Guest Editorial

Aging of Hybrid Layer

The current approach of Operative Dentistry is focused on conservative restorative procedures. This is possible due to improvement of restorative techniques and polymeric materials for dental applications. However, hybrid layer degradation over time is still a major issue. Thus, replacement of adhesive restorations is normally necessary, leading to the so-called restorative cycle, where restorations are replaced by larger and more complex ones, compromising resistance of dental structure.

Etch-and-rinse systems show excellent performance in dentin bond strength tests, when short-term bond strength is evaluated (24 hours). However, reduction in bond strength values is normally observed in long-term evaluations (6 months or more). This reduction in restoration durability occurs due to hydrolysis of resin and/or collagen fibrils, which causes degradation of the hybrid layer.

Water storage and thermocycling are established techniques for specimen aging in durability tests of dentin-resin interfaces. However, this method requires an idle period until results are obtained, and it is likely that the product under test becomes obsolete or out of the dental market. Thus, comparative studies of methods able to shorten this idle time are necessary and welcome.

Establishment of a standardized technique in order to compare results is essential. Tests of new formulations for dentin adhesives or new substrate treatments would be another important application, in which accelerated aging (within a few hours) could help to predict the long-term bond strength performance.

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