0579 Fatigue resistance of fiber posts and different cement/build-up materials

P. BALDISSARA[*1], D. MELILLI[2], C. MONACO[1], and L. CIOCCA[1], [1] University of Bologna, Italy, [2] University of Palermo, Italy*

Objectives:The purpose of this study was to evaluate the fatigue resistance to cycling loading of teeth restored with fiber post and different build-up systems. Methods: Forty human, sound single-rooted teeth were selected and stored in 0.02% thymol solution. The crowns were removed by cutting the teeth at the cement-enamel junction, thereafter endodontic treatment was performed using the vertical condensation technique. The roots were partially embedded in epoxy resin and randomly assigned to four groups. The specimens were restored with the same type of quartz fiber posts (DT Light Post, RTD, Grenoble, France), but different cements and build-up systems were used: 1)All-Bond2+C&B Cement+Bis-Core (Bisco, USA); 2)All-Bond2+Bisfil 2B; 3) Scotchbond1+RelyX Unicem+Supreme(3M ESPE, Germany); 4)Scotchbond1+RelyX ARC+Supreme. The restored teeth were subjected to 2millions fatigue cycles ranging from 3 to 100N, under 37±3°C water irrigation applying the force on the build-up with a 45° angle. After the cycling they were immersed in basic fuchsin for 24 hours for interface failure detection. Subsequently, the specimen were loaded with an Instron machine until complete fracture occurred, and the surfaces observed under the stereomicroscope. Results: After the cycling loading, one specimen collapsed in group 1, 2, and 3. No failures were recorded in group 4. No statistically significant difference between groups was found with Kruskal-Wallis test (P>0.05). All the specimens showed various degrees of die penetration along the restoration interfaces, mainly between the dentin and the composite build-up. The lingual side of the teeth, were the load applied developed a tensile stress, showed a significantly (P<0.01) higher interface failure rate when compared to the buccal side. Conclusions: Although all the restoration systems appeared resistant to fatigue stress, microleakage revealed that interface failures may occur without causing any macroscopically evident breakdown.

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