Evaluation of the Adjunctive Benefits of Platelet-Rich Plasma in Subantral Sinus Augmentation.

Brief Clinical Note

Journal of Craniofacial Surgery. 16(2):280-287, March 2005.
*Kassolis, James D. DDS *+; Reynolds, Mark A. DDS, PhD **

Abstract:
Subantral sinus augmentation is often necessary to permit placement of endosseous implants. Recent efforts to improve wound healing have focused on autogenous sources of bioactive mediators, such as platelet-rich plasma (PRP), which offer the potential to enhance the biological activity of bone replacement grafts. The purpose of this randomized, single-blinded, controlled study was to compare bone formation after subantral maxillary sinus augmentation with freeze-dried bone allograft (FDBA) plus PRP versus FDBA plus resorbable membrane. Ten patients underwent bilateral maxillary subantral sinus augmentation, with sites within subjects randomized to receive FDBA plus PRP or FDBA plus membrane. Core biopsy specimens were obtained 4.5 to 6 months after the grafting procedure at time of implant placement. Histomorphometric analysis revealed a significantly higher percentage of vital tissue in sinuses after treatment with FDBA and PRP (78.8 +/- 8.3) than with FDBA and membrane (63.0 +/- 15.7). Moreover, the percentage of bone formation in sinuses augmented with the combination of FDBA plus PRP (33.3 +/- 11.3) was nonsignificantly (P <= 0.10) higher than in sinuses grafted with FDBA plus membrane (26.5 +/- 6.8). Residual graft particles constituted a significantly higher percentage of the regenerate in sinuses treated with FDBA plus membrane than in sinuses augmented with FDBA plus PRP (37.0 +/- 15.7) versus (21.2 +/- 8.3, respectively). When comparing the relative proportion of vital bone to residual graft particles, a significant difference also was observed between sinuses treated with FDBA and membrane compared with sinuses augmented with FDBA and PRP (0.98 +/- 0.77 versus 1.82 +/- 0.88, respectively).

The results of this study suggest that the combination of FDBA and PRP enhances the rate of formation of bone compared with FDBA and membrane, when used in subantral sinus augmentation. Future research is needed to determine the clinical significance and the cost- and risk-benefit considerations of the approach.