Validity and reliability of three-dimensional palatal superimposition of digital dental models.

Nivine Ragy,Sameh Talaat ,Ahmed Kaboudan, Christoph Bourauel, Katherine Kula, Ahmed Ghoneim

Abstract

Objective:To evaluate the validity and reliability of three-dimensional (3D) landmark-based palatal superimposition of digital dental models using Ortho Mechanics Sequential Analyzer (OMSA).Methods:The sample consisted of pre- and post-treatment digital maxillary dental models of 20 orthodontic cases. For each case, the pre- and post-treatment digital models were superimposed using surface-based methods utilizing 3dMD Vultus and Invivo 5 software as well as a landmark-based method utilizing OMSA. The same set of parameters were measured on the superimposed 3D data by the three softwares for comparison. Agreement in the superimposition outcomes among the three superimposition methods was evaluated with intraclass correlation coefficients (ICCs), Bland-Altman plots, and repeated measures ANOVA. A P value of Ò 0.05 was considered statistically significant. Results: Repeatability was acceptable for all methods based on the ICCs. Agreement as measured by the ICCs and repeated measures ANOVA was high among the three methods.Conclusion:The results indicate that OMSA offers a valid and reliable tool for 3D landmark-based digital dental models superimposition using 3 points marked along the midpalatal raphe as reference.

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