

**PERBANDINGAN KEBOCORAN MIKRO PENUTUPAN PERFORASI
AKAR GIGI MENGGUNAKAN *BIOACTIVE CALCIUM SILICATE
CEMENT* DAN *ENHANCED RESIN MODIFIED GLASS IONOMER
CEMENT* PADA WAKTU PENGAMATAN YANG BERBEDA**

INTISARI

Kegagalan perawatan saluran akar dapat disebabkan komplikasi saat proses perawatan saluran akar seperti perforasi. Perforasi yang terjadi pada area akar, akan menimbulkan komunikasi antara sistem saluran akar dengan jaringan periradikular yang dapat menurunkan prognosis perawatan. Keberhasilan penanganan perforasi juga bergantung pada material penutup perforasi dalam mencegah terjadinya kebocoran mikro. Material yang digunakan salah satunya dengan material bioaktif seperti *bioactive calcium silicate cement* (BCSC) dan *enhanced resin modified glass ionomer* (ERMGIC). Penelitian ini bertujuan untuk membandingkan kebocoran mikro BCSC dan ERMGIC pada waktu pengamatan yang berbeda sebagai material penutup perforasi akar gigi

Penelitian dilakukan pada 30 gigi premolar pasca pencabutan, tidak ada karies dan berakar tunggal dibagi menjadi 2 kelompok yang berbeda. Simulasi perforasi dibuat 2 mm dari *cervical line* menggunakan bur *round end silindris fissure*. Setelah dilakukan penutupan perforasi dengan BCSC dan ERMGIC, sampel dibagi lagi menjadi 3 subkelompok waktu perendaman yang berbeda (24 jam, 7 hari dan 28 hari) dalam *Simulated Body Fluid* di dalam inkubator bersuhu 37°C. Sampel yang telah mencapai waktu perendaman diangkat dan dikeringkan untuk dilanjutkan dengan perendaman menggunakan *methylene blue* 1% selama 24 jam. Sampel selanjutnya dicuci dalam air mengalir dan dikeringkan, setelah itu sampel dibelah menjadi 2 bagian dan dilakukan pengamatan menggunakan mikroskop *compound* perbesaran 50x. Hasil pengamatan didapatkan dilakukan analisis data dengan uji ANAVA dua jalur dengan tingkat kepercayaan 95%.

Hasil uji ANAVA dua jalur didapatkan hasil tidak terdapat perbedaan signifikan antara jenis bahan dan waktu pengamatan terhadap kebocoran mikro penutupan perforasi akar gigi ($p>0,05$). Interaksi jenis material dan waktu material juga tidak terdapat perbedaan yang signifikan ($p>0,05$). Kesimpulan penelitian ini ialah jenis bahan dan waktu pengamatan tidak berpengaruh terhadap kebocoran mikro sebagai material penutup perforasi akar gigi.

Kata Kunci: kebocoran mikro, material penutup perforasi, perforasi

BIOACTIVE CALCIUM CILICATE CEMENT AND ENHANCED RESIN MODIFIED GLASS IONOMER CEMENT MICROLEAKAGE ROOT PERFORATIONS SEALING COMPARISON AT DIFFERENT TIME OF OBSERVATION

ABSTRACT

Complications during the root canal therapy, such as perforation, might lead to the failure of the root canal therapy. A perforation in the root area will cause communication between the root canal system and the periradicular tissue, which may worsen the prognosis of the treatment. The perforated repair material's ability to stop microleakage is also crucial to the success of the perforation treatment. Bioactive materials are used, such bioactive calcium silicate cement (BCSC) and enhanced resin modified glass ionomer (ERMGIC). This study compares the microleakage of BCSC and ERMGIC as a material for filling tooth root perforations at different observation times.

The study was conducted on 30 post-extraction premolars, no caries and single root were divided into 2 different groups. The perforation simulation was created using a cylindrical fissure round end bur at a distance of 2 mm from the cervical line. Following the use of BCSC and ERMGIC to fill the perforations, the samples were separated into three subgroups and immersed for varying lengths of time (24 hours, 7 days, and 28 days) in Simulated Body Fluid in an incubator set at 37°C. As soon as samples reach the immersion period, they are taken out, dried, then immersed in 1% methylene blue for 24 hours. The sample was then dried and rinsed under running water. It was then divided into two parts and examined under a microscope at a magnification of 50x. A two-way ANOVA test with a 95% confidence level was used to assess the observational results.

The two-way ANOVA test results demonstrated that there was no significant variation in the microleakage of root perforation closure depending on the type of material and the time of observation ($p > 0.05$). Material type and material time do not differ significantly from one another either ($p > 0.05$). This study found that microleakage, a material used to patch tooth root perforations, is unaffected by the types of materials used or the length of time that it is seen.

Key Words: microleakage, perforation, perforated repair materials,