

# **Maxillary Sinus Grafting With A Natural Flourohydroxyapatite for Immediate Load: A Preliminary Study With Histologic Analysis and Histomorphometry**

**Cameron Y.S. Lee, DMD, MD, PhD<sup>1</sup>**  
**Michael D. Rohrer, DDS, MS<sup>2</sup>**  
**Hari S. Prasad, BS, MDT<sup>3</sup>**  
**John D. Stover, DDS, MD, PhD<sup>4</sup>**  
**Jon B. Suzuki, DDS, PhD, MBA<sup>5</sup>**

<sup>1</sup> Formerly PhD Candidate, Department of Health Sciences, Touro University International, Cypress, California. Private Practice. Oral, Maxillofacial and Reconstructive Surgery. Address correspondence to Dr. Lee at 98-1247 Kaahumanu Street, Suite 314, Aiea, Hawaii 96701. E-mail: [CLee555294@aol.com](mailto:CLee555294@aol.com) Phone: 808-484-2288 Fax: 808-484-1181

<sup>2</sup> Professor and Director of Oral and Maxillofacial Pathology.  
University of Minnesota School of Dentistry.  
Hard Tissue Research Laboratory, Minneapolis, MN

<sup>3</sup> Senior Research Scientist. Oral and Maxillofacial Pathology.  
University of Minnesota School of Dentistry.  
Hard Tissue Research Laboratory, Minneapolis, MN

<sup>4</sup> Private Practice. Oral and Facial Surgery.  
Kailua-Kona, Hawaii

<sup>5</sup> Professor and Associate Dean.  
Temple University Kornberg School of Dentistry  
Philadelphia, PA

**Purpose:** The goal of this retrospective study was to evaluate the survival rates of dental implants placed in sinuses grafted with a 50:50 composite ratio of autogenous bone and a natural fluorohydroxyapatite (FHA) combined with platelet rich plasma (PRP) using an immediate load protocol. We hypothesized that a 50:50 composite ratio of FHA and autogenous bone combined with PRP would permit immediate loading without compromising implant survival rates.

**Materials and Methods:** Eleven patients with bilateral partial edentulism of the posterior maxilla were enrolled in this retrospective study. Autogenous bone used in the graft procedure was harvested from the tibia of the left lower extremity. Each patient was grafted with a 50:50 composite ratio of autogenous bone and FHA. Membranes were not used to cover the lateral wall osteotomy site. Platelet rich plasma (PRP) was added to the graft material to accelerate and enhance bone regeneration. Four to six months after the grafting procedure, thirty-seven hydroxyapatite coated dental implants were surgically placed and immediately loaded between 72 hours to five days later with custom titanium abutments and acrylic provisional restorations placed out of functional occlusion. Six months later, definitive ceramometal restorations were cemented on to the custom abutments. Patients were observed over a 52-week period.

**Results:** The overall implant survival rate was 97.3%. Histologic and histomorphometric analysis of core samples revealed formation of new vital bone in different graft specimens ranging from 23 % to 34 %. In each core bone sample, 100 % of the bone sample was determined to be vital.

**Conclusion:** In the grafted maxillary sinus, the natural fluorohydroxyapatite (FHA) combined with autogenous bone in a 50:50 composite ratio with PRP is a suitable graft material permitting immediate load without compromising implant survival rates, while decreasing the overall healing time.

**Key words:** Fluorohydroxyapatite (FHA). Autogenous bone. Platelet Rich Plasma. Immediate non-functional load. Implant survival rates. Vital bone formation.