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Immediate positioning of definitive abutments versus repeated abutment replacements in immediately loaded implants: effects on bone healing at the 1-year follow-up of a multicentre randomised controlled trial

Key words *dental abutments, dental implants, immediate loading, marginal bone levels*

Purpose: To compare bone resorption around implants immediately loaded and restored using definitive abutments versus provisional abutments later replaced by custom-made abutments up to 12 months after implant placement.

Materials and methods: 28 patients with partial edentulism were selected for a two-implant supported immediate restoration and randomised to provisional abutment (PA) and definitive abutment (DA) groups (14 patients for each group). In the PA group, implants were immediately restored using a platform-switched provisional titanium abutment. In the DA group, definitive platform-switched titanium abutments were tightened. In both groups, a provisional restoration was adapted, avoiding occlusal contacts. All implants were definitively restored after 3 months. In the PA group, patients underwent the standard prosthetic protocol: the abutments were removed and impressions were made directly on the implant platform. In the DA group, patients underwent the 'one abutment at one time' protocol: impressions were made of the abutments using a retraction cord. Peri-implant marginal bone levels were assessed immediately after surgery, and at 6- and 12-month follow-up examinations.

Results: At the 12-month follow-up no implant failed. In the PA group, peri-implant bone resorption was 0.359 mm after 6 months and 0.435 mm after 12 months. In the DA group, peri-implant bone resorption was 0.065 mm after 6 months and 0.094 mm after 12 months. There were statistically significant differences between the two groups for peri-implant bone level changes at the 6-month ($P < 0.001$) and the 12-month ($P < 0.001$) follow-up: 0.294 mm (CI 95% 0.276; 0.312) and 0.341 mm (CI 95% 0.322; 0.36), respectively.

Conclusions: Within the limits of this study, it can be suggested that the non-removal of abutments placed at the time of surgery results in a statistically significant reduction of the crestal bone resorption around the immediately restored implants in cases of partial edentulism, however a difference of 0.3 mm may not have a clinical impact.