PENGARUH FREKUENSI *BLEACHING* HIDROGEN PEROKSIDA 35% DAN APLIKASI SODIUM ASKORBAT 35% DENGAN DAN TANPA KOMBINASI SURFAKTAN TERHADAP KEBOCORAN MIKRO RESTORASI RESIN KOMPOSIT

INTISARI

Perawatan *bleaching* intrakoronal gigi dengan hidrogen peroksida (HP) 35% menyisakan radikal bebas yang mengganggu polimerisasi resin komposit. Pengulangan bahan *bleaching* akan meningkatkan radikal bebas dalam tubulus dentin sehingga memperbesar kebocoran mikro resin komposit. Salah satu teknik penghilangan residu radikal bebas dengan antioksidan sodium askorbat (SA) 35%. Penambahan surfaktan meningkatkan efektivitas sodium askorbat dengan membantu molekul sodium askorbat berpenetrasi ke dalam dentin dan menurunkan kebocoran mikro pada restorasi resin komposit. Penelitian ini bertujuan untuk mengetahui pengaruh frekuensi *bleaching* dan penambahan surfaktan dalam sodium askorbat 35% pasca *bleaching* dengan ydrogen peroksida 35% terhadap kebocoran mikro resin komposit.

Penelitian ini menggunakan 32 gigi premolar. Bahan *bleaching* HP 35% diaplikasikan pada kavitas gigi selama 5 hari (*bleaching* 1x) dan 10 hari (*bleaching* 2x). Sampel dibagi menjadi 4 kelompok perlakuan. Kelompok 1A *bleaching* 1x, diaplikasi SA 35% selama 5 menit kemudian ditumpat ; kelompok 1B *bleaching* 1x, diaplikasikan SA 35% kombinasi surfaktan selama 5 menit kemudian ditumpat; Kelompok 2A *bleaching* 2x, diaplikasikan SA 35% selama 5 menit kemudian ditumpat; dan kelompok 2B *bleaching* 2x, diaplikasikan SA 35% kombinasi surfaktan selama 5 menit kemudian ditumpat; seluruh sampel direndam pada saliva buatan dan diinkubasi selama 1 minggu. Sampel penelitian selanjutnya ditutup dengan cat kuku dan *wax* lalu direndam metilen biru 2% selama 24 jam kemudian dibelah longitudinal, diukur kebocoran mikro dengan perbesaran 8x.

ANAVA dua jalur menunjukkan terdapat perbedaan signifikan frekuensi *bleaching* dan kombinasi surfaktan pada SA terhadap kebocoran mikro resin komposit ($p<0,05$). Kesimpulan penelitian adalah frekuensi *bleaching* dan penambahan surfaktan mempengaruhi kebocoran mikro resin komposit.

Kata Kunci : hidrogen peroksida; kebocoran mikro; sodium askorbat; surfaktan

THE EFFECT OF BLEACHING FREQUENCY USING 35% HYDROGEN PEROXIDE AND APPLICATION OF 35% SODIUM ASCORBATE WITH AND WITHOUT SURFACTANT ADDITION ON MICROLEAKAGE OF COMPOSITE RESIN RESTORATION

ABSTRACT

Intracoronal bleaching procedure using 35% hydrogen peroxide (HP) produce free radicals residue which interfere composite resins polymerization. Repeated bleaching procedure would increase the amount of free radicals residue in dentinal tubules thereby increasing the risk of resin composite microleakage. 35% Sodium Ascorbate (SA) antioxidant could be applied to remove free radical residues. The addition of surfactants could increase the effectiveness of 35% SA by assisting the penetration of SA molecule thus reducing the risk of microleakage in composite resin restorations. The aim of this study is to determine the effect of bleaching frequency and the addition of surfactants in 35% Sodium Ascorbate application after bleaching procedure using 35% hydrogen peroxide on microleakage of composite resin restoration.

This study used 32 premolar teeth. 35% HP bleaching material was applied into tooth cavities for 5 days (1x bleaching) and 10 days (2x bleaching). Samples were then divided into 4 treatment groups. Group 1A (1x bleaching and 35% SA application); group 1B (1x bleaching and application of surfactant added 35% SA); Group 2A (2x bleaching and 35% SA application); and group 2B (2x bleaching and application of surfactant added 35% SA). After application of antioxidant, samples were restore with composite resin. Samples were incubated in artificial saliva for 1 week. Samples were coated with nail polish then followed by sticky wax. All samples were then immersed in methylene blue 2% for 1 day. Samples were then cut longitudinally and microleakage measurements were carried out using 8x magnification stereomicroscope.

Two-way ANAVA analysis showed a significant difference in bleaching frequency and surfactant addition to SA on microleakage of composite resin restoration ($p<0,05$). The conclusion is bleaching frequency and the addition of surfactants affect the microleakage of composite resin restoration.

Keywords: Hydrogen peroxide; microleakage; sodium ascorbate; surfactant