

Effect of Three Desensitizers on Dentinal Tubule Occlusion and Bond Strength of Dentin Adhesives

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Abstract : The ideal dentin desensitizing agent should not only have good biological safety, simple clinical operation mode, the superior treatment effect, but also should have a durable effect to resist the oral environmental temperature change and oral mechanical abrasion, so as to achieve a persistent desensitization effect. Also, when using desensitizing agent to prevent the post-operative hypersensitivity, we should not only prevent it from affecting crowns' retention, but must understand its effects on bond strength of dentin adhesives. There are various of desensitizers and dentin adhesives in clinical treatment. They have different chemical or physical properties. Whether the use of desensitizing agent would affect the bond strength of dentin adhesives still need further research. In this in vitro study, we built the hypersensitive dentin model and post-operative dentin model, to evaluate the sealing effects and durability on exposed tubule by three different dentin desensitizers and to evaluate the sealing effects and the bond strength of dentin adhesives after using three different dentin desensitizers on post-operative dentin. The result of this study could provide some important references for clinical use of dentin desensitizing agent. 1. As to the three desensitizers, the hypersensitive dentin model was built to evaluate their sealing effects on exposed tubule by SEM observation and dentin permeability analysis. All of them could significantly reduce the dentin permeability. 2. Test specimens of three groups treated by desensitizers were subjected to aging treatment with 5000 times thermal cycling and toothbrush abrasion, and then dentin permeability was measured to evaluate the sealing durability of these three desensitizers on exposed tubule. The sealing durability of three groups were different. 3. The post-operative dentin model was built to evaluate the sealing effects of the three desensitizers on post-operative dentin by SEM and methylene blue. All of three desensitizers could reduce the dentin permeability significantly. 4. The influences of three desensitizers on the bonding efficiency of total-etch and self-etch adhesives were evaluated with the micro-tensile bond strength study and bond interface morphology observation. The dentin bond strength for Green or group was significantly lower than the other two groups ($P < 0.05$).

Keywords : dentin, desensitizer, dentin permeability, thermal cycling, micro-tensile bond strength

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