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Topic: Implant therapy outcomes, surgical aspects

Background and Aim

Bone resorption following tooth loss often interferes with dental implant placement in a desired position, and requires additional bone augmentation procedures. Guided Bone Regeneration (GBR) treatment concept advocates that regeneration of osseous defects is predictably attainable by means of the application of occlusive membranes, which mechanically exclude non-osteogenic cell populations from the surrounding soft tissues, thereby allowing osteogenic cell populations originating from the parent bone to inhabit the osseous wound. The aim of the present study was to assess the survival rate of 192 implants placed in augmented bone in order to comprehend the predictability of the GBR procedures in the long-term period. Moreover the survival rate was analyzed comparing three different types of bone graft: heterologous, autogenous, a 1:1 ratio mixture of the previous ones. A long-term period follow-up is necessary to correlate the potentiality of specific bone graft and to address future treatment plan choices.

Methods and Materials

Patient recruitment: 61 patients with a range age of 25-79 years, in good general health were recruited from 1999 to 2012 in the same clinical centre: Department of Implantology, U. O. C. Maxillofacial Surgery and Dentistry Fondazione IRCCS Cà Granda. University of Milan.

Inclusion criteria were both mono and bilateral partial edentulism associated with different degrees of vertical and horizontal bone loss of the jaws (according to class II to VI Cawood & Howell atrophy classification).

Exclusion criteria were poor oral hygiene, active periodontal infections, uncontrolled systemic pathologies and presence of smoking habit (> 10 cigarettes/day).

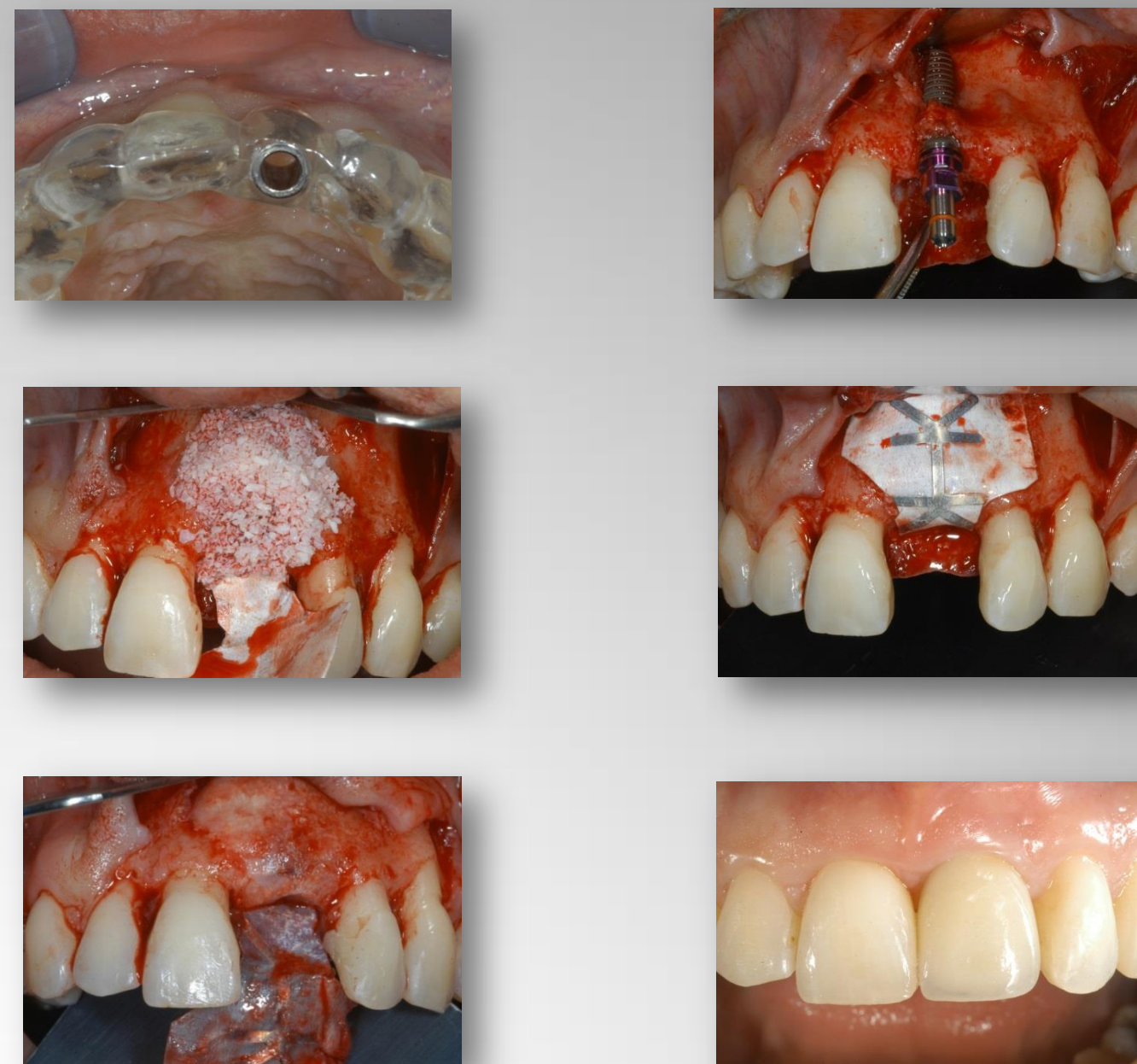
Statistical analysis was performed using the Statistical Package for Social Sciences (version 21.0, SPSS Inc., Chicago, Illinois, USA). Kaplan-Meier survival analyses were done for the entire group of implants and discriminated according to type of grafting material used and timing of implant placement. Log rank test was used for assessing the statistical significance. P values less than 0.05 were considered to be statistically significant.

