Author’s response to reviews

Title: Effect of two different primers on the shear bond strength of metallic brackets to zirconia ceramic

Authors:

Alexander Franz (alexander.franz@meduniwien.ac.at)
Modesto Raabe (modestoraabe@yahoo.de)
Bledar Lilaj (bledar.lilaj@meduniwien.ac.at)
Rinet Dauti (rinet.dauti@meduniwien.ac.at)
Andreas Moritz (andreas.moritz@meduniwien.ac.at)
Dieter Müßig (dieter.muessig@DP-Uni.ac.at)
Barbara Cvikl (barbara.cvikl@meduniwien.ac.at)

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Author’s response to reviews:

OHEA-D-18-00300

Effect of two different primers on the shear bond strength of metallic brackets to zirconia ceramic

Alexander Franz; Modesto Raabe; Bledar Lilaj; Rinet Dauti; Andreas Moritz; Dieter Müßig; Barbara Cvikl

BMC Oral Health

Dear Tamara Tedesco,

we would like to thank you to give us the opportunity to revise our manuscript.

Regarding the affiliations of the authors, we added a second affiliation for Barbara Cvikl, since the working address changed. A detailed response to the reviewers comments is given in this letter.

Detailed Response to Reviewers
We would like to thank the reviewers for their fair comments, which strongly helped us to improve the manuscript.

Answers to the reviewers:

Ranulfo Miranda (Reviewer 1): OHEA-D-18-00300

(1) The manuscript has an original idea and shows results with potential. However, there are some small issues that need to be addressed before publication.

Abstract

(2) Page 1, lines 27-28

The authors write:

"The use of Monobond Etch & Prime can be recommended for the bonding of brackets on dental zirconia ceramics."

could be changed to:

The use of Monobond Etch & Prime has great potential for the bonding of brackets on dental zirconia ceramics.

Authors: We changed the sentence according the reviewers suggestions on Page 1, lines 27-28.

Background

(3) Page 2, line 7

It would be interesting to introduce the reader a little more about the ceramics used in the work. Comment that the zirconia is highly translucent and describe its microstructure.

Authors: We now added background information about zirconia ceramics in general and on the inCoris TZI zirconium oxide sinter ceramic used in the study in particular (see Background, 4th paragraph and Discussion 7th paragraph).

Methods

(4) Page 2, line 59

What is the size of the ceramic block?
Authors: The size of the blocks were 30mm x 15mm x 12mm. We now added this information in the Methods section.

(5) Page 2, line 61

What is the bracket used?

Authors: The brackets used in the study were: Marquis 022 Roth (Ortho Technology, Tampa, USA). We now added this information in the Methods section.

(6) Page 3, line 1

A table with the composition of the two primers would be interesting.

Authors: We now added table 2 including detailed information about Monobond S and Monobond Etch & Prime.

(7) Page 3, line 9

About the figure 1, the image quality is not good. Thus it is difficult to observe the positioning and the distance between the brackets.

Authors: We revised the illustration and improved the quality.

(8) Page 3, line 28

If possible, insert the equation used to calculate the shear bond strength.

Authors: The debonding forces measured in Newton were used for calculating the shear bond strength in mega Pascal using the formula SBS (shear bond strength) = F (force in N) / A (cross-sectional area of the brackets in mm). We added this information.

Results

(9) Page 3, line 56

About the figure 2, what was the coefficient of variation?

Results of shear bond tests in mean, standard deviation and coefficient of variation are now given in table 3.
About the figure 3, the image quality is not good.

Authors: We revised the illustration and improved the quality.

Discussion

It would be important to discuss the microstructure of the zirconia and the composition of the two primers. And so, try to explain why the Monobond Etch & Prime had good results, while the Monobond S showed poor results.

Authors: We now discuss these points (Discussion 7th paragraph).

To compare the results of the present study with results from other studies using Monobond Etch & Prime on feldspathic ceramics or glass ceramics.

Authors: We now added results from other studies using Monobond Etch & Prime, however not for the same indication (Discussion, 7th paragraph).

Discuss the large standard deviation (Figure 2).

Author: We now also discuss the high standard deviation of the Monobond S group. As now shown in table 3, the standard deviation of the Monobond Etch & Prime group is not that high. A boxplot image might show this a little hard. But since the statistics were non-parametric, we decided to use this boxplot representation.

Gabriel Kalil Pereira (Reviewer 2):

Thank you for submitting your manuscript for consideration at BMC Oral Health journal. This paper consists on an interesting and original research evaluating a topic that could be of great interest on clinic. Monolithic restorations are becoming common. Zirconia materials have been evolving, becoming more translucent and with enhanced optical properties. So the orthodontic treatment allied to the presence of such restorations may occur and as explained by the authors a way to proper bond without damaging zirconia could be challenging. Studies that attempt on evaluate such scenario are therefore encouraged. The present study successfully show a promisor methodology to do so, the manuscript is well written and the methodology is sound. Therefore i have pointed to some aspects that may be considered prior to final acceptance.
Minor questions are:
- Figures seems to be of low quality, please replace them.

Authors: We revised the illustration and improved the quality.

- Please add the absolute mean and standard deviation values of the observed shear bond strength.

Authors: Results of shear bond tests in mean, standard deviation and coefficient of variation are now given in table 3.

- Any data distribution test was employed and based the decision in regards of the statistical analysis used?

Authors: The non-parametric Mann-Whitney-U Test was used due to the absence of a normal distribution. The information is added in the Material section “Statistical methods”.

- In regards of phase transformation? Why no analysis was made? What was the influence of primers on phase transformation of zirconia? Activated and not-activated? Aging? This is an important aspect in regards of zirconia performance.

Authors: Authors: We now discuss these points (Discussion 7th and 9th paragraph).

- After test pictures with higher resolution can be added? Focus on illustrative images of the scores Ari 0 and Ari 1, and if possible identify on the image the regions of cement residues.

Authors: This would indeed be of interest. However, due to the fact that no single ARI 1 in the Monobond S group and only few ARI 1 in the Monobond Etch & Prime could be detected we decided not to show them in the SEM pictures because we do not wish to misrepresent the results.