

Four implant bar-connected implants sufficient to support a maxillary overdenture

Abstracted from

Slot W, Raghoobar GM, Vissink A, Meijer HJ.

Maxillary overdentures supported by four or six implants in the anterior region; 1-year results from a randomized controlled trial. *J Clin Periodontol* 2013; **40**: 303–310.

Address for correspondence: Wim Slot, Department of Fixed and Removable Prosthodontics, Dental School, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands. E-mail: j.w.a.slot@umcg.nl

Question: Are four bar-connected implants as effective as six bar-connected implants in supporting a maxillary overdenture?

Design Randomised controlled trial.

Intervention Edentulous patients aged at least 18 years with lack of retention and stability of the upper denture and lower denture were randomised to receive a maxillary overdenture supported by either four or six bar-connected implants.

Outcome measure The primary outcome measure was change of radiographic bone level. Secondary outcome measures were implant survival, overdenture survival and soft tissue conditions (plaque index, presence of calculus, gingiva index, sulcus bleeding index and pocket probing depth). These were scored at placement of the overdenture and after 12 months of loading. Patient satisfaction was also scored at baseline and at 12 months.

Results Forty-nine patients (one drop out) completed the one year follow-up. Mean marginal bone resorption was 0.24 ± 0.32 mm in the four implants group and 0.25 ± 0.29 mm in the six implants group. Implant survival was 100% in the four implants group and 99.3% in the six implants group (one implant lost). Overdenture survival was 100% in both groups. There were no differences in the soft tissue outcomes between the groups. Patient satisfaction had improved in both groups.

Conclusions After one year a bar-connected maxillary overdenture on four or six implants results in a comparable treatment outcome with high implant survival, healthy peri-implant tissues and high patient satisfaction. For reasons of cost-effectiveness, treatment with four bar-connected implants to support a maxillary overdenture is preferred.

Commentary

Patient difficulties with conventional dentures in an edentulous atrophic mandible are well recognised. The York Consensus Statement in 2009 concluded ‘quality of life with two-implant supported mandibular overdentures is significantly greater than for conventional dentures’¹ following careful consideration of the available evidence. Early investigation of maxillary implant supported overdentures show similar improvement in patient related outcomes,² although there is some debate regarding surgical and prosthetic protocols to achieve an optimal result.³

Slot *et al.* aimed to compare clinical and patient outcomes of maxillary overdentures supported by four or six dental implants connected by a bar after one year follow up. Fifty patients (25 in each group) averaging 58 years of age were recruited between 2006 and 2009 following referral to secondary care. The trial participants had been edentulous on average for a period of 14.2 years, having had 2.6 maxillary dentures in this time, the current approximately 3.5 years old.

The study was an inferiority design and the primary outcome measure was radiographic peri-implant bone levels. The secondary outcomes were implant survival, overdenture survival and patient satisfaction. Baseline recordings were taken after implant installation. While this timing is important to measure peri-implant bone levels, it potentially overestimated the change in patient satisfaction as the patients’ own dentures were adjusted following surgery; the patient centred outcomes should have been assessed preoperatively.

The surgical and prosthetic stages were described in detail and are extremely informative for the reader. As criteria for prosthetic survival were not explained, this leaves the reader unable to discern between something as simple as a screw loosening compared to denture fracture, which could be considered a catastrophic failure. The relatively short follow-up period may underestimate these well documented complications.⁴ Furthermore a clinically significant change in peri-implant bone level is unlikely in such a short time period,⁵ except for complete failure which accounted for one fixture in the six implant group. Perhaps it would have been more suitable for the primary outcome to have considered patient satisfaction or contemporary quality of life measurement tools.

Maintenance is a considerable implication of such prosthetic restorations and their morbidities may be costly, yet there was no mention of maintenance of the prosthesis or peri-implant tissue to guide the clinician or patient who may be considering these treatment options.

In view of the small sample size and relatively short follow-up the definitive conclusions of the study have to be considered with caution, 'Bar-supported overdentures on four implants in the anterior maxillary region are not inferior to overdentures supported by si bar-connected implants'. With no formal comment on participant oral or prosthetic supportive care and questionable timing of preoperative satisfaction scoring dubiety exists for 'peri-implant conditions were healthy and patient satisfaction had increased significantly in both groups'. Although trial recruitment seems to have finished in 2009 the results were published in 2013; hopefully longer term follow-up will be provided by the authors in the future to help clinicians and patients consider the long-term prognosis of such treatments.

Gareth Calvert and Thomas Lamont

Dundee Dental School, University of Dundee, Dundee, Scotland, UK.

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