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Original Article

Effect of various chemical post surface treatments on the microtensile bond strength of fiber posts

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Abstract

Background/Objectives To evaluate the microtensile bond strength (μTBS) between epoxy-based or dimethacrylate-based fiber posts and resin cores after various post surface treatments.

Materials and methods Eighty DT light (DT) and forty FRC Postec Plus (FRC) posts were divided into 8 groups; group 1: silanization (S), group 2: silanization and application of bonding agent (SB), groups 3, 5, 7: etching with 37% phosphoric acid for 1 minute (P), 30% hydrogen peroxide for 10 minutes (H30), 35% hydrogen peroxide for 1 minute (H35), respectively, followed by S, groups 4, 6, 8: etched as in groups 3, 5, and 7, but followed by SB. The cores were built up with Multicore flow. Twenty stick-shaped specimens per group were randomly selected for the μTBS test with a universal testing machine. The failure modes were classified by stereomicroscope. The post surfaces after chemical treatment and cross-sectioned specimens of the fiber posts were examined by scanning electron microscope. The data were analyzed with two-way analysis of variances and Tukey's test.

Results Types of resin matrix and surface treatment and the interaction between them significantly affected μTBS ($p < 0.05$). The DT groups showed significantly higher bond strength than those of the FRC groups. Post surface treatment with SB, phosphoric acid or hydrogen peroxide followed by S or SB significantly increased the μTBS compared to S without other surface treatments.

Conclusion Post surface treatments and types of resin matrix of the fiber posts affected on the μTBS between fiber posts and resin composite cores.

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Keywords: *dimethacrylate; epoxy; fiber post; microtensile bond strength; surface treatment*

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