Reviewer’s report

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

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Reviewer: Christian Mertens

Reviewer's report:

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.

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 the described on page 9, lines 34-37.

What was used as anatomical landmark for the superimpositioning/matching of the different STL models?

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.

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.

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)

How many master casts were created? Three master casts? (parallel, 10-0-10 and 20-0-20)?

Results:
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.
Figures:
The description of Figure 2 seems to be wrong. Please check.
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.

Level of interest
Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

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