

8 Summary

Over the last years all-ceramic crowns have gained a larger market-share than all-ceramic bridges and thus it seems that all-ceramic bridges are implemented with a great deal of caution.

The purpose of this study was to show the correlation of the fracture-strength of four-unit zirconium-oxide bridges constructed with the CAD/CAM-designed LAVA[®]-System, in a three point-bending test. Thereby special attention was placed on the different die materials and the influence of thermocycling on them.

The die materials used were fibreglass-enforced resins (DC-Tell[®], Firm DCS), LAVA[®]-Zirconiumoxide-ceramics (3 M ESPE) and yellow brass.

Two dies of each material were embedded in Paladur Clear[®] (Heraeus Kulzer), whereby a defined mobility of the dies was reached by a heat shrink tubing (3 M, type HSR) which was previously wrapped around the dental roots.

For each group of die materials 20 bridges were cemented conventionally with zinc-oxide-phosphate cement (Hoffmann[®] Berlin) and were then stored in 0,9% Sodiumchloride-solution for 21 days.

Subsequently half of the bridges of each group were aged artificially through thermocycling. The results of the fracture strength test were analysed and described statistically with the t-test.

The results showed that when using ceramic or metal dies, the fracture strength of the bridges were clearly higher than the bridges that were cemented on resin enforced dies.

The artificial aging procedure through thermocycling had no significant influence in the case of ceramic or metal die materials, whereas it lead to a visible but not significant reduction of the fracture strength when full-ceramic bridges were cemented on fibre-enforced resin die material.

In conclusion it can be noted that the fracture strength, that was detected for these ceramics, implies a clear indication for use in the cantilever region. The previous reconstruction of teeth using ceramic or brass core materials, even under constant influence of changing temperatures and fluids in the oral cavity, are clearly recommended. About the implementation of resin-based core materials, when testing these bridges clinically, no reliable conclusion can be done.