

Effect of time repairing and surface treatment on repair bond strength of bisacryl resin provisional restoration with flowable composite resin



INTRODUCTION

At present, bisacryl resin material has gained popularity for using as provisional material due to low exothermic reaction, low polymerization shrinkage, good marginal adaptation, good wear resistance, good color stability, minimal pulpal irritation, excellent esthetic, minimal unpleasant odor and glossary appearance like natural tooth. However, old, shortened margin, chipping or fracture may occur in processing of bisacryl resin provisional restoration and processing in intraoral mastication. When these situations occur, repairing the defects or fabricating another complete provisional restoration is required. Light-cured flowable composite resin have been suggested. Time and surface treatment are important factors in the design of experiments on shear bond strength of repaired bisacryl resin with light cure flowable composite resin.



OBJECTIVE

To investigate the effect of repairing time on shear bond strength in repair of bisacryl resin materials with flowable composite resin. and to compare the effect of surface treatment on bisacryl resin with flowable composite resin



Data analysis

Data were analyzed by using Two-way ANOVA and Turkey's test ($P=0.05$). Mode of failure was determined under a stereomicroscope.



MATERIALS & METHOD

A total of 270 pieces of bisacryl resin blocks were randomly divided into three groups ($n=90$), (a) no aging: storage in artificial saliva at 37 °C 1 hour., (b) 194 thermal cycles (approximate 1 week), (c) 5,000 thermal cycles (approximate 6 months). Each group was then randomly divided into three subgroup ($n=30$) based on surface treatment (no treatment, cylinder carbide bur only, cylinder carbide bur and Adper Single Bond 2. The repair flowable composite resin was bonded to surfaces. All samples were then subjected to shear bond strength testing in a universal testing machine with a crosshead speed 0.5 mm./min. Data were analyzed by using Two-way ANOVA and Turkey's test ($P=0.05$). Mode of failure was determined under a stereomicroscope.

Group	Surface treatment	Time	n=270
1	No treatment	1 hrs.	30
		1 week	30
		6 months	30
2	Cylinder carbide bur only	1 hrs.	30
		1 week	30
		6 months	30
3	Cylinder carbide bur and Adper Single Bond 2	1 hrs.	30
		1 week	30
		6 months	30



Results

Grinding with carbide bur combined with adhesive had significantly highest shear bond strength between bisacryl resin and flowable composite resin in every time period. Specimens that was stored in artificial saliva for six months (under 5,000 thermal cycle) had significantly lowest shear bond strength ($P<0.05$) compared to other groups. Adhesive failure revealed to be the most predominance mode of failure under stereomicroscope.

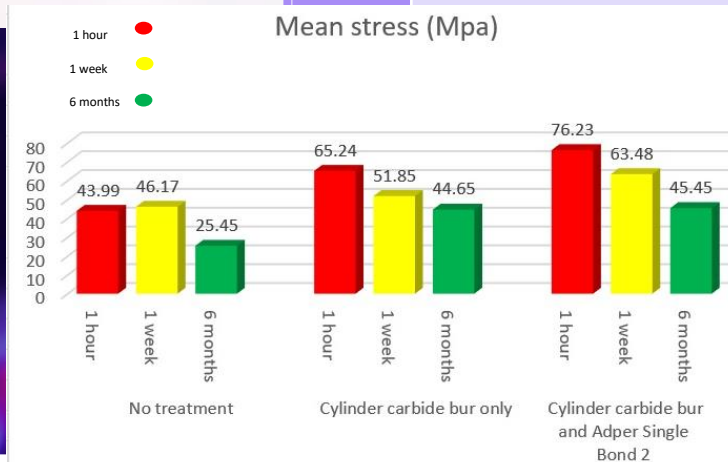


Figure 1: Plot of estimated marginal mean of shear bond strength



Conclusions

Combination of bur grinding and adhesive agent together increases the shear bond strength of bisacryl resin and flowable composite resin. However, the lowest bond strength was found in the group with no treatment surface and repair bisacry resin with flowable composite resin within 1 hour showed higher bond strength than 1 week and 6 months respectively.

Keywords : Bisacryl resin; :Provisional crown; Flowable composite resin; Repair; Surface treatment

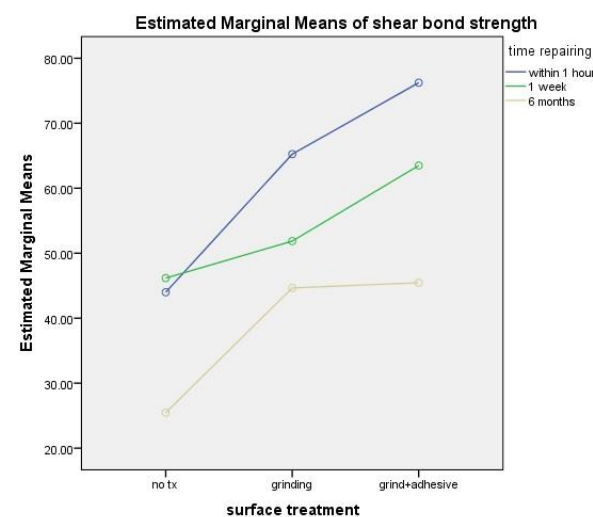


Figure 2: Plot of estimated marginal mean of shear bond strength



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