higher in the specimens restored using dual-cure composite than in those restored using RMGI.

Conclusions: In regard to microleakage, RMGI is a better choice than dual-cure composite in "open sandwich" posterior composite restorations.

Reviewer's Comments: A number of studies have reported that RMGI can reduce leakage at gingival margins of Class II composites that are in dentin. However, there are questions about RMGI durability in such restorations; for example, one study reported noticeable dissolution of the material after 6 years of clinical service. Dual-cure composite is a potential alternative because it can be placed in bulk and polymerizes slowly, which might relieve stress and improve marginal adaptation. However, this study indicates that RMGI provides a better marginal seal. The question is whether or not the material will hold up clinically. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Posterior Composites, Microleakage, Sandwich Restorations

Print Tag: Refer to original journal article



Dental Decay Significantly Increasing on a Global Level

The Global Increase in Dental Caries. A Pending Public Health Crisis.

Bagramian RA, Garcia-Godoy F, Volpe AR:

Am J Dent 2009; 22 (February): 3-8

Dental caries is increasing worldwide.

Discussion: This is a review manuscript evaluating caries incidence reports. In the United States, <1 of 5 children eligible for Medicaid sees a dentist in a given year. The NHANES study of >10,000 children from 1988 to 1994 and then repeated from 1999 to 2004 showed zero decrease in dental caries over that 10-year period. This is a reversal of a trend of decreasing caries from the 1950s to 60s to 70s in which we were seeing caries decrease. Here are some of the worldwide reports: Philippines - 97.1% of 6-year-olds with dental caries; China - 2014 children screened with 55% regular caries and another 14% with rampant caries; Brazil - 1151 5-year-olds with 45.8% caries in primary teeth; Mexico - 3048 children, with 81% in need of at least 2 restorations in permanent teeth; Norway - 50,000 children had a decline in caries incidence from 1985 to 2000 followed by a rise in caries rate from 2000 to 2004; and India - 51.9% caries in 5-year-old children and 63.1% in 15-year-old teenagers.

Conclusions: The World Health Organization estimates that in 12-year-old children, there are 200,335,280 decayed, filled, or missing teeth (DMFT). Every country report concluded that poverty increased the chances of having painful decayed teeth. After multiple decades of improving oral health there is now an alarming increase in coronal and root caries.

Reviewer's Comments: Most dentists think that dentistry has dental caries whipped! We have come to expect that a lot of the teenagers in our practices will have zero caries experiences. To think that dentistry is behind in economically depressed nations is sad, but not really unexpected. To think that we are losing ground here in the U.S. is shocking. We all know that high carbohydrate intake is the norm. Dentists here in the U.S. just expect that fluoride and regular dental care will hold back the caries rate or let us get a little ahead. At UTHSCSA, we are having trouble attracting a sufficient number of patients with decay to adequately train our dental students. We could probably fix that if the care was free rather than priced at 25% of private practice fees. Unfortunately, the school needs that 25% fee to stay in business. It is a very complex circle that will require funds that appear impossible to acquire at this time. As a public health issue, prevention is still the most cost effective treatment for dental caries. (Reviewer-J.D. Overton, DDS).

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Keywords: Dental Decay, Caries

Print Tag: Refer to original journal article

Bonding With Self-Etch Adhesives Doesn't Measure Up to Etch-and-Rinse

Effect of Enamel Etching Time on Roughness and Bond Strength.

Barkmeier WW, Erickson RL, et al:

Oper Dent 2009; 34 (March-April): 217-222

In this study, self-etch adhesives did not bond to enamel as well as etch-and-rinse adhesives, and extending their application time did not improve performance.

Objective: To examine the effects of different enamel conditioning times on surface roughness and shear bond strength of etch-and-rinse and self-etch adhesives.

Methods: The adhesives used in this study were Adper Single Bond Plus, Adper Prompt L-Pop, Clearfil SE Bond, Clearfil S3 Bond, and Xeno IV. Single Bond is a 2-step etch-and-rinse material; Clearfil SE Bond is a 2-step self-etching primer system; the others are "all-in-one" self-etch adhesives. Extracted human molars were sectioned to create buccal and lingual halves. Those were mounted in custom fixtures and polished to flat 4000-grit surfaces. Ten specimens were left untreated as a control. Additional specimens were treated using the manufacturer's recommended conditioning time, an extended conditioning time of 60 seconds, and a third time that was either longer or shorter than the recommended time, depending on the system. The surface roughness of each specimen was measured using a profilometer. For each adhesive system, shear bond strengths were determined for both the manufacturers' recommended conditioning times and for the extended (60-second) conditioning time. This was accomplished using a standard method - the Ultradent bonding fixture and Instron universal testing machine. Fracture modes were examined using an optical microscope at 20x magnification.

Results: Surface roughness was greatest for the etch-and-rinse adhesive (ie, phosphoric acid etching). Prompt L-Pop created significantly greater surface roughness than any of the other self-etch materials. Both of these systems had greater surface roughness using the longer conditioning time, and were the only 2 that did. Single Bond had the highest shear bond strengths at both conditioning times. Extending the conditioning time did not improve the bond strength of any adhesive.

Conclusions: Self-etch adhesives did not bond to enamel as well as etch-and-rinse adhesives, and extending their application time did not improve performance.

Reviewer's Comments: The results of this study are very much what one would expect, ie, the etch-and-rinse material had the highest enamel bond strength. The most acidic of the self-etch systems (Prompt L-Pop) created the roughest enamel surface and tended to have a higher bond strength than the other self-etch materials. Perhaps the most clinically relevant finding was that extending the application time did not improve the enamel bond of the self-etch materials. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Enamel Bonding, Self-Etch Adhesives, Etching Time

Print Tag: Refer to original journal article

Are Compomers and RMGIs Alternatives for Anterior Restorations?