Selection of the sample: 192 implants inserted in regenerated bone with GBR technique were considered with a mean six years follow-up. 72 implants were placed in heterologous bone graft, 20 implants in autogenous bone graft and 96 in into a 1:1 ratio mixture of autologous and heterologous bone graft. The cumulative survival rate of the entire sample and between the three mentioned groups was assessed.

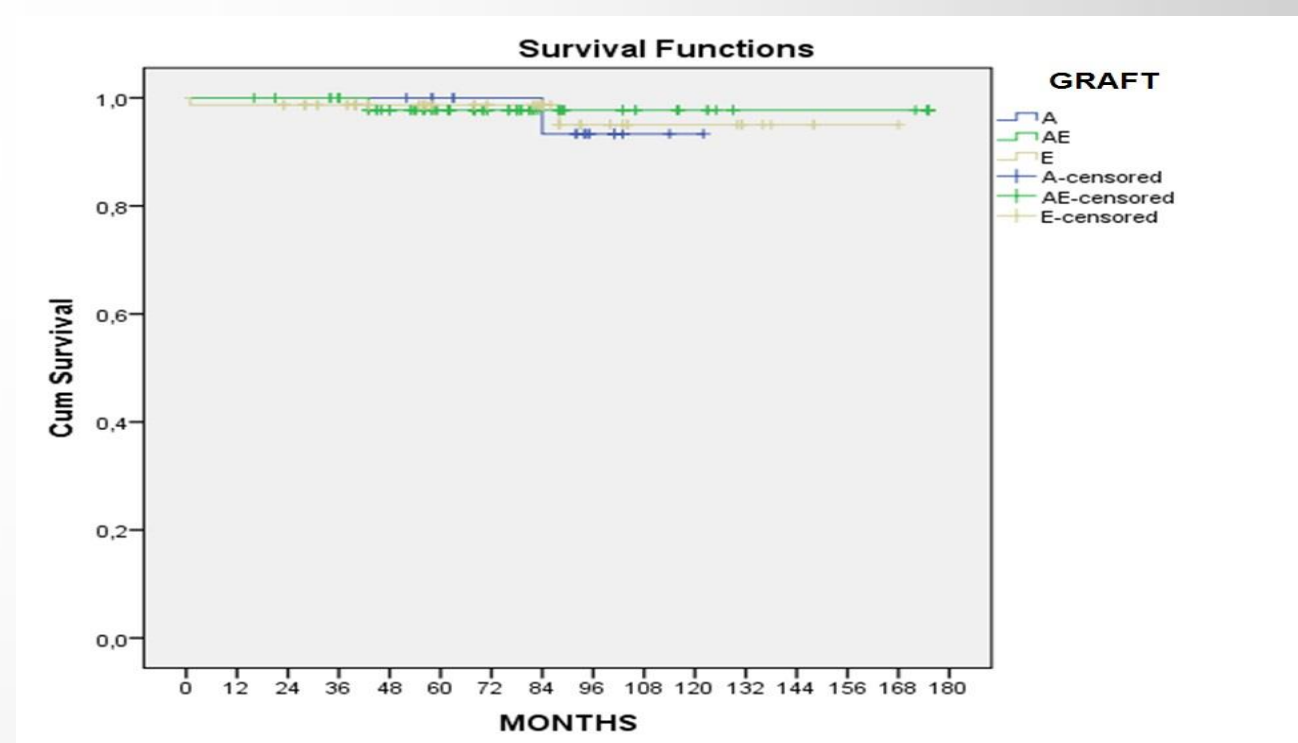
Results

From 192 implants positioned into regenerated bone, a total of 5 implant failures occurred. According to the Kaplan Meier analysis, the cumulative survival rate of implants placed was 96% (± 2). From 76 implants positioned into heterologous bone graft 2 failures occurred with a cumulative survival rate of the 95% ($\pm 3,8$). From 20 implants positioned into autogenous bone graft 1 failure occurred with a cumulative survival rate of the 93% (± 6). Implants placed in a 1:1 ratio of autogenous and heterologous bone graft mixed together were 96 with 2 failures and a cumulative survival rate of 98% ($\pm 1,6$).

No Log rank statistical significant difference ($p=0.93$) was shown between the three different types of graft.



A clinical case of implant therapy with GBR technique.



Survival rate according to the type of graft.

Conclusions

According to the data from the present study, implants placed in augmented bone by means of GBR technique represents a predictable procedure. In the implant rehabilitation of atrophic alveolar ridges. Comparing the three types of mentioned grafts, the 1:1 autogenous/heterologous mixture had slightly superior outcomes although they were not statistically significant.

References

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