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Original Article

Self-etching Ceramic Primer Protocol Provides Efficient Shear Bond Strength and Durability Between Lithium Disilicate Glass-ceramic and Resin Cement: A Potential Alternative to the Conventional Hydrofluoric Acid Protocol

Top Chitkraisorn [1,2], Nontawat Chuinsiri[3], Chawin Aungkatawiwat[1], Weerachai Singhatanadgit[4], Terawat Tosiriwatanapong[1,2]

[1]Division of Prosthodontics, Faculty of Dentistry, Thammasat University, Thailand
[2]Research Unit in Remineralized Tissue Reconstruction, Thammasat University, Thailand
[3]Institute of Dentistry, Suranaree University of Technology, Thailand
[4]Division of Oral and Maxillofacial Surgery, Faculty of Dentistry, Thammasat University, Thailand

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Corresponding Author:
Terawat Tosiriwatanapong,
Division of Prosthodontics,
Faculty of Dentistry, Thammasat University, Pathum Thani 12120, Thailand
E-mail: terawatt@bu.edu

Abstract

Objectives: This study investigated the effects of two surface treatment protocols on the shear bond strength, bond durability, and failure mode at the interface between lithium disilicate glass-ceramic and resin cement. The protocols compared were a self-etching ceramic primer and the conventional hydrofluoric acid (HF) etching followed by silane.

Methods: Fifty lithium disilicate specimens were randomly divided into five surface treatment groups (n=10 each). A control group received no treatment. The remaining 4 groups included: 5% HF etch with Monobond Plus thermocycled and non-thermocycled, Monobond Etch & Prime (MEP), thermocycled and non-thermocycled. Microshear bond strength (microSBS) was assessed before and after thermocycling to evaluate bond durability. Failure modes (adhesive, mixed, cohesive in resin/ceramic) were recorded under a stereomicroscope.

Results: Both surface treatment protocols exhibited comparable microSBS for both pre- and post-thermocycling results. Moreover, bone durability obtained from the two treatment protocols seemed to be comparable. Most groups displayed adhesive/mixed failures. Notably, the self-etching ceramic primer group showed cohesive failure in half of the specimens initially, persisting in 20% after thermal aging.

Conclusions: Compared with the conventional HF protocol, the self-etching ceramic primer protocol provided similar microSBS and bond durability between lithium disilicate glass-ceramic and resin cement. The data suggest a self-etching ceramic primer is a viable option for the conventional HF protocol in bonding to glass-ceramic, minimizing the HF hazard and simplifying the clinical procedure.

Keywords: bond durability, bond strength, hydrofluoric acid, lithium disilicate, self-etching ceramic primer