Fracture Frequency and Longevity of Fractured Resin Composite, Polyacid-Modified Resin Composite, and Resin-Modified Glass Ionomer Cement Class IV Restorations: An Up to 14 Years of Follow-Up.

van Dijken JW, Pallesen U:

Clin Oral Invest 2009; June 6 (epub ahead of print):

The best bonding and mechanical and physical properties of composite resin make it the material of choice for anterior restorations.

Objective: To evaluate the incidence of fractures of Class IV restorations.

Methods: 85 Class IV restorations placed between 1992 and 1997 with composite resin - Pekafile PLT (Bayer AG) after Gluma or Gluma 2000 (Bayer AG), resin-modified glass ionomer (RMGI) - Fuji II LC (GC) and Photac Fil Quick (ESPE), and compomer - Dyract (DeTrey/Dentsply) and Hytac (3M ESPE) were evaluated. The majority of the restorations were placed in upper centrals and laterals of 45 patients. The preparations for the composite resin restorations were done placing 1- to 2-mm bevels on enamel. Preparations with butt joint margins were done for the RMGI and compomer restorations. All cervical margins were in dentin. The restorations were evaluated yearly for a period of 8 to 14 years. Large or bulk fractures were considered failures.

Results: No restoration was replaced due to non-acceptable color or marginal discoloration. Four of 43 and 2 of 24 composite resin and compomer restorations, respectively, were repaired due to secondary caries. Those restorations were not excluded from the analysis of fractures. Eleven of 43 composite resin restorations, 13 of 24 compomer restorations, and 7 of 18 RMGI restorations fractured during the evaluation period. Longevity for composite resin, compomers, and RMGI was 9.1 years, 6.7 years, and 6.1 years, respectively. The estimated survival for restorations placed in bruxists was 8.0 years and for non-bruxists was 9.9 years. Longevity of replaced fractured restorations was 4.5, 4.3, and 3.3 years for composite resin, compomer, and RMGI, respectively. Overall, 77% of the replaced restorations that fractures recurred were found in bruxist patients.

Conclusions: Composite resins have higher longevity than compomers and RMGI in Class IV restorations.

Reviewer's Comments: The properties of composite resin make it the material of choice for restoration of Class IV preparations. Failures in the compomer and RMGI groups were likely related to those materials' properties and poor bonding. The compomers in this study were used with self-etching adhesive systems, which are known to perform not as well as total-etch adhesives in enamel. (Reviewer-Ricardo Walter, DDS).

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Keywords: Composite Resin, Compomer, Resin-Modified Glass Ionomer

Print Tag: Refer to original journal article

Tray-Applied Overnight Bleaching Gels Most Effective

Review of the Effectiveness of Various Tooth Whitening Systems.

Matis BA, Cochran MA, Eckert G:

Oper Dent 2009; 34 (March-April): 230-235

The most effective tooth whitening occurs with bleaching gels that are applied in trays and when the trays are used overnight.

Objective: To compare the effectiveness of various tooth whitening methods by examining studies in which most of the objective and all of the subjective evaluations were conducted using the same instruments. Nine clinical studies were included in the review. **Discussion:** All of the studies used the Trubyte Bioform Color Ordered Shade Guide as the subjective instrument for color evaluation. With one exception, all of the studies used a colorimeter for objective measurement of color. A single experienced examiner checked shades in an area with color-corrected lighting. For simplicity, only shade guide values and overall color differences (delta E) are reported in this paper. Four studies evaluated a total of 6 dentist-prescribed overnight bleaching products. Three of those used 10% carbamide peroxide (CP), and the other used 15% and 16% CP. The mean shade guide change of the 6 products was 16.3 units immediately after bleaching and 13.2 units 10 weeks later. The respective delta E values were 9.7 and 4.7. Two studies evaluated 4 dentist-prescribed products for use during the day. Immediately after bleaching, teeth had lightened by an average of 12.8 shade guide units. This declined to 10.5 units 10 weeks later. The respective delta E values were 6.6 and 3.4. Three studies evaluated a total of 11 in-office products containing hydrogen peroxide (HP) at concentrations of 15% to 40%. The mean shade guide changes were 9.6 immediately after bleaching and 6.7 at 10 weeks. Delta E values were 5.4 and 2.1, respectively. One study used 3 over-the-counter (OTC) products. These caused a 7.8-unit shade change that declined slightly to 7.2 at 2 weeks.

Conclusions: The most effective tooth whitening occurs with bleaching gels that are applied in trays and when the trays are used overnight.

Reviewer's Comments: This is an interesting paper from one of the most respected researchers in the area of bleaching. It compares the results of similar controlled clinical trials of the various types of bleaching alternatives. Not surprisingly, the dentist-prescribed, patient-applied tray materials were the most effective. Despite the initial lightening provided by in-office procedures, OTC products were as effective as in-office bleaching by 2 weeks after treatment. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Bleaching Products, Clinical Trials, Review

Print Tag: Refer to original journal article



Veneers Need an Enamel Substrate

Prep vs No-Prep: The Evolution of Veneers.

DiMatteo AM:

Inside Dent 2009; 5 (June): online

Direct advertising to the patient will bring some patients to your office asking for no-prep veneers when that is the incorrect treatment.

