

Potensi Biomineralisasi Siler Berbasis Kalsium Silikat terhadap Permukaan Dentin Saluran Akar = Biomineralization Potential of Calcium Silicate Based Sealer on Root Canal Dentine

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Abstrak

lingkungan kondusif untuk proses penyembuhan. Biological sealing dapat diperoleh melalui sifat bioaktivitas suatu material, salah satunya kemampuan biomineralisasi material, yaitu kemampuan material dalam membentuk apatite like layer pada permukaan ketika berkontak dengan cairan fisiologis.

Karakteristik tersebut dapat diperoleh dari material bioaktif, seperti kalsium silikat. Siler berbasis kalsium silikat pre- mixed saat ini telah banyak berkembang, di antaranya adalah Ceraseal® (Metabiomed, Korea) dan AH Plus® Bioceramic (Dentsply, USA). Komposisi masing-masing siler yang bervariasi menghasilkan perbedaan karakteristik, salah satunya kemampuan biomineralisasi. Tujuan: Menganalisis potensi biomineralisasi antara siler berbasis kalsium silikat pada dentin saluran akar dengan perendaman phosphate buffered saline (PBS). Metode: Siler berbasis kalsium silikat Ceraseal® dan AH Plus® Bioceramic diaplikasikan ke dalam dentin saluran akar gigi premolar yang telah dilakukan prosedur preparasi saluran akar, dan dilanjutkan dengan perendaman dalam PBS selama 14 hari. Analisis biomineralisasi dilakukan dengan menganalisis pembentukan lapisan apatit setelah 14 hari perendaman melalui penghitungan ketebalan deposit lapisan apatit menggunakan Scanning Electron Microscope (SEM), serta peningkatan pH larutan yang dihitung pada waktu observasi hari-ke 0, 7 dan 14 menggunakan pH-meter. Hasil: Terdapat perbedaan deposisi apatit pada interfacial layer antara Ceraseal® dan AH Plus® Bioceramic dalam waktu observasi 14 hari. Terdapat perbedaan bermakna antara nilai pH Ceraseal® dan AH Plus® Bioceramic pada waktu observasi 7 dan 14 hari.

.....Background: Endodontic treatment currently refers to the concept of biological sealing to form an environment conducive to the healing process. Biological sealing can be obtained through the bioactivity properties of a material, one of which is its biomineralization ability to form an apatite-like layer on the surface when in contact with physiological fluids. This characteristic is present in bioactive materials like calcium silicate. There are currently many developed pre-mixed calcium silicate based sealers, including Ceraseal® (Metabiomed, Korea) and AH Plus® Bioceramic (Dentsply, USA). The variation in their composition results in different characteristics, including biomineralization ability. Objective: To analyze the biomineralization potential of calcium silicate-based sealers on root canal dentine by phosphate-buffered saline (PBS) immersion. Methods Calcium silicate based sealer Ceraseal® and AH Plus® Bioceramic were applied to the root canal dentin of premolar teeth that had undergone root canal preparation procedures. The samples were then immersed in PBS for 14 days. Biomineralization analysis was performed by measuring the apatite layer thickness formed after 14 days of immersion using a Scanning Electron Microscope (SEM). Additionally, the pH of the solution was measured at observation times of 0,7 and 14 days using a digital pH-meter. Results: There was a significant differences in in apatite deposition at the interfacial layer between Ceraseal® and AH Plus® Bioceramic during 14 days of observation. Furthermore, there was a significant difference in pH values between Ceraseal® and AH Plus® Bioceramic at 7 and 14 days of observation.