

**PENGARUH JENIS PERAWATAN LESI *WHITE SPOT* TERHADAP KEKUATAN GESER DAN MORFOLOGI ENAMEL (Penelitian Eksperimental Laboratoris)**

**ABSTRAK**

**Latar belakang:** Pada gigi dengan lesi *white spot*, terjadi penurunan kekuatan cekat breket ortodonti yang menyebabkan breket mudah terlepas saat perawatan. Peningkatan prevalensi karies pasca insersi peranti cekat ortodonti juga menyebabkan lesi *white spot* perlu segera dirawat sebelum dilakukan insersi peranti.

**Tujuan:** Penelitian ini bertujuan untuk mengetahui pengaruh perawatan lesi *white spot* (*fluoride varnish*, *CPP-ACPF varnish*, dan infiltrasi resin) terhadap kekuatan geser breket dan morfologi enamel.

**Metode:** Sebanyak 60 sampel gigi *bovine* dibersihkan dan dipotong, kemudian dibagi dalam 5 kelompok. Kelompok 1 merupakan kelompok kontrol tanpa perlakuan. Pada kelompok lainnya, sampel direndam dalam larutan demineralisasi selama 96 jam. Sampel pada kelompok 2 hanya dilakukan demineralisasi kemudian disimpan dalam saliva buatan. Dilakukan perawatan lesi *white spot* pada sampel kelompok lain, yaitu *fluoride varnish* (kelompok 3);, *CPP-ACPF varnish* (kelompok 4), dan infiltrasi resin (kelompok 5). Kemudian, breket dipasang dengan bahan *bonding* RMGIC pada seluruh sampel, dan dilakukan uji kekuatan geser. Penilaian sisa adesif dengan skor ARI dilakukan setelah uji kekuatan geser. Pengamatan morfologi enamel (diameter porositas dan panjang retakan) dengan SEM dilakukan sebelum penempelan breket dan setelah proses *debonding* dan *polishing*.

**Hasil:** Aplikasi *varnish* menurunkan kekuatan geser secara signifikan, sedangkan proses demineralisasi dan aplikasi infiltrasi resin sedikit meningkatkan kekuatan geser tetapi tidak signifikan. Nilai ARI tertinggi didapatkan setelah aplikasi infiltrasi resin. Seluruh perlakuan mampu menutup porositas dan retakan yang terbentuk setelah proses demineralisasi, tetapi ukuran porositas dan panjang retakan tidak berubah.

**Kesimpulan:** Perawatan lesi *white spot* dengan *varnish* menurunkan kekuatan geser secara signifikan, sedangkan resin infiltrasi meningkatkan kekuatan geser. Aplikasi *varnish* mampu memperbaiki kondisi morfologi enamel, tetapi aplikasi resin infiltrasi menyebabkan kerusakan enamel yang lebih parah setelah *debonding* dan *polishing*.

**Kata Kunci:** perawatan lesi *white spot*, kekuatan geser, morfologi enamel

***EFFECT OF TYPES OF WHITE SPOT LESION TREATMENT ON  
ORTHODONTIC SHEAR STRENGTH AND ENAMEL MORPHOLOGY  
(An In-Vitro Study)***

***ABSTRACT***

***Background:*** Decreased orthodontic shear strength on enamel surface with white spot lesion makes brackets fall off easily during the course of treatment. White spot lesion needs to be treated prior to fixed appliance insertion as caries prevalence increases during orthodontic treatment.

***Purpose:*** To evaluate the effect of fluoride varnish, CPP-ACPF varnish, and resin infiltration as white spot lesion treatment on orthodontic shear strength and enamel morphology.

***Method:*** Sixty bovine mandible incisors were cleaned, then divided into 5 groups. No treatment was applied on group 1 (control). On other groups, samples were immersed in demineralization solution for 96 hours. Samples on group 2 were demineralized, then stored in artificial saliva. White spot lesion treatments were performed on the other 3 groups: fluoride varnish (group 3), CPP-ACPF varnish (group 4), and resin infiltration (group 5). After bracket bonding with RMGIC on all samples, their shear bond strength was evaluated. Adhesive remnant index (ARI) was observed by using digital photo. Enamel morphology (porosity diameter and crack length) was evaluated using Scanning Electron Microscope (SEM) before bracket bonding and after debonding and polishing process.

***Results:*** Varnish application significantly decreased orthodontic shear strength, while demineralization process and resin infiltration insignificantly increased shear strength. The highest ARI score was found after treatment with resin infiltration. All treatments could seal enamel porosity and cracks formed after demineralization process, but there was no change on porosity diameter and crack length.

***Conclusion:*** Pretreatment with fluoride and CPP-ACPF varnish lowers the shear strength, while resin infiltration insignificantly strengthens it. Varnish application enables good enamel morphology condition even after debonding and polishing, but resin infiltration causes further enamel damage.

***Keywords:*** white spot lesion treatment, orthodontic shear strength, enamel morphology