Discussion: This is an opinion paper that has a series of nice bullets from 9 different dentists about very thin veneers. Everyone that was interviewed concluded that ceramic veneers are intended to be bonded to enamel (not dentin). Concerns about bulk at the gingival surface suggest that a minimal preparation of 0.3 to 0.5 mm might be a superior default to a zero tooth preparation plan. The direct marketing to the patients for brand-specific no-preparation veneers can clearly mislead patients because most patients with significant aesthetic concerns are not candidates for no-prep. There is concern that some dentists are letting the lab technique (pressed veneers or milled veneers) dictate a more aggressive tooth preparation when the better choice for some patients would be the original feldspathic porcelains with 0.3- to 0.5-mm tooth prep. One doctor suggested it was OK to let the patient chose a bulky restoration if the patient insists on no tooth preparation. An excellent key point was made that bleaching and orthodontics that eliminate the restoration/replacement restoration cycle clearly need to be discussed with the patient. Dr. Friedman concludes that his best lesson about veneers is to "Tell the patient NO!" when they request veneers in the wrong application.

Reviewer's Comments: I have concerns that both dental students and practicing dentists fail to adequately cover with the patient the fact that aesthetic veneers will require replacement sometime in the future. The dentist with at least 3 years of experience has seen veneers that have stain on the margins, color shifts from the cement, and chipped/fractured/missing veneers. Not our veneers, of course, but those of that other dentist down the street. In the rough circumstance that it is my veneer, then I am looking at the patient's fingernails to see if they broke a solemn rule not to do high stress edge-to-edge gnawing on the ceramic. The advertising is very effective since I have had family members telephone me asking if they should get Brand X no-prep veneers. It took me more than a thousand words to explain away the beautiful photography and 40 words in the advertisement. Doctors and patients are in constant search for the quick and easy. No-preparation veneers look like the perfect combination until they are cemented in a mouth that needed a different diagnosis and a different treatment plan. (Reviewer-J.D. Overton, DDS).

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Keywords: Veneer, No-Prep, Enamel, Minimal Prep

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Does At-Home Bleaching Improve Results From In-Office Bleaching?

Clinical Evaluation of Two In-office Bleaching Regimens With and Without Tray Bleaching.

Matis BA, Cochran MA, et al:

Oper Dent 2009; 34 (March-April): 142-149

The effect of in-office bleaching can be improved by following it with at-home bleaching.

Objective: To evaluate the effectiveness of a 36% hydrogen peroxide (HP) in-office bleaching system using 2 different regimens and to evaluate the effects of tray-applied 15% carbamide peroxide (CP) on teeth whitened in-office.

Methods: The bleaching materials used in this study were NUPRO White Gold 36% HP gel and NUPRO White Gold 15% CP gel. The maxillary anterior teeth of 25 subjects were bleached using the three 15-minute applications of 36% HP. Twelve subjects were bleached using the same gel, but for a single 40-minute application. Tooth color was measured using 2 methods - the Vitapan Classical Shade Guide and a Minolta Chroma Meter that measured CIE L*a*b* values. In addition to the in-office treatment, custom trays were made for each subject. Subjects used these trays for overnight applications of 15% HP to a randomly selected half of the maxillary arch. The at-home bleaching was done for 7 days. Shade measurements were made before and after the in-office treatment, and at 4, 7, 14, and 84 days later. Subjects used a visual analog scale (VAS) to record tooth and gingival sensitivity.

Results: Three 15-minute applications of 36% HP gel were more effective than a single 40-minute application. Use of a post-treatment at-home bleaching regimen significantly increased the degree of color change caused by the in-office treatment. Reversal of the bleaching result was fairly dramatic. For example, the most effective color change occurred in the teeth that received 3 applications of 36% HP followed by at-home bleaching. The initial color change in those teeth approached a ΔE value of nearly 10. Twelve weeks after treatment, this was <5. At that time, the other 3 groups had values of only about 2.

Conclusions: At-home bleaching improved the effect of in-office bleaching.

Reviewer's Comments: This study showed that shorter but multiple applications of an in-office bleaching gel gave better results than a single but longer application, which is not surprising. The study also reported a measurable color change for the in-office system, but the result was improved by following the in-office treatment with a week of at-home bleaching. It would have been interesting to include a group that used only the at-home bleaching to see whether it would have been much different after 12 weeks. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Bleaching

Print Tag: Refer to original journal article

RelyX Unicem OK at 1 Year With Ceramic Inlays

IPS Empress Inlays Luted With a Self-Adhesive Resin Cement After 1 Year.

Taschner M, Frankenberger R, et al:

Am J Dent 2009; 22 (February): 55-59

In this study, the simplified cement RelyX Unicem performed similarly to Variolink II at 1 year of clinical service.

Objective: To determine whether a self-etch luting cement works as well as a conventional etch-wash-primer-adhesive cement for ceramic inlays.

Methods: 83 IPS Empress inlays were prepared and cemented by a single operator on 30 patients. A rubber dam was used for the cementation of every restoration (31 2-surface, 39 3-surface, 13 onlays). Syntac/Variolink II low viscosity was used for 40 and RelyX Unicem for 43 restorations.

Results: All patients were available for the recall at 2 weeks, 6 months, and 12 months. One of the Syntac/Variolink II inlays was replaced at 6 months due to severe enamel cracking. Not one of the 83 restorations was reported as sensitive, which is an unexpected finding because similar studies have consistently had a few sensitive teeth. Some color shift of the RelyX Unicem was noted in this study, which has been reported by other research projects. Tooth integrity at 1 year was reported (Variolink II vs RelyX) as Alpha 1=41%/33%; Alpha 2=54%/58%; Bravo=5%/9%, so there was appreciable chipping at the margins of more than half of the restorations at 1 year.

Conclusions: The self-etching cement performed similarly to the fourth-generation luting resin with the exceptions of a color shift with the RelyX Unicem and more marginal ditching with the RelyX Unicem.

