

AAO Foundation Award Final Report

Principal Investigator	Patricia A. Macchiarulo (Vayda)
Co-Investigator	
Secondary Investigators	
Award Type	Research
Project Title	The Effect of Applied Orthodontic Forces on the Local Production of Inflammatory Mediators
Project Year	1996
Institution	University of Minnesota
Summary/Abstract	<p>Previous studies have shown that prostaglandins and leukotrienes may play an important role in the bone remodeling process associated with orthodontic tooth movement. This study used a rat model to measure the production of inflammatory mediators around teeth subjected to orthodontic forces. This study also examined the affects of two commonly used non-narcotic analgesics on the rate of orthodontic tooth movement and the production of inflammatory mediators. The results of this study indicated that the application of orthodontic forces produces a time dependent increase in the production of the inflammatory mediator, leukotriene-B4 over the course of a typical activation cycle. The results of this study also indicate that inhibition of prostaglandin synthesis is sufficient to produce a significant decrease in the rate of orthodontic tooth movement. Rats treated with a short course of ibuprofen had significantly less tooth movement at day 21 than rats receiving acetaminophen or controls. Rats treated with ibuprofen had significantly lower levels of measured prostaglandin E-2 than those treated with acetaminophen or controls. The biochemical data in combination with the tooth movement data clearly implicates prostaglandins and leukotrienes as playing a critical role in the orchestration of orthodontic tooth movement. Patients medicating with iboprofen for other medical conditions may need to be advised of the possibility that orthodontic treatment may require a longer length of time.</p>