

OP06 VERTICAL AND HORIZONTAL ALVEOLAR BONE CHANGES AROUND MANDIBULAR INCISORS AFTER ORTHODONTIC TOOTH MOVEMENT

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AIM: To evaluate vertical and horizontal alveolar bone changes after orthodontic tooth movement in order to assess if the alveolar envelope limits orthodontic tooth movement.

MATERIALS AND METHOD: Pre- and post-treatment cone beam computed tomography images of 41 adult patients were used to measure alveolar bone width and height changes on the lingual and labial surfaces of mandibular incisors. Width measurements were made at 2.5, 5, 7.5 and 10 mm apical to the cemento-enamel junction (CEJ). Height measurements were made from the marginal bone crest to the CEJ. Linear regression was applied to correlate bone changes with a change in the incisor mandibular plane angle, labio-lingual and occluso-lingual movement of the incisal edge and root apex. Regression models to adjust for all parameters and with specific interactions between selected parameters were also applied.

RESULTS: Every 1 degree increase in the incisor mandibular plane angle reduced labial bone width by 0.07 mm ($P = 0.009$), and increased lingual width by 0.09 mm ($P = 0.003$) at 2.5 mm apical to the CEJ. For 1 mm of labial movement of the incisal tip, bone height decreased by 0.31 mm ($P = 0.012$) on the labial and by 0.28 mm ($P = 0.040$) on the lingual. For 1 mm of extrusion of the incisal tip, bone height decreased by 0.50 mm ($P = 0.030$) on the labial and by 0.24 mm ($P = 0.001$) on the lingual.

CONCLUSIONS: Alveolar bone width decreased on the labial and increased on the lingual surfaces with incisor proclination. Bone height decreased on the labial and lingual surfaces with incisor advancement and extrusion. Significant changes of the alveolar envelope occurred with orthodontic tooth movement.