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Evaluation of Immediate Bond Strength of Paste-Type RMGI Cements

T. Takahashi, K. Tanaka, T. Sato

GC Corporation, Itabashi-ku, Japan

Objectives Paste-type resin-modified glass ionomer (RMGI) cements are widely used because of advantages such as their ease of use. The immediate adhesion of cements is important for clinical performance, making it an important evaluation criterion. Therefore, the purpose of this study was to evaluate immediate bond strength of RMGI cements.

Methods FujiCEM Evolve (FCE; GC), Riva Cem Automix (RCA; SDI), RelyX Luting Plus Automix(RX; 3M ESPE) were evaluated. Bovine dentin surfaces were polished with 600-grit SiC paper. Adherent surfaces of stainless-steel rods were sandblasted.

RMGI was mixed, placed on the rod, and bonded to the bovine tooth. Then, 10N load was applied for 10 seconds and excess cement was removed.

For immediate bond strength evaluation, the specimens were incubated at 37 °C 90%R.H. for 3 minutes (n=5). For 1day bond strength evaluation, the specimens were incubated at 37 °C 90%R.H. for 1 hour and then immersed in 37 °C distilled water for 1 day (n=10).

Tensile bond strength (TBS) was measured by universal test machine (SHIMADZU AG-I). [Crosshead-speed 1mm/min, Wilcoxon rank sum test, p<0.05]

Results FCE showed the highest immediate TBS among the three products. RCA and RX had very low immediate bond strength. One day bond strength of FCE and RX were higher than immediate strength. One day bond strength of FCE was equivalent to that of RX. On the other hand, RCA did not show increased bond strength after one day.

Conclusions FCE showed highest immediate bond strength among other products. Therefore, it is suitable for restorations where high bond strength is required, such as low-retention preparations. In addition, it is suggested that FCE may have a high durability for external factors and be expected to bring good clinical result.