

TROY A. SCHMEDDING, DDS

Dr. Schmedding has been a practicing cosmetic and restorative dentist for the past 20 years. He is a 1993 honors graduate of the University of the Pacific, Arthur A. Dugoni School of Dentistry. He currently maintains a private practice in Walnut Creek, CA. Dr. Schmedding is one of approximately 450 dentists internationally to achieve accreditation status in the American Academy of Cosmetic Dentistry. He works with numerous manufacturers on implementation and testing of various restorative products being brought to market. He speaks and teaches nationally on both esthetic and restorative dentistry.



CASE PRESENTATION

Use of a Dual-Cured Bulk Fill Restorative Composite

For a long period of time, posterior direct composite restorations have enabled clinicians to provide patients with minimally invasive and esthetic restorations as an alternative to amalgam fillings. Since the introduction of direct composites, however, clinicians have faced a variety of challenges with their placement, handling, wear, longevity, and esthetics. Direct posterior composite placement has typically required strict attention to one's individual operative techniques to ensure complete polymerization and great marginal seal as well as no postoperative sensitivity. Because of their polymerization properties and limited depth of cure, light-curing composites are generally used in a layering technique with individual increments of no more than 2.0 mm of thickness. Each individual increment is polymerized separately, with exposure times from 10 to 40 seconds, depending on the power of the curing light and color/translucency of the composite material. With the materials available up until recently, thicker composite layers resulted in insufficient polymerization of the composite resin and thus offered inferior mechanical and biological properties.

Today's practitioner must effectively perform all required operative steps to successfully complete direct-composite resin restorations. If the steps (such as isolation, adhesion, composite placement, and curing) are performed correctly, the risk of premature composite resin failure is a moot point. In addition, these steps must be completed with relative promptness to contend with issues such as practice overhead and low insurance reimbursement. Efficiency in everyday dental practice should therefore be considered as not only the ability of the

operator to work quickly, but also competently. Given today's overhead per hour, dentists need material and technology advancements that allow posterior composites to be placed faster, easier, and more profitably without taking compromising shortcuts.

Understanding the needs of practitioners, a number of composite manufacturers have focused on material development to simplify composite-based restoration techniques in the posterior region. In these new fast-track systems, low-shrinkage, mechanically stable composite materials that can be applied directly into the cavities in larger increments have been developed. One of the products within this arena that I find myself using on a daily basis is Bulk EZ (Danville Materials, Zest Dental Solutions). It is versatile because it can be used not only as a flowable liner, but also as true direct restorative. When allowed to self-cure (no light introduced), dual-cure composites feature excellent physical properties for posterior restorations while offering an unlimited depth of cure.

Treatment

A 28-year-old female presented for a routine periodical oral exam and x-rays. It was determined radiographically as well as visually that interproximal decay was present on her upper left second premolar, both mesial and distal (Figures 1 and 2). Having been informed of the possible treatment alternatives and their costs, the patient elected to have a direct restorative composite restoration.

Before administering a local anesthetic, articulating paper (Bausch) was used to obtain an accurate imprint of the patient's maximum intercuspation position. The area was then anesthetized with 1

carpule of 4% Articaident DENTAL with epinephrine 1:100,000 (Dentsply Sirona) (Figure 3).

Isolation would have been preferable under a rubber dam setting, but because of patient intolerance, we used a Mr. Thirsty One-Step (Zirc) to achieve our optimal working environment. The tooth was then prepared for the restoration with an electric high-speed (Optima, Bien Air) and a 330 carbide bur (Brasseler USA), together with an Optima low-speed handpiece (Bien Air) and a series of round burs (Brasseler USA), making sure that residual decay was removed (Figure 4).

The Mega V sectional matrix system (Danville Materials, Zest Dental Solutions) was chosen to restore the interproximal surfaces, as the adaptation and correct anatomical positioning is superior to a tofflemire retainer system in this particular situation (Figure 5).

The use of a universal adhesive was decided upon for our bonding procedure (Danville Materials' Prelude One, Zest Dental Solutions). Together with the bonding agent, we decided to incorporate a selective etching technique. Because of the inherent lower pH of the universal adhesive, it is advisable in my opinion to incorporate a phosphoric acid to the enamel cavo surface margin to enhance the enamel bond. A 35% phosphoric acid (Ultra Etch, Ultradent Products) was placed on the enamel margins of the tooth for a period of 15 seconds. The acid was then rinsed off with compressed air and water for approximately 10 seconds. Excess water was carefully removed from the cavity preparations with compressed air only, as to not desiccate the dentinal surfaces. A generous amount of adhesive (Prelude One)

