## COMMENTARY

### EARLY HARDNESS OF SELF-ADHESIVE RESIN CEMENTS CURED UNDER INDIRECT RESIN COMPOSITE RESTORATIONS

Sharukh S. Khajotia, BDS, MS, PhD*

The advent of self-adhesive resin luting cements has added a new category of resin cement to the existing etch-and-rinse (previously known as "total-etch") and self-etching cement categories. Self-adhesive resin cements have received increasing interest from dentists primarily because they eliminate the need for separate etchants and primers for bonding to tooth structure, alloy, or ceramic substrates. The different resin cement categories have varying mechanisms of polymerization: self-adhesive cements are predominantly dual-cured with a few products having the option of being chemically-cured only, whereas etch-and-rinse cements are polymerized via either dual-curing or light-curing mechanisms. Most of the self-etching cements are chemically-cured with some having an optional light-curing mode. The present study by Giráldez and colleagues adds to the body of literature by comparing the effect of curing mode (chemically-cured only versus dual-cured with light-activation for 40 seconds or 80 seconds) on the initial surface hardness of products from all three resin cement categories.

The clinical performance of resin luting cements has been shown to depend on several factors: the composition and thickness of the indirect restorative material; the intensity and duration of exposure of light energy emitted by the light-curing unit; bonding to dentin versus enamel; compatibility with the indirect restorative material; and the effect of long-term exposure to saliva, among other factors. Several studies including the present study have demonstrated that the composition of the resin cement is also a factor that critically influences its performance in vitro. A common theme among these investigations is the importance of following the manufacturer's instructions to obtain the most optimal properties in the luting cement.

An important outcome of this study, as demonstrated previously, is that polymerization of dual-cured cements with light energy ensures the development of optimal hardness in the cement. It would have been interesting if the resin luting cement had been placed in contact with tooth structure in the present study to simulate the light transmission and setting characteristics that occur clinically, particularly as the acid-base setting reaction is necessary for the retention and setting of some self-adhesive and self-etching resin cements. The small sample size ($N = 3$) per experimental group in the present study was also a concern from the perspective of adequate statistical power. Despite these limitations, the present study by Giráldez and colleagues confirmed the results of previous investigations in which specific self-adhesive cement products yielded significantly lower mechanical property values than the other types of resin cements, regardless of curing mode or the composition of the indirect restoration. Although the selection of simplified luting systems can be justified by their ease of use, they have been viewed as a compromise from the perspective of retention of the restoration, even though lower in vitro bond strength values do not necessarily imply inferior clinical results.

Continued improvement of the products in the self-adhesive resin cement category would be beneficial. Toward that end, more research is needed in order to thoroughly evaluate the mechanism of failure of self-adhesive cements, the effect of alteration of the indirect restoration's surface on retention, the effect of self-adhesive cements on pulpal tissues, and the polymerization characteristics of the various products, beyond the small number of studies existing on each of those topics. An additional need is the standardization of in vitro testing parameters and the determination of clinically relevant threshold values of those parameters so that products from various resin cement categories can truly be compared with each other.

*President's Associates Presidential Professor, Chair, Department of Dental Materials, University of Oklahoma College of Dentistry, Full Member, OUHSC Graduate College, Associate Professor of Chemical, Biological and Materials Engineering, University of Oklahoma, College of Engineering, Oklahoma City, OK 73190 USA

*This commentary is accompanied by article, "Early Hardness of Self-Adhesive Resin Cements Cured under Indirect Resin Composite Restorations," Isabel Giráldez, DDS, Laura Ceballos, DDS, PhD, Miguel A. Garrido, PhD, Jesús Rodríguez, PhD, DOI 10.1111/j.1708-8240.2011.00408.x*


*DOI 10.1111/j.1708-8240.2011.00409.x*