

EFFECT OF A PRIMING AGENT ON BOND STRENGTH OF INDIRECT COMPOSITE TO DENTIN USING VARIOUS CEMENT SYSTEMS

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INTRODUCTION: The use of indirect resin composites, associated with resin-modified glass-ionomer cement (RMGIC) or resin-based adhesive cement (RBAC) has increased. Materials and technique have been improved and patient demand for aesthetic restorations has risen^{1,2}. In this study, shear bond strength (SBS) between dentin and composite inlays sealed with dental cements (2 RMGIC and 3 RBAC) was measured. In a second part, the effect of a priming agent on bond strength was evaluated. Three more cement systems are being tested and will soon be added.

METHODS: Gradia indirect resin composite cylinders were fabricated according to laboratory standards. Extracted third molars were sliced so that flat coronal dentin surfaces were exposed. The cylinders were “bonded” to the dentin surface (*Fig. 1 [left]*) using 5 different cement systems (*Fuji Plus Capsules, GC; Fuji Plus Powder/Liquid, GC; Super-Bond C&B, Sun Medical; RelyX Unicem, 3M-ESPE; Maxcem, Kerr*) according to the manufacturers’ instructions. A priming agent (*Composite Primer, GC, Fig. 1 [right]*) was applied or not, prior to bonding.

Each group was composed of ten specimens. SBS was measured with a universal testing machine (Ametek Lloyd LRX Plus) one hour after bonding. Dentin surfaces of all tested specimens were examined by binocular microscopy to determine failure modes. A direct resin composite (Filtek Z250, 3M-ESPE) was bonded (OSP: Optibond Solo Plus, Kerr) to dentin and tested similarly as a control.

RESULTS: Mean values of SBS with and without priming agent are presented in *Tables I and II* respectively. A statistical analysis (one-way ANOVA, $p < 0.05$) was performed. The highest values with priming agent were obtained with Super-Bond C&B (*Table I*) while the highest results without priming agent were found in the Super-Bond C&B and RelyX Unicem groups (*Table II*).

All groups showed a majority of adhesive failures except Fuji Plus (P/L) which had primarily adhesive-cohesive failures.



Fig. 1: Bonded specimen [left] – Priming Agent (GC Composite Primer) [right].

Table I. SBS with priming agent. Means with same letter are not significantly different

Group		Mean and Std deviation (MPa)
Super-Bond C&B	A	23.01 (6.95)
OSP+Z250	B	15.79 (5.79)
Fuji Plus (Caps.)	B	13.46 (5.59)
RelyX Unicem	C	9.97 (2.19)
Fuji Plus (P/L)	C	7.92 (3.73)
Maxcem	C	5.03 (3.37)

Table II. Without priming agent.

Group		Mean and Std deviation (MPa)
Super-Bond C&B	M	21.29 (6.15)
RelyX Unicem	M N	19.6 (6.89)
OSP+Z250	N O	15.79 (5.79)
Fuji Plus (Caps.)	O	15.11 (4.06)
Fuji Plus (P/L)	P	8.13 (4.83)
Maxcem	P	5.21 (2.6)

DISCUSSION & CONCLUSIONS: Super-Bond C&B showed high SBS with or without priming agent. Fuji Plus (Caps.) had significantly higher values than Fuji Plus (P/L). After statistical analysis to compare the SBS of each cement system with and without priming agent, adhesion values without priming agent always appeared higher than or not significantly different from values with priming agent.

REFERENCES: ¹ D. Ziskind et al. (1998) *J Oral Rehabil.* **25**:443-447. ² Thordrup M. et al. (2006 Feb) *Quintessence Int.* **37**(2):139-44.

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