

Effect of curing mode on bond strength of two resin cements to dentin

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Abstract

The aim of this study was to evaluate the effect of two curing modes (self-cured or dual-cured) on microtensile bond strength of two resin cements (RelyX Ultimate, 3M ESPE, USA and GCem LinkAce, GC Corp., Japan) to dentin surface. Occlusal dentin surfaces of forty human third molars were exposed and flattened. Resin cements were used according to manufacturer's protocol and teeth sectioned to obtain the specimens for bond strength test. When polymerizing, the light-activation increased the bond strength only for RelyX Ultimate.

Key words: resin cements, bond strength, dentin

Introduction

The Restorative Esthetic Dentistry was created based on efficacy of adhesive systems, resin cements and composites. Regarding indirect restorations, adhesive techniques provide ceramic and resin restorations with excellence esthetic and minimal tooth wear.

Results and Discussion

Occlusal dentin surfaces of 40 human third molars were exposed and randomly divided into 4 groups (n=10): 1- RelyX Ultimate self-cured, 2 – RelyX Ultimate dual-cured, 3- GCem LinkAce self cured; 4 – GCem LinkAce dual-cured. Resin disks (2.00 mm high) simulating indirect restorations were cemented to the teeth. After 24 hours, the teeth were sectioned to obtain sticks with approximately 1 mm² at the cross-sectional interface area. They were tested in tension until failure in a universal testing machine (EZ Test, Shimadzu). The failure modes were analyzed to determine where the failure occurred: 1- cohesive failure within dentin; 2- cohesive failure within the hybrid layer; 3- cohesive failure within cement; 4- adhesive failure between adhesive and resin cement, 5- adhesive failure between dentin and adhesive/cement, 6- mixed failure. Data were analyzed by two-way ANOVA and Tukey's test (5%).

Table 1. Mean bond strength of resin cement to dentin surface.

Resin Cements	Self-Cured	Dual-cured
RelyX Ultimate	15.7 (2.8) A a	21.0 (4.7) B b
GCem LinkAce	14.8 (1.4) A a	14.5 (3.7) A a

Capital letters compares curing modes for the same resin cement and lowercase letters

compares resin cements in the same curing mode.

Table 1 shows that the light-activation of RelyX Ultimate increased the bond strength around 25% when compared to self-cure mode. No statistical difference was observed for GCem LinkAce when this resin cement was cured or not. The bond strength of RelyX Ultimate was higher than GCem LinkAce following the light-activation, while in self-cured no difference was noted.

Conclusions

Results suggested that the curing mode influenced the bond strength only for RelyX Ultimate, while GCem LinkAce was not affect by type of activation.

Acknowledgement

This study was supported by PIBIC/CNPq

¹ Abo-Hamar SE, Hiller KA, Jung H, Ferderlin M, Friedl KH, Schmalz G. Bond strength of a new universal self-adhesive resin luting cement to dentin and enamel. Clin Oral Invest 2005; 9: 161-67

² De Menezes MJL, Arrais CAG, Giannini M. Influence of light-activated and auto- and dual-polymerizing adhesive systems on bond strength of indirect composite resin to dentin. J Prosthetic Dent 2006; Aug;96(2):115-21.