



CFAO GRADUATE STUDENT POSTERBOARD ABSTRACTS

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3D evaluation of molar and canine buccolingual inclinations in maxillary transverse deficiencies.

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Objective: Propose a novel 3D method for measurement of molar and canine buccolingual inclinations in maxillary transverse deficiencies and compare it to the CWRU transverse analysis.

Methods: Pre-treatment CBCTs of 60 patients with different degrees of maxillary transverse deficiencies were assessed using two methods to evaluate maxillary and mandibular molar and canine buccolingual inclinations. A novel method was proposed that used the 3D potential of DICOM images with a 3D skeletal maxillary reference plane and a software algorithm to determine 3D angular measurements through the true buccolingual plane of each tooth. These findings were compared to the CWRU transverse analysis that used coronal slices for 2D buccolingual angular measurements. Each method was assessed for intra- and inter-examiner reliability.

Results: Both techniques demonstrated excellent reliability ($ICC > 0.91$). There was a statistically significant difference for all measured teeth between techniques. Using a clinically significant difference of 10 degrees, only maxillary canine buccolingual inclinations showed a clinical difference between both methods.

Conclusion: The clinical difference between methods for maxillary canines can be attributed to the use of different reference planes and different approaches to the long axis of the teeth. However, a new reliable method for 3D analysis of buccolingual inclinations was developed and shown that it did not differ clinically from the CWRU transverse analysis for all teeth except maxillary canines. Further studies are required to confirm the accuracy of either analysis, to develop norms and to assess its clinical application.