

Contamination of bonding sites and its influence on conventional etching and conditioning with a self-etching primer. An in vitro study.

L. Brauchli, M. Eichenberger, A. Wichelhaus

Clinic for Orthodontics and Pedodontic Dentistry, University of Basel, Switzerland.

INTRODUCTION: Adhesive technologies in orthodontics have rapidly developed over the last decades. However, contamination of the bonding site with blood or saliva still leads to a drastical decline in bond strength, and thus to bracket failure in the orthodontic patient¹⁻³. It was the aim of this study to evaluate the influence of contamination on bond strengths and to investigate possible decontamination procedures.

METHODS: Four different bonding systems were evaluated for their shear bond strengths under five different bonding situations: control (without contamination and decontamination), contamination with blood/saliva, decontamination with water, air and repriming following the above mentioned contaminations. The 25 specimens of each group consisted of composite blocks bonded to bovine teeth. Shear forces were measured with an Instron 4444 after thermo-cycling.

RESULTS: The 3 composite primers showed a similar behaviour. With the exception of Transbond SEP with saliva contamination, all contaminations resulted in strongly reduced shear forces. The controls as well as the decontaminated groups showed shear forces of around 20 MPa. The resin modified glass ionomer however did not reach clinically sufficient bond strengths in either setup.

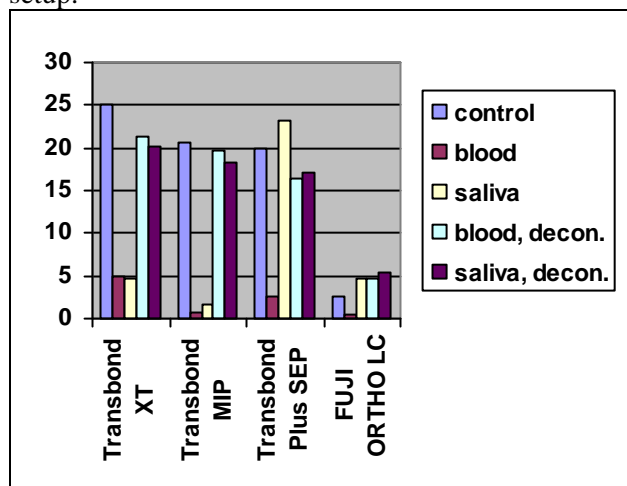


Fig. 1: Diagram showing mean shear force values (MPa) for five different bonding situations: control, contamination with blood or saliva, decontamination after contamination with blood or saliva.

DISCUSSION & CONCLUSIONS: The present investigation showed that a decontamination procedure consisting of thorough rinsing with water, drying with air and repriming can successfully be administered to surfaces contaminated with blood or saliva after priming. A contamination with blood without decontamination however results in strongly reduced bond strengths for all tested adhesives. Interestingly the self-etching primer Transbond SEP was not affected by a saliva contamination, whereas the other groups all showed strongly reduced bond strengths. The clinical management of contaminated bonding surfaces can be recommended as follows: renewed etching is not necessary. A simple decontamination with water, air and repriming gives sufficient bond strength for all tested adhesives. In the case of Transbond SEP and saliva contamination even repriming only leads to adequate adhesion.

REFERENCES: ¹V. Cacciafesta, MF. Sfondrini, A. Scribante, et al. (2004) *Am J Orthod Dentofacial Orthop* **126**: 207-12. ²MJ Webster, RS Nanda, MG Duncanson, et al. (2001) *Am J Orthod Dentofacial Orthop* **119**: 54-8. ³SE Bishara, C Oonsombat, R Ajlouni, G Denehy (2002) *Angle Orthod* **72**: 554-7.

ACKNOWLEDGEMENTS: We would like to thank those manufacturers who supplied materials for this study.