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Effect of Pro-Argin Technology on Bond Strength After Artificial Aging

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Introduction

Dentinal hypersensitivity can occur after tooth preparation because of the exposure of dentinal tubules (Figure 1) (1). One approach to alleviate or prevent dentinal sensitivity after cavity preparation of teeth to receive indirect restorations involves sealing of dentinal tubules or application of desensitizing agents (1). Furthermore, a new desensitizing paste (Elmex Sensitive Professional Desensitizing Paste; GABA International, Figure 2) could also be used to seal hypersensitive dentin surfaces (2). The use of such barriers to seal the dentinal tubules prior to cementation has been advocated in order to reduce the effect of external stimuli on hypersensitivity. Some ingredients present in dentin desensitizers may induce chemical interaction with organic substances of the dentin that may consequently affect the bonding ability of adhesive cement systems (3,4).

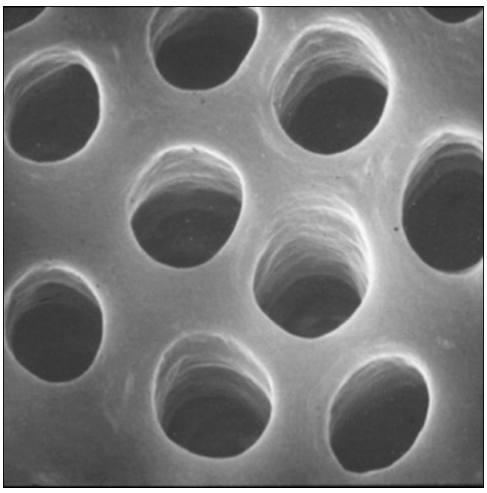

Fig. 1: Open dentin tubules

Fig. 2: Elmex Sensitive Proessionel Desensitizing Paste

Objectives

Therefore, the aim of this study was to evaluate the effect of a recently introduced desensitizing paste based on Pro-Argin technology (elmex Sensitive Professional Desensitizing Paste, GABA, Germany) on microtensile bond strength of a total etch adhesive system (Syntac, Vivadent, Liechtenstein) after artificial aging using water storage and application of a provisional cement (Temp Bond, Kerr, Germany).

Material and Methods

60 freshly extracted third molars were included in the study. All teeth were specially prepared allowing the simulation of dentin perfusion and standardized conditions. The specimens were randomly assigned to one of the four experimental groups of fifteen each:

- Group 1 (G1): control without desensitizer;
- Group 2 (G2): desensitizing paste application;
- Group 3 (G3): desensitizing paste, water storage;
- Group 4 (G4): desensitizing paste, application of Temp Bond, water storage.

Group 3 and 4 were stored in water for one week. In group 3 Temp Bond was additionally applied after desensitizer application. All materials were applied as recommended by the manufacturer. Microtensile bond strength was measured using a Zwick testing machine. Statistical analysis was performed using SPSS 15.0. The data of mTBS were analysed by one-way anova and Tukey's multiple comparisons. For each out-come, statistical significance was set at $P < 0.05$.

Results

For the test series following tensile bond strengths were evaluated (mean values and standard deviations in MPa) (Table 1, Figure 3).

	G1	G2	G3	G4
Mean	24.66	15.54	13.61	16.16
±	7.96	2.99	2.25	1.55

Table 1: Mean value and standard deviations (in MPa) within the different groups

Statistical analysis showed a significant influence of the different aging procedures on microtensile bond strength ($p < 0.001$, ANOVA). After application of the desensitizing paste a significant reduction of bond strength could be observed compared with the untreated control ($p < 0.05$, Tukey test). Pairwise comparison showed no further significant reduction of bond strength in specimen after water storage and application of the provisional cement ($p > 0.05$, Tukey test).

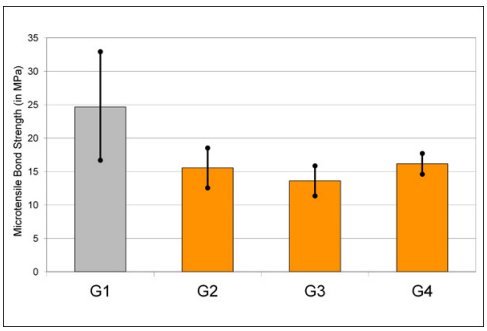

Fig. 3: Graphically expression of the results

Conclusions

Within the limitations of an in vitro investigation it can be concluded that application of the desensitizing paste based on Pro-Argin technology might affect microtensile bond strength of the used total etch adhesive system.

Literature

1. Külünk S, et al. (2011): The Effects of Different Desensitizing Agents on the Shear Bond Strength of Adhesive Resin Cement to Dentin. Journal of Esthetic and Restorative Dentistry.
2. Schiff T, et al.(2009):The clinical effect of a single direct topical application of a dentifrice containing 8.0% arginine, calcium carbonate, and 1450 ppm fluoride on dentin hypersensitivity: the use of a cotton swab applicator versus the use of a fingertip. J Clin Dent 20:131-6.
3. Gürgan S, Bolay S, Kiremitçi A (1999) Effect of disinfectant application methods on the bond strength of composite to dentin. J Oral Rehabil 26:836-840.
4. Kobler A, Schaller HG, Gernhardt CR (2008) Effects of the desensitizing agents Gluma and Hyposen on the tensile bond strength of dentin adhesives. Am J Dent 21:388-392.

Abbreviations

MPa = megapascals
mTBS = micro tensile bond strength

This Poster was submitted by PD Dr. Christian R. Gernhardt.

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Effect of Pro-Argin Technology on Bond Strength After Artificial Aging

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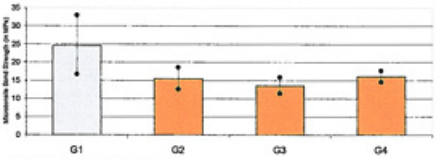

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