Repair of Dental CAD/CAM Ceramics Using Resin Composite

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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.

Aim of study: 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).

Material and 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: 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 with composites (Z-LSC).

Conclusion: 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.

Key Words: Repairability – CAD/CAM Ceramics – Feldspar ceramic – Zirconia-reinforced lithium silicate ceramics.

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.

Then, the bond strength was measured using a universal microtensile testing machine. Can penetrate surface in ANOVA. The acceptable level of significance was \( p<0.05 \).

Material and Methods

King Abdul-Aziz University Faculty of Dentistry prosthodontics laboratory. CAD-CAM were 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 x 5º to 55º) [1-3].

Results

The effect of surface treatment on repaired tensile bond strength:

Hydrofluoric acid etching increased the tensile bond strength of repaired ceramic \( (p<0.00) \).

![Graph showing tensile bond strength](image)

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

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

The repaired bond strength was higher in feldspar ceramics ($p<0.001$).

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**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 a 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., [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.

References


