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Evaluation of Platelet-Rich Plasma in Combination with Deproteinized Bovine Bone Mineral in the Rabbit Cranium; A Pilot Study

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Abstract:

Statement of Problem: Reconstruction methods are an essential prerequisite for functional rehabilitation of the stomatognathic system. Platelet-rich plasma (PRP) offers a new and potentially useful adjunct to bone substitute materials (e.g. Xenografts) in oral and maxillofacial bone and implant reconstructive surgery. Purpose: An animal study was carried out to investigate the influence of PRP on the regeneration of non-critical sized bony defects, treated with Deproteinized Bovine Bone Mineral (DBBM). Materials and Methods: Eight New Zealand white rabbits were included in this randomized, pilot study. Three equal cranial bone defects (3 × 6 mm) were created and immediately grafted with DBBM and PRP+DBBM; one of them was left unfilled to serve as a control. The defects were evaluated using histologic and histomorphometric analysis at 2, 4, 8 and 12 weeks. Results: The histomorphometric findings showed a significant increase in bone area and trabecular maturity in experimental defects as compared to the control at 4, 8 and 12 week intervals. A significant increase in bone formation was seen with the addition of PRP to DBBM at 2, 4 and 8 week intervals. At 12 weeks, the level of bone formation was similar between the two groups. There was also a significant increase in the rate of biodegradation of the DBBM particles with the addition of PRP at 2, 4, 8 and 12 weeks. No foreign body reaction and severe inflammation was seen in any of specimens. Conclusion: Within the limitations of this pilot study, it was concluded that the addition of PRP to Xenogenic bone substitute material in non-critical-sized defects of the rabbit cranium showed a histomorphometric increase in bone formation (until the 8th week of healing) and a greater amount of biomaterial degradation throughout the study period.

Keywords:

[Bone grafting](#) . [Deproteinized Bovine Bone Mineral](#) . [Platelet-rich Plasma](#) . [Histomorphometry](#) . [Trabecular maturity](#)

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