Reviewer’s report

Title: Applying intraoral scanner to residual ridge in edentulous regions: in vitro evaluation of inter-operator validity to confirm trueness

Version: 0 Date: 12 Jun 2019

Reviewer: Francesco Mangano

Reviewer's report:

Title and abstract:

From the title and abstract, it looks the authors focus their attention on the precision, at least they say that, but in reality it is an in vitro study (please specify that!) in which they capture reference scans of a plastic model by means of a desktop lab scanner (which one? you must specify all data in the abstract!

Different desktop scanners give different performance). why? if you just want to evaluate precision, first you can do it in vivo (that is, much better than in vitro!) second, you do not need a reference scan.

I think the authors have no idea of what precision actually is, in metric, precision is repeatability of results and to gather data about precision, you do not need a reference model, you can simply superimpose the different scans taken by the different operators, intraorally. No need to have an in vitro model.

If you capture reference scans, you are evaluating the trueness, so if you calculated the trueness, it makes sense to have in vitro approach (in vivo it is rather impossible), and your study is logic. so please refer to trueness, in your work, instead of precision.

you can refer to precision only if you superimpose the scans taken by the different operators, on each other (without using the reference scans). in that case and only in that case, you can use the term "precision".

Please specify from the abstract the name and manufacturer of the desktop and intraoral scanner used. Devices are very important in digital dentistry.

There is a major bias in this work. the material you selected for your reference model has a completely different behaviour, when compared to the behaviour of human soft tissues. you need to add a limitation statement on your discussion section, highlighting this limitation.

in addition you do not specify, in the abstract, the n° of scans taken by each dentist, nor the level of the experience of these dentists with scanning, nor the scanning strategy. Please insert all this info, it is mandatory in the abstract.

You are focusing on the edentulos regions of a partially and totally edentulous model. Did you appropriately trim the partially edentulous model, in order to calculate the trueness uniquely in selected areas?

Please specify the software used for calculation of deviations after the superimpositions.
Introduction:

I like it but you do not mention the real problem with the digital fabrication of dentures (complete removable dentures or over dentures): it is the difficulty of capture the functionalization of tissues and activation of all muscle insertions and frenules by means of an intraoral scanner. the authors should add this limitation in the introduction and most of all, in the discussion section, moreover they should consider that indirect methods may represent the solution for this issue (i.e. normal inversion).

Methods:

Once again you misuse the term "precision" because here you are evaluating "trueness". Please refer to the following article for the correct definition of trueness and precision:

Trueness and precision of 5 intraoral scanners in the impressions of single and multiple implants: a comparative in vitro study.

Mangano FG, Hauschild U, Veronesi G, Imburgia M, Mangano C, Admakin O. BMC Oral Health. 2019 Jun 6;19(1):101. Please change it into "trueness" and never use the term "precision" because you did not superimpose the different scans taken with trios on each other, you just superimposed to the reference models. you used only 3shape materials and no data are available here on the quality of the superimpositions within the 3shape cad software. Please provide this data or a valid certification.

Only 5 scan per operator? very few!
How did you calculate "the molar region" or the "premolar region"? did you use a template?

Discussion and conclusions:

Please do not use the term "precision" but the term "trueness". please introduce and discuss the results of previously published similar studies (Patzelt et al)
please refer to the limits of your study (In vitro, no functionalization that is key with removable dentures, limited samples- only 5 scans per operator, very little, a minimum of 10 would be advisable). I do not think the head or tip of scanner is the issue, the issue is functionalization, in vivo. of course not with models. There are many studies on this topic, also published in bmc oral health, you should discuss them thoroughly

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

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