## COMMENTARY

## INITIAL REPAIR BOND STRENGTH OF A NANO-FILLED HYBRID RESIN: EFFECT OF SURFACE TREATMENTS AND BONDING AGENTS

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This study emphasizes a very important feature of direct resin composite restorations-their ability to be repaired in order to prolong function and extend the life of the restoration. Repairing, rather than replacing, minimizes tooth loss, reduces pulpal stress, and is more economical for the patient. The authors' show that, by using a combination of mechanical abrasion and the application of a dentin bonding agent, a measurable bond strength of repair composite to the aged original composite can be achieved. The difference with this particular study versus other studies referenced by the authors is their use of a nano-filled hybrid resin with two current dentin adhesives, a single-bottle total etch product and a two-bottle self-etching product. The authors evaluated a number of possible chairside approaches to create measurable repair bond strength, with mechanical abrasion methods showing the most promise. The use of a diamond bur to provide micromechanical retention is probably the most practical approach in this protocol because of its simplicity and lack of needing additional equipment. The authors did use aged resin composite samples in their experimental design to try and mimic the clinical situation of resin repair. However, a more meaningful experimental design would have been if the study evaluated the long-term durability of these repairs. Aging the repaired samples and then subjecting them to fatigue testing by cyclic loading would provide conditions more closely related to the intraoral environment and would have generated data that would more closely reflect these repair technique's in vivo results. Therefore, the data from this study can only be considered short term, and clinicians should look for longterm data to evaluate the merits of any repair procedure.

In this era where "minimal invasive dentistry" is a buzz word that is often used to describe a practice philosophy, the implications of the results from this study for clinical practice should be apparent. Replacement of a "failing" existing resin composite restoration results in an increase in tooth loss, which could lead to more involved and costly restorative treatment in the future.<sup>1</sup> Additionally, in vitro repair studies have been supported by minimal intervention studies, which have demonstrated that you can increase the longevity of resin composite restorations by repairing defective areas in lieu of total replacement.<sup>2,3</sup> When possible the use of repair techniques should be considered the standard of care to possibly prolong the life of these restorations indefinitely.

## REFERENCES

- 1. Gordan VV, Mondragon D, Shen C. Replacement of resin-based composite: evaluation of cavity design, cavity depth, and shade matching. Quintessence Int 2002;33:273–8.
- 2. Gordan VV, Shen C, Riley J, III, Major IA. Two-year clinical evaluation of repair versus replacement of composite restorations. J Esthet Rest Dent 2006;18:144–54.
- 3. Monacada G, Fernandez E, Martin J, et al. Increasing the longevity of restorations by minimal intervention: a two-year clinical trial. Oper Dent 2008;33:258–64.

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