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Effect of JPEG compression on the diagnostic accuracy of periapical images; mistakes and misinterpretations

LETTER TO THE EDITOR

We were interested to read the paper by Noujeim M and colleagues published in the June 2012 issue of Dent Traumatol. The authors aimed to evaluate the effect of Joint Photographic Experts Group (JPEG) compressions on the diagnostic capability of periapical images in the detection of root fractures. The authors reported that Receiver operating characteristic (ROC) and ANOVA analyses were performed to compare the performance of the three different systems and evaluate the effect of the compression on the accuracy of root fracture detection showing no statistically significant difference between the original, large images presented in tagged image file format (TIFF) and the two compressed images (JPEG medium file and JPEG small file images) in the detection of root fractures (1). It is important to know that ANOVA is not a good test for evaluating the accuracy. Diagnostic accuracy of a test is being evaluated by the well known statistical tests and ROC is usually being used for comparing diagnostic models (2–4). Moreover, reporting added diagnostic value of a test is clinically much more important than just simple diagnostic accuracy of that test (2–4). They have also reported that four observers detected root fracture on the images saved in one uncompressed and two compressed formats finding that the intra-rater comparison showed a significant consistency in the detection of the fracture (1). Reporting intra rater consistency for evaluating accuracy can be confusing and easily lead to misinterpretations, since the exact amount of differences in reports of one rater may be clinically more important than statistically significant! Here, just by dichotomising the outcome (fracture), we can easily misclassify our patients with small fractures resulting in overestimation of the diagnostic accuracy of the mentioned image (JPEG).

Moreover, why did the authors not evaluate reliability of the mentioned test using methods such as Intra class correlation coefficient agreement (quantitative variables), weighted kappa (Qualitative variables) or bootstrapping (Models)? (2–4) Reliability or precision of a test should be evaluated before making any judgment for clinical use, since validity or diagnostic accuracy is just the first step for evaluating any clinical tests (2–4). It would be more informative, if the authors could also report inter-rater agreement to evaluate reliability of the different images.

References

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Response from the authors

Thank you for your interest in our paper. The ANOVA test was used to compare ROC analysis and results for different modalities, and not to evaluate the accuracy. All other points and suggestions were extremely relevant and will be followed in our future research project.

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