

CFAO Graduate Student Posterboard Abstracts

University of Western Ontario

AN EVALUATION OF NOVEL APPROACHES TO ANTIMICROBIAL CONTROL OF ORAL BIOFILMS

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Introduction: *Streptococcus mutans* (SM) and *Haemophilus actinomycetemcomitans* (HA) are important pathogens in the development of caries and periodontitis. This thesis investigated several novel strategies aimed at preventing their growth and biofilm forming capacity.

Methods: SM and HA biofilms were challenged with numerous antimicrobial solutions and assessed for biofilm retention and bacterial survival. Antibiotic susceptibility profiling was performed and the ability of antimicrobial-impregnated silicone disks and *Streptococcus salivarius* probiotic strains K12 and M18 to inhibit the pathogens was investigated.

Results: Silicone oil effectively disrupted HA biofilms but did not affect either pathogen's viability. Neither HA nor SM showed any relevant antibiotic resistance and polyvinyl siloxane impregnated with triclosan and chlorhexidine demonstrated antibacterial activity against both strains. Finally, both probiotics inhibited the growth of HA but not SM via differential antagonism.

Conclusions: This work supports the widening application of silicone-based products and probiotics in maintaining oral health and fighting disease.

Keywords: *Actinomycetemcomitans*, *Streptococcus mutans*, *Streptococcus salivarius*, K12, M18, Biofilm, Oral, Antimicrobial

IN VITRO COMPARISON OF TWO SELF-ETCHING PRIMERS USING AN INDIRECT BONDING METHOD

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Introduction: Indirect bonding allows brackets to be positioned more accurately and decreases clinical chair time. Another step in the bonding process that decreases chair time is the use of a self-etching primer (SEP). There is a paucity of information in the literature regarding how indirect bonding in combination with an SEP affect bond strength.

Purpose: To determine if there is a difference in shear bond strength (SBS) between two SEP products (3M Transbond Plus SEPTM, Reliance SEPTM) in an indirect bonding method, compared to an indirect bonded conventional acid etch (AE) control and a direct bonded AE control.

Materials And Methods: One hundred ninety two human bicuspids were arranged in acrylic bases mimicking human arch forms, with four arches per group. Teeth were bonded, stored for 30 days, thermocycled and debonded with an Instron universal testing machine. Using light microscopy, a modified Adhesive Remnant Index (ARI) was used to describe mode of bracket failure and presence of enamel fracture (EF).

Results And Conclusions: The mean SBS value for all groups was above an accepted minimum value required for orthodontic treatment. Significant differences were found ($p < 0.5$) among the four groups. The direct bonded AE control group had significantly higher bond strengths than the other three indirect bonded groups. The distribution of ARI scores among the four groups was not significantly different; all groups experienced mainly cohesive bond failures. The incidence of EF was highest in the direct bonded AE group and the other three groups had a similar number of enamel fractures.