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Factors Influencing the Success of Nonvascularized Iliac Bone Graft for Mandibular Reconstruction: A Retrospective Study of 26 Cases

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Abstract

Objective: This study aimed to identify the prognostic factors influencing the success of nonvascularized iliac bone grafts for mandibular reconstruction.

Methods: This was a retrospective cohort study conducted at a single center, involving 26 patients who underwent segmental mandibulectomy followed by nonvascularized iliac bone grafts between 2012 and 2022 at the Oral and Maxillofacial Surgery Unit, Buddhachinaraj Phitsanulok Hospital. Data were collected by reviewing electronic medical records and radiographic images. Patients who had received vascularized bone grafts or had a history of head and neck irradiation therapy were excluded from the study. The patients were classified into two groups: successful and failed. Success was defined as clinical and radiographic evidence of bone continuity, a graft resorption rate not exceeding 30% of the initial height, and no evidence of chronic infection for at least 6 months.

Results: Successful bone grafting was achieved in 19 patients (73.1%). Multivariable risk difference regression analysis identified that the factors influencing graft incorporation were jaw immobilization using reconstruction plates with maxillomandibular fixation for at least 21 days (RD 63.0; 95% CI 33.1, 93.0; $p < 0.001$) and long segmental block graft design (51.3%; 95% CI 16.9, 85.7; $p < 0.003$). A clinically significant factor, although statistically insignificant, was the duration of plate stabilization, which should ideally range from 172 to 232 days prior to plate removal. The sample size constituted a limitation of this study.

Conclusions: Nonvascularized bone grafting remains a viable option for reconstructing mandibular segmental defects. The factors influencing graft stability can help improve clinical outcomes.

Keywords: iliac crest bone graft, mandibular reconstruction, nonvascularized bone graft