IADR Abstract Archives

Surface Roughness Modification and Bond Strength of Hybrid CAD/CAM Materials

Objectives: To investigate the effect of different surface roughness treatments on the bond strength of different hybrid CAD/CAM materials.
Methods: Four hybrid CAD/CAM blocks (Shofu Block HC, Shofu; Lava Ultimate, 3M; Brilliant Crios, Coltene;Enamic, Vita Zahnfabrik) were cut in slabs of 4-mm thickness, divided into four groups, and subjected to the following surface treatments: group 1: no treatment; group 2: sandblasting with 29μm Al2O3 (SB) (Aquacare, Twin, Veloplex Int, London UK); group 3: 5% hydrofluoric acid etching (HF) + Si; and group 4: tribochemical silica coating (CJ) (Cojet, 3M ESPE). SEM and AFM analysis of the surfaces were performed (magnifications ≤ 3000x). Sections of the same group were luted together (2 sandwich specimens/group) using a dual-cure self-adhesive cement for all groups.After two days storage in 0.5% chloramine at 37°C, the sandwich specimens were sectioned in rectangular microspecimens. One half of the specimens were subjected immediately to a microtensile bond strength (μTBS) test, and the other half were tested after 4 month water storage (artificial aging). The statistical methodology followed was the General Linear Full Factorial Model.
Results: SEM and AFM analysis indicated that surface roughness modification protocols had different effect on each material. Micro-tensile bond strength tests indicated that the lowest μTBS values were obtained in the absence of any surface treatment, whereas highest μTBS values where obtained after either mechanical or chemical surface roughening. The results indicated that bond strength values depended on the type of surface treatment and on the interaction between the material and surface treatment.
Conclusions: Surface roughness modification treatments contribute to a higher bond strength of hybrid CAD/CAM materials. However, optimal surface treatment appears to be material dependent.

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SESSION INFORMATION
Poster Session
CAD/CAM MATERIALS
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