Pengaruh Deproteinisasi Smear Layer Menggunakan Papain dan Restorasi Adhesif S-PRG terhadap Ketebalan Acid-Base Resistant Zone (ABRZ) pada Dentin = The Effect of Smear Layer Deproteinization Using Papain and S-PRG Adhesive Restoration on the Thickness of the Acid-Base Resistant Zone (ABRZ) in Dentin

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Abstrak

Latar Belakang: Acid-Base Resistant Zone (ABRZ) merupakan "super dentin" yang terbentuk di bawah lapisan hibrida, yang diharapkan dapat menahan demineralisasi dari acid-base challenge oleh mikroorganisme dalam karies sekunder. Teknik deproteinisasi smear layer menggunakan papain telah terbukti meningkatkan penetrasi monomer adhesif self-etch, sedangkan restorasi adhesif S-PRG terbukti melepaskan multi-ion, yang keduanya dapat membentuk ketebalan ABRZ. Belum ada penelitian yang menggabungkan kedua faktor ini dalam memberikan pengaruh terhadap ketebalan ABRZ. Tujuan: Untuk mengetahui pengaruh deproteinisasi smear layer menggunakan papain dan restorasi adhesif S-PRG terhadap ketebalan Acid-Base Resistant Zone (ABRZ) pada dentin. Metode: 20 gigi geraham molar tiga yang bebas karies di potong dibagian mid-korona menghasilkan lempeng dentin setebal 1 mm, secara acak dibagi menjadi empat kelompok, dilakukan restorasi membentuk dentin sandwich (n=20) yaitu: (1) Non deproteinisasi dan non S-PRG (ND-NS), (2) Non deproteinisasi dan S-PRG (ND-S), (3) Deproteinisasi dan non SPRG (D-NS), (4) Deproteinisasi dan S-PRG (D-S). Seluruh sampel dilakukan acid-base challenge. Setelah itu dilakukan persiapan sampel untuk uji SEM untuk melihat perubahan morfologi dan ketebalan ABRZ pada interface adhesif-dentin. Hasil: Terdapat peningkatan rata-rata ketebalan ABRZ dengan deproteinisasi smear layer menggunakan papain dan restorasi adhesif menggunakan S-PRG pada dentin. Kesimpulan: Deproteinisasi smear layer menggunakan papain dan restorasi adhesif menggunakan S-PRG bekerja secara sinergis meningkatkan ketebalan ABRZ pada dentin.

.....Background: The Acid-Base Resistant Zone (ABRZ) is a 'Super dentin" layer formed beneath the hybrid layer, anticipated to resist demineralization caused by acid-base challenges from microorganisms in secondary caries. The technique of smear layer deproteinization using papain using papain has been demonstrated to enhance the penetration of self-etch adhesive monomers, while S-PRG adhesive restorations have been shown to release multi-ions, both contributing to ABRZ thickness. However, no research has yet combined these factors to assess their collective influence on ABRZ thickness. Objective: To investigate the impact of smear layer deproteinization using papain and S-PRG adhesive restoration on the thickness of the Acid-Base Resistant Zone (ABRZ) in dentin. Methods: Twenty caries-free third molar teeth were sectioned at the mid-coronal level to produce dentin discs with a thickness of 1 mm, then randomly assigned to four groups and restored to form dentin sandwiches (n=20): (1) non-deproteinization and non-S-PRG (ND-NS), (2) Non-deproteinization and S-PRG (ND-S), (3) Deproteinization and non-S-PRG (D-NS), (4) Deproteinization and S-PRG (D-S). All samples underwent acid-base challenges. Subsequently, sample preparation was conducted for SEM examination to observe changes in morphology and ABRZ thickness at the adhesive-dentin interface. Results: There was an increase in the average ABRZ thickness with smear layer deproteinization using papain and adhesive restoration using S-PRG on dentin.

Conclusion: Deproteinization of the smear layer using papain and adhesive restoration using S-PRG synergistically increase ABRZ thickness in dentin.