

Study about interface of composite resin by direction to the dentinal tubule with confocal laser scanning microscopy

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I . Objectives

The purpose of this study was to evaluate the penetration pattern of dentin bonding agent by direction to the dentinal tubule with confocal laser scanning microscopy.

II . Material and Methods

It was fabricated that the specimen with perpendicular, parallel and bevel surface to dentinal tubule. The primer of dental adhesive(ALL BOND[®] 2, CLEARFIL[™] SE BOND, PQ 1) was mixed with fluorescent material, rhodamine B isothicyanate(Merck, Darmstadt, Germany). and it was applied to the specimen according to the instructions of manufacture. The specimen was covered with composite resin(Esthelite, A2) and then cut to a thickness of 500 μ m with low speed saw(Isomet low speed saw , Buehler, USA) The interface between dentin and composite resin was observed by fluorescence imaging with confocal laser scanning microscopy.

III . Results

1. For the groups with tubules perpendicular to bonded interface, funnel shape of resin tag was observed in all specimen. However, phosphoric acid etching system(ALL BOND[®] 2 and PQ 1) was more prominent than self etching system(CLEARFIL[™] SE BOND).
2. For the groups with tubules parallel to bonded interface, there were few resin tag. In the parallel group of PQ 1, acid etching removed peritubular dentin from long section of tubule, permitting more radial diffusion into surrounding intertubular dentin.
3. For the groups with tubules bevel to bonded interface, resin tag was irregular and the deepest one to the inferior but, it did not penetrate to the same dentinal tubule.