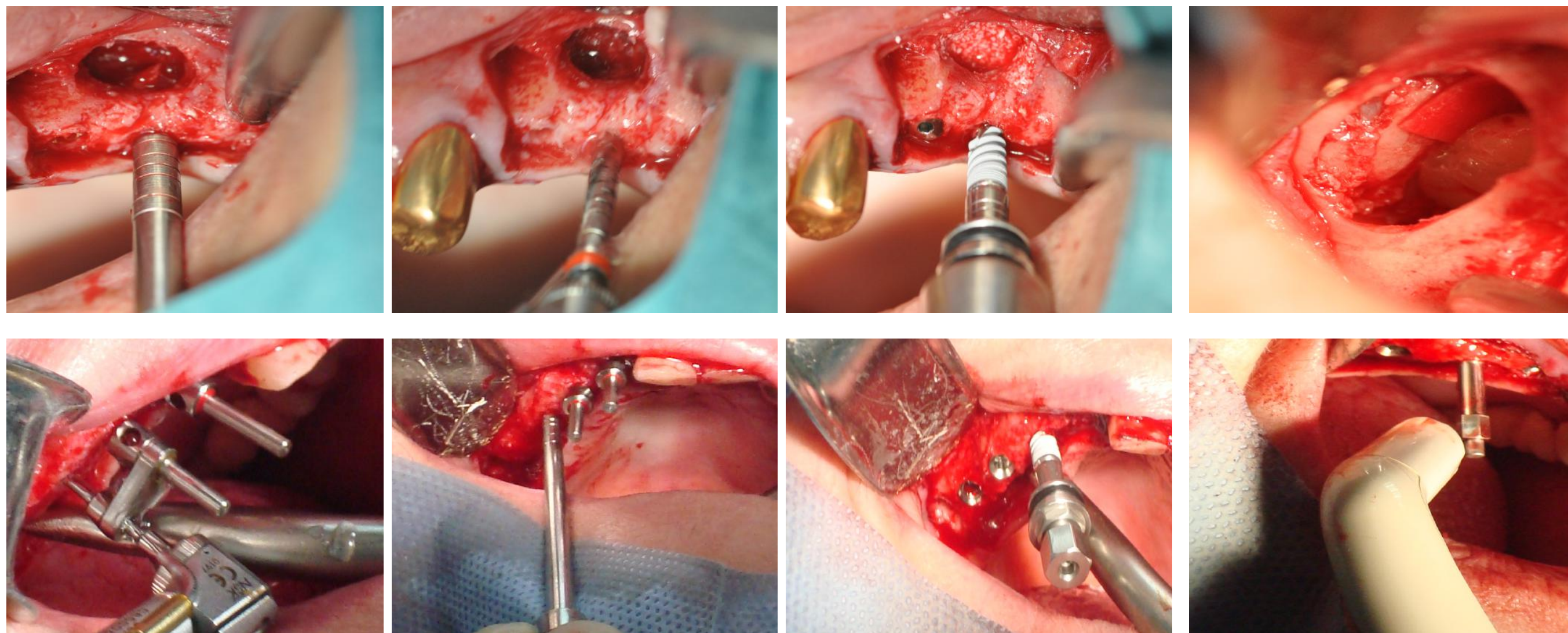


COMPARATIVE STUDY OF THE TRANSCRESTAL SINUS LIFT VERSUS LATERAL APPROACH SINUS AUGMENTATION AND SIMULTANEOUS INSERTION OF BIOACTIVE CALCIUM-PHOSPHATE COATED DENTAL IMPLANTS: 7 YEARS OF FOLLOW-UP

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Objectives

In this prospective follow-up study, the cumulative survival and success rate of the implants with bioactive calcium-phosphate coating after 7 years post-insertion via lateral sinus lift approach in comparison with transcrestal technique was documented. The second criteria were evaluation of bone remodeling around elevated sinus floor. The descriptive data showed no presence of painful symptoms or mobility in any of the evaluated implants.

Methods

The results of 90 conical self-drilling implants with calcium-phosphate coating (Bioactive® Alfa Gate, Israel) placed with simultaneous sinus lift procedure in 40 consecutive men patients (2008) presenting 5-6 mm of residual bone have been analyzed. The mean age at the surgery time was 41 years. Half of patients were treated with lateral sinus lift procedure and simultaneous insertion of 50 implants (Group A). In these patients it was used the following grafting protocol: mixtures of platelet-rich fibrin and deproteinized bovine bone particles and covering with a collagen membrane (Bio Oss® and Bio-Gide®, Geistlich AG, Switzerland). In rest of patients, 40 implants were inserted via transcrestal sinus lift procedures without grafting materials (Group B). The time between implant placement and loading was 4 months. All restorations were cemented.

