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Short vs Longer Dental Implants. a Systematic Review of RCTs

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Objectives The aim of this systematic review was to systematically review randomized controlled trials (RCTs) that compare short implants (≤ 6 mm) with rough surface and longer implants (> 6 mm) in atrophic alveolar ridge in terms of implant survival rates, peri-implant marginal bone level changes (MBL), prevalence of peri-implantitis and technical complications.

Methods A thorough electronic search was performed in electronic databases in September 2023. RCTs with follow-up of at least 1-year post-loading comparing the clinical outcomes of short implants with rough surfaces to longer implants in posterior jaws of systemically and periodontally healthy, partially edentulous adult subjects were considered for inclusion. The revised Cochrane risk-of-bias tool for randomised trials was used for Risk of bias assessment. Fixed-effects meta-analysis of the selected studies was applied to compare the outcome variables. Random-effect meta-analysis was performed, on the basis of within-study comparisons.

Results From an initial search of 3468 articles, 16 were selected for meta-analysis and incorporated 408 short implants and 475 longer implants inserted in 317 and 388 patients, respectively. The survival rates of longer implants in pristine or augmented bone were significantly increased compared to short implants (95%CI: 2%-5%, $p < 0.001$). Longer implants displayed increased MBL -from both implant placement and loading (95%CI: -0.17-0.04, -0.47-0.19, respectively, $p > 0.05$)-, and prevalence of peri-implantitis (95%CI: 0%-5%, $p > 0.05$). However, the differences were not statistically significant. Concerning technical complications, no statistically significant differences were observed between short and longer implants at implant and patient level (implant-level 95%CI: -4%-6%, $p > 0.05$, patient-level 95%CI: -21%-10%, $p > 0.05$).

Conclusions Short implants represent an alternative treatment option for the rehabilitation of posterior jaws to avoid additional bone augmentation procedures. However, they should be selected cautiously due to a potentially limited survival rate compared to longer implants. Particularly in cases where bone augmentation procedures are associated with reduced predictability and increased risk for complications, short implants provide a promising alternative.