

PENGARUH KETEBALAN PITA *POLYETHYLENE FIBER* DAN *QUARTZ GLASS FIBER* TERHADAP KETAHANAN FRAKTUR RESTORASI RESIN KOMPOSIT

Intisari

Sistem penguatan *fiber* merupakan teknik yang digunakan untuk meningkatkan daya tahan dan toleransi terhadap kerusakan pada suatu restorasi berbahan resin komposit. Tujuan penelitian ini adalah untuk mengetahui pengaruh ketebalan pita *fiber* (*polyethylene fiber* dan *quartz glass fiber*) sebagai penguat restorasi terhadap ketahanan fraktur resin komposit.

Limapuluh gigi premolar maksila yang telah dipreparasi kavitas kelas I, dengan diameter 4 mm serta kedalaman 3 mm. Spesimen penelitian dibagi dalam 3 kelompok, yaitu kelompok 1 direstorasi resin komposit dengan *polyethylene fiber*, kelompok 2 direstorasi resin komposit dengan *quartz glass fiber*, dan kelompok 3 (kontrol) direstorasi resin komposit tanpa *fiber*. Kelompok 1 *polyethylene fiber* dibagi menjadi kelompok 1a (1-lapis) dan 1b (2-lapis). Kelompok 2 *quartz glass fiber* dibagi menjadi kelompok 2a (1-lapis) dan 2b (2-lapis). Setelah dilakukan penyimpanan dalam inkubator pada suhu 37° selama 24 jam, dilakukan uji kompresi dengan *universal testing machine* kecepatan 0,5 mm/menit. Nilai ketahanan fraktur diukur dalam satuan Newton (N).

Hasil rerata didapatkan pada kelompok 1a=2267 N, 1b=1792 N, 2a=2809 N, 2b=2674 N, dan kelompok 3=2036 N. Analisis data menggunakan uji ANAVA dua jalur ($\alpha=0,05$) dan uji *Post Hoc Tukey* ($\alpha=0,05$). Hasil uji ANAVA dua jalur menunjukkan tidak terdapat perbedaan bermakna penambahan lapisan *fiber* namun terdapat perbedaan bermakna dari jenis *fiber* yang digunakan. Hasil uji *Post Hoc Tukey* menunjukkan rerata kelompok *quartz glass fiber* memiliki perbedaan bermakna, baik dengan kelompok *polyethylene fiber* maupun kelompok kontrol.

Kata kunci : *quartz glass fiber*, *polyethylene fiber*, pita *fiber*, ketahanan fraktur, resin komposit

THE EFFECT OF POLYETHYLENE AND QUARTZ GLASS FIBER RIBBON THICKNESS ON THE FRACTURE RESISTANCE OF COMPOSITE RESIN RESTORATION

Abstract

Fiber-reinforcement systems are techniques used to increase durability and damage tolerance in a composite resin restoration. The purpose of this study was to determine the effect of fiber ribbon thickness (polyethylene fiber and quartz glass fiber) as reinforcement on the fracture resistance of composite resins restoration.

Fifty maxillary premolars that have been prepared for class I cavity, with a diameter of 4 mm and a depth of 3 mm. The specimens were divided into 3 groups, group 1 restored composite resin with polyethylene fiber, group 2 restored composite resin with quartz glass fiber, and group 3 (control) restored composite resin without fiber. Group 1 polyethylene fiber is divided into groups 1a (1-layer) and 1b (2-layer). Group 2 quartz glass fiber is divided into groups 2a (1-layer) and 2b (2-layer). After storage in the incubator at 37° for 24 hours, a compression test with a universal testing machine speed of 0.5 mm/ minute was carried out. The value of fracture resistance is measured in Newtons (N).

The average results were obtained in group 1a=2267 N, 1b=1792 N, 2a=2809 N, 2b=2674 N, and group 3=2036 N. Data analysis used Two-way ANOVA test ($\alpha=0.05$) and Post Hoc Tukey test ($\alpha=0.05$). The results of two-way ANOVA test showed no significant difference in the addition of fiber layers but there were significant differences from the type of fiber used. The results of Post Hoc Tukey test showed that the average quartz glass fiber group had significant differences, both with the polyethylene fiber group and the control group.

Keywords: quartz glass fiber, polyethylene fiber, fiber ribbon, fracture resistance, composite resin