Author’s response to reviews

Title: Comparison of the accuracy of different impression procedures in case of multiple and angulated implants

Authors:

M. Wafa Richi (wafa.richi1@gmail.com)
Sevcan Kurtulmus-Yilmaz (sevcankurtulmusyilmaz@gmail.com)
Oguz Ozan (oguzozan@gmail.com)

Version: 1 Date: 05 Dec 2019

Author’s response to reviews:

5.12.2019
Prof Thomas Stamm
Editor-in-Chief
Head & Face Medicine

Dear Prof. Stamm,

With this letter, we would like to express our sincere gratitude to you. We are very grateful to have been given the opportunity to revise our manuscript. We are re-submitting our revised manuscript #HAFM-D-19-00084, entitled “Comparison of the accuracy of different impression procedures in case of multiple angulated implants”. We appreciated your constructive criticisms for improving our manuscript. We have carefully considered your all comments and have revised the manuscript accordingly. Herein, we explain how we revised the research paper based on those comments. We offer detailed responses to your comments in point-by-point manner below. Additionally, we have highlighted the revised sections in the manuscript. For further information or if you have any question, please contact me. I can provide any additional information related to this manuscript. Thank you again for your deep and thorough review.

Sincerely,

Dr. M. Wafa Richi
Near East University Faculty of Dentistry Department of Prosthodontics, Lefkosa, Mersin 10, Turkey
RESPONSES TO THE REVIEWER(S)’ COMMENTS

REVIEWER 1

Comment 1: Language review: Overall very good but there are some changes required. For example, line 16 in the Abstract - replace parallelly with 'in parallel'. Line 36 Detected not detected. There are some minor omissions of the word 'the' that, if inserted, would make it read better. Please check the text for these and any other errors. Otherwise, it seems a very good study

Response 1: We want to extend our appreciation to you for the time and effort you spent reviewing our research paper. We are very proud of your positive feedback regarding our study and pleased to revise the manuscript in accordance with your suggestions. Whole manuscript was rechecked and errors regarding the spelling were eliminated, the changes were highlighted.

REVIEWER 2

Comment 1: General Points: The aim of the study "Comparison of the accuracy of different impression procedures in case of multiple angulated implants" was to evaluate the effects of impression variables (impression level (abutment/implant), impression coping (hexed/non-hex), splinting or non-splinting the copings) on the accuracy of impression in the case of 6 implants placed in edentulous maxillary arch. The issue is relevant, the design of the study is well defined, and the discussion addresses the positive points and limitations of study design. However, some points may be better clarified.

Response 1: We thank you for your precious time and helpful comments on editing that will greatly improve the manuscript. We are also very grateful for your positive feedbacks and pleased to response your comments and thoroughly revise the manuscript in accordance with your highly valuable suggestions.

Comment 2: The authors commented that all impression procedures were performed by a single clinician (M.W.R.). As, one only researcher performed the assay, I think would be important to demonstrated the reproducibility of measures. It should be important to repeat some set of impressions after at least one week and compare both measures and maybe calculate Kappa value.

Response 2: As you stated, it is of paramount importance to check the reproducibility of measurements by repeating impression procedure after a while. Unfortunately, this is the limitation of the current study and can be attributable to a limited amount of funding. We added this limitation to Discussion (9th paragraph), thank you.

Comment 3: The authors showed in the tables the values obtained from coronal and angular deviation in the results and discussion. Are the significant differences found in the laboratory relevant in the clinic? Would the authors recommend any of the techniques? I think it would be interesting for the authors to add a paragraph about this translating the laboratory trial to the clinic in the discussion.

Response 3: According to the results of the study, a recommendation was added to Discussion section (8th paragraph).

Comment 4: The text contains some spelling errors. Please review it.

