Reviewer's report

Title: Bond strength between alumina substrate and veneering composites with various adhesive resin systems

Version: 2
Date: 11 February 2015

Reviewer: Rafael Moraes

Reviewer's report:

Major compulsory revisions

• The structured abstract indicates that a background should be detailed, but it seems the authors have addressed the objectives of the study.
• I believe the short title should be revised to better convey what was evaluated in the manuscript.
• Specimens tested at 24h were dry-stored after bonding. The rationale for that procedure should be addressed since this is not a clinically relevant scenario.
• The temperature the specimens were stored should be mentioned in the Materials and Methods chapter; only in the discussion the authors indicate the temperature was 37°C.
• When mentioning materials, it is preferable to address types and/or characteristics of each material rather than their commercial brands/names. If necessary, acronyms might be used to refer to specific materials tested.
• The content of Table 2 can be mentioned in the Materials and Methods chapter.
• Why cohesive failures within the test substrates were not excluded from the analysis? If cohesive failures are not discarded the authors might be actually not measuring “bond strengths” between the substrates. This is really controversial and requires attention.
• The Materials and Methods chapter logically leads the reader to believe two factors were tested in the study: composite resin (3 levels) and adhesive (4 levels). This is corroborated with passages where the authors state, for instance, that “bond strengths were affected by the brand of veneering resin composites”. It is logical to expect a two-way ANOVA is used, but this was not the case. Please consider re-running the statistical analysis as indicated. Alternatively, the authors could calculate 95% confidence intervals for each group.
• It seems the authors have calculated Weibull moduli based on a sample size of 10. This is also controversial and should be addressed in your Discussion chapter and supported by previous studies indicating this sample size is appropriate for that analysis.
• Table 3: load data (N) is meaningless, it has to be adjusted to the bonded area for calculating strength. Please remove.
• Table 4: It would be preferable to have statistical grouping indicated in Table 3 if
possible.

- Table 5: Weibull modulus data should be accompanied by respective 95% confidence intervals for comparisons across groups. Note that the 95% CIs should be calculated according to the estimation method used in the Weibull analysis (e.g. maximum likelihood).

- Figures 7 and 8: The shape of the distribution of failure probabilities seems not to fit well a 2-parameter Weibull analysis, indicating multiple failure modes, although this was not observed in the failure analysis. This should be addressed in the revised manuscript particularly having in mind the small sample size used.

- Figure legends: not all figures have associated legends.

Minor essential revisions

- Appropriate decimal figures should be used for shear bond strength values, e.g. 24.2 instead of 24.17.

- I believe it is not necessary to educate the reader in the Introduction chapter about the shear bond strength test. This chapter should be use to state and contextualize the problem under investigation.

- The meaning of “adhesive loosening of restorations” in page 3 line 21 is unclear. Please clarify.

- Was this a hypothesis-driven study? If so, please state the hypothesis tested.

- Table 3: Please consider another manner to indicate the groups tested. It is not reader-friendly as it is.

- I don’t see the need for including Figure 1 in the manuscript.

- Discussion: implications of the findings were only marginally addressed as well as limitations of the methods.

- Conclusion: I think this chapter should be revised as the polymerization temperature of the composite resin was not actually tested in the study.

Discretionary revisions

- The term “veneering composite” in the title is controversial. Some of the materials tested are not used only for veneering purposes.

- Page 4, lines 9-10: Please mention that combinations between restorative composites and adhesive systems were tested.

- Numbering groups (1, 2, 3…) is not reader-friendly as one might have to go back to the text to understand what are the differences between groups when any mention is done in the Results or Discussion sections. This is particularly relevant when you have subgroups, which is the case here.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests.