

PENGARUH BAHAN DAN TEKNIK IRIGASI AKHIR TERHADAP KERAPATAN SILER BIOKERAMIK PADA SEPERTIGA APIKAL SALURAN AKAR

INTISARI

Salah satu fungsi penting dari irigasi saluran akar adalah menghilangkan *smear layer*, sehingga meningkatkan kerapatan apikal siler saluran akar. Penelitian dilakukan untuk membandingkan pengaruh irigasi akhir menggunakan EDTA 17%, *novel silver citrate*, dan kitosan nanopartikel 0,2% yang diagitasi secara manual, sonik, dan ultrasonik terhadap kerapatan siler biokeramik di sepertiga apikal saluran akar.

Empat puluh lima premolar mandibula dipreparasi kemudian dibagi menjadi tiga kelompok secara acak (n=15), kelompok 1 yang diirigasi akhir menggunakan EDTA 17%, kelompok 2 *novel silver citrate*, dan kelompok 3 kitosan nanopartikel 0,2%. Tiap kelompok dibagi menjadi tiga sub kelompok (n=5) dengan sub kelompok A menggunakan teknik agitasi manual, sub kelompok B diagitasi sonik, dan sub kelompok C diagitasi ultrasonik. Gigi diobtulasi dengan teknik *single cone* dan siler biokeramik. Pengamatan dilakukan menggunakan SEM perbesaran 120x. Kerapatan apikal siler diukur dengan membandingkan luas penampang area obturasi dengan luas penampang area preparasi di sepertiga apikal.

Hasil uji ANAVA dua jalur menunjukkan terdapat perbedaan yang signifikan pada bahan irigasi akhir terhadap kerapatan apikal siler biokeramik, tetapi tidak terdapat perbedaan yang signifikan pada teknik irigasi akhir serta interaksi bahan dan teknik irigasi akhir. Kesimpulan penelitian ini adalah terdapat pengaruh bahan irigasi terhadap kerapatan siler biokeramik di sepertiga apikal saluran akar, dan kitosan nanopartikel 0,2% menunjukkan kerapatan apikal yang tertinggi, dan tidak terdapat pengaruh teknik irigasi akhir serta interaksi bahan dan teknik irigasi akhir terhadap kerapatan siler biokeramik di sepertiga apikal saluran akar.

Kata kunci : Kerapatan apikal siler, irigasi saluran akar, *novel silver citrate*, kitosan nanopartikel 0,2%, teknik agitasi.

EFFECT OF FINAL IRRIGATION MATERIALS AND TECHNIQUES ON APICAL SEALING ABILITY OF BIO-CERAMIC SEALER IN THE APICAL THIRD OF ROOT CANAL

ABSTRACT

One crucial function of root canal irrigation is eliminating the smear layer, thus increasing the apical sealing ability of endodontic sealers. This study was conducted to compare the effect of final irrigation using 17% EDTA, novel silver citrate, and 0.2% chitosan nanoparticles agitated manually, sonically, and ultrasonically on the apical sealing ability of bioceramic sealers in the apical third.

Forty-five mandibular premolars were prepared and were then randomly divided into three experimental groups (n=15). Group 1 used 17% EDTA as the final irrigation material, group 2 used novel silver citrate, and group 3 used 0.2% nanoparticle chitosan. Each group was divided into three subgroups (n=5), with subgroup A was using manual agitation technique, subgroup B using sonic agitation, and subgroup C using ultrasonic agitation. All teeth were obturated using single cone and bioceramic sealers. Observations were made using 120x magnification SEM. The sealer's apical sealing ability was measured by comparing the cross-sectional area of the obturation area with the cross-sectional area of the preparation area in the apical third.

Results of the two-way ANOVA test showed that there was a significant difference in final irrigation material ($p < 0.05$), but there was no significant difference in final irrigation technique and interaction of final irrigation material and technique ($p > 0.05$). This study concluded that irrigation materials affected the apical sealing ability of bioceramic sealers in the apical third of the root canal, and 0.2% chitosan nanoparticles produced the highest apical sealing ability than other groups. There is no difference in the effect of the final irrigation technique and the interaction of materials and final irrigation technique on the apical sealing ability of bioceramic sealers in the apical third of the root canal.

Keywords : Apical sealing ability, endodontic irrigants, novel silver citrate, 0.2% chitosan nanoparticles, agitation techniques.