

Ethanol-wet vs water-wet technique: current findings

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Numerous studies of the adhesion of composite materials to tooth tissues suggest that despite a wide variety of adhesive systems many unresolved questions still remain. One major reason why successful bonding to dentin is difficult to achieve is that dentin is a wet substance while adhesives are hydrophobic. The ethanol wet-bonding technique (EWBT) was introduced in an attempt to overcome the problems caused by high hydrophilicity and/or incomplete penetration of adhesive systems, but its efficacy hasn't yet been proved

To compare the ethanol- and water-wet bonding techniques according to the literature data.

23 literature sources on the problem of EWBT were analyzed using the databases and search engines Elsevier, Scipers, European Journal of Dentistry, ScienceDirect. The ethanol- and water-wet techniques were compared by laboratory and clinical findings. They included the effects of these protocols on the coronal and root dentin bond strength, the effect of bonding strength with chlorhexidine adding, microtensile bond strength and nanoleakage of dentin bonded interfaces under clinical and laboratory conditions.

EWBT suggests the idea of replacing water in the demineralized collagen matrix with ethanol. This strategy is thought to increase the bond strength and durability by saving the structure of collagen fibers from collapse, creating conditions for fibers infiltration with a hydrophobic monomer, increasing interfibrillar space, decreasing hydrolysis of hybrid layer and activity of matrix proteinases. Application of EWBT instead of the water protocol is not yet fully defined. EWBT can create similar or higher bond strength with hydrophilic etch-and-rinse adhesives and display enhanced bonding durability under chemical challenge. It was shown in vitro that deploying EWBT can increase the adhesion abilities of commercial adhesives to enamel and have potential benefits on root canal resin–dentin bonding under an appropriate processing time. The addition of 2% chlorhexidine to EWBT did not further improve the bond strength of luting of a fiber post to intraradicular dentin when compared to EWBT alone after 12 months of ageing. The immediate benefits of the EWBT observed in the laboratory setting were not confirmed when the same protocol was performed in vivo.

The literature data reveals similar and sometimes controversial results of the effectiveness of ethanol- and water-wet techniques application. Most investigations demonstrate EWBT to show better results than the water protocol in vitro. However longitudinal clinical evaluation of the EWBT is still unclear and is the subject of further research.