Response 4: In accordance with your valuable suggestion, whole manuscript was rechecked and errors regarding the spelling were eliminated.
Comment 1: The in-vitro study by Richi et al. analyzes an interesting topic: the accuracy of impression procedures in cases of differently angulated implants in an edentulous maxilla. Although there is quite some literature available on the topic, this study analyzes in detail different degrees of implant angulation and different impression techniques. The factor if impressions were taken on implant level or on abutment level was evaluated as well. However, there are some sections of the manuscript that need to be further improved and revised.

Response 1: We would like to express our sincere gratitude to you for your precious time and helpful comments on editing that will greatly improve the manuscript. We also appreciate your positive feedbacks. Moreover, we are very grateful to have been given the opportunity to thoroughly revise and thereby improve our manuscript in accordance with your highly valuable suggestions.

Comment 2: Materials and Methods: To measure the difference in angulation and vertical displacement conventional impression copings were used. Why did the authors not use lab scan bodies that are typically used when using a lab scanner as described on page 9, lines 34-37.

Response 2: In our study, digital scanner was only used to obtain the stl data of the master and duplicate models. Since the main goal of the study was to evaluate the factors that affect the accuracy of conventional impression techniques, impression copings were scanned with laboratory scanner to follow the routine clinical process. We aimed to determine the amount of deviation between the stl files obtained from master and duplicate cast. Lab scan bodies enable the digitalization of the workflow. However, deviation based on variables cannot be calculated if they are used in the study.

Comment 3: Materials and Methods: What was used as anatomical landmark for the superimposition/matching of the different STL models?

Response 3: Since it would be difficult to find anatomic landmark as a reference in completely edentulous jaw, 3 predefined reference points that are incisive foramen and 2 mm palatal to the cervical line of maxillary 1st molar teeth (bilaterally) were created in our study.

Comment 4: Materials and Methods: How were angular deviation and vertical displacement measured? Figure 7 shows measurement points that will not be visible in the STL files as these are located at the implant connection. See also page 10 lines 54-57: "One point was located at the bottom of the coping and second point was located at the top of the coping using x-, y-, z-coordinates. The point at the bottom of the implant will be inside the implant when impressions are made on implant level.

Response 4: As we know the exact dimensions and geometries of the impression copings, it is possible to convert the impression coping into the cylinder when ¾ part of the coping is visible. Two points through the long axis of coping provides the sufficient data for the software to align the master and duplicate copings. The figure below shows the procedure for better understanding.

Figure 7 is just a representative figure to clarify the angular and coronal deviations.
Comment 5: Materials and Methods: Please describe the specific STL measurement technique in the software used. An image showing the measurement technique used should also be added as this is a very important factor.
Response 5: In accordance with your suggestion, following figure (Figure 8) was added to the manuscript in order to indicate how the STL measurements were conducted with the aid of aforementioned software. Also the formulas for the calculation of the deviations were given in the Materials and Methods section.

Comment 6: Materials and Methods: Please describe more in detail what the “apparatus with a pulley” is that was used for the standardized removal of the impressions. (Page 9 line 16; Page 12 line 26).
Response 6: A detailed description of the apparatus was added in related part.

Comment 7: Materials and Methods: How many master casts were created? Three master casts? (parallel, 10-0-10 and 20-0-20)?
Response 7: As you stated, three master models were fabricated: (1) Parallel, (2) 10,0,10 degrees angulation, and (3) 20,0,20 degrees angulation.

Comment 8: The results should be displayed in a better way. The tables should permit to see the actual p-values, not only if results were significant or not. Visualization in form of boxplots can help to show the results in an improved manner and give a good overview of the influencing factors that occur under the different conditions. Please add.
Response 8: Two tables (Tables 3 and 4) representing P values were added. Two charts (Figures 9 and 10) showing the boxplot diagrams were added.

Comment 9: Figures: The description of Figure 2 seems to be wrong. Please check.
Response 9: All figure legends were rechecked and edited. Thank you.

Comment 10: Figures: Figure 6: left picture: There are no impression copings on the multi unit abutments. That does not fit the description in the M&M section.
Response 10: Figure 6 left picture was inserted to manuscript mistakenly. Correct figure was added, thank you for your warning.