

9 SUMMARY

The demand for esthetic tooth coloured restorations has been arising in the last years. For larger cavities indirect ceramic restorations are used.

In order to reduce the insertion time and to avoid the time-consuming total etch technique, self etching primer and self curing resin cement systems were developed. The purpose of this study was to analyze the quality of marginal adaptation after using the different primer/resin cement systems.

72 extracted teeth were stored in 0,1% thymol solution. After levelling the approximal surfaces mesially in enamel distally in dentin, 8 cylindrical cavities (diameter: 3.5 mm) were prepared with the Cerafil diamond preparation set for each investigated luting system in enamel as well as in dentin. The cavities were then filled with the corresponding Cerafil ceramic inserts using the self etching primer/resin cement systems Bistite II DC (Tokuyama), M-Bond (Tokuyama) and RelyX Unicem (3M Espe). The primer systems Syntac Classic and OptiBond FL in combination with Variolink II (Ivoclar Vivadent) and Variolink Ultra (Ivoclar Vivadent) served as control groups. OptiBond FL (Kerr) in combination with Sonocem (3M Espe) was used in two additional control groups. In one group the cavities were filled with a temporary filling material (Luxatemp and Temp Bond NE) for one week before the inserts were applied. The already etched and silanized Cerafil ceramic inserts were cleaned with acetone and again etched with hydrofluoric acid and again silanized. After reducing the extending parts of the inserts with a preparation diamond the restorations were finished by using fine grade flexible Al_2O_3 -coated discs and stored in water for 21 days. The teeth were thermocycled for 2000 cycles between 5°C and 55°C. Immediately before and after thermocycling replicas were taken and a quantitative margin analysis in the SEM was performed at a magnification of 200X. Statistical analysis of the results was performed by using the KRUSKAL-WALLIS-test with BONFERRONI-correction ($p < 0,05$).

The statistical analysis showed rather favourable results when the complex resin cement systems Syntac Classic and OptiBond FL were used in combination with the different luting composites (control groups). The easier application technique by using the resin cement system Bistite II DC with a self etching primer offered good results, which did not differ significantly ($p > 0.05$) from the control groups. The use of thixotropic luting systems like Variolink Ultra and Sonocem tends to

result in better marginal adaptation in combination with the ultra sonic insertion technique. The resin cement systems with an easier handling, M-Bond and RelyX Unicem, showed statistically significant ($p \leq .05$) lower amounts of margin quality “continuous margin” than the control groups Syntac Classic/Variolink II and OptiBond FL/Sonocem. The reduced insertion time of the chemically curing resin cement M-Bond is compensated by the poor results in comparison to those of the control groups.

Due to the significant differences of the marginal quality in this study, the application of M-Bond and RelyX Unicem is to be considered critically. Bistite II DC as well as the adhesive systems Syntac Classic and OptiBond FL in combination with the different luting composites showed very good results and can be recommended for the adhesive insertion technique of ceramic restorations.