

Ridge Preservation Using a Composite Bone Graft and a Bioabsorbable Membrane With and Without Primary Wound Closure: A Comparative Clinical Trial

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Background: The aim of this single-masked, randomized controlled clinical trial is to compare hard and soft tissue changes after ridge preservation performed with (control, RPc) and without (test, RPe) primary soft tissue closure in a split-mouth design.

Methods: Eleven patients completed this 6-month trial. Extraction and ridge preservation were performed using a composite bone graft of inorganic bovine-derived hydroxyapatite matrix and cell binding peptide P-15 (ABM/P-15), demineralized freeze-dried bone allograft, and a copolymer bioabsorbable membrane. Primary wound closure was achieved on the control sites (RPc), whereas test sites (RPe) left the membrane exposed. Pocket probing depth on adjacent teeth, repositioning of the mucogingival junction, bone width, bone fill, and postoperative discomfort were assessed. Bone cores were obtained for histological examination.

Results: Intragroup analyses for both groups demonstrated statistically significant mean reductions in probing depth (RPc: 0.42 mm, $P = 0.012$; RPe: 0.25 mm, $P = 0.012$) and bone width (RPc: 3 mm, $P = 0.002$; RPe: 3.42 mm, $P < 0.001$). However, intergroup analysis did not find these parameters to be statistically different at 6 months. The test group showed statistically significant mean change in bone fill (7.21 mm; $P < 0.001$). Compared to the control group, the test group showed statistically significant lower mean postoperative discomfort (RPc 4 versus RPe 2; $P = 0.002$). Histomorphometric analysis showed presence of 0% to 40% of ABM/P-15 and 5% to 20% of new bone formation in both groups. Comparison of clinical variables between the two groups at 6 months revealed that the mucogingival junction was statistically significantly more coronally displaced in the control group than in the test group, with a mean of 3.83 mm versus 1.21 mm ($P = 0.002$).

Conclusions: Ridge preservation without flap advancement preserves more keratinized tissue and has less postoperative discomfort and swelling. Although ridge preservation is performed with either method, $\approx 27\%$ to 30% of bone width is lost. *J Periodontol* 2011;82:■■■■-■■■.

KEY WORDS

Alveolar bone loss; bone regeneration; grafting, bone; intercellular signaling peptides and proteins; postoperative complications; tooth socket.

B one resorption of varying amounts is a phenomenon that always occurs after extraction.¹⁻³ The resorption may lead to esthetic and functional disadvantages, which may compromise future implant placement. By evaluating the width of the ridge, Schropp et al.⁴ found a reduction of the width 12 months after extraction by $>50\%$, from 12 to 5.9 mm. Ridge preservation is a guided bone regeneration (GBR) technique used to minimize volumetric changes of hard tissue after tooth extraction. Similar to the dynamics of bone tissue formation in tooth extraction sites, GBR requires a stable environment for the blood clot to reorganize and be replaced by a provisional connective tissue matrix, woven and lamellar bone, and by bone marrow.⁵⁻⁷ Barrier membranes are used to make space for the blood clot and to exclude soft

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