



CFAO GRADUATE STUDENT POSTERBOARD ABSTRACTS

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Validity and comparison between 2D and 3dMD in Orthodontic diagnosis

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Objective:

The aim was to evaluate the validity and comparison between direct anthropometry measurements as the “Gold Standard” with 2D-images (Normal Photo) and 3D-images (3dMD) as a new contemporary tool for orthodontic diagnosis.

Methods & Materials:

51 subjects (22 Male and 29 Female) were randomly selected, without facial deformity, surgery or facial hair. Nine anatomical landmarks were selected and plotted on the face to create 7 linear and 4 angular measurements which were measured directly (D) by a digital caliper and a protractor (www.examobile.com).

Photos (2D) were taken with a Nikon DSLR camera and ring flash in NHP as well as a 3Dimage with the 3dMD system (Atlanta, Georgia, USA). Both 2D photos and 3D images were analyzed by Tracker (www.opensourcephysics.org/Douglas Brown) and Vultus software for the same linear and angular parameters measured for each subject, respectively.

10% of the samples (5 cases) were randomly re-measured for intra-observer reproducibility. Collected data were analyzed by SAS using the paired t-test to compare the validity of direct (D), 2D and 3D measurements.

Results:

The highest mean differences for linear and angular measurements are presented in the table below:

Comparison	Linear	Angular
D-2D	1.1 mm	1.2 °
D-3D	0.17mm	0.26 °
2D-3D	0.89 mm	1.05 °

The results show no statistically significant difference between the direct measurement group (D) and 3D measurements. ($p > 0.05$) but a highly statistically significant difference is evident between the direct measurement group (D) and 2D measurements. ($p < 0.01$)

The 2D and 3D measurement groups also showed a statistically significant difference. ($p < 0.05$)

Conclusion:

Although the literature suggests that differences under 2 mm / 2 degrees are not clinically important, this study shows that the 3D imaging analysis may be a more accurate and reliable imaging method for use in orthodontics.