Reviewer's report

Title: Measurement Error and Reliability of three available 3D Superimposition Methods in Growing Patients

Version: 0 Date: 06 Aug 2019

Reviewer: Dieter Dirksen

Reviewer's report:

The study seems to be generally well conducted and described. However, some questions remain which should be adressed by the authors.

- The authors superimpose two data sets by registering at the cranial bases. It is not completely clear to me, whether this is done by a best fit algorithm or manually. If a best fit is used, does the software provide data about the remaining deviation as RSME? If this is the case, it would be a good estimator for the quality of the fit and should be provided.

- One problem that should be discussed is the limited resolution of the CBCT data (0.3mm). Its effect cannot be quantified by the presented study design as all three methods use the same data set (at each point in time). It should therefore be clarified that the study provides an estimation of the precision limits due to the superimposition methods only and not of the overall precision. The additional error that would be observed if different CBCT scans were used for each method would probably extend the confidence intervals. This aspect should be discussed with a perspective to its practical consequences.

- An obvious limitation of the study is that it is based on the results of a single investigator. This limitation should be further discussed. The order in which the data was evaluated and the methods used should be described. Was there a learning curve?

- The flowcharts (Figs. 1, 5 and 7) appear somewhat confusing. I would suggest to provide them in the usual syntax with standard graphical flowchart elements.

- Fig. 4: Instead of showing two views of the same situation, would it be possible to replace one of them with a false color image showing the remaining deviation at the cranial base after registration?

- Fig. 9: dito

- Fig. 8 is quite dark and of low contrast.

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