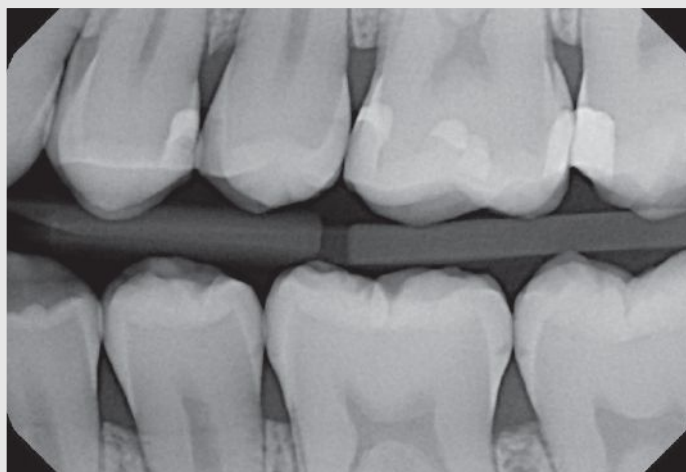
was applied to the preparation in a scrubbing motion for 10 seconds. The solvent was then carefully air-dried with oil-free, compressed air for 10 seconds, followed by a 20-second cure (VALO, Ultradent Products) (Figures 6 and 7).

Bulk EZ was introduced into the preparation starting from the deepest portion of each box form and working my way out toward the occlusal. The key here is to keep the applicator tip embedded in the material at all times to help eliminate voids. When the cavo surface was reached and I was happy with my placement, the timer was set for 90 seconds. There should be no light at all during this time; rather, this is the time to begin to form your general tooth shape. I prefer to slightly overfill and perform a subtractive technique with diamond finishing burs and points (Figure 8).

After 90 seconds, a curing light was used, going from the buccal, lingual, and occlusal direction for 10 seconds each to help ensure complete polymerization (Figure 9).

Conclusion

The restoration was finished and polished using fine diamonds (Brasseler USA) and Enhance polishing cups and points (Dentsply Sirona Restorative). The dual-cure composite was used in a full restorative fashion. The design principle of this very versatile composite allows one to use it either as shown or as a traditional composite to cap over the top. Radiographically, one can see the radiopacity of this material to be well above the acceptable level of variance in relationship to tooth structure (Figures 10 and 11).



Figures 1 and 2—Interproximal decay was present on upper left second premolar, both mesial and distal.



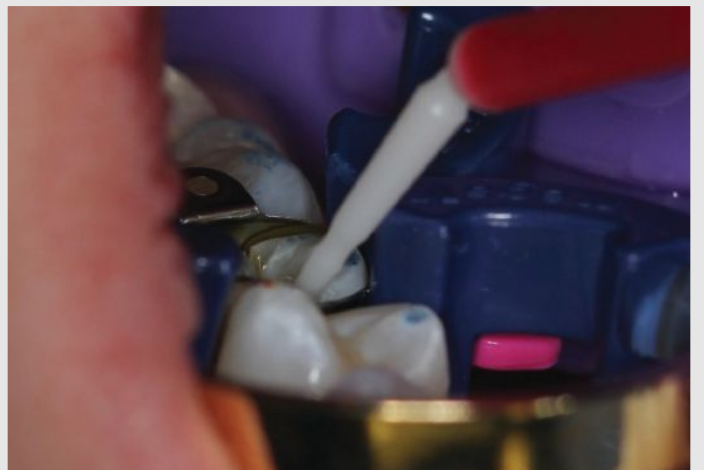
Figure 3—Articulating paper (Bausch) was used to obtain an accurate imprint of the maximum intercuspation position.



Figure 4—The tooth was then prepared for the restoration, making sure that residual decay was removed.



Figure 5—The Mega V sectional matrix system (Danville Materials, Zest Dental Solutions) was chosen to restore the interproximal surfaces.



Figures 6 and 7—A 35% phosphoric acid (Ultra Etch, Ultradent Products) was placed on the enamel margins of the tooth. Prelude One adhesive (Danville Materials, Zest Dental Solutions) was applied to the preparation in a scrubbing motion.

