

INTISARI

Retainer dibutuhkan untuk membantu menstabilkan posisi gigi geligi selama proses reorganisasi jaringan periodontal berlangsung. Retainer FRC ortodonsi dikembangkan sebagai alternatif material estetika serta aman bagi pasien alergi terhadap nikel. E-glass fiber lebih sering digunakan sebagai retainer ortodonsi. Penelitian ini bertujuan untuk mengkaji pengaruh komposisi glass fiber non dental dan penambahan silane terhadap kekuatan geser FRC sebagai retainer ortodonsi.

Subyek penelitian terdiri dari 9 kelompok perlakuan dengan 3 jenis glass fiber yang berbeda yaitu glass fiber non dental A (LT, China), B (CMAX, China) dan C (HJ, China). Masing-masing glass fiber diberi perlakuan yang bervariasi yaitu tanpa penambahan silane, penambahan silane 1x dan 2x. Subyek penelitian direndam dalam akuades dan disimpan pada suhu 37°C selama 24 jam sebelum dilakukan uji kekuatan geser dengan menggunakan alat Universal Testing Machine. Hasil penelitian dianalisis variansi dua jalur dan post hoc Tukey untuk mengetahui perbedaan statistik masing-masing kelompok.

Hasil penelitian menunjukkan bahwa glass fiber non dental A dengan penambahan 2x silane memiliki rerata kekuatan geser tertinggi ($12,72 \pm 2,02$ MPa) sedangkan glass fiber non dental B tanpa penambahan silane memiliki rerata kekuatan geser terendah ($6,96 \pm 1,69$ MPa). Terdapat perbedaan bermakna antara komposisi fiber maupun penambahan silane terhadap kekuatan geser FRC ($p < 0,05$). Tidak terdapat perbedaan bermakna pada letak kegagalan FRC ($p > 0,05$). Berdasarkan hasil penelitian dapat disimpulkan bahwa komposisi SiO_2 dan Al_2O_3 yang tinggi pada glass fiber non dental serta penambahan silane dapat meningkatkan kekuatan geser FRC.

Kata kunci: fiber reinforced composite, glass fiber, komposisi glass fiber, silane, kekuatan geser.

ABSTRACT

Retainers are required to stabilize the position of the teeth to permit reorganization of periodontal tissue. FRC orthodontic retainer was developed as an alternative material aesthetic and safe for nickel allergic patients. E-glass fiber is commonly used as an orthodontic retainer. The purpose of this study was to assess the effect of non dental glass fiber composition and silanes addition on the shear bond strength of the FRC as an orthodontic retainer.

This study consisted of 9 treatment groups with three different types of non dental glass fiber, namely non dental glass fiber A (LT, China), B (C MAX, China) and C (HJ, China). Each glass fiber was given a variation treatment, without silanes, one time and two times of silanes addition. All the samples were stored in distilled water at 37°C for 24 hours and subsequently tested for shear strength by using Universal Testing Machine. The groups were submitted to two way ANOVA analysis of variance with Tukey post test to verify the statistical difference between groups.

The results showed that a non dental glass fiber A with two times of silanes addition has the highest shear bond strength (12.72 ± 2.02 MPa), meanwhile a non dental glass fiber B without silane addition has the lowest shear bond strength (6.96 ± 1.69 MPa). There were significant differences between the composition of glass fiber and the addition of silane toward the shear bond strength of FRC ($p < 0,05$). No significant differences in debonded locations of FRC ($p > 0,05$). Based on the results of this study concluded that the composition of the high SiO_2 and Al_2O_3 in the non dental glass fiber and the silanes addition can increase the shear bond strength FRC.

Key words: fiber reinforced composite, glass fiber, glass fiber composition, silanes, the shear bond strength.