Author’s response to reviews

Title: Reliability and validity of miniscrews as references in cone-beam computed tomography and intraoral scanner digital models: study on goat heads

Authors:

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Author’s response to reviews:

Dear Editor,

Thank you for your review of our manuscript (OHEA-D-19-00602). We appreciate the concerns and suggestions provided by the reviewers, and have revised our manuscript accordingly. Our point-by-point responses are provided below, and text that has been added or modified from the original text is shown in the revised manuscript. We know that your journal has high publication standards, so we have already had the language of this paper corrected by a professional language editing service that specializes in scientific manuscripts. An Authorship Change Form has been replied in the form of an attachment to the mailbox requested.

Upon review of our revised manuscript, we hope that you will find it acceptable for publication in BMC Oral Health and we look forward to your response.

Sincerely,

Yiran Jiang, Gui Chen

Junaid Ahmed (Reviewer 1):

1. In background section, the sentence-'Park found that the borders of mental brackets were blurred in image created by image created by certain type of IOS, and literature does not support the use of IOSs for impression capture on multiple dental implants' is grammatically incorrect.

Thank you for your careful review of our manuscript, and we are sorry for our mistake. A deletion of duplicate text was made in the manuscript text in Background section, line 18, page 6.
2. In Methods section, under the sub heading of CBCT & Intraoral imaging, the sentence- 'Eight hemimandibles were rescanned re-imaged by 0.3-mm voxels' is grammatically incorrect.

We thank you again for reading this manuscript carefully, and the correction was done in Methods section, line 44, page 7.

3. The Authors speak about superimposition of miniscrews on 3D images but nowhere in their study, the actual superimposition of miniscrews by using CBCT finds a mention in their Research work.

Thank you for your constructive comments. We have reedited our manuscript. As we mentioned in Background section from line 6 in page 6 and in Discussion section from line 4 in page 11 and from line 56 in page 11, both metal artifact in CBCT and IOS will worsen the image quality of miniscrews. The systematic error of miniscrew digital image both on CBCT and IOS needs to be quantified before being served as reference for superimposition, which is the main aim of this preliminary study. According to previous studies referred in our manuscript (reference 20-27), the linear measurement between landmarks is popular methodology for evaluating the reliability and accuracy of CBCT and IOS images in comparison with actual measurement (we have added this relative content in background section from line 27 in page 6). Besides, on account that the positional stability of miniscrews during orthodontic treatment should be evaluated before superimposition, not only linear distance difference between two miniscrew should be measured, but also the angular difference should be measured (reference 8 and 16, we also added this content in Background section from 56 in page 5). Therefore, we followed the similar methodology to quantify the systematic error of digital miniscrews images.

4. The study has been conducted on Goat heads. The feasibility of such studies on Humans using CBCT with the amount of Radiation and cost has not been discussed nor justified in the study.

We appreciated your kindly reminder, and we added the relative content in Discussion section, from line 12 in Page 11.

5. Grammatical errors are present throughout the Manuscript and what exactly do the Authors hope to achieve through the present study is confusing.
We are sorry again for those grammatical errors at present manuscript, and we have already had the language of this paper corrected by a professional language editing service that specializes in scientific manuscripts. Here, we want to accentuate again the aim of our study: because of metal artifact degrading the image quality of miniscrews both on CBCT and IOS digital models (in Background section from line 6 in page 6 and in Discussion section from line 4 in page 11 and from line 56 in page 11), we hope that this study would quantify the systematic error of miniscrew images and test the reliability of miniscrew measurements on CBCT and IOS digital models and provide a justification for further evaluation of miniscrew stability and superimposition (an amendment was done in Background from line 44 of page 6).

Michele Cassetta (Reviewer 2): The present study is interesting and original. In my opinion the manuscript requires a minor revision. In particular I recommend the following changes:

1. Page 2, Abstract, line 48, Results: please use 3D models instead "three digital models" please modify: .. was observed when the 3D models angular measurements were considered.

We appreciate your kind suggestion for a modification of the expression. Actually, the meaning of “three digital models” here is an abbreviation of “digital models of CBCT at two voxels and IOS”. We also find it may bring confusion with 3D models, therefore we have changed the expression in the Abstract in line 52 of page 2.

2. Page 2, Abstract, Conclusion: IOSs please modify as IOS

Thank you for reading our manuscript carefully. We have modified it in Abstract, Conclusion: line 1 of page 3.


We appreciated the reviewer for kindly providing the reference, and we have added it in the manuscript in Material and Methods section in line 15 of page 9 and reference 28.

4. Discussion: Page 13, line 17, the present study is an in vitro study, please modify the text.

We thank you again for the careful reading of our literature. Considering that our experiments were done on jaws of goats, and were not completely consistent with the normal meaning of in vitro experiments, such as cell culture, we have modified our text it in Discussion line 29 of page 13.