Reviewer's Comments: This paper used Modified USPHS criteria that splits Alpha into Alpha 1 (Perfect) and Alpha 2 (slight deviation from perfect). The authors still define Bravo as few defects with no negative effects expected. We certainly have to start somewhere and 1-year clinical data is a good start. In the past, 3-, 5-, and 7-year data have at times shown clusters of failures with the passing of time. The results in this study are so close that it is likely that both cements will continue to perform similarly. I hope that they have funding to look at the patients again at 3 and 5 years to confirm the first-year results. (Reviewer-J.D. Overton, DDS).

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Keywords: Porcelain Inlay, Onlay, Adhesive Luting

Print Tag: Refer to original journal article

Patients Find Stark Tooth Shade/Skin Tone Discrepancies Unattractive

Assessing the Influence of Skin Color and Tooth Shade Value on Perceived Smile Attractiveness.

Sabherwal RS, Gonzalez J, Naini FB:

J Am Dent Assoc 2009; 140 (June): 696-705

Patients with very light or very dark skin should be counseled that high contrast in tooth shade is widely seen as unattractive.

Background: Tooth shade is one of the most critical criteria in the perception of a smile's attractiveness as evidenced by the widespread use of tooth whitening and other means to change the shade of teeth. This is not as simple as achieving the lightest shade possible; there is likely a balance between tooth shade and skin shade. Most of the literature regarding natural tooth color and skin tone does not demonstrate a correlation; however, as we manipulate tooth shade it is important to know if this relationship influences the attractiveness of the smile. Moreover it is important to know if dentists and laypeople generally have differing perceptions.

Objective: To investigate the perceptions of laypersons and dentists regarding the relationship between tooth shade and skin color as they pertain to the attractiveness of a smile. The study examined these perceptions as they relate to the gender and age of the evaluators.

Methods: A photograph of a woman's smile was selected for good tooth alignment, tooth-size symmetry, and relationship to the lips. The nose and chin were cropped out to reduce those influences. The image was digitally manipulated to create 4 skin tones (fair, fair/medium, medium/dark, and dark) and 6 levels of tooth brightness resulting in 24 images. These images were presented to the subjects for evaluation one at a time and in random order. Seventy dentists and 70 laypeople were asked to rate the smiles for attractiveness on a 10-step scale. The subjects were also asked to rate the tooth shade as "too bright," "too dark," or "natural."

Results: Generally, dentists rated images higher in attractiveness than laypeople, and as subjects were older, darker shades were rated higher than with younger subjects. Women gave generally higher ratings than men. Overall, 92% of respondents rated the brightest shade as "too bright" when framed by the dark skin. A similar percentage rated the darkest teeth in the fair skin frame as "too dark."

Conclusions: Variations in skin color influenced perception of tooth shade. Subjects generally rated attractiveness as related to their own dentition as evidenced by their changes in perception relative to the subject's age. Laypeople are more critical of tooth shade than dentists.

Reviewer's Comments: The results of this study are not particularly surprising: younger patients and women give more importance to lighter tooth shades. The observation that stark contrasts in tooth/skin shade are not attractive is an important one for us to keep in mind as we select shades and counsel our patients. As with all esthetic matters, the most important perception is that of the individual patient receiving the treatment and living with the results. Therefore, effective communication and understanding between the dentist and individual patient is critical for predictable and favorable outcomes. (Reviewer-Daniel E. Wilson, DDS).

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Keywords: Tooth Shade, Skin Color, Patient Perceptions, Esthetics

Print Tag: Refer to original journal article



Digital Shade Capture Devices Interpret Translucent Incisal Edges as Low Value

Incorporating Advanced Technologies for Precise Shade Capture.

Staff Writers:

Pract Proced Aesthet Dent 2009; 21 (January-February): 38-40

Shade taking devices will report translucent incisals as too low in value.

Discussion: This is a very short technique tips paper on taking a tooth shade with a hand-held shade capture device. Examples would be the Vita EasyShade (Vident) and the Shade-X by X-Rite. It stands to reason that the shade capture tip should be sitting flush and square on the tooth to get a good reading. The recommendation to allow the lip to drape over the top of the device to shut out external light was new to me. It turns out that these devices are not good at selecting a shade for teeth that have translucent incisal edges. You need to use your eyes to write the prescription for the incisal edges because the digital devices read translucent as areas of very low value.

Reviewer's Comments: I suppose I was just ready to read this paper, but I enjoyed it. In my practice, I think it better to use a sheet of cardboard to block the ambient light rather than drape the patient's lip over the top of the digital shade guide device. I think that if the device will give me an accurate reading to guide my lab for the gingival and middle thirds, I am in good shape. I certainly can describe the incisal third as (a) no translucency; (b) moderate translucency with or without a white halo; or (c) high translucency, distinct mammelons, with or without a white halo. The Vident EasyShade is priced at \$2295 at the Vident web site. The Shade X is advertised as under \$1000 retail. There are some unhappy customers with hand-held shade devices if you look at the blogs; however, that is common with blogs. One customer was high on a device that is hard wired to a computer for shade selection, which probably makes a lot more 1 and 0 power available for color recording. That customer reported that even the product representative could not make the hand-held device he was selling match a shade guide. (Reviewer-J.D. Overton, DDS).

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Keywords: Shade Taking Devices, Translucent Incisal Edges, Precise Shade Capture

Print Tag: Refer to original journal article

The Day of the Impression Tray and Material May Be Over

Digital Impressions for the Fabrication of Aesthetic Ceramic Restorations: A Case Report.

Glassman S:

Pract Proced Aesthet Dent 2009; 21 (January-February): 60-64

Digital impressions are proving to be time saving and accurate.

