

**PENETRATION EFFICACY OF A CARIES
INFILTRANT RESIN USING DIFFERENT
ETCHING AND APPLICATION TIMES**

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقَالَ إِنِّي ذَاهِبٌ إِلَىٰ رَبِّي سَيَهْدِينِ

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Dedication

Speechless I am, can hardly find the words that can express how much I loved, love and will always love, respect and appreciate all the people I met throughout the journey.

I dedicate this small effort to all the blessings I have especially my mother, my brother and at last but not least my son "Malik" the greatest blessing I have wishing that you would be proud of your father

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Introduction

Incipient caries lesions osculate major challenges; as early caries detection, means of control and means of progression prevention. During development of incipient subsurface lesions minerals are dissolved out of the enamel, resulting in increased porosities that appear clinically as "white spot" lesions **(Paris et al., 2007_a)**. These tiny pores within the enamel body act as diffusion pathways for acids and minerals therefore, enable further dissolution of enamel at advancing front of lesion **(Meyer-Leuckel et al., 2005)**.

Caries infiltration is a novel treatment option of these lesions and might bridge the "gap" between non operative and operative options. Thus may possibly postponing first placement of restoration **(Paris et al., 2010_a)**. This treatment aims to occlude pores within lesion body with resinous material, which act as diffusion pathways for acids and dissolved minerals thus sealing the lesion **(Paris et al., 2009)**.

It was postulated that the removal or perforating the pseudo-intact surface layers is beneficial for a deeper infiltration of infiltrant material to the lesion body **(Paris et al., 2009)**. Efficacy of the resin infiltrate technique is based on two crucial steps; first: optimum etching regimen

to induce sufficient erosive effect on the surface layer of the carious lesion, thus enhance better resin penetration. Second: optimum time required to allow the infiltrant to completely seal the lesion body.

Several studies were orbiting about the effect of etching step and its impact on the surface layer and how beneficial it could be regarding the depth of penetration of the infiltrant resin when used with different etching times (**Meyer-lueckel et al., 2007, Meyer-lueckel et al., 2008, Paris et al., 2010_b**). As well as the effect on application of the infiltrant resin and how beneficial it could be regarding depth of penetration when the infiltrant was applied with different application times (**Meyer-lueckel et al., 2005, Paris et al., 2008, Soviero et al., 2012, Soviero et al., 2013**).

Yet the interaction between both crucial steps was not tackled in literature. Thus this study was carried out to evaluate the penetration efficacy of a caries infiltrant resin using different manipulative variables in terms of different etching times and application times. The hypotheses tested: first: different etching time will not affect the penetration of the infiltrant material. Second: different application times of the infiltrant will not affect the penetration of the infiltrant material.