Republic of Iraq
Ministry of Higher Education
and Scientific Research
University of Baghdad
College of Dentistry

Shear Bond Strength, Bonding Time, and Surface Topography of Different Bonding Systems after Thermocycling (A Comparative an in Vitro Study)

A thesis submitted to the council of the College of Dentistry/University of Baghdad in partial fulfillment of the requirements for the degree of master of science in orthodontics

By

Sarah Dheyaa Al-Dabbas

B.D.S.

Supervised by

Assist. Prof. Dr. Mustafa M. Al-Khatieeb

B.D.S., M. Sc. (Orthodontics)
Baghadad-Iraq

C.E 2018 **A.H 1439**

Abstract

The accumulation of plaque around fixed orthodontic appliances for extended periods of time can contribute to enamel demineralization and the development of white spot lesions, which diminish the final aesthetic outcome. Complete elimination of excess adhesive flash, therefore, is desirable.

So this study was designed to evaluate the different aspects of the new APC™ Flash-Free adhesive bracket system (shear bond strength, adhesive remnant index after thermocycling, time required for bonding, and surface topographic measurement of the excess adhesive), then compared the findings with other light cure bonding systems of the same bracket type.

Sixty extracted human maxillary first premolars were randomly divided into five groups (12 per group): APC™ Flash-Free adhesive coated bracket-bonding system; APC™ Plus adhesive coated bracket-bonding system; APC™ II adhesive coated bracket-bonding system; manual light cure bonding system (with the use of Transbond™ XT Primer); and manual light cure bonding system (with the use of Transbond™ Plus Self Etching Primer).

After bonding, the teeth were stored in distilled water at 37^0C for 24 hours, then thermal cycling was performed between 5^0C and 55^0C for 500 cycles.

The result of this study showed that there was a significant decrease in bonding time and excess adhesive flash with the use of APC™ Flash-Free adhesive system. APC II, had the highest value of mean shear bond strength, followed by Conven.1, then APC Plus, after that APC FF, while group Conven.2, had the lowest value of mean shear bond strength. With regards to ARI, most of the adhesive in APC FF, APC Plus and Conven.2 retained

to the bracket surface, while in APC II and Conven.1 the adhesive mostly retained to the tooth surface, so less time was required to clean the tooth surface in APC FF, APC Plus and Conven.2.

In conclusion, the APC™ Flash-Free adhesive system is able to reduce the time needed for orthodontic bracket bonding, also there is no need for excess adhesive clean up, and has optimum shear bond strength value for clinical routine use.