LETTER TO THE EDITOR

A comparative study of the accuracy and reliability of multidetector CT and cone beam CT in the assessment of dental implant site dimensions

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We read the article written by AA Al-Ekrish and M Ekram, “A comparative study of the accuracy and reliability of multidetector CT and cone beam CT in the assessment of dental implant site dimensions”,¹ with great interest.

We would like to congratulate the authors for their effort in the preparation of the manuscript. According to the mentioned study, measurements recorded for both modalities showed high intra and interexaminer reliability. Although cone beam CT (CBCT) measurements were significantly more accurate than those of multi-detector CT (MDCT), both systems showed clinically and statistically significant errors.

In this research, the measurements were recorded by two observers. As stated by the authors, CBCT measurements are highly operator dependent and this may explain the lower interexaminer reliability calculated for CBCT compared with MDCT. Interestingly, no specific information was given concerning the specialty and experience of the observers with tomographic slices. When presenting the results (Tables 1–3), which observer was taken into account? Did the authors calculate any intra and inter-observer agreement? It is our belief that these agreement calculations should be done and then the results could be presented by evaluating these agreements.

The authors had presented the intra and interobserver reliability using correlation and Cronbach's alpha. However, while assessing agreement between two measurement techniques, it is not appropriate to use the correlation analysis. For those types of studies, Bland-Altman² is a better method of choice. Also, for the evaluation of reliability, Cronbach's alpha is not an appropriate coefficient; Cronbach's alpha is used to rate the internal consistency or the correlation of the items in a test and it is generally used to evaluate the scales. It is appropriate to use intraclass correlation coefficient

(ICC) instead of Cronbach's alpha. ICC is used to measure inter-rater reliability for two or more raters.

Another drawback of the study design is the wrongly chosen voxel resolution for the Iluma CBCT scanner (Imtek Imaging, 3M Company, St Paul, MN) which was set at 0.3 mm. A similar research article published 2 years earlier, conducted by the authors of the present “letter to the editor”, used the same CBCT unit.³ We found that the accuracy of measurements of various distances surrounding the mandibular canal was highly comparable with that of digital caliper measurements. Our results were obtained from Iluma CBCT scanner images reconstructed at 0.2 mm voxel and two trained oral radiologists served as observers. It would be interesting to know the effects of different voxels in the implant site measurement accuracy.

The authors also mentioned in the last paragraph of their discussion that “recording of the ridge dimensions for implant site assessment and placement of implants should be performed by the same operator”. We do not have objection to this idea as long as an oral and maxillofacial radiologist consultation is provided.

We believe that the way the authors present their statistical analysis, the sole selection of a 0.3 mm voxel size and the obscure observer performance may mislead the readership with regard to the accuracy of assessment of dental implant site dimensions with CBCT.

We hope the authors will consider our constructive comments in their future work.

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