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Original Articles

On the Interaction between Incisor Crown-Root Morphology and Third-Order Angulation

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Abstract

Objective: To evaluate the significance of crown-root angles (CRAs) by testing the null hypothesis that there are no significant differences in deviations of third-order angles to axial inclination values between Angle Class II division 2 incisors and a neutral occlusion control sample.

Materials and Methods: The study group comprised $n_{\text{total}} = 130$ whites with either Angle Class II division 2 ($n_1 = 62$; group A) or neutral ($n_2 = 68$; control group B) occlusal relationships. Upper central incisor inclination (U1) was assessed with reference to the cephalometric lines NA and palatal plane (U1NA/deg, U1PP/deg). Craniofacial sagittal and vertical relations were classified using angles SNA, SNB, ANB, and NSL-PP. Third-order angles were derived from corresponding dental cast pairs using an incisor inclination gauge. Welch's two-sample *t*-tests (α -level: .05) were used to test the null hypothesis. Single linear regression was applied to determine third-order angle values as a function of axial inclination values (U1NA, U1PP) or sagittal craniofacial structures (ANB angle), separately for group A and B.

Results: The discrepancy between axial inclination (U1NA, U1PP) and third-order angles is significantly different ($P < .001$) between groups A and B. Regression analysis revealed a simply moderate correlation between third-order measurements and axial inclinations or sagittal craniofacial structures.

Conclusion: The hypothesis is rejected. The results of this study warn against the use of identical third-order angles irrespective of diminished CRAs typical for Angle Class II division 2 subjects. Routine CRA assessment may be considered in orthodontic treatment planning of Angle Class II division 2 cases.

Keywords: [Class II division 2](#), [Third-order angle](#), [Upper incisor inclination](#), [Crown-root morphology](#)

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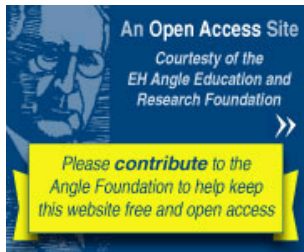
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