OP04 PERIODONTAL BONE CHANGES IN CONE-BEAM COMPUTED TOMOGRAPHY AFTER ORTHODONTIC TOOTH MOVEMENT WITH FIXED APPLIANCES

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AIM: To quantify the treatment-related change in periodontal bone volume in orthodontic patients.

MATERIALS AND METHOD: Cone-beam computed tomographs (CBCT) of 43 patients (24 females, 19 males; mean age: 25 years 5 months ± 13 years 5 months; 10 years 2 months to 56 years 9 months), who had been receiving orthodontic treatment with multibracket appliances for at least 1 year, were chosen for retrospective evaluation. Patients with periodontal diseases or requiring combined orthodontic-surgical treatment were excluded; the key inclusion criterion was an image resolution of 0.25 mm^3 voxel size. Despite dehiscence depth and bone width, the change in inclination was determined for 954 teeth. Statistical analyses were conducted with the help of SPSS Statistics®.

RESULTS: There was a significant decrease in mean periodontal bone height (vestibular: –0.82 ± 1.47 mm, +1.27 to –9.5 mm; lingual: –0.57 ± 0.79 mm, +1.84 to –6.07 mm) and width (–0.56 ± 0.71 respectively –0.69 ± 0.9 mm) during the period of treatment ($P < 0.001$). In terms of gender, there was no difference regarding bone height and vertical bone loss. A significantly greater dehiscence depth with an increased vertical bone loss occurred in patients older than 30 years. In patients <30 years old, approximately 20 per cent of the teeth showed defect depths >2 mm before treatment. In 90 per cent of these patients at least one tooth was affected. The upper canines and all lower teeth showed a higher risk for vestibular bone loss. The initial vertical defect depth and the amount of bone loss during orthodontic treatment were not mutually dependent. The therapeutic change in inclination correlated with horizontal bone loss.

CONCLUSIONS: Based on the present results it is reasonable to evaluate the periodontal bone volume in orthodontic patients older than 30 years on a routine basis due to increased vertical bone loss. Ninety per cent of patients younger than 30 years showed a reduced bone volume on at least one periodontium. Three-dimensional imaging, especially in young patients should be performed with milliampere-reduced CBCT.