Discussion: Impressions for fixed prostheses involve many variables for both dentists and technicians. Impressions may present problems such as unclear margin reproduction, distortion, fluid contamination, and tray movement during the period in the mouth. Even when each step is correctly performed, additional chair time is often needed for final restoration adjustment. Time for restoration adjustment can be an expensive waste of time. Technicians may compound the inaccuracies by adjusting teeth adjacent to and opposing the prepared teeth. Full arch impressions are expensive. Estimated costs range from \$30 to \$40 for stock trays and \$15 to \$20 for custom trays (not including tray fabrication time). A new method of gaining an impression is now available. This article describes this method. CAD/CAM uses mechanical- and laser-based scanning technology in fabricating restorations. The digital technologies developed for scanning and milling restorative materials can perform the impression process. One system available is the iTero digital impression system (Cadent). It is based on a laser scanning protocol known as "parallel confocal" imaging which supports impression making. This eliminates the need for conventional impression materials. The laser scanner captures 3-dimensional images of prepared teeth and the opposing dentition and creates a digital bite registration. Combined, these can produce a digital 3-dimensional image. This affords the clinician a magnification of the image at chairside so any discrepancies in the preparation and/or moisture-control or isolation can be immediately corrected. Tissue management must be sufficient to allow complete visualization of the entire preparation including finish lines so that they can be accurately recorded. The system is similar to the CEREC 3D but does not require placement of imaging powder on the teeth to allow accurate imaging. The images create a computer file for the patient's record. The image file is sent to the system's manufacturer so a precise working/master model can be made. This model is then forwarded to the preferred dental laboratory for fabrication of the actual restoration. A case study is presented to illustrate the use of the system.

Conclusions: Digital impressions can provide an efficient and accurate means to create a well-fitting restoration. They are less time-consuming and allow immediate extra-oral evaluation and correction of any preparation problems while being less traumatic to the patient. Impression-making in the future will be performed with digital imaging.

Reviewer's Comments: Digital impression making has been available for several years, but it was limited by scanner size, need for powder on the target teeth, and dedication to one method of restoration fabrication. New systems offer greater ease of image making and model fabrication that can then be sent to the dentist's choice of labs for any restoration type. It is time to consider one of the several systems now available. (Reviewer-Thomas G. Berry, DDS, MA).

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Keywords: Digital Impression Making, Ceramic Restorations

Print Tag: Refer to original journal article

Does Drying Technique Affect Self-Etch Bonding?

Influence of Drying Time and Temperature on Bond Strength of Contemporary Adhesives to Dentine.

Garcia FC, Almeida JC, et al:

J Dent 2009; 37 (April): 315-320

The use of warm air-drying might increase the dentin bond strength of self-etch adhesive systems.

Objective: To evaluate the effect of different solvent evaporation conditions on the microtensile dentin bond strength (MTBS) of 4 self-etch adhesives.

Methods: The adhesives tested in this study were Clearfil SE Bond (Kuraray), Clearfil Protect Bond (Kuraray), Adper Prompt L-Pop (3M ESPE), and Xeno III (Dentsply DeTrey). The first 2 of those are self-etching primer systems; the other 2 are all-in-one self-etch adhesives. The adhesives were applied to flattened mid-coronal dentin of extracted human third molars. After adhesive application, the surface was gently air-dried for 5, 20, 30, or 40 seconds from a distance of 2 cm. The drying procedure was done at both 21°C and 38°C. Composite was added, and the specimens were sectioned for MTBS testing. This was done using a universal testing machine after 24 hours of water storage.

Results: Drying time and air temperature both had significant effects on bond strength. At the short (5 seconds) drying time, temperature made very little difference. However, with the longer drying times, bond strengths tended to increase with temperature. This was especially true for Clearfil SE Bond and Protect Bond.

Conclusions: The use of warm air-drying might increase the dentin bond strength of self-etch adhesive systems.

Reviewer's Comments: This is a study that I expected to have more clinical relevance than it actually does. I doubt that many clinicians will use extended drying times of up to 40 seconds, and dental warm air dryers, while available, are not particularly popular. Also, some of the results are not particularly consistent, which makes clinical extrapolation difficult. For example, at the 40-second drying time, the mean MTBS of Clearfil SE Bond increased dramatically (by almost 75%). In contrast, the bond strength of Clearfil Protect Bond, a similar material, increased much less (by only about 25%). Although it is not addressed directly in this study, the air-drying step is an important one for any self-etch adhesive system. All of these contain water as a necessary functional component. The clinician must be careful to evaporate the water before applying the composite resin restorative material. With room temperature air, 5 seconds was an adequate evaporation time in this study. However, this was done on flat dentin specimens in a laboratory. Longer times might be required in the mouth, where humidity and substrate geometry make removal of water more difficult. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Dentin Bonding, Self-Etch

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Time of Light Activation May Determine Degree of Conversion

Microhardness of a Resin Cement Polymerized by Light-Emitting Diode and Halogen Lights Through Ceramic.

Hooshmand T, Mahmoodi N, Keshvad A:

J Prosthodont 2009; March 26 (epub ahead of print):

The type and intensity of the light-curing unit as well as the time of application are factors that determine the degree of conversion of light-cured cements.

Objective: To evaluate the curing efficiency of different light curing units through ceramic.

Methods: A Teflon mold of 5 mm in diameter and 1 mm in height was filled with Variolink Ultra (Ivoclar Vivadent) with and without its self-curing catalyst and light-cured according to each group. The light-curing procedure was done through a Mylar strip (control) or through a 2-mm thick IPS Empress II ingot (Ivoclar Vivadent) using a Coltux 75 (QTH light, Coltene, Whaledent) at 800 mW/cm² for 40 seconds or a Radii (LED light, SDI) at 1100 mW/cm² for 20 seconds (5 seconds ramp, 15 seconds full cure) or 40 seconds (5 seconds ramp, 35 seconds full cure). Each group contained 5 specimens. Specimens were stored in a light-proof container in water at 37°C for 24 hours prior to testing. Vickers microhardness was determined on top and bottom surfaces of each specimen.

