Shear bond strength of different lingual buttons bonded to wet and dry enamel surfaces with Resin Modified Glass Ionomer Cement (In Vitro Comparative Study)

> A Thesis Submitted to the Council of The College of Dentistry, University of Baghdad In Partial Fulfillment of Requirements for The Degree of Master of Science In Orthodontics

> > By

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## Abstract

Moisture is the frequent cause of orthodontic bonding failure. When bonding field does not have to be dry, attachment placement will be easier and quicker. The resin modified glass ionomer cements adhesives can bond attachments to teeth without etching in the presence of saliva which are usually needed during bonding of the lingual buttons on difficult -to dry- places inside the patient mouth.

The present study was carried out to evaluate the shear bond strength of two type of Resin Modified Glass Ionomer Cements adhesives (Self-Cured / GC Fuji Ortho and Light-Cured / GC Fuji Ortho LC) which were used for bonding three types of orthodontic lingual buttons (Nickel free / rectangular base, Nickel free / round base and composite) to wet and dry enamel surface, and to determine the predominant site of bond failure.

One hundred and twenty sound extracted human maxillary first premolar teeth were selected and randomly divided into two equal groups, each with sixty teeth, representing the two types of adhesive (Self-Cured and Light-Cured). Then according to the condition of enamel surface (wet or dry) each group was subdivided into two equal subgroups, each with thirty teeth. Then within each subgroup, every ten teeth were bonded with one type of buttons (Nickel free / rectangular base, Nickel free / round base and composite).

After twenty four hours of samples incubation, the orthodontic buttons were debonded by a Tinius-Olsen universal testing machine to measure the shear bond strength. After debonding, each button base and the corresponding tooth surface were examined under a stereomicroscope and their Adhesive Remnant Index were recorded. The result of this study revealed that there was no difference in shear bond strength between the Self-Cured and Light-Cured systems, the Self-Cured system yields higher values of shear bond strength in dry environment than in wet environment, and the Nickel free / round base orthodontic buttons demonstrated the highest shear bond strength than the other two button types in both enamel conditions.

Also, the result of the failure site scores revealed that both adhesive systems allowed for safe debonding without enamel damage or fracture.