COMMENTARY

MICROLEAKAGE AROUND GLASS-CERAMIC INSERT RESTORATIONS LUTED WITH A HIGH-VISCOUS OR FLOWABLE COMPOSITE

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Correctly restoring diseased tooth structure to proper function and esthetics is a complex and dynamic task. Esthetically, resin composites are exceptional, yet they suffer from certain physical property limitations such as polymerization shrinkage and lack of durability. Ceramic inserts have been introduced to reduce the deleterious effects of polymerization shrinkage at the tooth-composite interface. Research has been equivocal but has generally shown that by reducing the bulk of resin composite with a glass-ceramic insert, the effects of polymerization shrinkage can be reduced. Logically, it would follow that marginal integrity would therefore improve. In addition, in larger restorations, ceramic inserts have the potential to improve contours and durability.

The purpose of this study was to evaluate microleakage around glass-ceramic insert restorations luted with either a high-viscous hybrid resin composite (Tetric) or a flowable resin composite (Crystal-Essence). The study found that marginal leakage was the same whether ceramic inserts were luted with a high-viscous resin composite or bulk filled with the high-viscous resin composite alone. Conversely, microleakage was significantly reduced when ceramic inserts were luted with the flowable composite compared with bulk filling with flowable composite alone. There was no difference in microleakage at the occlusal or gingival margins when comparing bulk-filled restorations to ceramic insert restorations, regardless of composite type. This is most likely a result of the study design because both occlusal and gingival margins were placed in enamel. Clinically, most Class II and Class V preparations result with the gingival margin being placed in cementum. The study could perhaps have been more clinically relevant had the gingival margins been placed in cementum.

The study determined that there was significantly less microleakage at the gingival margins of ceramic insert restorations luted with the flowable composite compared with ceramic insert restorations luted with the viscous hybrid composite. Unfortunately, results comparing the different resin composites (viscous hybrid to flowable) to each other are not conclusive because different bonding systems were used. Comparing a flowable and a viscous hybrid resin composite from the same manufacturer would have produced more meaningful results because the same bonding system could have been used.

In vitro studies are good indicators, but clinical studies are the gold standard and are the ones upon which to base best practices and procedures. Although some in vitro studies have shown glass-ceramic inserts to be beneficial in reducing polymerization shrinkage effects and reducing microleakage, a recent 3-year clinical trial study determined that the glass-ceramic insert restorations performed poorer than did ceramic or resin composite posterior restorations in most earlier studies. The estimated survival rate after 3.5 years was only 59%.[1]

This is a good first study comparing the luting of glass-ceramic inserts with flowable and viscous hybrid resin composites. Further research should address the effects of gingival margins in cementum, different sized restorations, and the use of the same bonding system to directly compare the flowable to the viscous hybrid resin composites.

REFERENCES

1. Sjogren G, Hedlund SO, Jonsson C, Sandstrom A. A 3-year follow-up study of preformed beta-quartz glass-ceramic insert restorations. Quintessence Int 2000; 1:25–31.

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