Compendium
of Continuing Education in Dentistry

AEGIS COMMUNICATIONS

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KEY TAKEAWAYS

- The life of restorations and health of teeth can be affected by polymerization shrinkage and shrinkage stress.
- Low-shrink composites can be utilized to increase the likelihood of favorable clinical outcomes.
- Bioactive materials such as Beautifil II LS, a universal composite with Giomer chemistry, can provide a solution to problems associate with shrinkage.

Low-Shrink Composite With Giomer Chemistry Creates Predictable and Functional Esthetics

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Polymerization shrinkage of composite materials and related shrinkage stress can present clinical problems that may affect the longevity of a definitive restoration and health of the tooth. Microleakage, postoperative sensitivity, and microfractures in enamel are some of the associated phenomena that can ultimately lead to restorative failure. One goal of material science has been to produce low-shrink composites (eg, Shofu Dental Corp., shofu.com) that can significantly reduce the chance of experiencing less than desirable clinical outcomes. As demonstrated in the case presented, a low-shrink universal composite with Giomer chemistry, Beautifil® II LS, was used to successfully perform a Class II restoration.

FIG 1. The maxillary right first molar of the patient presented radiographic caries on the mesial aspect that extended into the dentin. A low-shrink composite (Beautifil II LS, Shofu Dental) would be chosen to complete the restorative process.

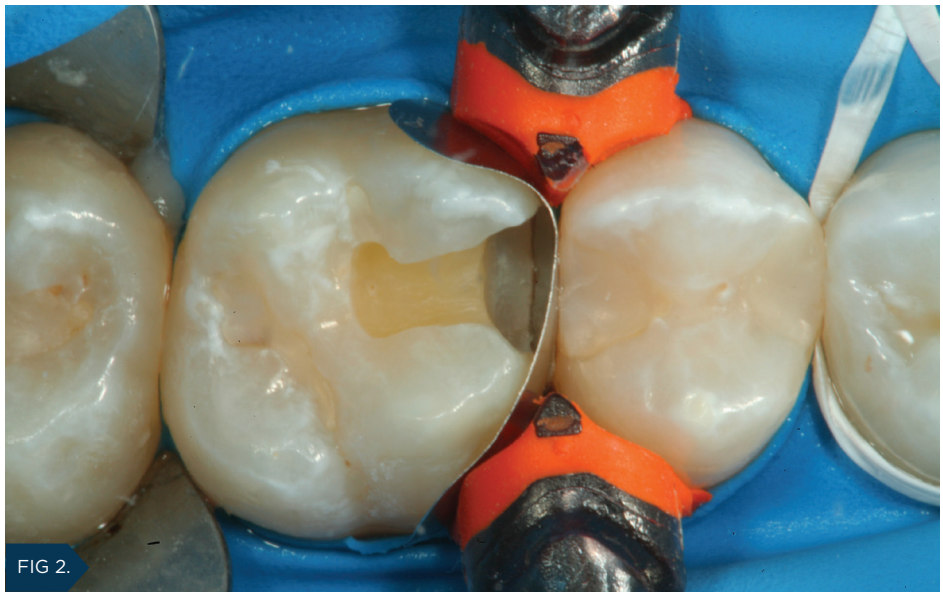
FIG 2.

FIG 2. The tooth was prepared, including removal of proximal decay, and then a sectional matrix was placed (Composi-Tight® 3D, Garrison Dental Solutions, garrisondental.com) on the mesial aspect.

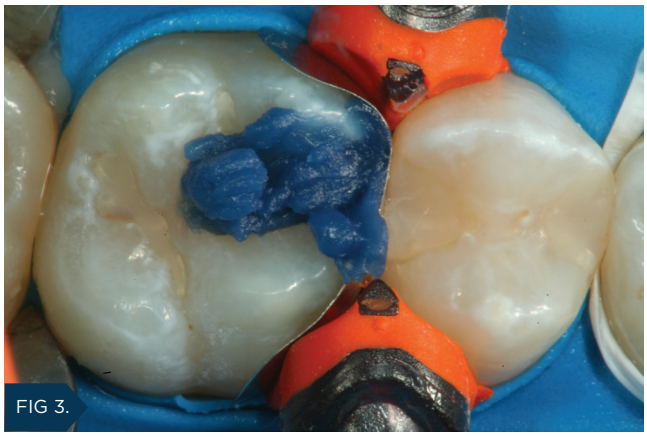
FIG 3.

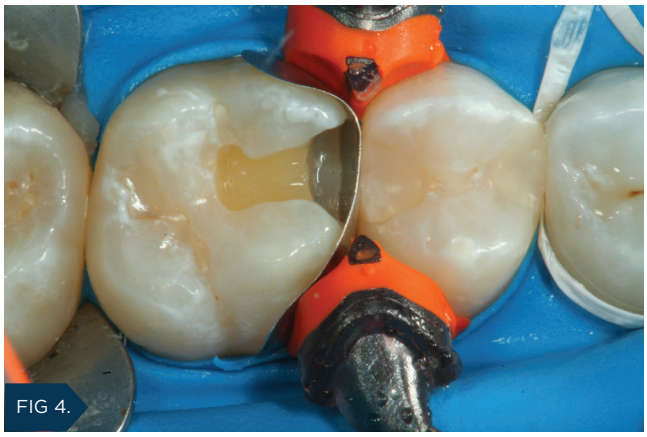
FIG 4.


