INTISARI

Fissure sealing merupakan tindakan penutupan pit dan fisur yang dalam pada gigi dengan *sealant* untuk mencegah karies. Kegagalan *fissure sealing* sering terjadi karena lemahnya adhesi antara material dan gigi, sehingga terjadi kebocoran tepi. Penelitian ini bertujuan untuk mengetahui pengaruh metode preparasi dengan bur dan aplikasi asam terhadap kebocoran tepi *fissure sealant* RMGIC.

Dua puluh empat gigi premolar maksila cabutan dibagi menjadi empat kelompok perlakuan. Kelompok 1 dilakukan *enameloplasty* dengan bur bulat dan aplikasi asam fosfat 37%, kelompok 2 dengan bur tapered dan asam fosfat 37%, kelompok 3 dengan bur bulat dan asam poliakrilat 10%, dan kelompok 4 dengan bur *tapered* dan asam poliakrilat 10%. Aplikasi asam fosfat 37% dilakukan selama 15 detik, sedangkan asam poliakrilat 10% selama 20 detik, sesuai ketentuan pabrik, sebelum dilakukan *sealing* dengan RMGIC. Gigi disimpan dalam saliva buatan selama 24 jam, selanjutnya *thermocycling* 100 siklus. Gigi direndam dalam larutan metilen biru 1% selama 24 jam, kemudian dipotong melintang. Pengamatan panjang kebocoran tepi dengan mikroskop stereo perbesaran 8 kali dan diukur dengan aplikasi *Image Raster*. Data dianalisis dengan Anava satu jalur.

Perbedaan rerata kebocoran tepi ditemukan antar kelompok perlakuan ($F=562,14$; $p<0,05$). Rerata kebocoran tepi terdalam pada kelompok preparasi bur bulat dan asam poliakrilat 10% (1657,87 ± 78,08) dan terdangkal pada kelompok preparasi bur bulat dan asam fosfat 37% (500,70 ± 38,55). Disimpulkan bahwa preparasi bur bulat dan asam fosfat 37% menghasilkan kebocoran tepi terdangkal dan direkomendasikan sebagai metode preparasi *fissure sealant* RMGIC.

Kata kunci: kebocoran tepi, bur bulat, bur *tapered*, asam fosfat 37%, asam poliakrilat 10%, *fissure sealing* RMGIC

ABSTRACT

Fissure sealing is preventive caries treatment by covering the deep pit and fissure. Failures of this treatment may be caused by the sealant resulting in microleakage. The aim of this study was to determine the effect of preparation method with a bur and acid application on the RMGIC fissure sealant microleakage.

The experimental laboratory study was performed using 24 non carious maxillary premolar teeth which were randomly assigned to four treatment groups. In group 1 and 3, the fissures were widened with round bur, while group 2 and 4 using tapered bur. Then, the fissures in group 1 and 2 were conditioned with 37% phosphoric acid for 15 s, while group 3 and 4 conditioning with 10% polyacrylic acid for 20 s. The sealant (RMGIC) was applied on the occlusal fissure of all teeth, according to the manufacturer's recommendations. The teeth were stored in artificial saliva for 24 hours, then thermocycled for 100 cycles. All groups were immersed in a 1% methylene blue solution and cut crosswise. The teeth showing microleakage by using stereo microscope 8 times magnification and measured with Image Raster application. The means microleakage of all groups were compared using one-way Anova.

It was found a significant difference in the mean of microleakage among the treatment groups ($F=562.14$; $p<0.05$). The fissure sealant using round bur and 37% phosphoric acid preparation showed the lowest mean microleakage value (500.70 ± 38.55) and the highest was round bur and 10% polyacrylic acid group (1657.87 ± 78.08). The conclusion was that the use of round bur and 37% phosphoric acid showed the least microleakage and was recommended for RMGIC fissure sealant preparation method.

Keywords : microleakage, round bur, tapered bur, polyacrylic acid, phosphoric acid, fissure sealant RMGIC.