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Posterior atrophic jaws rehabilitated with prostheses supported by 5 × 5 mm implants with a nanostructured calcium-incorporated titanium surface or by longer implants in augmented bone. 3-year results from a randomised controlled trial

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ABSTRACT

As short implants could be a simple, cheap and fast alternative with less morbidity when compared to longer implants placed in augmented bone, it is indispensable to verify if they can provide similar success rates, especially in the long-term. The aim of this RCT was to compare the results of partial fixed prostheses supported by 5.0 mm × 5.0 mm implants with prostheses supported by implants at least 10.0 mm long placed in augmented posterior jaws, up to 3 years post- loading. This was a randomised controlled trial of parallel group design with two arms. One arm consisted of patients having one to three 5.0 mm × 5.0 mm implants either in the mandible or in the maxilla. Patients of the other arm had their jaw augmented to allow placement of one to three at least 10.0 mm × 5.0 mm implants either in the mandible or in the maxilla. The augmentation procedures consisted of interpositional blocks of collagenated cancellous bovine bone (OsteoBiol® *Sp-Block*, Tecnoss®, Giaveno, Italy) in mandibles, or the insertion, using a sterile syringe, of a sticky paste made of 600 μm to 1000 μm pre-hydrated collagenated cortico-cancellous bone granules of porcine origin (OsteoBiol® *mp3*®, Tecnoss®, 1 cc) in a lateral window below the lifted maxillary sinus membrane. All implants had a diameter of 5.0 mm and were submerged and loaded after 4 months with provisional prostheses. Four months later, definitive screw-retained or provisionally cement metal-ceramic or zirconia prostheses were delivered. The follow-up of all patients was 3 years post-loading and the outcome measures were: prosthesis and implant failures, biological or prosthetic complications, and peri-implant marginal bone level changes. Three years after loading, 5.0 mm × 5.0 mm implants achieved similar results than longer implants placed in augmented bone. There were no statistically significant differences in prostheses and implant failures up to 3 years after loading. Significantly more complications occurred at mandibular grafted sites. Longer implants showed a greater bone loss up to 3 years after loading than short implants, both in maxillae and in mandibles.

CONCLUSIONS

As bone augmentation procedures are more technically demanding than the placement of short implants and based on the results of this trial, it is possible to suggest that implants as short as 5.0 mm may be as effective as longer implants placed in augmented posterior jaws at least up to 3 years after loading. Anyway, the Authors recommended to keep in mind that the long-term prognosis is yet unknown and the sample size of the present and other published RCTs is still relatively small to be able to draw definitive conclusions.