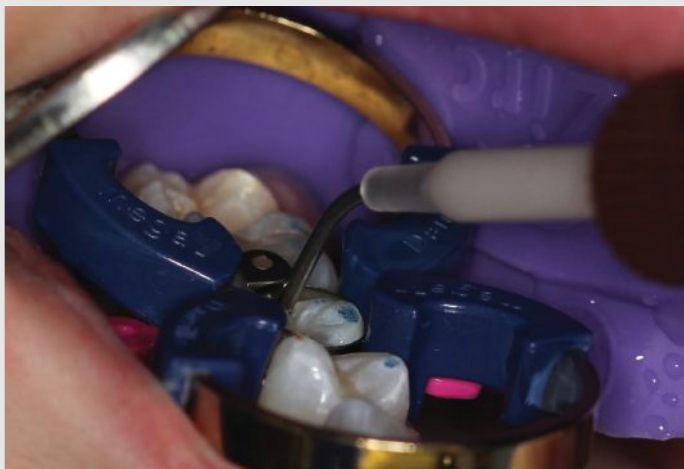


Figure 8—Bulk EZ (Danville Materials, Zest Dental Solutions) was introduced into the preparation, starting from the deepest portion of each box form and working its way out toward the occlusal.

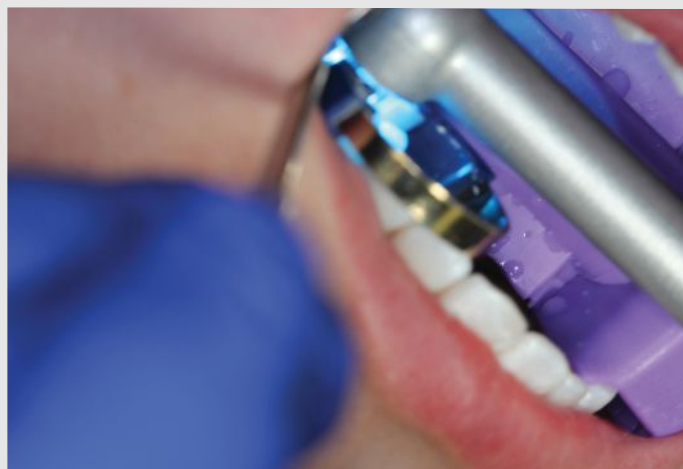
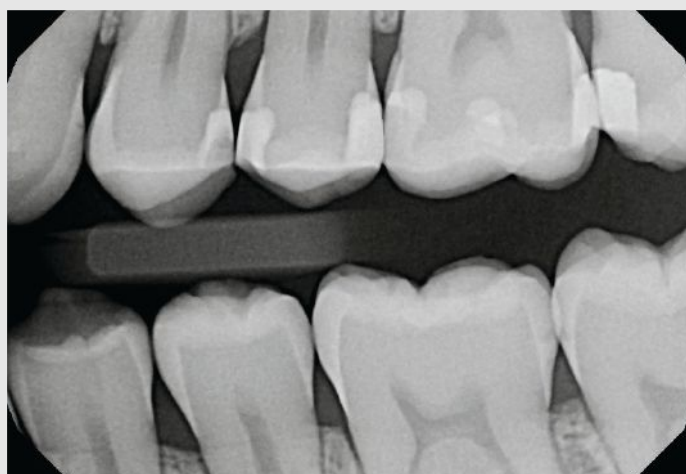


Figure 9—After 90 seconds of self-cure time, a curing light (VALO, Ultradent Products) was used, going from the buccal, lingual, and occlusal direction for 10 seconds each to help ensure complete polymerization.



Figures 10 and 11—The restoration was finished and polished using fine diamonds (Brasseler USA) and Enhance polishing cups and points (Dentsply Sirona Restorative).



GO-TO PRODUCTS USED IN THIS CASE

BULK EZ

Bulk EZ is an easy-to-place, dual-cure composite that combines flowable cavity adaptation with high strength and wear resistance—all in one simple step. Its self-cure, patent-pending IntelliTek Technology is designed to specifically control and direct shrinkage while eliminating leakage in all posterior restorations.



Dental PRODUCT SHOPPER
RECOMMENDED PRODUCT



ZEST DENTAL SOLUTIONS
800.921.4806 ext. 127
www.dps.li/a/5R9-196
Reader Service 196

PRELUDE ONE

Danville Materials' Prelude One is a light-curable, single-component, self-etch adhesive designed to bond composite resins to most dental surfaces. These surfaces include dentin, enamel, zirconia, alumina, metals, porcelain, lithium disilicate, and composite restorations.



ZEST DENTAL SOLUTIONS
800.921.4806 ext. 127
www.dps.li/a/5R9-197
Reader Service 197

MR. THIRSTY ONE-STEP

Zirc's Mr. Thirsty One-Step is an inexpensive and efficient hands-free device that retracts, isolates, and evacuates. The easy-to-use, hands-free isolation device allows for continuous work. One-piece and disposable, Mr. Thirsty One-Step easily connects to an HVE line and is portable to any operator.



Dental PRODUCT SHOPPER
RECOMMENDED PRODUCT



ZIRC COMPANY
800.921.4806 ext. 179
www.dps.li/a/5R9-198
Reader Service 198