AAO Foundation Award Final Report

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Award Type	Biomedical Research Award
Project Title	Gingival Crevicular Fluid Levels of Cytokines, Lysosomal and Cytoplasmic Enzymes in Young Patients Undergoing Rapid Palatal Expansion.
Project Year	1995
Institution	Columbia University, SDOS, Division of Orthodontics
Summary/Abstract	This study examined whether the inflammatory mediators interleukin (IL-1β) and β-glucuronidase (βG) are present in the gingival crevicular fluid (GCF) of children undergoing rapid palatal expansion and whether their levels vary upon activation of the appliance and movement of the maxillary first molars. Nine adolescent patients who needed palatal expansion were studied. Each patient received a periodontal prophylaxis and instruction in proper home care, including rinsing with chlorhexidine. Four weeks later, a modified Hyrax appliance was inserted. The jackscrew was activated twice daily until the appropriate expansion was achieved. GCF samples were collected at 2 pretreatment observation periods and 9 observation periods after placement of the appliance. Samples were collected with filter paper strips and analyzed by means of ELISA and time-dependent fluorometry for IL-1β and βG, respectively. The values recorded at the observation period 2 weeks after the periodontal prophylaxis were used as baseline. Paired t tests were used to compare mediator levels at this baseline to the levels obtained at each of the subsequent observations. The results indicate that (1) βG and IL-1β are present in GCF of young, healthy individuals, (2) their levels decrease following a strict regimen of plaque control, (3) orthodontic/orthopedic forces evoke changes in the levels of the inflammatory mediators IL-1β and βG in the periodontal tissues that can be detected in GCF. The results of this study support the hypothesis that mechanical stimulus causes an inflammatory reaction within the periodontal tissues, which in turn may trigger the biological processes associated with bone remodeling.