

# Pengaruh Penambahan Fluor dalam Sistem PILP terhadap Perubahan Topografi Dinding Tubulus Dentin dan Persentase Fluoroapatit = Effect of Fluorine Addition in the PILP System on Topographical Changes of the Dentine Tubular Walls and the Percentage of Fluoroapatite

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## Abstrak

Latar Belakang: Remineralisasi dentin dapat dicapai melalui beberapa metode, di antaranya secara Guided Tissue Remineralization (GTR) dalam sistem Polymer-Induced Liquid Precursor (PILP). Remineralisasi secara GTR terbukti dapat remineralisasi affected dentin dengan membentuk mineral intrafibrillar dan ektrafibrillar. Melalui sistem PILP, kristal terbentuk dengan ukuran kecil sehingga remineralisasi lebih banyak terjadi secara intrafibrillar. Penambahan fluor dalam sistem PILP diharapkan dapat membentuk kristal fluoroapatit yang berukuran lebih besar dan mampu menyempurnakan remineralisasi hingga ke ektrafibrillar. Penelitian yang ada selama ini hanya berfokus pada permukaan dentin, sedangkan belum terdapat penelitian untuk membuktikan remineralisasi dengan penambahan fluor yang terjadi pada dinding tubulus dentin. Tujuan: Mengetahui pengaruh penambahan fluor 5ppm dan 25ppm dalam sistem PILP terhadap perubahan topografi dinding tubulus dentin dan persentase fluoroapatit. Metode: Sampel blok dentin terdemineralisasi direndam pada larutan remineralisasi dengan penambahan 5ppm dan 25ppm fluor. Sampel blok dentin kemudian akan dipotong lintang menggunakan metode fraktur lalu diamati dan dianalisis menggunakan uji FE-SEM dan XRD. Hasil: Terjadi perubahan topografi pada dinding tubulus dentin setelah dilakukan remineralisasi melalui proses PILP dengan penambahan 5ppm dan 25ppm fluor selama 14 hari yang dievaluasi secara deskriptif menggunakan FE-SEM. Hasil analisis XRD menunjukkan tidak ada perbedaan bermakna secara statistik penambahan fluor pada larutan remineralisasi PILP terhadap persentase fasa mineral fluoroapatit, namun secara substansi terjadi peningkatan persentase fluorapatit. Kesimpulan: Penambahan fluor dalam sistem PILP berpengaruh terhadap perubahan topografi dinding tubulus dentin dan persentase fluoroapatit.

..... Background: Dentine remineralization can be achieved through several methods, including Guided Tissue Remineralization (GTR) in the Polymer-Induced Liquid Precursor (PILP) system. GTR remineralization has been shown to remineralize affected dentin by forming intrafibrillar and extrafibrillar minerals. Through the PILP system, crystals are formed with small sizes so that more remineralization occurs intrafibrillarly. The addition of fluorine in the PILP system is expected to form larger fluoroapatite crystals and be able to complete the remineralization to extrafibrillar. Existing research so far has only focused on the dentin surface, although there has been no research to prove remineralization with the addition of fluorine that occurs in the dentine tubule walls. Objective: To determine the effect of adding 5ppm and 25ppm fluorine in the PILP system on changes in the topography of the dentinal tubule walls and the percentage of fluoroapatite. Methods: Demineralized dentine block samples were immersed in remineralization solution with the addition of 5 ppm and 25 ppm fluorine. The dentine block samples will

then be cross-sectioned using the fracture method and then observed and analyzed using the FE-SEM and XRD tests. Results: Topographical changes occurred in the dentinal tubule walls after remineralization through the PILP process with the addition of 5ppm and 25ppm fluorine for 14 days which were evaluated descriptively using FE-SEM. The results of the XRD analysis showed that there was no statistically significant difference in the addition of fluorine to the percentage of fluoroapatite mineral phase in the addition of fluorine to the percentage of fluoroapatite, but in substance there was an increase in the percentage of fluorapatite. Conclusion: The addition of fluorine in the PILP system affected the topography of the dentinal tubule walls and the percentage of fluoroapatite.