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S. S. Huja, E. L. Grubaugh, A. M. Rummel, H. W. Fields, F. M. Beck (*2009*) Comparison of Hand-Traced and Computer-Based Cephalometric Superimpositions. The Angle Orthodontist: Vol. 79, No. 3, pp. 428-435.

Original Articles

Comparison of Hand-Traced and Computer-Based Cephalometric Superimpositions

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Abstract

Objective: To determine the ability to produce comparable superimpositions using hand tracing and digital methods (Dolphin v10). In addition, if the two methods were comparable, we wanted to determine if a difference existed between the best-fit cranial base superimposition and S-N superimpositions using the digital method.

Methods and Materials: Sixty-four initial (T_1) and final (T_2) cephalometric film radiographs were obtained. Cranial base and regional superimpositions were completed independently for each pair of radiographs by either hand tracing and digital methods. To quantitatively evaluate the differences between the two methods, the hand and digital superimpositions were digitized to obtain x-y coordinates of routine cephalometric landmarks at T_2. Linear distance between multiple corresponding (hand and digital) T_2 cephalometric landmark locations (e.g., A point) were measured and defined as the T_2 landmark distance (T_2 LD). Additionally, 61 patient records were used to compare the digital method for best-fit cranial base superimpositions versus S-N superimpositions. A Friedman test was applied to examine for differences.

Results: The upper 95% confidence limit for the mean of the T_2 LD for hand and digital superimposition methods was <1 mm for all landmarks except maxillary incisor tip and apex. The upper 95% confidence interval for best-fit vs S-N was >1 mm for most landmarks.

Conclusion: This study validates the use of superimpositions produced by Dolphin Imaging version 10 and is a necessary step forward toward widespread acceptance of digital superimpositions.

Keywords: Cephalometrics, Superimpositions, Hand, Digital, Computerized

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