

Marginal adaptation and fracture resistance of adhesively luted glass fibre-composite reinforced molar crowns with different inner crown surfaces.

[Behr M](#), [Rosentritt M](#), [Sikora MI](#), [Karl P](#), [Handel G](#).

Department of Prosthodontics, University of Regensburg, Franz-Josef-Strauss-Allee 11, 93042, Regensburg, Germany. michael.behr@klinik.uni-regensburg.de

OBJECTIVES: This study compared the influence of different inner crown surfaces on the fracture resistance and marginal adaptation of adhesively fixed glass fibre-reinforced molar crowns. **MATERIALS AND METHODS:** Vectris/Targis crowns were constructed with an inner framework of glass fibres (directly on the tooth) or an inner veneering composite layer between the fibre-framework and the tooth-substance. Both groups were sandblasted inside using Al(2)O(3); 50 microm grain size (200 kPa, 20 s) and silane coated. A control group had the inner fibre framework, but was neither sandblasted nor silane coated. The crowns were adhesively cemented on extracted human teeth, and thermally cycled and mechanically loaded (TCML: 6000 x 5 degrees C/55 degrees C; 1.2 x 10(6) x 50 N, 1.66 Hz). The marginal adaptation before and after TCML was evaluated and the fracture resistance was investigated using a Zwick universal testing machine. **RESULTS:** After TCML the proportion of 'perfect margin' of the control group decreased significantly at the interface crown/cement. For the variations with an inner fibre framework or inner composite layer the marginal adaptation or fracture resistance did not decrease significantly after ageing. The fracture resistance values were control: 1509N+/-486; inner fibre framework: 1896N+/-342; inner composite layer: 1754N+/-340. **CONCLUSIONS:** In the case of the investigated fibre framework and veneering composite, the inner surface of glass fibre-reinforced molar crowns can be covered with a composite layer or with a glass fibre framework. Both methods achieve comparable high fracture strengths and reliable marginal adaptation.

PMID: 12927462 [PubMed - indexed for MEDLINE]