

9 Summary

Within the last 10 years, direct posterior composite resin restorations have become increasingly popular with dental patients. The development of modern composite restorative materials and adhesive systems has extended the indications for composite resins to Class I and II cavities.

While bonding to enamel is reliable and durable, bonding to dentin can apparently only be achieved when rather complicated, time consuming and technique-sensitive application procedures are accurately followed. Most recent developments have focused on simplification of the multi-step bonding process using “one-bottle” adhesives.

Preclinical in-vitro studies are necessary as screening tests for new adhesives to predict their clinical performance. However, the effectiveness of adhesive systems has to be validated by clinical trials. The objective of this study therefore was to evaluate in-vivo the effectiveness of the one-bottle adhesive *Excite* combined with the composite *Tetric Ceram* versus the multi-step adhesive Scotchbond MP combined with the composite *Z100* in Class II restorations after three years.

72 Class II restorations were placed in 41 patients by one operator. Interproximal cavity-margins were located in dentin (41 restorations) or in enamel (31 restorations). All cavity margins located in enamel were bevelled. Rubberdam was applied, the cavities were etched with phosphoric acid (37 %) and filled either with *Excite/ Tetric Ceram* or with *Scotchbond MP/ Z100*. *Excite* was applied in two different application techniques:

following the manufacturers instruction (MI), moderate air drying and by active application with excess (E), so that four groups were obtained:

group1A- EX/TC MI (14 restorations), group2A- SB/Z (14 restorations), group1B- EX/TC (E) (24 restorations) and group2B- SB/Z (20 restorations). At baseline and after 6, 18 and 36 months recalls, the restorations were evaluated clinically by two examiners using modified USPHS criteria. Statistical evaluation was performed by using the chi-square test.

Both types of adhesive-composite-combination performed well clinically after 6, 18 and 36 months. In group 1A hypersensitivities occurred at three restorations, so that they had to be replaced. The evaluation of the restorations showed no

significant difference ($p < 0,05$) by the chi square test for all other criteria in this part of the study. In part B there could be found a significant difference after 36 months dependent on the cervical margin for the criteria „ marginal irregularities-occlusal“ ($p=0,03$). Recurrent caries was not detected. Conclusion: The one-bottle-adhesive *Excite*, applied with excess, showed clinical results as good as the multi-step adhesive *Scotchbond MP* in Class II restorations after 3 years.