

Int Poster J Dent Oral Med 2005, Vol 7 No 03, Poster 282

International Poster Journal

# Micro Tensile Bond Strength of Adhesive Systems Combined With Flowable Composites

IP

Language: English

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### Date/Event/Venue:

CED / NOF / ID Joint Meeting of the IADR August, 25th-28th, 2004 Istanbul, Turkey

# Introduction

Previous studies have shown a correlation between bond strength of dentin adhesive systems and different test modalities like shear or tensile bond tests (1). Other investigations focused on the influence of perfusion or specimen preparation (2,3). It is also known that the composite material and colour of this material have a significant influence on bond strength of dentin adhesive systems (4). But until now only low information is available about the correlation between the clinical performance of dentin adhesive systems combined with flowable composites on micro tensile bond strength.

# Objectives

The aim of the present study was to evaluate the difference of microtensile bond strength (m-TBS) of three different composite/ dentin adhesive combinations depending on the additional use of the corresponding flowable composite.

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Fig. 1: Standardized preparated classII-cavity.
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Fig. 2: Special apparatus used for preparation of standardized cavities.

# **Material and Methods**

In this study twenty-four freshly extracted third molars were included. All teeth were prepared in a special manner allowing the simulation of dentin perfusion. The specimens were randomly assigned to six experimental groups of four samples each: group A: Excite/ Tetric Ceram; group Af: plus Tetric Flow; group B: Clearfil New Bond/ Tetric Ceram; group Bf: plus Tetric Flow; group C: AdheSE/ Tetric Ceram; group Cf: plus Tetric Flow (Fig. 4 -6). All materials were applied in standardized class II cavities (Fig. 1, 2). After 24 h in water, the specimens were cut perpendicularly with a low-speed diamond saw to obtain sticks with a surface area of 1mm2 (n=15). The m-TBS was measured using a Bencor device in an universal testing machine (Fig. 3).

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Fig. 3: Bencor test device mounted in an universal testing machine.
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Fig. 4: Dentin adhesives used in the present investigation.



Fig. 5: Dentin adhesives used in the presentFig. 6: Dentin adhesives used in the presentinvestigation.investigation.

In all groups microtensile bond strength could be measured. Following m-TBS were evaluated (mean values and standard deviations, printed in MPa): Group A: 18.27 ( $\pm$  6.09); group Af: 26.82 ( $\pm$  6.68); group B: 22.82 ( $\pm$  5.82); group Bf: 24.23 ( $\pm$  7.95); group C: 20.34 ( $\pm$  6.89); group Cf: 21.97 ( $\pm$  6.55) (Tab. 1, Fig. 7). Statistical analysis showed a significant influence of the combination with or without flowable composites on microtensile bond strength (p< 0.001, ANOVA). Generally, the additional use of the flowable composite resulted in higher values. In group Af this increase was significant (p< 0.001, Tukeys test). Between the groups Af and Bf no significant differences could be detected. The values in group Cf were significantly decreased compared to group Af (p< 0.001, Tukey's test).

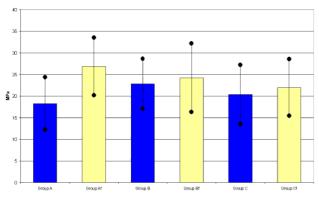


Fig. 7: Mean value and standard deviation within the experimental groups.

Mean	18,27	26,82	22,82	24,23	20,34	21,97
Standard deviation	6,09	6,68	5,82	7,95	6,89	6,55

Tab. 1: Mean value and standard deviation within the different groups.

# Conclusion

Regarding the combinations tested in this study, differences in microtensile bond strength could be observed. Within the limitations of an in vitro investigation it can be concluded that the additional use of flowable composites increased m-TBS only in the case of Excite.

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## Abbreviations

MPa = Megapascals

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### **Poster Faksimile:**

# Martin-Luther-University Halle-Wittenberg 264 **Micro Tensile Bond Strength of Adhesive Systems Combined With Flowable Composites** K. BEKES\*<sup>1</sup>, C.R. GERNHARDT<sup>1</sup>, M. MAKOWSKI<sup>1</sup>, U. BLUNCK<sup>2</sup>, H.-G. SCHALLER<sup>1</sup> <sup>1</sup> Dept. of Operative Dentistry and Periodiotelogy, University School of Dantal Medicine, Martin-Laiher-Oniversity <sup>1</sup>Dept. of Operative Dentistry and Periodiotelogy, Dental School Campus Firehew Klimkam, Charite Barlin , Germ

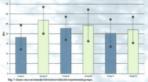
#### Introduction

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Results Kenults In all groups assistantia band strongth could be measured. Following an-THS wave varianted (mass values and inductif divisions, pitterial on NPU)-(mays At L127 (1-600), groups AL 2021 (1-6.68), group C2 124 (1-5.32), group H2 423 (1-7.53), group C 2.33 (1-6.68), group C2 124 (1-5.32), group H2 423 (1-7.53), group C 2.33 (1-6.68), group C2 127 (1-6.53) (1-6), 1-500 (1-6), 1-60



Group A. Group Af Group B Group Bf biese. 18,27 26,81 22,82 34,25 26,34 21,97

Standard deviation 5,82 6,09 6,58 7,95 6,55 6,89



Regarding the combinations tested in this study, differences in reirectential band strength could be observed. Within the limitations of an in vitro immengation is can be concluded that the additional use of flowable composites increased re-TBS only in the case of Excite. Bafarmara

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