Results: Control (Mylar) groups had higher mean microhardness values than experimental (under ceramic) groups. There was no difference between top and bottom surface microhardness within the control and experimental light-cured specimens. Dual curing with QTH and LED for 40 seconds improved the microhardness of experimental specimens when compared to light curing only, both at top and bottom of specimens.

Conclusions: A curing time of 20 seconds with LED lights for photopolymerization of dual-cured resin cements under ceramic restorations is not recommended.

Reviewer's Comments: Dual-cured resin cements should always be light-cured if possible. That will improve esthetics by giving more color stability to the complex restoration/cement. The development of high-intensity light-curing units has allowed a better photoactivation of resin cements through thicker substrates, which was not possible in the recent past with the lower intensity lights. As shown in the present study, the time of light activation may also be a factor and should be increased when appropriate. (Reviewer-Ricardo Walter, DDS).

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Keywords: Laboratory Research, LED, Halogen Light, Ceramic, Indirect Restoration

Print Tag: Refer to original journal article



Elevating Temperature of Composite Resin Improves Flow Characteristics

Porcelain Laminate Veneer Insertion Using a Heated Composite Technique.

Helvey G:

Inside Dent 2009; 4 (April): Online

You might want to cement your porcelain laminate veneers with a filled resin composite that has been heated to increase flow.

Discussion: Dr Helvey presents a review of a technique that has been around for >15 years. The theory follows the line that if our cement is a material that is successful when used to restore a Class III cavity preparation, then it should be successful at making up for any marginal deficiency in an indirect porcelain laminate restoration. He shows photographs of a bench study with various filled resin composites and how much better they flow when heated to 150.3° F. Under the same load, the greatest to least flow was Clearfil Majesty Flow (Kuraray)>Venus (Heraeus Kulzer) = Point 4 (Kerr) = Prodigy (Kerr)>Tetric EvoCeram (Ivoclar Vivadent)>Gradia (GC America) >Filtek Supreme (3M ESPE). He presented the increase in flow of each of the materials by percentage increase, but this does not seem significant to the question at hand. The important feature has to be the ultimate flow of the material and not the increase in percent flow when heated. Most of the research does not show an adverse effect from heating filled resin composites. The CalSet (AdDent) composite ampule heater has been available for several years, but the photograph of the veneer heating tray was new to me. A novel presentation was that Dr Helvey placed the adhesive and filled resin composite into all of the veneers at the same time. The veneers with filled resin as a luting agent were heated in the tray and then taken out and placed on the teeth.

Reviewer's Comments: I first learned to cement veneers with filled resin composite from Dr Bill Robbins. He heated the ampules in a water bath to make it flow. I have no idea if Dr Robbins got the idea from someone else. It was a successful technique as will be Dr Helvey's technique with a veneer heating element. Here at UTHSCA, we do a sufficient number of veneers to justify purchase of a dedicated luting kit for porcelain laminates. Dr Barghi has done a great deal of research on finding bonding agents and cements that do not exhibit a color shift over time. He currently recommends a HEMA free system because HEMA indeed does have a color shift to yellow as it ages. I have two concerns with the techniques proposed in this manuscript. The reason for placing 2 coats of silane eludes me. One thin coat of freshly mixed two part silane is the best. The second concern is in the photograph of his etched veneer in Figure 11. There is a white chalky crust on the intaglio surface of the veneer which is a sign of over-etching. The author reports he places the veneer in an ultrasonic to remove these salts. It would be superior to etch the porcelain correctly and not create this opaque layer in the first place. (Reviewer-J.D. Overton, DDS).

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Keywords: Veneer, Porcelain Laminate, Filled Resin Composite

Print Tag: Refer to original journal article

Ibuprofen May Be Just What the Doctor Ordered to Prevent Tooth Sensitivity

The Effect of Preoperative Ibuprofen on Tooth Sensitivity Caused by in-Office Bleaching.

Charakorn P, Cabanilla LL, et al:

Oper Dent 2009; 34 (March-April): 131-135

The use of an analgesic might help to reduce tooth sensitivity during in-office bleaching treatment.

Objective: To determine the effects of preoperative ibuprofen on tooth sensitivity associated with in-office bleaching using 38% hydrogen peroxide.

Design/Methods: This was a randomized double-blind clinical trial designed to measure tooth sensitivity using a modified visual analog scale (VAS). Thirty-three patients were enrolled in the study and randomly divided into 2 groups. Thirty minutes prior to bleaching, patients received either a single 600-mg dose of ibuprofen or a placebo capsule that was similar in appearance. The in-office bleaching procedure was done using 38% hydrogen peroxide gel (Opalescence Xtra Boost [Ultradent]). The gel was applied to both maxillary and mandibular anterior teeth for 20 minutes. It was rinsed off and the application was repeated for another 20 minutes, for a total contact time of 40 minutes. Patients reported tooth sensitivity along a 0 to 100 VAS scale (ranging from "no sensitivity" to "unbearable sensitivity") at 30 minutes before treatment, immediately after treatment, and at 1 and 24 hours after treatment. The post-treatment VAS scores were modified by subtracting the pre-treatment value.

