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Implant Restoration 3 months after One Stage Sinus Lift Surgery in Severely Resorbed Maxillae: 2-Year Results of a Multicenter Prospective Clinical Study

Clin Implant Dent Relat Res 2010, in press

Objectives: This multicenter prospective study was aimed to clinically evaluate implant behavior inserted in severely resorbed maxillae and restored 3 months after sinus grafting.

Materials and Methods: In three clinical centers, 67 totally rough wide diameter implants were inserted during 30 consecutive sinus lifts. Computed tomography and panoramic analysis were preoperatively requested for each patient. Sinus grafting was performed using a nano-crystalline hydroxyapatite sole bone filler; no membrane was used to cover the buccal window. Preoperative residual bone height ranged between 1–4 mm (mean value: 2.70 mm, standard deviation [SD]: 0.9 mm). Uncovering procedure was carried out following 3 months of healing; 2 weeks later, a definitive restoration was seated using platform switching concept. To monitor stability changes, resonance frequency analysis was performed and implant stability quotient (ISQ) values were collected at the first surgery (baseline, T0), at the abutment connection (T1), and at 2-year follow-up (T2). To measure bone changes, patients underwent panoramic analysis after 2-year follow-up. The image analysis software calculated the grafted bone height changes at level of implant site comparing pre-operative and follow-up panoramic films; the software compensated for eventual radiographic distortion.

Results: Mean ISQ value was 35.7 (SD: 8.8) at baseline, 66.61 (SD: 4.76) at T1, and 77.9 (SD: 4.7) at T2. Statistically significant differences ($p \geq 0.005$) regarding ISQ mean values were found between T1 and T0, as well as between T1 and T2. After 24 months of functional loading, only two implants were lost (cumulative survival rate: 97%). During the same observation period, the mean value of radiographic vertical height of grafted sinus was 13.75 mm (SD = 1.3 mm), with a mean gain of 11 mm.

Conclusions: Within the limits of this study, despite of preoperative residual bone height ranging 1 to 4 mm and absence of the membrane covering the buccal bone wall, maxillary sinus lift restoration 14 weeks after first surgery seems to be a reliable procedure using totally-rough surfaced implants restored using platform switching concept and nano-structured hydroxyapatite as sole bone filler.