Comparison of Regional Bond Strength of Post space of Fiber-Reinforced post luted with Two Types of Cements at Different Testing Times

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Abstract

This in vitro study was carried out to investigate the effect of post space regions (coronal, middle and apical), the effect of time and the mode of polymerization (dual, self-cured) of the cements used on the bond strength between translucent fiber post and root dentin by using push-out test.

Forty eight extracted mandibular first premolars (single root) were instrumented with ProTaper Universal system files (for hand use) and obturated with gutta percha for ProTaper and AH26® root canal sealer following the manufacturer instructions, after 24 hours post space was prepared using FRC postec ® plus drills no.3 creating 8 mm depth post space. The prepared samples were randomly divided into two main groups (24 samples each) according to the used cement (Group M, self-cure, Multilink N) and (Group R, dual cure, Relyx U100). Then each group was subdivided into three groups (each group contains 8 samples) according to the testing time after cementation. (g M1: push out test after 24 hour of cementation with Multilink N), (g M2: push out test after one week of cementation with Multilink N),(g M3: push out test after two weeks of cementation with Multilink N), (g R1: push out test after 24 hours of cementation with RelyxU100), (g R2: push out test after one week of cementation with RelyxU100), (g R3: push out test after two weeks of cementation with RelyxU100). After cementation and incubation each root was sectioned horizontally into 3 slices (2 mm in thickness) represent the coronal, middle and apical regions of the post space. Push out bond strength test was performed and measured using a universal testing machine (Tinius-Olsen) at across head speed of 0.5 mm/min.

The results showed that regarding the root region, the bond strength values increased significantly apical to coronal region in both tested cements. For the effect of time, the bond strength values also significantly increased with time for both tested cements.For mode of polymerization, the self-cured resin cement Multilink N showed higher bond strength values.

In conclusion the retention of fiber post was affected by root region, mode of polymerization of the cements used and time elapsed after cementation of the post.