



CFAO GRADUATE STUDENT POSTERBOARD ABSTRACTS

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Reliability of 3-Dimensional Cone-Beam Computed Tomography Superimposition Methods in Growing Patients

AUTHORS: Ponce-Garcia C, Cevidanes L, Flores-Mir C, Carey J, Lagravere-Vich M (Supervisor)

AIM:

Determine and compare the reliability generated by three three-dimensional (3D) cephalometric superimposition methods (voxel-based and landmark-based) in growing patients.

MATERIALS AND METHODS:

A retrospective, observational longitudinal study was carried out on individuals that received comprehensive orthodontic treatment at the University of Alberta. Thirty-six patients with available pre- (T1) and post- (T2) treatment CBCT were selected from a population of teenagers from 11 to 14 years. The interval between T1 and T2 ranged from 22 - 25 months apart. CBCT volumetric data were taken using the iCAT Volumetric Scanner. Sagittal, axial and coronal volumetric slices, as well as the 3D image reconstructions, were used to determine the landmark positions, required for all three methods. Analysis of the images was carried out by one researcher using the respective superimposition techniques (CMFreg/Slicer, Dolphin and landmark-based). The SPSS (Statistical Package for the Social Sciences) was used to run the Intra-class Correlation Coefficient (ICC) test to analyze the data.

RESULTS:

ICC was good to excellent for intra-examiner repeatability for most landmarks used when assessed each method separately, $ICC \geq 0.97$ (CI 95% 0.93,0.99). When the reproducibility of the three methods was evaluated, ICC had a less powerful agreement with a wide range of confidence interval.

CONCLUSIONS:

All methods provide an acceptable level of repeatability when assessed individually. Determining a gold standard is needed to evaluate accuracy of 3D superimposition methods.