FIG 5.

FIG 3 AND FIG 4. For this case, a 7th generation bonding resin (BeautiBond™, Shofu Dental) was utilized for the adhesive step; the preparation first was etched for 15 seconds, rinsed, and then dried.

FIG 5. A dentin desensitizer then was placed to rehydrate the dentin and occlude the dentinal tubules.

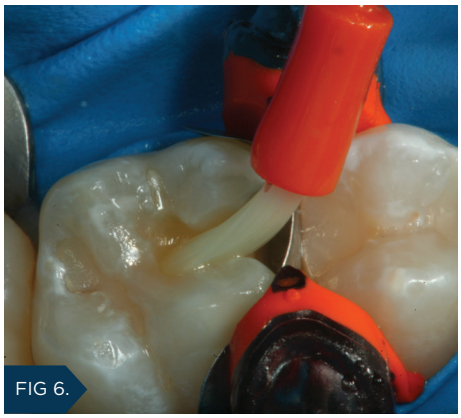
FIG 6.

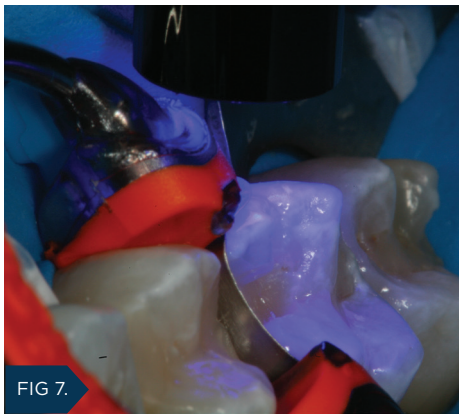
FIG 7.

FIG 6. Next, a few drops of adhesive were expressed into a disposable well and, using a microbrush, the adhesive was applied to the dentin/enamel surfaces with a light brushing motion for 15 to 20 seconds.

FIG 7. The solvent then was evaporated with air spray and the adhesive light-cured, according to the manufacturer's instructions, for 20 to 30 seconds.

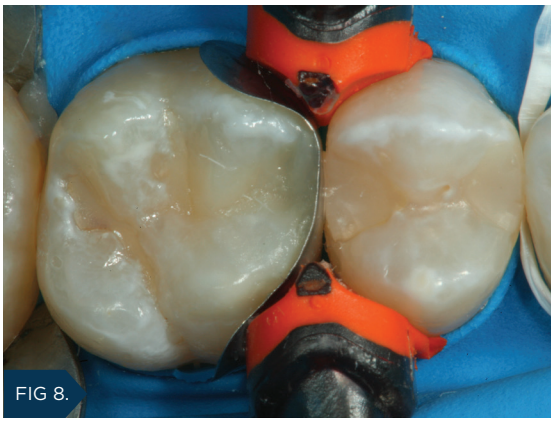
FIG 8.

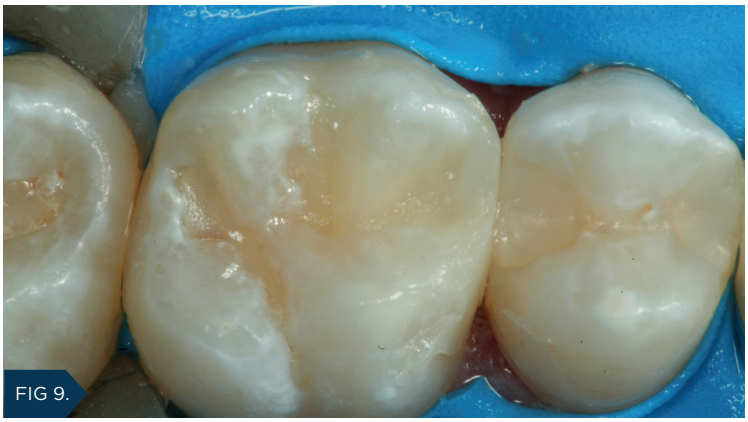
FIG 9.

FIG 8. A universal low-shrink composite material with bioactive chemistry (Beautifil II LS) was placed into the cavity and sculpted into final morphologic form using a plastic filling instrument (Goldstein Flexi-thin Mini 4: Hu-Friedy, hu-friedy.com). A fine, sable brush (No. 4 flat, Keystone Industries, dental.keystoneindustries.com) was used to smooth and adapt the composite material at the marginal areas prior to final cure.

FIG 9. After final curing was completed, the sectional matrix was removed and additional curing was done near the gingival margins from the facial and lingual aspects to ensure thorough proximal cure after matrix removal. The rubber dam isolation then was removed and the occlusion was checked with articulating film (AccuFilm® II, Parkell Inc., parkell.com). Any minor adjustments were performed with an interproximal finishing diamond (Komet USA LLC, kometusa.com).

FIG 10. An occlusal view of the completed Class II composite restoration.


FIG 10.

SHRINKAGE

Shrinkage **0.85%**

Beautifil II LS (Low-Shrink) composite provides dentists with the means to reduce polymerization shrinkage and shrinkage stress while creating predictable and functional aesthetics.

- Low volumetric shrinkage (0.85%) and shrinkage stress (2.72 MPa)
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- Sustained fluoride release/recharge with bioactive Giomer chemistry

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