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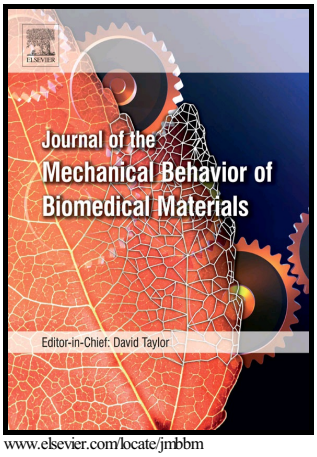

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Selective dentin etching: a potential method to improve bonding effectiveness of universal adhesives

Thiago Henrique Scarabello Stape[a,b*], Patrik Wik[a,b], Mustafa Murat Mutluay[a,c], Anas Aaqel Salim Al-Ani[a,b], Arzu Tezvergil-Mutluay[a,b]

[a] Department of Restorative Dentistry and Cariology, Institute of Dentistry, University of Turku, Turku, Finland and Adhesive Dentistry Research Group, Biomaterials and Medical Device Research Programme, Biocity, Turku, Finland
[b] Turku University Hospital, Turku, Finland
[c] Department of Prosthetic Dentistry, Institute of Dentistry, University of Eastern Finland, Kuopio, Finland

thiagohs@hotmail.com

pasawi@utu.fi
mmutluay@utu.fi
aassal@utu.fi
arztez@utu.fi

*Corresponding author at: [1] Institute of Dentistry, University of Turku, Lemminkaisenkatu 2 20520, Turku, Finland

Abstract

Objectives:

To evaluate whether selective dentin etching protocols using reduced phosphoric acid (H_3PO_4) etching-times would affect the resin-dentin interaction of a universal adhesive to improve long-term bonding effectiveness.

Methods:

Mid-coronal flat dentin surfaces were produced on sound third molars, selectively etched with 32% H_3PO_4 for 3, 5, 10 or 15 s and bonded with a universal adhesive (Scotchbond Universal, 3M ESPE: SU). SU in self-etch mode and a three-step etch-and-rinse adhesive were used as control groups. Bonded specimens were stored in deionized water for 24 h and sectioned into beams (cross sectional area of 0.7 mm^2). Micro-tensile bond strength test (n=6) and nanoleakage evaluation were performed immediately, after thermocycling or 6-month storage in artificial saliva. Energy dispersive X-ray analysis (n=6) was performed to determine the residual Ca-content ratio at the hybrid layers and scanning electron microscopy (SEM) was used to observe the micromorphology of the etched dentin surfaces before and after SU application. Data were analyzed by ANOVA and Tukey test (α=0.05).