



**EFFECT OF THREE PRE-TREATMENTS METHODS OF
ZIRCONIA AND LITHIUM DISILICATE CROWN
SURFACES ON SHEAR BOND STRENGTH OF CERAMIC
AND METAL ORTHODONTIC BRACKET
(AN IN-VITRO STUDY)**

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ABSTRACT

Background and objective: One of the most common difficulties during orthodontic treatment is the bonding of brackets to the esthetic crown, which has a higher degree of failure compared with bonding to enamel. The aim of this study was the 3D evaluation of shear bond strength for metal and ceramic brackets after three pretreatments surfaces of lithium disilicate crowns and zirconia crowns.

Materials and methods: One hundred twenty crowns [sixty lithium disilicate (LD), sixty Zirconia (Zr) crowns] were used. Both types of crowns were divided into six groups (three groups for metal brackets and three groups for ceramic). The First group were treated with bur, the Second group by hydrofluoric acid (HFA) 4.5% and the third group by laser (Er, Cr: YSGG). All treated surfaces were examined by Laser profilometer and scanning electron microscope (SEM). The central incisors 0,022 inch slot brackets were used (metal and ceramic brackets). Universal testing machine was used for shear bond strength (SBS). Adhesive remnant index was recorded. In order to analyze the data Chi-square test, ANOVA test and t- test was used.

Results: ceramic brackets showed significantly higher SBS values than metallic brackets. The treated surfaces with HFA gave the highest roughness parameter (RP) and SBS for both metal and ceramic brackets, then Laser and finally the bur in LD crowns. The bur gave a higher RP and SBS than Laser and HF in Zr crowns.

Conclusion: all pretreatment methods gave higher SBS values than the acceptable range for both types of brackets and crowns. In relation to the adhesive remnant index most of the failures had been cohesive in the resin layer.

Key words: Zirconia crowns, lithium disilicate crowns, shear bond strength, Metal bracket, ceramic bracket.