LETTER TO THE EDITOR

Accuracy of linear intraoral measurements using cone beam CT and multidetector CT: methodological mistake: Author response

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We were pleased to receive the letter from Sabour and Kermani¹ which addresses our article “Accuracy of linear intraoral measurements using cone beam CT and multidetector CT: a tale of two CTs”.²

We consider their comments to be helpful to readers because they broaden the discussion on the proper statistical approach to be used to validate accuracy. In brief, Sabour and Kermani caution not to confuse the assessment of validity (*i.e.* accuracy) with reliability (*i.e.* repeatability or reproducibility). We share their concern and have likewise mentioned elsewhere³ that many studies evaluating imaging accuracy suffer from unsuitable statistical evaluations. Thus, we took care to address the questions of validity and reliability in our article separately, each with an appropriate statistical approach.

We are, however, surprised at Sabour and Kermani's comment on the assessment of accuracy. In their letter, they suggest sensitivity, specificity, positive and negative predictive values, likelihood ratios and odds ratio as tests to evaluate the validity (accuracy) of a method compared with a gold standard. Although inherently correct for categorical data, these comments fail to be relevant to our study, because all these analyses are inapplicable for continuous values such as linear measurements.

So, what would be the best way to evaluate the validity of linear measurements? When trying to assess the degree of agreement, the correct statistical approach is not obvious.

To identify whether two methods of measurement are interchangeable, we need to know by how much one method is likely to differ from the other.⁴ The simplest and most popular approach⁵ is the Bland–Altman method,⁶ consisting of plotting the difference between the two measurements against the mean of the two measurements and establishing the limits of agreement (LOA).⁷ Provided the assumptions of uniform mean and standard deviation are met, the Bland–Altman plot with its LOA can be carried out by anyone with basic statistical knowledge, offering results that are easy to interpret in a meaningful way.⁸

Sabour and Kermani charge us by writing that “the common practice for assessing validity (accuracy) is to apply well-known statistical tests, and it is unclear why the authors did not consider employing such practice.” The original publication of Bland and Altman⁶ has by now been cited well over 25 000 times. We wonder how much more well known a method could be?

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