Placing a Bulk Fill Composite to Achieve Predictable and Esthetic Posterior Restorations

Michael R. Sesemann, DDS, FAACD

INTRODUCTION

Direct posterior restorations play a significant role in daily dental practice. Predictable and successful outcomes from resin composite restorations remain a major concern for many practitioners primarily due to the technique sensitive steps required for proper placement.

Over time it was established that alternately placing and curing resin composite in increments has been required to achieve successful resin composite posterior restorations.[1-3] Multiple increments are difficult to place and increase the arduousness of the task and the time it takes to complete it.[1] If not performed properly, placing multiple layers can result in polymerization shrinkage and marginal leakage.[4] Such challenges have led to numerous studies, some of which suggest reducing the number of composite layers or utilizing a bulk fill material. However, many clinicians shy away from such procedures fearing equally negative sequelae.[1]

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Having performed posterior composites since the 1980s, with many still in service, this author has mastered the meticulous protocol of fourth-generation bonding and incremental layering to achieve highly esthetic restorations. Yet, with all of the careful steps, there is often the appearance of a white line due to the contraction stresses, and occasionally a crack at the base of a bicuspid cusp after curing a mesial/occlusal/distal (MOD) direct restoration. When a restorative material shrinks, strain is created at the composite-to-tooth interface, causing the separation of the composite from the tooth surface, leading to post-operative sensitivity and secondary caries.[1,4,5]

Before transitioning to layering techniques to combat leakage and sensitivity, dentists resorted to lining the base of preparations with a thin layer of resin-based glass ionomer before placing the

FIGURE 1—View of the armamentarium used for this case on the assistant's cart.

FIGURE 2—Preoperative view of the patient's teeth nos. 29 through 31 showing defective amalgam restorations in need of replacement.

FIGURE 3—The preparation margins were finely finished using a Brasseler #368-016 diamond.

FIGURE 4—A 5th generation adhesive bonding agent (ExciTE F) was applied to the preparations using a Vivapen.

FIGURE 5—The adhesive was air dried for two to three seconds using an Adec Warm Air Dryer.

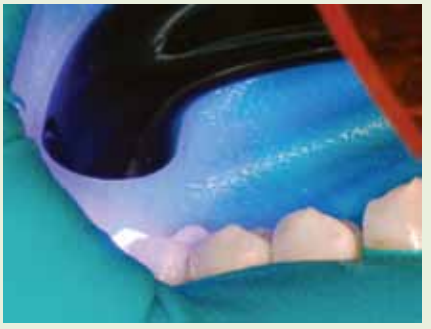

FIGURE 6—The bonding agent was light cured.

FIGURES 7 & 8—Tetric EvoCeram Bulk Fill composite was placed into the cavity preparations in increments up to 4 mm.

FIGURE 9—An OptraSculpt composite placement instrument was used to easily sculpt the bulk composite.

bonding agent.[2] To further reduce shrinkage, flowable resin was placed over the bonding agent.[2,6] After two decades of fourth-generation bonding and incremental layering resulting in contraction stresses that caused tooth stress and white lines at the margins,[2] dentists began looking for a more desirable technique to ease the tediousness and difficult protocol of the procedure. When new techniques were suggested to reduce procedure steps, it was often at the expense of quality and longevity of the restorations. However, new advancements in resin and photo-polymerization technology allow us to be productive without compromising quality.

Faster and easier to perform, bulk filled restorations require less chair time and are more predictable.[7,8] To out-perform conventional resin composite and eliminate many of its disadvan-

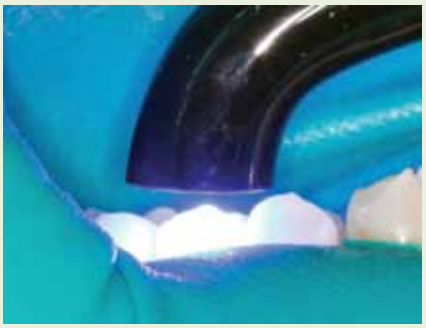

FIGURE 10—Each restoration was cured for 10 seconds using the Bluephase G2 curing light.

FIGURES 11 & 12—The Tetric EvoCeram Bulk Fill restorations were finished using #368-016 Brasseler diamonds.

FIGURES 13 & 14—Final finishing and polishing was completed using a series of Optrapol finishing and polishing points.

FIGURE 15—Postoperative view of the Tetric EvoCeram Bulk Fill restorations following removal of rubber dam.

tages, bulk fill composites possess specific characteristics, including enhanced flowability to achieve consistent adaptation to the cavity preparation. Elasticity and low polymerization shrinkage stress reduce microleakage, postoperative sensitivity and secondary caries.[8-10] Improved depth of cure of at least 4 mm eliminates the need for layering.

