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Paper Digest 2015:42 10

EFP European Federation of Periodontology

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Study: ✓

Randomised controlled multicentre study comparing short dental implants (6 mm) versus longer dental implants (11-15 mm) in combination with sinus floor elevation procedures.

Part 2: clinical and radiographic outcomes at 1 year of loading.

Schincaglia, G.P., Thoma, D.S., Haas, R., Tutak, M., Garcia, A., Taylor, T.D. and Hämmerle, C.H.F.
J Clin Periodontol 2015:42 1042-1051.

Summarised from original article with kind permission from Wiley Online Library

Relevant background to study:

For the treatment of the atrophic maxilla, short dental implants and sinus elevation in conjunction with longer implants have been shown to be clinically successful in terms of survival rates. However, only a limited number of studies have compared both procedures in a randomised controlled clinical trial.

Study aims:

To evaluate whether the use of short dental implants (6 mm) results in similar clinical and radiographic outcomes compared to long implants (11/13/15 mm) in combination with sinus grafting.

Methods:

In this prospective, randomised controlled, multicentre study, 101 patients received a total number of 137 implants (4mm ø, ASTRA TECH Implant System OsseoSpeed) to restore function in the posterior edentulous maxilla, for patients presenting with a residual ridge height of 5-7mm and a width of ≥ 6 mm.

Volunteers were randomly allocated to two treatment groups. At implant placement surgery, group GS (Group Short) was treated with short implants (6mm), potentially penetrating 1-mm into the sinus and perforating the Schneiderian membrane. In such cases no additional precautions were taken.

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Methods: *(cont'd)*

In group GG (Group Graft), however, long implants (11/13/15 mm) were inserted after a lateral sinus-lift procedure, with concomitant grafting with a bone substitute (Bio-Oss Granules) and a resorbable membrane (Bioguide). The implants were left to allow trans-mucosal healing. Where primary stability was poor, a two-stage approach was employed.

Six to seven months following surgery, implants were restored with individual, non-splinted crowns.

97 patients (and 132 implants) were clinically and radiographically examined at the evaluation 12 months following prothesis delivery (FU-1).

Outcome variables included: cumulative implant survival rate (CSR), periodontal probing depth (PPD), bleeding on probing (BoP), plaque control record (PCR), marginal bone-level alteration (MBL) and crown-to-implant ratio (C/I). Statistical analyses, both at subject and implant levels, were performed using parametric tests.

Results:

In 97 subjects, 132 implants were evaluated at FU-1.

- The CSR was 100% at FU-1 excluding the data of subjects lost to follow-up.
- Comparisons between GS and GG showed no significant differences for PPD ($p = 1.0$) and PCR ($p = 0.09$). BoP was higher in GS than GG ($p = 0.04$).
- The MBL from the time of implant placement to time of restoration was -0.22 ± 0.4 mm for GG and -0.3 ± 0.45 mm for GS ($p < 0.001$). The MBL from time of placement to FU-1 was - 0.37 ± 0.59 mm for GG and -0.22 ± 0.3 mm for GS ($p < 0.001$).
- Comparisons between groups (GS and GG) showed no significant difference regarding MBL at any of the time intervals ($p > 0.05$), (Fig. 2).
- The C/I was 0.99 ± 0.17 for GG and 1.86 ± 0.23 for GS ($p < 0.001$). No correlation was observed between C/I and MBL, (GG: $p = 0.13$; GS: $p = 0.38$).

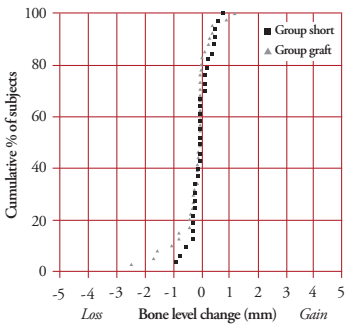

Fig. 2. Cumulative representation of marginal bone level alteration average (Gain/Loss) of group short and group graft from prosthesis insertion (PR) to the 1 year follow-up (FU-1).

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Limitations, conclusions and impact:

Limitations:

The short observational period constitutes the principal limitation of this study. The cumulative implant survival rate, together with clinical and radiographic parameters need to be assessed longer term.

In addition, patients were pre-medicated with antibiotics and analgesics according to the centre's normal routine, but no further information is provided regarding how many patients from the respective groups undertook the pre-medication protocol.

Conclusions:

Within the limitations of this study, short implants and long implants in combination with sinus floor elevation procedures demonstrated similar outcomes at 1 year of function with regard to implant survival rates and marginal bone - level alterations. Crown-to-implant ratio did not affect the implant survival rate and the marginal bone level at 12-months.

Impact:

- Short implants represent a potential treatment alternative for restoring the atrophic posterior maxilla.
- Increased crown-to-root ratio seems not to negatively affect the outcome of the treatment at 1-year follow-up.
- Short implants seem to provide function with less morbidity costs and treatment time.