The primary outcome criteria were implant survival and success rate according to Albrektsson's and Buser's co-authors. The secondary outcome criteria were appreciation of modified Loe and Silness gingival index, plaque index according to Mombelli as well as bleeding score according to Mühlemann. The following analyses were determined to access the necessary dates for follow up: implant primary and secondary stability [resonance frequency analysis – (ISQ, Osstell®, Sweden) and Periotest® (Siemens AG, Germany)], as well as radiological outcomes of the bone changes around implants and sinus floor.

Results

All patients were seen at 4, 12 months and at 2-7 years of follow-up. ISQ dates were collected during surgery and after 4 months of healing. The Periotest dates were obtained immediate, 4, 12 months and during 7 years post surgery. After healing in-group A ISQ values were 63.1 compared with 59.1 post surgery. In-group B the mean ISQ at the insertion was 68.8 and 72.1 later 4 months. Post surgery, the mean Periotest value was -2.15 (A) and -3.64 (B). After 4 months the value was -4.32 (A) versus -4.74 (B). The mean value (A&B) of the Periotest in 1 year was -4.75 and -4.2 after 7 years.

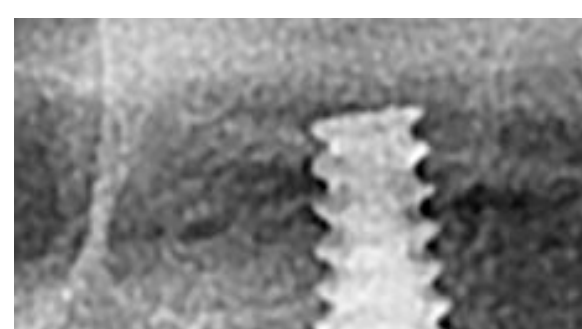
4 months post surgery; the mean bone loss was -0.52 mm in transcrestal cases. After 1 year, a bone gain of +0.16 mm was observed with decreasing of value of -1.3 mm after 7 years. For the implants in augmented sinuses, it was observed more bone formation after 4 months of surgery (+0.46 mm). After 1 year, the bone loss was -0.4 mm and -2.1 mm after 7 years.

On comparing the bone gained in sinus area, the mean height in-group A was more (7.8 mm) than in B (3.2 mm) after surgery. At the rehabilitation time in-group A the bone height gained was 7.6 mm with following changes: year 1 – 7.7 mm with decreasing until 2.3 mm at the year 7th. For the group B the values are: 4 months 2.9 mm, 1 year 3.1 and 7 years 3.6 mm.

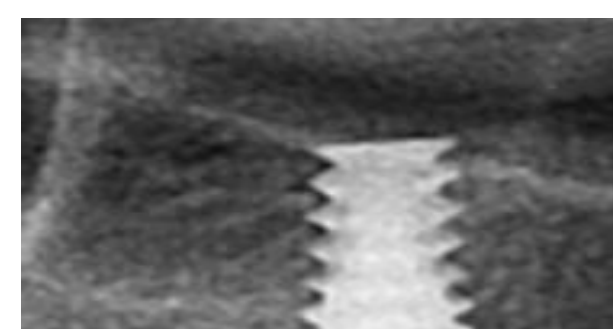
At the end of observation periode, in the most of cases (75.9%), a normal gingiva was observed. No plaque accumulation was observed in 93% of implants. In 90% no bleeding could be provoked.

Conclusions

The comparison of the clinical and paraclinical outcomes in this follow up study with the results of aftercare examinations of other implant systems indicates a promising 7 years survival and success rate for the bioactive calcium-phosphate coated implant system. This applies to the partial atrophied posterior maxilla edentulous jaws and should be interpreted with respect to the critical patient selection in this study – transcrestal sinus lift versus lateral approach sinus augmentation with simultaneous implants insertion. The results demonstrate that Bio-Oss is a useful scaffold for augmentation in lateral approach sinus lift. Transcrestal osteotomy and elevation of the sinus membrane with autogenous local bone has the advantage of being stable and having an osteoconductive property that allows for direct contact of the implant body with newly formed bone. The resorptive processes in both techniques proceed slowly enough to provide sufficient time for bone maturation.



Post operative xray of the transcrestal implant



Crestal sinus floor image after 7 years of loading

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