

The influence of Caries Infiltrant combined with and without conventional adhesives on sealing of sound enamel (In Vitro Study)

A thesis

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Abstract

The formation of white spot lesions around fixed orthodontic attachments is a common complication during and following fixed orthodontic treatment, which hinder the results of a successfully completed case.

The aim of the study was to assess the effectiveness of the *Caries Infiltrant* (**ICON®**) on prevention of caries on the smooth enamel surface when applied alone or combined with conventional adhesives. To achieve this objective, seventy eight human premolar enamel discs were randomly assigned to six groups (n=13). The discs were etched and treated with resins of different monomer content forming the following groups: (1) Untreated etched samples served as the negative control, (2) **ICON® (DMG)**, (3) **Adper™ SB 2 (3M ESPE)**, (4) **Heliobond (Ivoclar Vivadent)**, (5) **ICON®+ Adper™ SB 2** and (6) **ICON®+ Heliobond**. Specimens were subjected to demineralization by immersion in hydrochloric acid (pH 2.6) for 18 days. Calcium dissolution into the acid was assessed by photometric test via spectrophotometer at 24 hour intervals.

The results revealed that, there was a highly significant difference between the sealed groups and the unsealed (untreated) one ($p \leq 0.00$) indicating that the unsealed specimens showed the highest amount of Ca ion loss among all other groups. Additionally, there was no significant difference between untreated specimens and the **ICON®** sealed ones. While, **Heliobond** decreased the Ca ion loss significantly compared to the untreated specimens and **Adper™ SB 2** performed significantly better than both **ICON®** and **Heliobond**. Furthermore, the combination of **ICON®** with either **Adper™ SB 2** or **Heliobond** served as the best protective measures and maintained the protective effect during the whole experiment period.

Therefore, within the limitations of this in vitro study, it could be concluded that the use of low- viscosity *Caries Infiltrant* prior to application of the tested conventional adhesives increases their protective effect against demineralization.