



Our Research is Your Success...

December
2013

Published in:

CURRENT THERAPEUTIC RESEARCH

”

The Use of Platelet-Rich Fibrin in Combination with Biphasic Calcium Phosphate in the Treatment of Bone Defects: A Histologic and Histomorphometric Study” *

Nilüfer Bölükbaşı, PhD, Sinem Yenyol, PhD, Merva Soluk Tekkesin, PhD,
Kemal Altunalmaz, PhD

* Nilufer Bolukbasi, PhD, Sinem Yenyol, PhD, Merva Soluk Tekkesin, PhD, Kemal Altunalmaz, PhD The Use of Platelet-Rich Fibrin in Combination with Biphasic Calcium Phosphate in the Treatment of Bone Defects: A Histologic and Histomorphometric Study. Current Therapeutic Research; 75(2013)15-21

CURRENT THERAPEUTIC RESEARCH



Support online publication of research & reviews.
Current being available on all Elsevier platforms.

www.CurrentTherapeuticResearch.com

¹Nilüfer Bölükbaşı, PhD
¹Sinem Yeniol, PhD
²Merva Soluk Tekkesin, PhD
³Kemal Altunalmaz, PhD

“The Use of Platelet-Rich Fibrin in Combination with Biphasic Calcium Phosphate in the Treatment of Bone Defects: A Histologic and Histomorphometric Study”

SUMMARY.

Background

Platelet-rich fibrin (PRF) is a leukocyte and platelet concentrate containing many growth factors. Its potential for hard tissue augmentation as a sole grafting material or in combination with other grafting materials has been investigated in many studies.

Objective

The aim of this histologic study was to evaluate the efficacy of PRF mixed with biphasic calcium phosphate (BCP) on bone regeneration in surgically created bone defects.

Methods

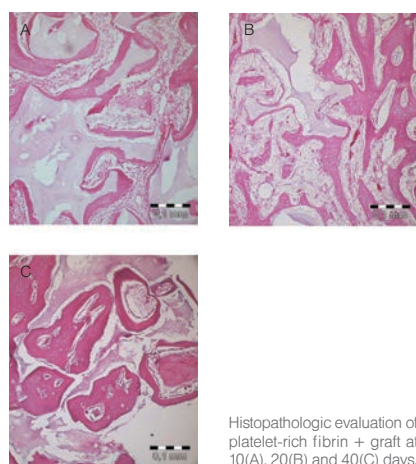
Defects 5 mm in diameter were created in both tibias of 6 sheep. The defects were left empty or grafted with BCP, PRF, or BCP (HA-to-TCP ratio 60:40; (4Bone, MIS Implants Technologies, Israel) + PRF (1:1 ratio). Animals were killed at 10, 20, and 40 days. The specimens underwent histologic and histomorphometric analysis.

Results

None of the groups displayed any signs of necrosis. Inflammation was observed in all groups at 10 days; 2 specimens of PRF+BCP and all empty defects showed inflammatory cell infiltration at 20 days. During the 40-day evaluation period, the PRF+BCP group showed the highest ratios of new bone. The other 3 groups showed statistically similar results. In the BCP and PRF+BCP groups, the residual graft ratios were decreased at consecutive time intervals. The difference between the 2 groups was not statistically significant during follow-up.

Conclusions

The current study revealed a histomorphometric increase in bone formation with the addition of PRF to BCP in surgically created defects in sheep tibia.



Histopathologic evaluation of platelet-rich fibrin + graft at 10(A), 20(B) and 40(C) days.

New bone formation ratios in each group at 10, 20 and 40 days. Data are mean (SD).

Killing day	Empty defect	PRF	BCP	PRF+BCP
10 days	3.4(0.7)	7.4(0.7)	7.2(1.6)	11.4(0.7)
20 days	24.9(0.8)	29.5(1.6)	29.6(1.7)	42.2(0.9)
40 days	39.7(3.1)	38.9(4.9)	49.1(3.1)	54.9(0.8)

BCP, biphasic calcium phosphate; PRF, platelet-rich fibrin.

Authors' affiliations

¹Department of Oral Implantology, Faculty of Dentistry, Istanbul University, Istanbul, Turkey

²Institute of Oncology, Department of Tumor Pathology, Istanbul University, Istanbul, Turkey

³Department of Surgery, Faculty of Veterinary Medicine, Istanbul University, Istanbul, Turkey