

# Using Gionomers in Pediatric Care

New type of restorative material demonstrates many characteristics of glass ionomers.

**D**entists who provide restorative care for children are always seeking materials that demonstrate characteristics such as: being easy to place, fast setting, high fluoride release, low polymerization shrinkage, good compressive strength, hydrophilicity, and bonding ability to enamel and dentin. Glass ionomers have largely satisfied many of these needs. Light-activated glass ionomers in particular have the added benefits of reduction in microleakage and immediate finishing and polishing.<sup>1</sup> Gionomers are a new type of restorative material that demonstrates many of the same characteristics as glass ionomers but with clinically demonstrated esthetics and durability.<sup>2</sup> Gionomers are composed of milled, silanized glass-ionomer fillers that have undergone the reaction between fluoroaluminosilicate glass and polyalkenoic acid prior to milling. The fillers are then used in a base of composite resin which allows fluoride release and recharge similar to glass ionomers while still retaining the strength and esthetics of composites.

The restoration of Class II caries in a child will be used to illustrate the ease of use and clinically proven longevity with gionomer restorative materials. Some of the benefits of gionomers include: caries-protective fluoride release; can be recharged with fluoride; durable

strength and esthetics; easy delivery; and command set curing.

The clinical applications for direct-placement restoratives containing gionomer materials include the following:

- Class I to V restorations
- Provisional restorations for caries control
- Dentin substitute as a liner
- Small core build-ups
- Endodontic access for temporary restorations
- Anterior and posterior restorations
- Restorations in stress-bearing areas
- Subgingival caries adjacent to crown margins
- Repair of root perforations in endodontics
- Repair of external-root resorptive caries lesions

Gordan et al has shown the clinical evaluation of a gionomer after 8 years. The results of the study found the teeth restored with gionomer to have no secondary caries, no failures, and no postoperative sensitivity.<sup>2</sup> Beautifil™ (Shofu, www.shofu.com) is a tooth-colored gionomer restorative, which uses pre-reacted glass (PRG) filler in a resin matrix.

Flowable composites were first introduced in 1996. These materials have the ability to conform to the preparation without the formation of gaps between the cavity margin and material or between successive layers of the restoration.

**“Gionomers are a new type of restorative material that demonstrates many of the same characteristics as glass ionomers but with clinically demonstrated esthetics and durability.”**

Fluoride application to enamel and dentin is possible through its incorporation in adhesives and restoratives by using the matrix or filler component of the materials. Resin-based restorative materials, including resin-modified glass ionomers, compomers, and some composites, have variable percentages of fluoride release and recharge.<sup>3</sup> Beautifil Flow F02™ (Shofu) has been shown to have a higher amount of fluoride released compared with other flowable resins in a study published by Nakamura et al.<sup>4</sup> Beautifil II™ (Shofu) could reduce plaque formation, thus leading to the prevention of secondary caries.<sup>5</sup>

## Case Report

The patient was a healthy 5-year-old boy. Upon routine radiographic examination,

mesial and distal caries were noted on the maxillary right second and first primary molars, respectively. Using an Er;Cr:YSGG laser, the Class II preparations were completed with no anesthesia. Matrix bands and a wedge were placed and the teeth were isolated and dried. A one-step primer/bonding agent was applied to the cavity preparations (BeautiBond™, Shofu). After 10 seconds, the preparations were air-dried and light-cured. A flowable gionomer (Beautifil Flow Plus) (Figure 1) was applied as a liner for the restorations and light-cured. Beautifil II, a nano-hybrid composite, was then placed and light-cured to fill the preparation (Figure 2). The restorations were finished and polished (Figure 3).

## References

1. Graham L. Advances in tooth-colored restoratives. December 2010. Available at: www.ineedce.com. Accessed August 31, 2011.
2. Gordan VV, Mondragon E, Watson RE, et al. A clinical evaluation of self-etching primer and a gionomer restorative material: results at eight years. *J Am Dent Assoc.* 2007;138(5):621-627.
3. Strassler HE. Glass ionomers for direct-placement restorations. February 2011. Available at www.ineedce.com. Accessed August 31, 2011.
4. Nakamura N, Yamada A, Iwamoto T, et al. Two-year clinical evaluation of flowable composite resin containing pre-reacted glass-ionomer. *Ped Dent J.* 2009;19(1):89-97.
5. Saku S, Kotake H, Scougall-Vilchis RJ, et al. Antibacterial activity of composite resin with glass-ionomer filler particles. *Dent Mater J.* 2010;29(2):193-198.

*This article was written by Fred S. Margolis, DDS, FICD, FACD, FADI, the director of the Institute for Advanced Dental Education, Ltd, and a private practitioner in Buffalo Grove, Illinois.*

## FOR MORE INFORMATION, CONTACT:

Shofu Dental Corporation  
Phone: 800-827-4638  
Web: www.shofu.com

## Disclaimer

The preceding material was provided by the manufacturer. The statements and opinions contained therein are solely those of the manufacturer and not of the editors, publisher, or the Editorial Board of *Inside Dentistry*.



FIG. 1



FIG. 2



FIG. 3

**CASE EXAMPLE (1.)** A flowable composite was placed into the cavity preparations. **(2.)** A composite was placed over the flowable composite. **(3.)** The final composite restorations were finished and polished.