Results: The mean VAS score for the placebo group immediately after treatment was 26.6; the mean for the ibuprofen group at that time was 5.0. The difference was statistically significant. At 1 hour and 24 hours after bleaching, differences between the 2 groups were not statistically significant. In the ibuprofen group, the 1-hour and 24-hour VAS scores were significantly higher than the value immediately after treatment. When interviewed at the 24-hour recall, patients reported that most sensitivity occurred within 1 to 6 hours after treatment.

Conclusions: The use of an analgesic might help to reduce tooth sensitivity during in-office bleaching treatment.

Reviewer's Comments: The results of this study suggest that taking ibuprofen before an in-office bleaching treatment might reduce tooth sensitivity during treatment. However, the effect of a single dose of ibuprofen did not persist, and patients in the treatment group were as likely as those in the placebo group to experience sensitivity later. It would be interesting to determine whether different ibuprofen dosage regimens provide a longer effect. For example, a second dose of ibuprofen could be administered after the bleaching treatment. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Bleaching, Tooth Sensitivity, Preop Ibuprofen

Print Tag: Refer to original journal article

Do Fiber Posts Prevent Root Fractures?

Photoelastic Stress Analysis of Different Post and Core Restoration Methods.

Yamamoto M, Miura H, et al:

Dent Mater J 2009; 28 (March): 204-211

Fiber posts are able to better distribute occlusal stresses throughout the root surface.

Objective: To evaluate the stress distribution of composite resin post and core, composite resin core with glass fiber post, and cast metal post and core in the restoration of endodontically treated teeth.

Methods: 2-dimensional photoelastic models were prepared. The length of the posts was two thirds the length of the root with a diameter of one third of the diameter of the root. The modulus of elasticity of each component was estimated at 3.0 GPa for root dentin, 2.7 GPa for composite resin, 7.0 GPa for glass fiber post, and 20.0 GPa for gold-silver-palladium alloy. The created models did not simulate the periodontal ligament. The models were loaded at a static load of 400 N at 45° on the palatal surface. Stress concentration was measured at 4 predetermined points.

Results: Stress concentrations were higher at the buccal margin. Composite resin core with glass fiber post presented the best stress distribution along the root structure.

Conclusions: Composite resin core with glass fiber post is effective in preventing stress concentration in endodontically treated teeth.

Reviewer's Comments: Several in vitro and some clinical studies have suggested a lower frequency of root fractures with glass fiber posts when compared to other materials in the restoration of endodontically treated teeth. Along with the lower number of complicated failures; however, come a high number of non-complicated failures, ie, restoration debonding. The combination of compromised bonding to root canals and similar properties of glass fiber and dentin result in more debonding failures than fractures. Important to emphasize are the limitations of this study. Neither the periodontal ligament nor the cement material was mimicked. Those might have had influenced the results. (Reviewer-Ricardo Walter, DDS).

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Keywords: Laboratory Research, Post and Core, Fiber Post, Fracture, Stress Concentration

Print Tag: Refer to original journal article

CHX Improves Stability of Hybrid Layer Formed by Etch-and-Rinse Adhesives

Effect of 2% Chlorhexidine Digluconate on the Bond Strength to Normal versus Caries-Affected Dentin.

Komori PC, Pashley DH, et al:

Oper Dent 2009; 34 (March-April): 157-165

Chlorhexidine might stabilize the bond of etch-and-rinse adhesives to normal dentin.

Objective: To study the effect of a 2% chlorhexidine digluconate primer (CHX) on the durability of resin-dentin bonds in normal and caries-affected dentin, using both 3-step and 2-step etch-and-rinse adhesives.

Methods: 40 extracted carious human molars were used in the study. They were sectioned perpendicular to the long axis of the tooth to expose a flat dentin surface containing a carious lesion surrounded by normal sound dentin. A red caries detector solution was applied and the stained caries was removed manually. Caries-affected dentin was defined as dentin that was colorless to light pink, firm, and opaque. The entire dentin surface was ground flat using 600-grit silicon carbide abrasive paper. The dentin was etched for 15 seconds using 35% phosphoric acid gel. After rinsing and blot-drying, the surfaces were bonded using either Scotchbond Multi-Purpose (3-step system) or Single Bond (2-step system). In the experimental groups, etching was followed by 30-second application of 2% CHX (1-minute dwell time) before the adhesive was applied. Composite was built up on the bonded surfaces and the specimens were sectioned into beams for microtensile bond strength testing. Half of the beams were tested immediately, and the other half were stored in artificial saliva for 6 months before testing

Results: Application of CHX had no effect on immediate bond strengths, regardless of adhesive type or dentin condition. Generally, storage in artificial saliva significantly reduced the bond strengths of Single Bond. Bond strengths for Scotchbond Multi-Purpose were more stable, with the only decline occurring in normal dentin without CHX. Immediate bond strengths were significantly higher for normal than for caries-affected dentin, but this difference was not present at 6 months.

Conclusions: Chlorhexidine might stabilize the bond of etch-and-rinse adhesives to normal dentin.

Reviewer's Comments: CHX has been used as a disinfectant in bonding procedures, but also acts as an MMP inhibitor. MMPs are matrix metalloproteinases that are present in the organic matrix of dentin and are thought to degrade unprotected collagen fibers within incompletely infiltrated etched dentin. Some studies have reported that MMP inhibition by CHX can improve the stability of the hybrid layer formed by etch-and-rinse adhesives, and the present study tends to confirm that. (Reviewer-Edward J. Swift, Jr, DMD, MS).

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Keywords: Dentin Bonding, Bond Strength, Chlorhexidine

Print Tag: Refer to original journal article

FRC FPDs Not Ready for Prime Time

Five-Year Survival of 3-Unit Fiber-Reinforced Composite Fixed Partial Dentures in the Anterior Area.

van Heumen C, van Dijken JW, et al:

Dent Mater 2009; 25 (June): 820-827

Fiber-reinforced composite bridges should be reserved for those patients with a clear indication and a willingness to accept significant risk.

