



## Dental Implant Outcomes in Grafted Sockets: a Systematic Review and Meta-Analysis

### ABSTRACT

It is well known that after tooth extraction a three-dimensional alveolar bone resorption occurs and this can jeopardize the results of the following implant rehabilitation. In order to limit these dimensional changes, different alveolar ridge preservation techniques have been proposed, with positive clinical results of implants placed in grafted sites.

As the Authors verified that the evidence regarding the clinical outcomes of implants inserted following ridge preservation was still limited, they proposed this systematic review so to assess the existing evidence regarding the clinical outcomes of implants placed into previously grafted extraction sockets. In order to evaluate the treatment outcomes in terms of implant survival rates (primary outcome), marginal-bone-level (MBL) changes, clinical parameters (i.e., bleeding on probing, probing depth), occurrence of peri-implant diseases, and aesthetic outcomes (secondary outcomes), a review protocol was developed according to the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) statement, including randomized controlled clinical trials (RCTs), controlled clinical trials, and prospective studies with at least 12 months of follow-up and a minimum of 10 patients having at least one dental implant inserted into the grafted socket were conducted. Search in MEDLINE (PubMed) and the meta-analysis performed using the random-effects model on the selected qualifying articles resulted in 7 RCTs. This systematic review pooled data collected from 512 patients (243 men, 270 women). In all seven studies guided bone regeneration approach was adopted with the use of bone substitute material covered with a barrier membrane. As a bone substitute, either xenogenous (six studies) or alloplastic (one study) bone-filler particles were used. As a barrier membrane, either collagen membranes (in five studies), porcine derma (one study) or a pericardium membrane (one study) were used. The bone substitute materials used were: corticocancellous porcine bone (OsteoBiol® Gen-Os® and OsteoBiol® mp3®, Tecnos®, Giaveno, Italy), cortical porcine bone (OsteoBiol® Apatos, Tecnos®), porcine derma (OsteoBiol® Derma, Tecnos®), deproteinized bovine bone graft (Geistlich Bio-Oss®), absorbable collagen membrane (Geistlich Bio-Gide®), algae-derived Frios Algipore (Dentsply Friadent®), resorbable membrane derived from equine pericardium (OsteoBiol® Evolution, Tecnos®). Based on the included 7 randomized clinical trials, the survival rate of the implants inserted into the grafted sockets ranged from 95 to 100% after 1 to 4 years of follow-up. MBL loss was found to be significantly greater for the implants placed in the non-grafted healed sites than for those placed in the previously grafted sockets.

### CONCLUSIONS

Based on this systematic review, the Authors concluded that *“in terms of survival rates, placing dental implants in previously grafted sockets is a predictable treatment option. Differences could be found for the peri-implant marginal-bone-level changes when compared with the implants placed into the non-grafted sites”*.

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