

Three-year outcomes of tilted dental implants in patients with low bone density

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The aim of this retrospective study was to report the mid-term outcome (3 years) of standard implants with 20 to 24 mm of length in immediate function with bicortical anchorage for prosthetic rehabilitation of complete edentulous jaws with low-density bone. To this end, clinical, instrumental and 3-year outcome data of 27 patients with complete edentulous arches and low bone density treated with long implants were investigated. Follow-up examinations were performed at 10 days, 2, 4, 6 months, 1 year, 2 years, and 3 years after implant placement. Marginal bone was evaluated at baseline (before surgery) and after 1, 2, and 3 years. The survival of the prosthesis was evaluated in terms of function. A prosthesis that needed to be substituted was considered a failure. A 100% survival rate was observed. All prostheses were in function during the follow-up period. No patient was lost during the follow-up. Regarding the short implants, the average marginal bone remodelling was 0.09 ± 0.21 at the baseline time point, 0.71 ± 0.32 after 1 year and 1.48 ± 0.28 at 3-year follow-up. Similarly, a constant and significant increased average marginal bone was observed at the sites of long implants. In conclusion, the data reported improved evidence about the clinical success of using long implants (≥ 20 mm) in immediate function with bicortical anchorage to treat patients with low bone density and partial or complete edentulous fixed prosthetic rehabilitation.

The dental rehabilitation of areas affected by low bone density currently represents a clinical challenge in clinical dental research. Several approaches have been proposed in this scenario, including the sinus lift and/or bone substitute materials (1-5). It is important to note that these techniques are not fully supported by scientific literature. Numerous authors report confusing and debated data (6). In any case, dental practitioners commonly apply these clinical methods with controversial results. Therefore, it is clear the need to use alternative and less invasive rehabilitation approaches to improve the management of patients with low bone density (7-12). Recent studies demonstrated that bone graft techniques in the rehabilitation of the maxilla are both more expensive and technically more

demanding concerning long implants, also showing similar or even lower implant success rates (12-15). In addition, it is important to note that the use of short implants may negative influences the long-term implants' survival in patients with low bone density by considering the crestal portion of the implant body load-bearing capacity, the pattern of distribution of prosthetic loads to the bone-implant interface, and the restorations' augmented crown (16-18).

Despite this evidence, the association between the length of the implant and the success rates is not entirely understood yet, especially for mid-long term follow-up (19-20).

From a mechanistic point of view, a significant reduction in implant-associated bone stress was

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