

NEW PRODUCT review



by
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Dr. Newton Fahl, Jr. graduated from Londrina State University, Brazil, in 1987, and received his M.S. degree and Certificate in Operative Dentistry from the University of Iowa College of Dentistry in 1989. He is a member of the AACD and is a founding member and president of the Brazilian Society for Esthetic Dentistry. Dr. Fahl has lectured internationally on cosmetic and restorative dentistry. He is on the editorial board of REALITY and PP&A and has consulted with several manufacturers in product development and refinement. Dr. Fahl maintains a private practice in Curitiba, Brazil.

Even though two-component and multi-component adhesive systems are still largely utilized because of a positive track record, single-component, also known as one-bottle, systems have legitimately earned their own place among the dental professionals. Simplicity, effectiveness and rapid application are a few of the many advantages and benefits offered by single-component systems. Reducing the number of bottles to just one has eradicated the problems associated with memorizing modes of application for each individual component, thus minimizing the chances of making mistakes which might compromise an adequate bond.

Single-component systems are surely simpler in nature and tend to allow for a more rapid application of the adhesive than two-component and, most certainly, multi-component systems because of a decrease in the number of clinical steps. This feature is allegedly responsible for saving precious chairside time. This may not be necessarily true in all clinical instances since proper adhesion is accomplished through thorough permeation



Figure 2

and saturation of the demineralized dentin, and it may take several coats of a single component adhesive to achieve that result. The clinical “go” which indicates that the dentin is completely sealed intra- and inter-tubularly is a uniform shiny surface. Until a shiny surface is achieved, it is recommended to keep applying as many coats of adhesive as necessary, regardless of the time it takes. The bottom line is — quicker sometimes may not mean more effective.

The effectiveness of an adhesive is measured by the ability it has of achieving high bond strengths to dentin (any adhesive will provide adequate bond to enamel) while eliminating/minimizing microleakage and post-operative sensitivity. Since the introduction of the first single-component adhesive system, many studies have reported promising data on both in vivo and in vitro evaluations with one-bottle systems. One such system has been recently introduced by Heraeus/Kulzer. (Figure 1)

Gluma One Bond is made up of four components: HEMA, UDMA, 4-META, and acetone. HEMA and UDMA are hydrophilic components that ensure proper wetting of the exposed network of collagen fibers and saturation of the demineralized dentin. They collaborate in dragging monomers deep through the partially mineralized zone down to the mineralized front of the collagen network (HEMA) and in ensuring excellent, non-interrupted film formation all the way to the dentin surface (UDMA). 4-META is a well known and proven chemical substance also with good penetrating power that will bond not only to composites but to amalgam and non-precious alloys as well. Acetone is a highly hydrophilic solvent that carries the monomers into the demineralized dentin replacing the residual water present in the interstitial spaces.

Clinically, acetone-based adhesives are more sensitive to the level of dentin moistness compared to ethanol-based adhesive systems. At least one in-vitro investigation has reported adequate bond strengths of Gluma One Bond to dentin (25.4 ± 3.2 MPa) and enamel (35.1 ± 4.3 MPa).

Gluma One Bond is packaged in a glass bottle under the manufacturer claims that that is crucial for preventing the acetone solvent from volatilizing. We have found that the

use of a glass bottle becomes somewhat cumbersome from a clinical standpoint due to the fact it cannot be squeezed to get a drop-by-drop dispensing. In our clinical experience, either no drop would come out or too many drops would be dispensed at a time. However, the manufacturer has reported intentions of modifying the packaging into a more user friendly one in the near future.

