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Clinical Evaluation of a New Self-Etching Adhesive after Six Months

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Introduction

Due to the characteristic polymerization shrinkage of resin-based composites, clinical success with composite restorative materials is dependent on effective and durable adhesion to enamel and dentin (1). Flowable resin composites have been reported to adapt well to the cavity wall (2). This optimal adaption may result in an improvement of the adhesive performance of resin composites (2-4). Moreover, a number of new self-etch adhesives have been developed to simplify clinical bonding procedure. The efficiency of these simplified bonding systems is still controversia (5).

Fig. 1,2:
The selfetch adhesive system AdheSE One and the composite material Tetric Evo Ceram and Tetric Flow used in this study.

Objectives

The purpose of this prospective randomized clinical study was to compare the clinical performance of the new self-etching adhesive system AdheSE One in combination with the composite Tetric Evo Ceram and the influence of the additional application of the flowable resin composite Tetric Flow after six months.

Material and Methods

In 50 patients 25 class I and 75 class II cavities were placed with at least two restorations per patient. The adhesive system AdheSE One was used for all the restorations:
An adequate amount of AdheSE One was directly applied to the cavity. Starting with the enamel portion, all cavity surfaces were thoroughly coated for 30 seconds. Excess amounts of AdheSE One were dispersed with a strong stream of air until there was no longer any movement of the material. Then, AdheSE One was polymerized for 10 seconds at a light intensity of more than 500 mW/cm2 (bluephase; Ivoclar Vivadent).
In one of the two fillings in each patient, an additional layer of the flowable resin composite Tetric Flow was applied in the entire cavity and separately light-cured. The fillings were placed under rubber dam. All materials were used as recommended by the manufacturer. Two clinicians evaluated the restorations at baseline, two week following placement, and at the six month recall visit according to the modified clinical criteria of Ryge.

Modified clinical criteria of Ryge

sensitivity
hypersensitivity
marginal discoloration
marginal adaption
recurrent caries
surface
color match
proximal contact

For each of the criteria, Alpha was used to indicate the highest degree of clinical acceptability; Beta to Delta were used to indicate progressively lessening degrees of clinical acceptability. The thermic test for sensibility was done by using a cold stimulus (Endofrost). In addition, each restoration was photographed at each recall. Statistical analysis was based on Man-Whitney-U-test using SPSS 12.0 . The test was carried out at 95% confidence level and used to determine the differences in the performance of the Tetric and Tetric flow restorations.

Fig. 3: Example of a filling procedure: Amalgam filling to be renewed.

Fig. 4: Excavated cavity.

Fig. 5: Application of AdheSE One for 30 seconds.

Fig. 6: Light curing of the adhesive system for 10 seconds with bluephase.

Fig. 7: Cavity filled with Tetric Evo Ceram.

Fig. 8: Renewed and polished filling.

Fig. 9: Amalgam filling to be renewed.

Fig. 10: Excavated cavity.

Fig. 11: Filling at baseline.

Fig. 12: Filling after 6 months.

Fig. 13,14: Teeth 25, 26 at baseline and after 6 months. 25 is filled without the additional use of the flowable liner Tetric Flow.

Results

After six months all fillings could be re-examined. All teeth remained vital and did not show any signs of postoperative sensitivity. Marginal adaption code Bravo could be evaluated in four fillings (three with flowable liner, one without). In one tooth a filling integrity was scored as Bravo (without fowable liner). None of the one hundred teeth showed signs of secondary caries. Statistical analysis showed no significant difference between techniques for any of the evaluation criteria ($p>0.05$, Man-Whitney-U-test).

Conclusions

At this inital phase the use of a flowable composite showed no significant impact on the clinical performance of class-I and -II restorations. The self-etch adhesive AdheSE One might be a promising alternative to other systems. Acknowledgment This study was supported by Ivoclar Vivadent, Germany.

Literature

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5. Frankenberger R, Tay FR: Self-etch vs etch-and-rinse adhesives: effect of thermo-mechanical fatigue loading on marginal quality of bonded resin composite restorations. Dent Mater (2005) 21:397-412.

This Poster was submitted by Dr. Katrin Bekes.

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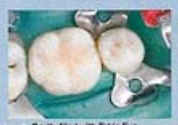

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