Author’s response to reviews

Title: Improving the prediction of the trabecular bone microarchitectural parameters using dental cone-beam computed tomography

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Author’s response to reviews:

Thank you for the editor and reviewer’s comments and suggestions. Our responses to the reviewers’ comments are given on a point-by-point basis in this document. This revision has been carefully edited by Wallace Academic Editing.

Technical Comments:

Editor Comments:
1. Please and respond to the comments provided by the reviewers below.
Reply: Thank you.

2. Please remove the response letter, cover letter and English certificate from the file inventory.
Reply: We have modified accordingly.

3. At this stage, please upload your manuscript as a single, final, clean version that does not contain any tracked changes, comments, highlights, strikethroughs or text in different colours. All relevant tables/figures/additional files should also be clean versions. Figures (and additional files) should remain uploaded as separate files. Please ensure that all figures, tables and additional/supplementary files are cited within the text.
Reply: We have done accordingly.
BMC Medical Imaging operates a policy of open peer review, which means that you will be able to see the names of the reviewers who provided the reports via the online peer review system. We encourage you to also view the reports there, via the action links on the left-hand side of the page, to see the names of the reviewers.

Reviewer reports:

Ruben Pauwels (Reviewer 1): I thank the authors for meticulously revising the manuscript in accordance with each comment. Several methodological aspects are more clear in this revision. I have a few more small comments to follow up on comments made previously:

1. The reply stating "The scan conditions for the use of dental CBCT in the present study were based on that commonly used in clinical dentistry. In addition, we have revised the manuscript" misses the point of my initial comment. While the scan _settings_ were clinically representative, the scanned _object_ was not because it is much smaller than a full human head. As a result, you are overestimating the actual quality (sharpness, noise, artefacts) found in a real clinical scan. This is a common limitation and should not be a reason why this manuscript cannot be published, but please take it into account for future research.

Reply: Thank you for the understanding. We will consider this issue in our future study.

2. The reply stating "This study adopted BV/TV (%), TbTh (mm), TbN (1/mm), and TbSp (mm) for assessment indicators, following Bouxsein et al. [1], because they are the most representative parameters for trabecular bone microarchitecture" is not entirely satisfactory, because this reference deals with _rodent_ bone. For human bone characterization, it is quite possible that other parameters can be useful as well. In future research, I suggest to not only focus on BV TbTh and TbSp but to augment your data using other bone structure parameters.

Reply: Thank you for the comment. We will consider all the other trabecular bone parameters in our future study.

3. First paragraph in discussion: "However, the use of dental CBCT for measuring trabecular bone microarchitectural parameters was limited by the partial volume effect caused by the resolution of dental CBCT". This is one reason, yes, but even a CBCT reconstructed at 1 micron voxel size would not have the same resolution as microCT, because there are physical factors limiting its spatial resolution rather than reconstruction parameters. I suggest to revise this sentence to mention the larger focal spot size in CBCT (usually 0.5 mm), the limited number of projections (up to 1000 but usually a few hundred), and finally also the partial volume effect (although the voxel size is dictated by the detector pixel size, it is OK to mention that PVE is due to the large voxel size)

Reply: Thank you for the suggestion. We have modified the manuscript; the changes are in boldface and underlined in the revised manuscript.

4. I believe the following study can be added to Table 3 because it also included correlation analysis between CBCT and microCT:

Reply: Thank you for the suggestion. We have added this reference in the Table 3; the changes are in boldface and underlined in the revised manuscript.
Reviewer 2 (Reviewer 2): REVISION ASSESSMENT FROM THE ACADEMIC PEER REVIEWER: Has the author addressed your concerns sufficiently for you to now recommend the work as a technically sound contribution? Yes
Reply: Thank you.

Reviewer comments: The authors have adequately addressed the reviewing comments and the article reads well and provides useful information.
Reply: Thank you.

A minor thing, the heading in table 1 repeats parameter twice
Reply: We have modified accordingly. Thank you for the correction; the changes are in boldface and underlined in the revised manuscript.