

OP10 COMPARISON OF TWO- AND THREE-DIMENSIONAL MEASUREMENTS OF ALVEOLAR BONE OVER MAXILLARY INCISOR ROOTS USING POINT A AS A REFERENCE

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AIM: In cephalometry, the landmark point A is used to determine the most forward position of the maxilla and the maxillary incisors. However, overlying structures can confound structure identification on two-dimensional radiographs. The purpose of this retrospective study was to use point A as the reference to compare bone thickness over the most forward maxillary incisor (MFMI) in two- (2D) versus three-dimensions (3D) and, in 3D, to compare bone thickness, inclination, and position of the roots of each maxillary incisor to MFMI.

MATERIALS AND METHOD: Following power analysis, 34 pre-treatment cone beam computed tomographs (CBCTs) of Caucasian adults were coded, randomized and evaluated in Dolphin 3D. Two dimensional cephalograms were derived from each CBCT. Point A and the MFMI crown were located. Following reliability tests, alveolar bone buccal to three root points on the MFMI, bone to reference line [Frankfort Horizontal (FH-A)] at the three points, and incisor inclination (1-FH) were measured by one investigator. Measurements were repeated on three-dimensional CBCTs for all maxillary incisors. 2D and 3D measurements were compared using paired *t*-tests; 3D comparisons made with ANOVA. Associations were performed using Pearson's correlations. A 5 per cent significance level was used for all tests.

RESULTS: In 2D, the width of buccal bone at the MFMI root apices and distance between the buccal bone and FH-A line at the root apices and 3 mm from the cemento-enamel junction (CEJ) were significantly greater than in 3D. In 3D, bone thickness at the MFMI root apex and the distance from the FH-A line at all root points was significantly greater than at the lateral incisors whereas bone thickness 3 mm from the CEJ was significantly smaller than at the lateral incisors. An increased incisor angle was associated with greater bone thickness at the root apices but less 3 mm from the CEJ.

CONCLUSIONS: The amount of bone covering MFMI root apices is overestimated in 2D as compared with 3D and could affect treatment outcome when labial root torque is applied. Upright incisors have less bone over the root apices than proclined incisors. Incisor proclination is related to more bone thickness at the root apices and less bone thickness at the CEJ compared with retroclination.