# Comparison of a resin-based sealant with a nano-filled flowable resin composite on sealing performance of marginal defects in resin composites restorations: a 36-months clinical evaluation


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**Abstract**

Objectives: Our goal was to evaluate the clinical behavior of resin-based composite (RBC) restorations with sealed marginal defects using nano-filled flowable RBCs (FRS) compared with resin-based sealant (RBS); this work used marginal adaptation, marginal staining, and secondary caries according to the World Dental Federation (FDI) criteria. Materials and methods: This was a prospective, randomized, double-blind, controlled trial. Fifty-four patients who met the inclusion criteria (older than 18 years old; with high cariogenic risk determined by Cariogram software; and restorations with marginal defects, 3 and 4 according to FDI criteria) were randomly divided into three groups. There were three defective RBC restorations per patient and were repaired (n = 162). The groups were RBS—marginal sealing using a resin-based sealant (Clinpro Sealant, 3 M ESPE, MN, USA) plus adhesive (Single Bond Universal, 3 M ESPE, MN, USA); FRS—sealing using flowable resin (Filtek Flow Z350XT, 3 M ESPE, MN, USA) plus adhesive (Single Bond Universal, 3 M ESPE, MN, USA); and control—no repair treatment. All procedures were performed under complete isolation. Evaluations were evaluated at 1-week post treatment (baseline) as well as at 18 and 36 months after treatment regarding marginal adaptation, marginal staining, and secondary caries according to FDI criteria. The data were analyzed using the Wilcoxon test ($\alpha = 0.05$) to compare the differences in each treatment group at different evaluation times. Results: Marginal adaptation of micro-repaired RBC restorations were seen in patients with a high risk of caries using flowable resin composite or resin-based sealants. There were differences ($P < 0.001$) when baseline was compared at 18 and 36 months. Marginal staining showed differences when baseline was compared to 18 months ($P < 0.001$) and 36 months ($P = 0.001$) for both treatments. Secondary caries parameters for RBS treatment showed differences when baseline was compared to 36 months ($P = 0.025$) and when 18 months was compared to 36 months ($P = 0.046$). Conclusions:

Micro-repair of RBC restorations resulted in clinical deterioration of marginal adaptation and marginal staining. Nano-filled flowable resin composites were sealed on defective restorations; 3 and 4 FDI marginal defects have better clinical performance to prevent secondary caries than resin-based sealants after 36 months. Clinical relevance: Micro-repair with RBS does not seem to be an effective treatment to prevent secondary caries. 
**Author keywords**
Flowable RBC; Repair; Sealant