Author’s response to reviews

Title: The accuracy and reliability of digital measurements for gingival recession versus conventional methods

Authors:

Hytham Fageeh (hfageeh@jazanu.edu.sa, dr.fageeh@hotmail.com)

Abdullah Meshni (drmeshni@gmail.com)

Reghunathan Preethanath (drpreethanath@gmail.com)

Hassan Jamal (hajamal@moh.gov.sa)

Esam Halboub (mhelboub@gmail.com)

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Author’s response to reviews:

Dear Editor,

Thank you for considering our study for BMC Oral Health. We have read the comments and feedback from the reviewers in regards to our study and would like to address them in the same sequence that has been sent to us.

Andy Yeung, BDS, PhD (Reviewer 1):

1. Why the details of the ethical clearance are redacted? The authors' details are provided by the reviewer PDF, the study site detail is provided in the Methods, and ethical approval details are provided in Declarations.

   Reply: This detail was not edited in our final draft and has been corrected to “Ethical approval was obtained by the ethical committee of the scientific research unit, College of Dentistry, Jazan University under the reference number: CODJU-1709I and a written informed consent was obtained from all participants.” (Methods section 2, line 49 & line 51, page 4).

2. Why patients with aggressive periodontitis, any periodontal treatment received during the preceding three months were excluded? Gingival recession is highly relevant to periodontology.

   Reply: It is well known in the periodontal literature that the gingival complex exhibits significant changes in pocket depth, attachment, with of the keratinized gingiva and most importantly...

Furthermore, patients who have who have been diagnosed with aggressive periodontitis are known to have a rapid rate of disease progression that eventually results in attachment loss, gingival recession and bone loss. Hence, it was imperative that only healthy sites with gingival recession and with no signs of inflammation that exhibit stable attachment levels are included in the study to prevent our sample sites from exhibiting any changes in soft tissue level during measurement.

3. Please state clear if the measurements from conventional methods were done on the same day / visit as the intraoral optical impressions and polyether impressions. If they were done on different occasions, then the comparisons would be meaningless.

Reply: All the sample sites that were included in the study were obtained by patients scheduled on the same day to receive an examination by the assigned faculty members. This visit included a manual reading of the recession sites, a chair side optical scan of the oral cavity and polyether impressions that were poured immediately by dental technicians in the College’s Laboratory. All measurements of gingival recession were recorded by the examiners on the TRIOS 3 shape software while the impressions were being poured. The cast models were then returned and scanned so that the measurements of the recessions can be taken again by the examiners on the software. Comparisons were all performed on the same day since all faculty members were calibrated prior to the examinations.

4. Reference list is missing a lot of information, such as volume and page numbers of the cited papers.

Reply: The full reference list has been edited according to the Harvard citation format

Fabrizia Luongo (Reviewer 2):

The manuscript is well written and includes all the different available methods for the evaluation of the gingival recession. The digital measurements surely have many advantages like the storage of the data and reproducibility. On the other hand they may present great variabilities according to the quality of the scanners and the operator ability. Moreover, the scanning of the model might add an extra error compared to direct intraoral scanning. As the authors report, it is not possible to conclude that the digital measurements are more accurate than the analogical ones which might be the most interesting conclusion. The accuracy of the digital measurements can be better evaluated using a standardised reference.
Reply: We are grateful for the reviewer for his/her positive comments, and we agree with him/her about the variability that encircles such a topic.

Roberto Rongo (Reviewer 3):

This work deals with the reproducibility of conventional and digital methods to assess gingival recession. The question investigated is clear and the paper adds something of new in the knowledge of our field.

Reply: We are grateful for the reviewer for his/her positive impression.

In the abstract please indicates the numerical results and introduce the use of Bland Altman plots

Reply: Corrected as the reviewer recommended; all amendments have been highlighted.

The introduction is clear

Reply: Thank you.

Methods are well designed

Reply: Thank you.

The results are confusing, the study should focus on the ICC for each examiner for each method and for the ICC for each method considering the four observers together. Hence these results should be presented first also with a test to compare statistically significant differences among the four ICC (all the observers together for the four methods).

Reply: Owing to the fact that there were no repeated measurements for each examiner using the same method (which is one limitation of the current study), the ICC could not be calculated for each examiner for each method.

and for the ICC for each method considering the four observers together.

Reply: This has been already presented (Table 2). For example, ICC for CP method considering the four examiners was 0.631.

The data on the differences among observers are interesting but secondary and are useful more to discuss about the preferences of each observer.
Please explain better table 3 and discuss if these differences could affect the clinical decision.

Reply: Done. The following text has been added to the discussion section where appropriate:

“On the basis of biases shown in Table 3, it can be implied that the differences in measurement (between examiners and to lesser extent between methods are not clinically significant; the maximum difference did not exceed half a millimeter. However, these differences have somewhat broad 95% confidence intervals extending up to 2 mm which is known to be clinically paramount and may violate the reliability of the used methods. (Discussion Section3, line 165 - 170, Page 6).

The discussion should be resembled. After the first paragraph the authors should focus on the results of the ICC after on the results and interpretation of the Bland-Altman, and after on the limits of the conventional methods and importance of intraoral scanning. Finally, on the limits of the study.

Reply: Done as the reviewer recommended.” (Discussion Section 3,4,5,6,7 line 142 -214, Page 6 and 7).

Moreover, the authors might comment on the limits of the William's periodontal probe that does not allow to measures the tenths of millimeter and this can alter the results. In Table 2 is 95%CI and not 95%ICC

Reply: Done as the reviewer recommended.

Hytham N. Fageeh, BDS,MS.
Diplomate of the American Board of Periodontology