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Effect of Different NaOCl Concentrations on MTBS of a Dual-curing Dentin Adhesive

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Introduction

The success of root canal treatment depends on the control of microorganisms in infected root canals (1, 2).

Objectives

The aim was to evaluate the effect of different concentrations of NaOCl on microtensile bond strength (mTBS) of a dual-curing total-etch adhesive (LuxaBond-Total Etch) in combination with a dual-curing composite (Luxacore Z-Dual) on pulpal dentin in vitro (Fig. 1, 2).

Fig. 1, 2: Luxabond – Total Etch and Luxacore Z-Dual

Material and Methods

Seventy-two extracted third molars were included in the study. Dentin specimens of the pulp chamber were obtained under standardized conditions. The specimens were randomly assigned to one of the six groups of twelve samples each: L-C: Luxabond/Luxacore (light-curing), control (no NaOCl-application); L-1: immersion in 1% NaOCl (24 hours) before bonding, L-5: immersion in 5% NaOCl (24 hours) before bonding; groups C-C, C-1, C-5 followed the same procedure using the self-curing mode. The dentin bonding agents and the resin material were applied on a standardized surface area of 0.785 mm^2 (Ø 1 mm). Microtensile bond strength was measured 15 minutes after application of the composite using an universal testing machine. Statistical analysis was performed using SPSS 15.0.

Results

For the test series following tensile bond strengths were evaluated (in MPa) (Tab. 1, Fig. 3):

	L-C	L-1	L-5	C-C	C-1	C-5
Mean	30.9	26.6	19.8	23.1	21.5	18.3
±	3.7	4.8	2.0	4.4	4.6	2.1

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

Statistical analysis showed a significant influence of the used curing method and the different NaOCl concentrations ($p < 0.001$, ANOVA). The application of 1% and 5% NaOCl before bonding resulted in a reduction of mTBS. In the case of 5%, this difference was significant. Pairwise comparison between both curing groups showed no significant diffe-rences between L-C/C-C and L-1/C-1 ($p < 0.05$, Tukey's test).

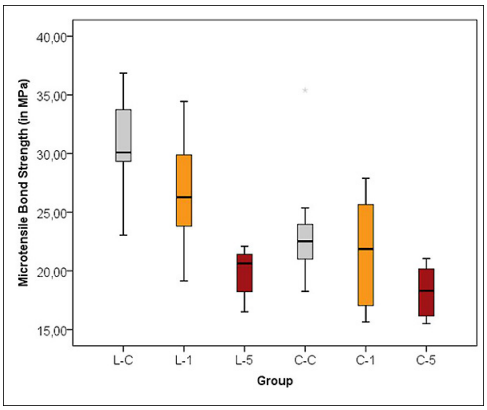

Fig. 3: Boxplot of the results

Conclusions

It can be concluded that the curing method might have an influence on mTBS. The application of higher concentrations of NaOCl prior to bonding decreases mTBS.

Literature

1. Basrani B.: Irrigation in endodontic treatment. Alpha Omegan. 2011 Spring;104(1-2):18-25.
2. Kovac J, Kovac D.: Effect of irrigating solutions in endodontic therapy. Bratisl Lek Listy. 2011;112(7):410-5. Review.

Abbreviations

mTBS = microtensile bond strength
MPa = megapascals

This Poster was submitted by Dr. Katrin Bekes.

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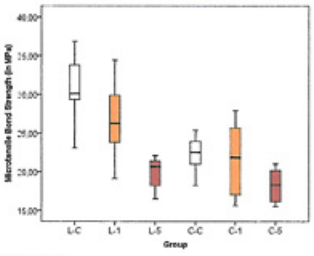

Fig. 1: Boxplot of the results.

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References

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