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A Protocol for Repair of Dental CAD/CAM Ceramics Using Resin Composite

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Short Communication

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ABSTRACT

Background: As it is seen, ceramic restorations are adopted by patients and dentists, however, the problem of chipping or fracture are made which made it crucial to repair it intra-orally.

Objective: The aim of this study was to test the reparability of CAD/CAM feldspar ceramic (FP) in contrast to zirconia-reinforced lithium silicate ceramics with composites (Z-LSC).

Methods: This study was a case-control study which was conducted in King Abdul-Aziz university faculty of dentistry prosthodontics laboratory. Analysis of Variance (ANOVA) was made as statistical analysis.

Results and Conclusion: The results are encouraging the use of Feldspar ceramic and it was concluded that Repair bond strength to feldspar ceramic could be improved when surfaces are etched with hydrofluoric acid. Zirconia-reinforced lithium silicate ceramics in not reparable using the tested conditioning protocols.

INTRODUCTION

With the increase in aesthetics demand in dentistry, all-ceramic restorations are in high demand. With use, these restorations tend to chip or fracture. Intra-oral repair should be a viable clinical option [1].

OBJECTIVES

The aim of this study is to test the effect of surface conditioning on the reparability of CAD/CAM feldspar ceramic (FP) and zirconia-reinforced lithium silicate ceramics with composites (Z- LSC).

MATERIALS & METHODS

King Abdul-Aziz university faculty of dentistry prosthodontics laboratory. CAD-CAM was used in this study feldspathic porcelain and zirconia-reinforced lithium silicate ceramics (Z-LSC) Both types of ceramics were divided into four groups based on the surface treatment protocol. Control group (C): No treatment, 5% hydrofluoric acid etching group (HF), sand blast group (SB) and tribochemical surface treatment group. All samples were fitted with silane, and then the samples were then subjected to thermal (500 × 50 to 550) [2].

Then, the bond strength was measured using a universal microtensile testing machine. Can penetrate your face in ANOVA. The acceptable level of significance was $P<0.05$.

RESULTS

The effect of surface treatment on repaired tensile bond strength:

Hydrofluoric acid etching increased the tensile bond strength of repaired ceramic ($P<0.00$) **(Figure 1)**.

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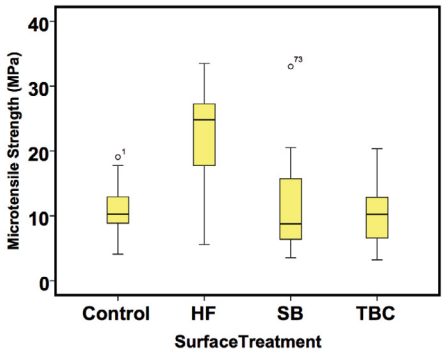

Figure 1. Feldspar ceramic.

While conditioning Z-LSC SURFACES with HF, SB, or TBC had no effect on tensile bond strength **(Figure 2)**.

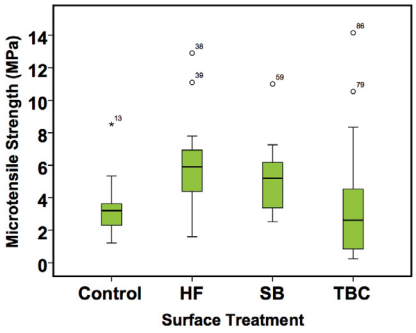

Figure 2. Z-LSC SURFACES.

The effect of the type of ceramic on the repair bond strength was:

The repaired bond strength was higher in feldspar ceramics P<0.001) **(Figure 3).**

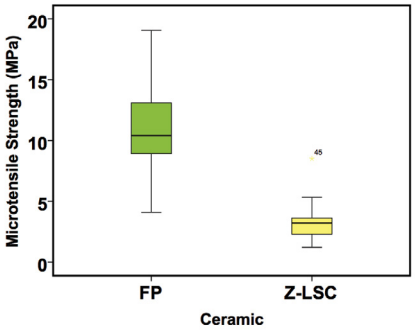

Figure 3. FP *vs* Z-LSC SURFACES repaired strength among control.

The repaired bond strength was higher in feldspar ceramics (P<0.001) **(Figure 4).**

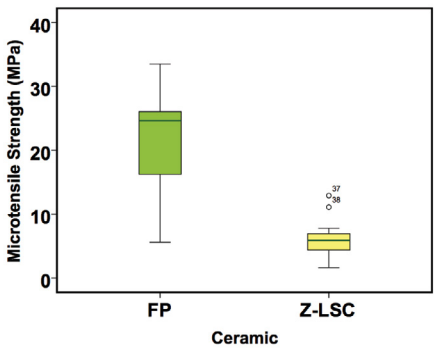

Figure 4. FP *vs* Z-LSC SURFACES repaired strength among HF.

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The repaired bond strength was higher in feldspar ceramics (P<0.001) **(Figure 5).**

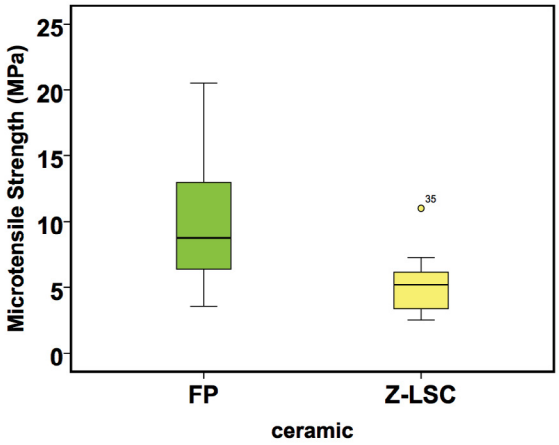

Figure 5. FP *vs* Z-LSC SURFACES repaired strength among SB.

The repaired bond strength was higher in feldspar ceramics (P<0.001) **(Figure 6).**

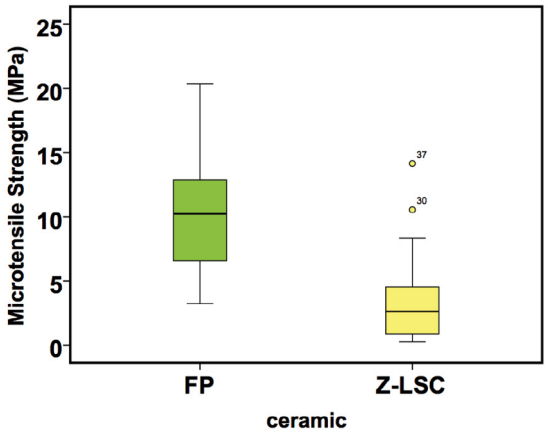

Figure 6. FP *vs* Z-LSC SURFACES repaired strength among TBC.

DISCUSSION

Repair of fractured or chipped ceramics intra-orally should be an available clinical option because of various reasons including; cost effectiveness, conservative and minimal chair time. However, producing repaired bond strength with a predictable long-term outcome is very challenging. To enhance the bond strength for repair, ceramic surfaces should be conditioned to improve the adhesion of composite to ceramics.

In this study, treating feldspar ceramics with hydrofluoric acid improved the repair bond strength which is comparable to the work done by Neis et al. 2015 [3,4].

CONCLUSION

Repair bond strength to feldspar ceramic could be improved when surfaces are etched with hydrofluoric acid. Z-LSC in not reparable using the tested conditioning protocols.

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