COMMENTARY

EFFECT OF ARTIFICIAL AGING ON THE ROUGHNESS AND MICROHARDNESS OF SEALED COMPOSITES

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The finishing and polishing of resin composites are necessary steps to reshape and provide a smooth surface to the restoration. Although necessary, these procedures are destructive to the restoration and have been shown to exacerbate the marginal gaps formed during polymerization, and adversely affect wear. The sealing of resin composites with surface sealants have been advocated. The main advantage of applying a sealer is to infiltrate the marginal gaps and microcracks created after the finishing and polishing procedure, thereby improving the marginal integrity, reducing microleakage, marginal staining, and wear, and ultimately increasing the longevity of the restoration.

Dr. Paulo Henrique dos Santos and colleagues developed an interesting research project in order to evaluate the surface roughness and microhardness of different types of composites that were rebounded with an unfilled resin, before and after artificial aging.

This in vitro study showed that the application of a composite sealer, such as Biscover, prevented the decrease in microhardness when the restoratives were exposed to water, acidic beverages, and accelerated aging, for two out of the three composites evaluated. These findings are in agreement with clinical studies that have demonstrated that rebonding significantly reduces wear and prolongs marginal integrity.[1–3] Despite this finding, it is noteworthy that the initial microhardness was drastically reduced upon application of the sealer when compared with the composites that did not receive the treatment. In addition, although the composite sealer prevented a decrease in surface microhardness when exposed to certain conditions, the final microhardness of the sealed composites was significantly lower than the nonsealed ones. The authors attributed this finding to the composition of the nonfilled sealer, which presents a lower microhardness.

Dr. dos Santos and colleagues also showed that the surface sealer application significantly improved the surface smoothness of all composites; besides, the aging process did not affect the surface roughness of all materials tested whether sealed or not. As mentioned by the authors, the sealer application is certainly an advantage because smooth surfaces reduce the chances of plaque accumulation, therefore reducing the likelihood of secondary caries.

It is important to note that despite the advantages of composite sealers showed by Dr. dos Santos and colleagues, sealer application on composite can pose some disadvantages. A laboratory study has shown perceivable resin composite color change right after surface sealer application, and even more pronounced changes after exposure to red wine[4]; and another study has shown removal of the material upon repeated toothbrush abrasion.[5] The discoloration and sealer retention were dependent on the sealer and composite type. Clinical studies on this area are still lacking.

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