

PENGARUH PENAMBAHAN *NANOFIBER* SISAL (*Agave Sisalana*) PADA SILER RESIN EPOKSI TERHADAP KEKUATAN PELEKATAN *PUSH-OUT* BAHAN OBTURASI SALURAN AKAR

INTISARI

Nanofiber sisal dapat digunakan sebagai tambahan bahan pengisi untuk meningkatkan kekuatan pelekatan siler resin epoksi. Tujuan penelitian ini adalah untuk mengetahui pengaruh penambahan *nanofiber* sisal pada siler resin epoksi terhadap kekuatan pelekatan *push-out* bahan obturasi saluran akar pada dinding saluran akar.

Penelitian ini menggunakan 25 gigi premolar mandibula. Saluran akar dipreparasi menggunakan teknik *crown down*. Saluran akar diirigasi menggunakan NaOCl 2,5%, EDTA 17% dan dibilas dengan akuades steril setiap pergantian larutan. Spesimen penelitian dibagi ke dalam 5 kelompok perlakuan, masing-masing 5 gigi. Kelompok I diobturasi menggunakan siler *nanofiber* sisal 0%, kelompok II diobturasi menggunakan siler *nanofiber* sisal 0,25%, kelompok III diobturasi menggunakan siler *nanofiber* sisal 0,5%, kelompok IV diobturasi menggunakan siler *nanofiber* sisal 0,75%, kelompok V diobturasi menggunakan guta perca dan siler *nanofiber* sisal 1%. Setelah spesimen disimpan dalam inkubator pada suhu 37°C selama 7 hari, dilakukan pemotongan secara horizontal pada sepertiga apikal dengan ketebalan 2 mm. Potongan gigi kemudian dilakukan uji *push-out* dan dilakukan pengamatan tipe kegagalan dengan mikroskop stereo. Data kemudian dianalisis dengan uji ANAVA satu jalur dan uji *LSD pos hoc* dengan tingkat kepercayaan 95% ($\alpha=0,05$).

Hasil uji ANAVA satu jalur menunjukkan menunjukkan penambahan *nanofiber* sisal dalam siler resin epoksi memiliki pengaruh bermakna terhadap kekuatan pelekatan *push-out* bahan obturasi saluran akar. Tipe kegagalan dominan pada tipe kohesif.

Kesimpulan : Penambahan *nanofiber* sisal pada siler resin epoksi dapat meningkatkan kekuatan pelekatan *push-out* bahan obturasi saluran akar. Siler resin epoksi dengan penambahan *nanofiber* sisal pada kelompok konsentrasi 0,75% menghasilkan kekuatan pelekatan *push-out* bahan obturasi saluran akar paling tinggi diikuti dengan konsentrasi 0,5%.

Kata kunci : *nanofiber* sisal, kekuatan pelekatan *push-out*, siler resin epoksi.

THE EFFECT OF SISAL (*Agave Sisalana*) NANOFIBER IN RESIN EPOXY SEALER TO THE ROOT CANAL FILLING PUSH-OUT BOND STRENGTH

ABSTRACT

Sisal nanofiber can be used as an additional filler to increase the adhesion strength of the resin epoxy sealer. The aim of this study was to observe the effect of sisal nanofiber addition to epoxy resin sealer on push-out bond strength of root canal filling material against the root canals.

This study used 25 mandibular premolars. The root canals were prepared using crown down technique. The canals were irrigated with NaOCl 2,5%, EDTA 17% then were rinsed with aquadest steril. These specimen were divided randomly into five treatments group of five teeth each. Group I was obturated with 0% sisal nanofiber sealer, group II was obturated with 0,25% sisal nanofiber sealer, group III was obturated with 0,5% sisal nanofiber sealer, group IV was obturated with 0,75% sisal nanofiber sealer, group V was obturated with 1% sisal nanofiber sealer. After the specimens were stored in an incubator at 37°C for seven days, specimens were then horizontally sectioned in apical third with 2 mm thickness. Root sections were tested with push-out technique, and observed under a stereo microscope to determine the failure type. Data were analyzed with one-way ANOVA and LSD pos hoc at 95% confidence level ($\alpha=0,05$).

A one-way ANOVA test revealed that the addition of sisal nanofiber in epoxy resin sealer had a significant effect on the push-out bond strength of the obturation material against the root canals. The failure type was observed predominantly in the cohesive type and the lowest in the adhesive type.

Conclusion: The addition of sisal nanofiber to the epoxy resin sealer could increase the push-out bond strength of the obturation material against the root canals. Epoxy resin sealers with the addition of sisal nanofiber at a concentration group of 0.75% resulted in the highest push-out strength of root canal obturation materials followed by 0,5% concentration group.

Keyword : sisal nanofiber, push-out bond strength, epoxy resin sealer