

## RAPPORTEURS

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## study

# Short implants or combine sinus graft and long implants?

Daniel S. Thoma, Robert Haas, Katarzyna Sporniak-Tutak, Abel Garcia, Thomas D. Taylor, Christoph H.F. Hämmeler. *J Clin Periodontol.* 2018;45:1465–1474.

Summarised from original article 'Randomized controlled multicentre study comparing short dental implants (6mm) versus longer dental implants (11–15 mm) in combination with sinus floor elevation procedures: 5-year data,' with kind permission from Wiley Online Library

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## RELEVANT BACKGROUND

In the past five years, implant research has focused on the use of shorter dental implants whose potential benefits include reduced treatment time, lower costs, and less morbidity by avoiding the need for bone-augmentation procedures. Various recent systematic reviews, based on mid-term data, conclude that implant survival rates of short implants are similar to longer dental implants placed into native bone.

In the posterior maxilla with a limited ridge height, sinus-elevation procedures are often performed to allow implant placement. The implant survival rates are relatively high, but the procedure is associated with an increased patient morbidity including post-operative swelling, pain, and sinus-membrane perforations rates of up to 20%.

Shorter dental implants might overcome these drawbacks by avoiding primary or simultaneous bone-augmentation procedures and reducing patient-reported morbidity. However, there is a need of confirmatory studies with longer follow-up.

## AIMS

The primary aim of this multicentre study was to compare the implant survival rate between short (6mm) and standard-length (11-15mm) implants, the latter placed in combination with bone grafting, at five years from loading. Secondary aims included biological and technical complications, changes in marginal-bone levels, peri-implant soft-tissue parameters, and patient-reported outcomes.

## MATERIALS AND METHODS

This is a prospective randomised controlled multicentre study, with a follow-up at five years after loading, comparing short (6mm) and standard (11-15mm) implants, the latter installed in combination with a sinus-floor elevation procedure for the treatment of partial edentulism in the posterior maxilla.

In total, 101 patients (137 implants), with a posterior maxillary bone height of 5-7mm, were enrolled and randomly received either short (6mm) implants (GS) or standard (11-15mm) implants with sinus grafting (GG). Six to seven months after implant placement, final restorations (non-splinted, single-tooth crowns) were inserted and a follow-up was performed at one year (FU-1), three years (FU-3), and five years (FU-5) after implant loading.

At each time point, clinical parameters were recorded including plaque, bleeding on probing, probing depths at the implant site and on the neighbouring tooth, and marginal-bone level. The crown-to-implant ratio as well as the crown height space were also recorded after implant loading. Patient-reported outcome measures (PROMs) were assessed using a standardised questionnaire (OHIP-49) before implant surgery and at all follow-up time points. Statistical analysis was performed using a non-parametric approach.

# results

The analysis was based on 90 patients (124 implants) at five years.

- The survival rate at patient and implant levels did not differ between the short and long implants: at five years, at patient level it was 98% and 100%, and at implant level 98.5% and 100% for short (GS) and long (GG) implants respectively.
- Higher crown-to-implant ratio, greater crown height, and greater implant length had no statistically significant impact on technical and biological outcomes.
- Five years after loading, no difference between the two treatment modalities was found regarding biological outcomes such as marginal-bone levels, marginal-bone-level change, probing depth, bleeding on probing, plaque, mucositis (40.9% GS and 50% GG at patient level), and peri-implantitis (2% GS & 0% GG at patient level).
- In total, 35 technical complications occurred. The rate of technical complications was higher for short implants at three years, but this difference was not statistically significant at five years (47.7% for GS and 30.4% for GG).
- Patient-reported outcomes evaluated by the OHIP-49 questionnaire did not diverge between the two treatment procedures, with significantly increased scores compared with baseline values prior to implant placement.



## LIMITATIONS

- The low number of implants included (137), when the sample-size calculation prior to the study yielded a number of 250 implants.
- Inclusion of only partially edentulous patients, which implies limited generalisation on the use of shorter implants.
- Future studies should include patients with larger edentulous areas, as by increasing the number of chewing units in posterior areas supported by shorter dental implants, the load on these implants might increase.



## CONCLUSIONS

- High implant survival rates for both treatments – 98.5% for GS and 100% for GG – were observed at 5.5 years post-loading.
- Limited median marginal-bone levels for both treatments – 0.14mm for GS and 0.00mm for GG – were observed at 5.5 years post-loading.
- Crown-to-implant ratio and implant length did not influence the outcome of treatment.
- Short dental implants were more prone to technical complications compared with longer implants.



## IMPACT

- Shorter dental implants should be considered as a suitable option to treat maxillary posterior edentulous areas, but they should be closely monitored within the first three years after loading.
- Clinicians should carefully consider whether sinus-elevation procedures should be avoided in sites with height of 5 to 7mm.



LINK TO ORIGINAL JCP ARTICLE:

<https://www.onlinelibrary.wiley.com/doi/pdf/10.1111/jcpe.13025>

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