TETRIC EVOCERAM BULK FILL COMPOSITE

Conventional composite resins can be cured in up to 2 mm increments. However, designed with the patented "Polymerization Booster," Tetric EvoCeram® Bulk Fill composite has an intensified polymerization initiator system and is capable of a complete cure of 4-mm thick increments in 10 seconds. Marginal integrity is increased and leakage decreased with the incorporation of the innovative patented "Shrinkage Stress Relievers." As a result, Tetric EvoCeram® Bulk Fill ensures a fast and long-lasting restoration. The "Light-Sensitivity Filter" provides ample working time by keeping the material soft for easy contouring and anatomic detailing, without the stiffness found in conventional materials. Improved adaptability allows for easy handling and smooth and consistent conformity along cavity walls and surfaces, without the need for a final layer.

Available in three universal shades — IVA, IVB, and IVW for mildly reddish, yellowish, and quick deciduous restorations or light-colored teeth, respectively — Tetric EvoCeram® Bulk Fill demonstrates 15% enamel-like translucency to ensure seamless blending with existing dentition. The distinctively balanced filler composition contributes to a quickly attained high-gloss polish. In addition, the material is highly radiopaque for convenient and easy detection on dental x-rays. Placed in one increment with one material, Tetric

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EvoCeram® Bulk Fill simplifies the placement technique for Class II restorations, providing esthetic and predictable treatments in half the time.

CASE PRESENTATION

A 39-year-old male engineer in good health presented with defective amalgam restorations in the occlusal of tooth #29, the occlusal and buccal pit of tooth #30, and the occlusal of tooth #31.

A hygienic non-latex rubber dam was placed, and the defective amalgam restorations removed. Preparations were performed using a #1557SC Sabre Cut carbide bur (Brasseler USA, Savannah, GA), and the margins were finely finished using a #368-016 diamond bur (Brasseler USA).

The preparations were etched using a total etch technique. A 37% phosphoric acid with benzalkonium chloride (Bisco, Schaumburg, IL) was first applied to the enamel, then to the dentin, for 20 to 25 seconds each. The preparations were then cleansed for 10 to 15 seconds.

Next, a fifth-generation adhesive (ExciTE F, Ivoclar Vivadent) was applied using a Vivapen. The bonding agent was air-dried for two to three seconds. The adhesive was then light cured for five seconds before the composite was placed.

The bulk fill composite (Tetric EvoCeram®, Ivoclar Vivadent) in shade IVA was injected from the compule directly into each cavity preparation in 4 mm increments. A modeling instrument (OptraSculpt, Ivoclar Vivadent) was used to easily sculpt the composite into placement. Each restoration was light cured (Bluephase G2, Ivoclar Vivadent) for 10 seconds.

The restorations were finished with a #368-016 fine diamond bur (Brasseler USA) and a Brownie point (Brasseler USA). The patient's occlusion was checked and adjusted, and a final polish was performed using a series of grey, green, and pink polishing points (Astropol, Ivoclar Vivadent).

Bulk fill composites provide a choice between the difficult and time consuming layering technique and a fast and easy restoration

CONCLUSION

For 20 years, dentists have struggled with the successful placement of posterior restorations when using direct composite resin materials. Despite its effectiveness, incremental layering was time consuming and riddled with disadvantages, such as polymerization shrinkage within the bulk of the restoration that led to leakage at the margins.[11-13] Although direct resin composite material may have its place in the industry, fourth-generation bonding and incremental layering for direct restorations no longer need be relied upon. Bulk fill composites provide a choice between the difficult and time consuming layering technique and a fast and easy restoration.

The development of Tetric EvoCeram® Bulk Fill has been a defining moment within the dental industry, and for individual practices utilizing the product. By eliminating the complicated protocol, which in turn shortens the length of the procedure, Tetric EvoCeram® Bulk Fill enables dentists to achieve strong, predictable and esthetic restorations quickly and easily. Tetric EvoCeram® Bulk Fill composite has revolutionized this author's office protocol. While using Tetric EvoCeram® Bulk Fill, the white lines encountered with conventional resin composite were eliminated. Post-operative sensitivity, a result of contraction stress, was non-existent. **OH**

Dr. Michael R. Sesemann, Nebraska Institute of Comprehensive Dentistry, Omaha, NB. Dr. Sesemann can be reached at: www.smilesonline.net

Oral Health welcomes this original article.

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