Clinical Placement and Blind Evaluation of a Microhybrid Composite Resin Used With Different Bonding Systems

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Objectives

The aim of this study was to evaluate the clinical performance of a posterior composite restorative system, the Venus microhybrid composite resin system (Heraeus Kulzer), used in conjunction with either Gluma Comfort Bond or I-Bond adhesives at 1 year posttreatment.

Methods

One hundred and twenty posterior restorations to repair carious lesions or failed restorations were performed. Seventy-two were class II restorations (two-thirds on molar teeth; one-third on premolars). Two different bonding systems-I-Bond and Gluma- were randomly utilized. The restorations were performed by clinicians trained specifically in the use of the materials being tested. All restorations were evaluated for post-operative sensitivity at 24 hours via telephone. Research subjects returned for evaluation by two blinded examiners utilizing United States Public Health Service (USPHS) criteria at one week, six months, and one year posttreatment.

Results

At 1 year, 43 patients had been lost to follow-up, leaving 77 available for evaluation: 35 had been treated with Gluma; 42, with I-Bond. Treatment groups were balanced in regard to gender, ethnicity, and age. Gluma was used more frequently than I-Bond in Class II restorations.

The majority of patients in each group experienced no unusual sensitivity at 24 hours or one week after treatment, although a small number ranked the sensitivity they experienced as mild or moderate after 1 week. Patients treated with I-Bond reported less sensitivity than did those treated with Gluma. Pain when biting or chewing was reduced after one week in each group of patients, but the reduction was slightly less in those treated with I-Bond.

According to USPHS criteria, color stability was the same in each group of patients; distributions of color ranking were equal in each group, and differences in outcome were almost imperceptible. Regarding marginal discoloration, almost equal distributions were observed, although I-Bond showed slightly less stability than Gluma. No secondary caries were found in either patient group, nor was occlusal wear significant in either group. Marginal adaptation appeared almost equal with each bonding agent, but was slightly less with Gluma. Surface texture was slightly coarser with Gluma than with I-Bond, but again, the distributions in each group were equal. Proximal contact was rated as tight in the majority of patients in each group, again demonstrating equal distributions across each group. Regarding functional occlusion, each bonding agent exhibited slight wear, with a shift observable from the surface of the restoration to the surface of the tooth. Axial contour was equal in the two groups. There was little difference in posttreatment sensitivity between the two groups, although patients treated with Gluma showed slightly more sensitivity. Restoration retention was 100 percent in each group at 1 week, 6 months, and one year. One restoration fracture occurred at six months in a patient treated with I-Bond. He was subsequently withdrawn from the study. No other failures occurred.

Conclusions

Based on 77 restorations reexamined at one year after initial treatment, no significant differences between I-Bond and Gluma were observed according to Venus material objective measures. Each bonding agent led to superb results.