Background: The conservative, esthetic replacement of missing anterior teeth continues to be a difficult endeavor. When implant restoration is not possible or practical, the fixed partial denture is commonly utilized. The desire for good esthetics leads us to non-metallic restorations, either ceramic or resin-based, which have historically had disappointing clinical longevity. Fiber-reinforced resin composite bridges have been proposed, both with full crown retainers as well as partial coverage surface bonded retainers.

Objective: To evaluate the clinical longevity of anterior fiber-reinforced resin 3-unit fixed partial dentures.

Methods: 3 academic centers in Sweden, Finland, and the Netherlands placed 60 anterior fiber-reinforced composite fixed partial dentures (FRC FPDs) of various designs and tracked them for a minimum of 5 years. Fifty-two patients were treated with 60 anterior bridges fabricated indirectly from fiber (Stick Resin [StickTech])-reinforced Artglass (Hereaus Kulzer) or Sinfony (3M ESPE). Fifty-seven FPDs were in the maxilla with 3 in the mandible. The bridges were adhesively cemented with Twinlook (Hereaus Kulzer), Panavia (Kuraray), or Compolute (3M ESPE). Patients were evaluated several times over 5 to 9 years. Repairs and dislodgements as well as failures were tracked. An FPD was deemed a failure if the dislodgement, fracture, or delamination could not be repaired in situ.

Results: 22% of prostheses were lost to follow-up. Nineteen bridges failed but were regarded as repairable. Delamination was the most frequently occurring reason for repairable failure. Fracture and combinations of reasons were the most common cause of total failure. Fractures occurred mainly in the connector areas and debonding most commonly affected the surface (Maryland type) retainers. Wear, although observed, was never cited as a reason for failure or repair.

Conclusions: The overall survival rate of the 3-unit anterior resin-bonded FRC bridges was 64% after 5 years, with a significant number of those requiring repair along the way. Fracture, delamination of the veneering resin, and dislodgement were the common reasons for failure. Although wear was not listed as a reason for failure, the authors did note that wear could expose the fibers and contribute to delamination. The success rate was 45% over 5 years, so there is evidence that repair increases the survival rate.

Reviewer's Comments: This study, as well as others, demonstrates that these fiber-reinforced prostheses are not ready for prime time. When compared to metal-based resin bonded bridges that exhibit a survival rate of up to 87%, the only advantages are esthetics and the possibility of repair. At the current time, these prostheses must be reserved for those who have both a clear indication such as metal allergies, a clear esthetic desire, and a willingness to accept the risk of somewhat frequent repair and a likelihood of failure requiring replacement. (Reviewer-Daniel E. Wilson, DDS).

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Keywords: Fiber-Reinforced Composite Resin, Clinical Longevity, Fixed Partial Denture

Print Tag: Refer to original journal article

Indirect Pulp Capping Can Reduce Bacteria in Infected Dentin

Clinical and Microbiological Performance of Resin-Modified Glass-Ionomer Liners After Incomplete Dentine Caries Removal.

Duque C, Negrini TC, et al:

Clin Oral Investig 2009; June 23 (epub ahead of print):

Calcium hydroxide and glass ionomer materials have the potential to neutralize bacteria that may be left in cavity preparations.

Objective: To evaluate the effectiveness of resin-modified glass ionomers (RMGIs) as liners after incomplete caries removal.

Participants/Methods: 20 children aged 4 to 8 years were included in the study. Thirty primary molars with radiographically diagnosed dentinal caries and free of other pathologies were restored. Clinical procedures were performed with rubber dam isolation. The caries lesions were explored, the vertical walls were cleaned (clean DEJ), and infected dentin was left on the pulpal floor of the preparations. Pulpal walls were covered with Vitrebond (3M ESPE) or Fuji Lining LC (GC) or Dycal (Dentsply) prior to temporarily restoring the teeth with IRM (Dentsply). After 3 months, the base/liner was completely removed and the teeth permanently restored with amalgam after replacing the base/liner. Carious dentin was collected at the initial and 3-month appointments. Differences in consistency, color, and humidity of dentin before and after indirect pulp capping were studied. Bacterial counts were determined at the 2 time points and compared.

Results: None of the teeth were symptomatic or showed signs of pulpal or periapical pathology throughout the study period. Dentin was considered harder and drier for Dycal- and Vitrebond-treated teeth. No differences were noticed for the dentin covered with Fuji Lining LC. Fourteen teeth had no growth of *S mutans* or *L acidophilus*. Eight of 9, 3 of 10, and 7 of 8 teeth treated with Vitrebond, Fuji Lining LC, and Dycal, respectively, had no growth of *S mutans* during the study period. Six, 8, and 6 teeth treated with Vitrebond, Fuji Lining LC, and Dycal, respectively, had no growth of *L acidophilus*.

Conclusions: Indirect pulp capping with RMGI and calcium hydroxide materials can successfully reduce *S mutans* and *L acidophilus* counts.

Reviewer's Comments: While calcium hydroxide is known by inducing the formation of tertiary dentin, glass ionomer materials are known by their antibacterial and remineralization effects (fluoride). As shown in the present study, they are both capable of reducing bacterial counts when used as liners/bases. For that treatment to be successful, an optimal sealing of the cavity preparation is required. Important to point out is that the present study was done in primary teeth, which have a better chance of recovering from injury. Different results may be seen in permanent teeth and/or older adults. (Reviewer-Ricardo Walter, DDS).

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Keywords: *S mutans*, *L acidophilus*, Indirect Pulp Capping, Infected Dentin

Print Tag: Refer to original journal article