This author has been using Gluma One Bond very successfully for a few

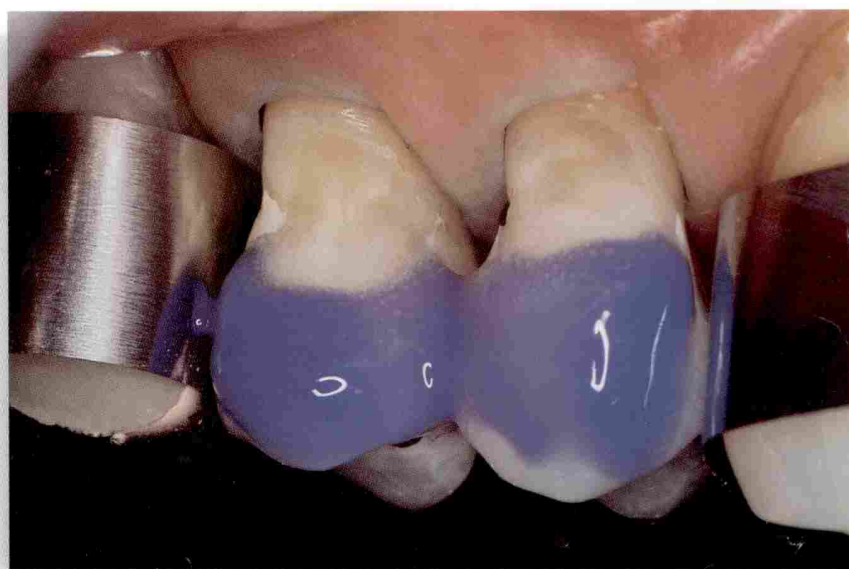


Figure 3

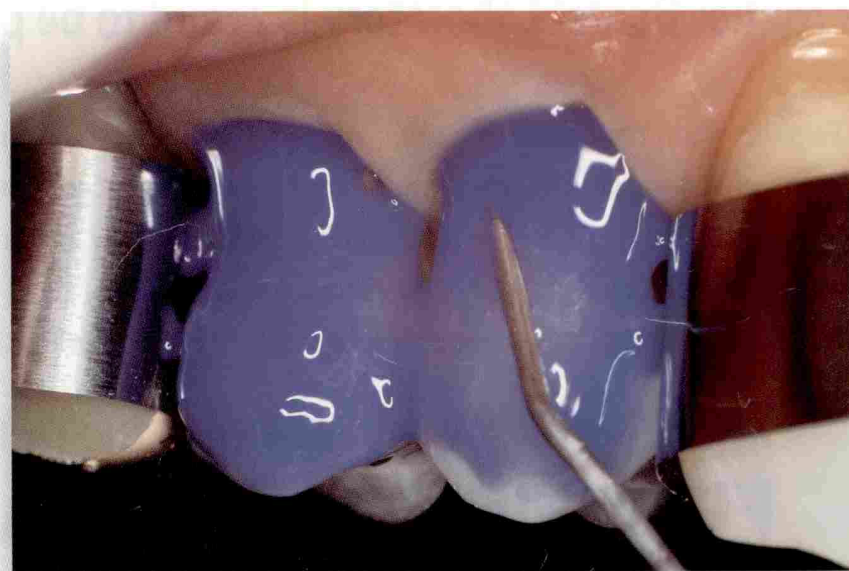


Figure 4

months in both direct and indirect procedures as well as desensitization very successfully, with virtually no post-operative sensitivity and excellent marginal finishing (i.e., in direct procedures). We have particularly used Gluma One Bond for restoring many abfraction lesions, all of which with no cavity preparation except for minor enamel beveling. Following is a description of this technique.

- Check for any interference on the working and balancing sides and adjust any contacts that might be causing trauma. Round off any sharp angles and place a bevel on enamel, if necessary. Most abfraction lesions require no preparation whatsoever. Remove the glazed dentin surface by micro-etching or using a carbide #4 round bur under low speed to ensure proper acid-etching and wetting of the dentin. (Figure 2)
- Pack a dry cord into the labial and part of the proximal sulcus to promote gingival retraction. Remove organic matter/plaque by scrubbing a 3% hydrogen peroxide solution along the gingival margins. Rinse and dry. Apply and scrub a bactericidal solution such as 2% chlorhexidine or 1% benzalkonium chloride for 30 minutes and dry.
- Protect the adjacent teeth with a sectional metal matrix band. Apply a 35-38% gel etchant first on enamel encompassing the entire buccal aspect and then on dentin (15 seconds). (Figures 3 and 4) Rinse the etchant thoroughly and remove excess moisture from the preparation with a gentle stream of air for 1-2 seconds. Do not dehydrate the dentin. The best bonding effect is obtained when Gluma One Bond is applied to moist and shiny dentin.



Figure 5



Figure 6

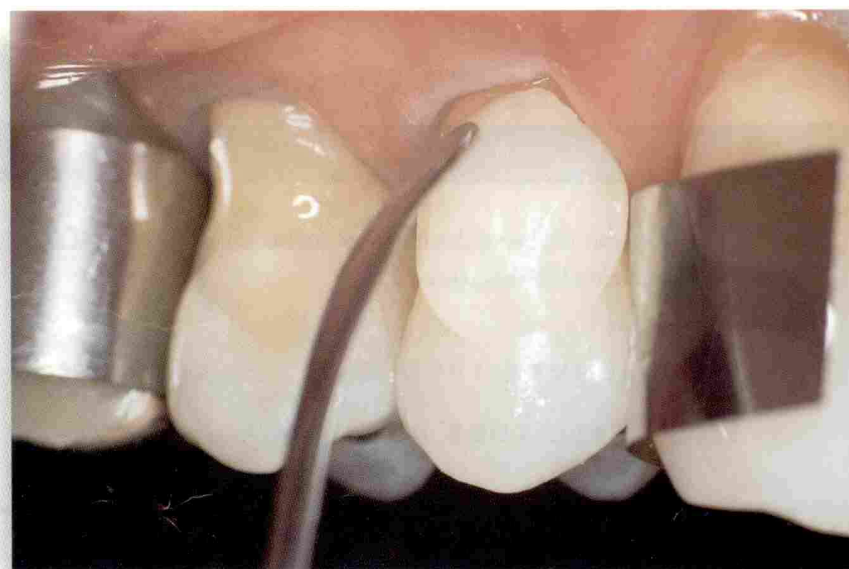


Figure 7

- Dispense Gluma One Bond into a well only at this time to prevent unwanted evaporation of the acetone solvent and thickening of the resin monomers. Apply the adhesive abundantly with a disposable brush or an applicator tip using as many coats as necessary to ensure thorough wetting and saturation of the dentin. (Figure 5) Delicately spread the adhesive with a gentle stream of air for

approximately five seconds to evaporate the water and solvent. If the cavity surface is not uniformly shiny after this step, reapply additional coats until it becomes shiny. (Figure 6)

- Light cure Gluma One Bond for 20 seconds with a halogen curing light. Spread a thin film of a flowable composite over the entire cavity to ensure complete wetting and minimize gap forma-

tion, then light cure it. Depending on the operator's preferences, the entire cavity can be restored with a flowable composite resin by application of sequential layers. A more viscous, opacious, restorative microfill composite is applied in one or more increments according to the selected shades and sculpted to the desired morphology with contouring instruments and artist brushes. (Figure 7) An oxygen-inhibiting medium such as glycerin or oxalate gel, or any of the available commercial brands, is applied over the restoration and light cured. This gets rid of the mushy composite surface optimizing surface and marginal finishing and polishing.

- Finish the restoration with fine diamonds and 12-flute carbide burs, and remove intrasulcular excess flashes with a #12 scalpel blade. Polish with silicone points and cups and highlight the gloss with an aluminum oxide paste and felt wheels. (Figure 8) *AG*



Figure 8

J U S T A r e m i n d e r

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SUMMER 1999 ISSUE due April 9, 1999

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