

AAO Foundation Award Final Report

Principal Investigator	Clarice S. Law, DMD, MS
Co-Investigator	Kang Ting, DMD, DMSc
Secondary Investigators	David S. Han, DMD, MS; Thien Truong, DDS
Award Type	Biomedical Research
Project Title	Growth factor-induced osteogenesis during expansion of the midpalatal suture
Project Year	2001
Institution	UCLA School of Dentistry
Summary/Abstract	<p>The objective of this particular study was to test the effect of growth factors on the rate and amount of bone fill in the midpalatal suture following expansion. The long-term goal of our research is to develop gene therapy-directed osteoinduction in the midpalatal suture to reduce retention time and increase clinical success for humans undergoing palatal expansion. The palates of 4-week old rats were surgically resected and maintained in culture. Twenty-five gauge needles were wedged between the palatal halves to mimic the application of an expansile force. Suture samples were randomly assigned to either expansion or non-expansion groups as well as non-growth factor vs. growth factor supplemented groups. Recombinant protein forms of BMP-2 and TGF-β1 were added to the media according to experimental design. Fluorescent microscopy was used to visualize and measure the widths of the midpalatal sutures in expanded and non-expanded groups. Masson-Goldner Trichrome stain was performed for histological evaluation of each suture. Results indicate a statistically significant difference in midpalatal suture width following expansion by needle insertion. Histological analysis demonstrates an elongation of the cells of expanded midpalatal sutures along the axis of expansion. Suture samples to which growth factors were added demonstrated 4 to 6 fold increases in osteoid deposits in the midpalatal sutures. We conclude that BMP-2 and TGF-β1 effectively increase the rate and amount of bone fill in the <i>in vitro</i> expanded midpalatal suture of the rat.</p>