Push out bond strength of glass ionomer impregnated gutta percha/Glass Ionomer sealer system to root canal dentin conditioned with different endodontic irrigants

Abstract

The present study evaluated the push out bond strength of Active GP system versus Guttapercha/AH Plus sealer using different irrigants. Fifty six human single rooted teeth were instrumented with a crown-down technique using Endosequence rotary Ni-Ti file system. The teeth were equally divided into two main groups and eight subgroups according to final irrigant: NaOCl, EDTA, Citric acid, and MTAD. Obturation was done by single cone technique in Active GP system, and with lateral compaction in GP/AH Plus group. Each obturated tooth was embedded in Epoxy cylinder, where three sections of 2 mm were done using the Isomet saw. The push out bond strength was done using universal testing machine working at a speed of 0.5 mm/ min. Data were analyzed using one way analysis of variance followed by Newman-Keulsposthoc test. Stereomicroscopic examination determined the type of bond failure. Results showed that in Active GP group, NaOCl dentin-treated subgroup had the highest bond strength mean value (6.98 ± 1.9MPa) followed by citric acid subgroup (5.40±1.1MPa), then MTAD subgroup (4.71 ± 0.7MPa), while EDTA subgroup recorded the lowest value (4.14±1.4MPa), however they were statistically nonsignificant (P›0.05). In the GP/AH Plus group, EDTA dentin-treated subgroup showed statistically significant higher mean bond strength (5.9±0.7MPa) followed by NaOCl subgroup (5.40 ± 1.1MPa), then citric acid subgroup (4.6±0.6MPa), while MTAD subgroup recorded the lowest value (3.5 ± 0.1MPa). Failure in Active GP group was mainly cohesive in the Gutta-percha, while GP/AH Plus group showed mainly adhesive failure of AH Plus sealer with the gutta-percha.