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A multi-centre randomized controlled trial on alveolar ridge preservation with immediate or delayed implant placement: Need for soft-tissue augmentation

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Abstract

Aim: To assess the impact of the timing of implant placement following alveolar ridge preservation (ARP) on the need for soft-tissue augmentation (STA) and to identify the risk factors for horizontal and vertical soft-tissue loss. **Materials and Methods:** Patients with a single failing tooth in the anterior maxilla (15–25) were treated at six centres. Following tooth extraction, they were randomly allocated to the test group (immediate implant placement, IIP) or control group (delayed implant placement, DIP). ARP was performed in both groups and implants were immediately restored with an implant-supported provisional crown. Six months after tooth extraction and ARP, a panel of five blinded clinicians assessed the need for STA on the basis of anonymized clinical pictures and a digital surface model. Lack of buccal soft-tissue convexity and/or mid-facial recession qualified for STA. Pre-operative and 6-month digital surface models were superimposed to assess horizontal and vertical soft-tissue changes. **Results:** Thirty patients were included per group (test: 20 females, 10 males, mean age 53.1; control: 15 females, 15 males, mean age 59.8). The panel deemed STA as necessary in 24.1% and 35.7% of the cases following IIP and DIP, respectively. The difference was not statistically significant (odds ratio [OR] = 1.77; 95% confidence interval [CI] [0.54–5.84]; $p = .343$). Loss of buccal soft-tissue profile was higher following DIP (estimated mean ratio = 1.66; 95% CI [1.10–2.52]; $p = .018$), as was mid-facial recession (mean difference [MD] = 0.47 mm; 95% CI [0.12–0.83]; $p = .011$). Besides DIP, regression analysis identified soft-tissue thickness (–0.57; 95% CI [–1.14 to –0.01]; $p = .045$) and buccal bone dehiscence (0.17; 95% CI [0.01–0.34]; $p = .045$) as additional risk factors for mid-facial recession. Surgeons found IIP significantly more difficult than DIP (visual analogue scale MD = –34.57; 95% CI [–48.79 to –20.36]; $p < .001$). **Conclusions:** This multi-centre randomized controlled trial failed to demonstrate a significant difference in the need for STA between IIP and DIP when judged by a panel of blinded clinicians. Based on objective soft-tissue changes, patients with thin buccal soft tissues, with a buccal bone dehiscence and treated with a delayed approach appeared particularly prone to soft-tissue loss. © 2023 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Author Keywords

delayed; dental implant; immediate; single tooth; soft tissue

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