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Steroids and Platelet-Rich Plasma as Coadjuvants to Microfracture for the Treatment of Chondral Lesions in an Animal Model

Can the Healing Be Enhanced?

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Abstract

Objective:

The aim of this study was to evaluate the contribution to hyaline cartilage regeneration of the microfracture (MFx) technique plus intraarticular betamethasone (BMS) or platelet-rich plasma (PRP).

Design:

Full-thickness chondral defects of 3 × 6 mm^2 were surgically performed in both femoral condyles of each knee in 13 New Zealand rabbits and then treated with MFx associated with intraarticular BMS or PRP. At 12 weeks postimplantation, the animals were killed and the condyles were characterized macroscopically, molecularly according to collagen type II and I gene expression (quantitative reverse transcriptase–polymerase chain reaction), and histologically (hematoxylin–eosin staining). For the latter, samples were scored using the International Cartilage Repair Society visual histological scale. Data of MFx/BMS-treated and MFx/PRP-treated condyles were compared against untreated, MFx-treated, or normal condyles without lesions.

Results:

Our macroscopic findings showed that in MFx/BMS-treated and MFx/PRP-treated groups, the defects were filled with an irregular, partially rough tissue similar to the MFx-treated group. No differences in the ratio between collagen type II versus collagen type I expression were observed among groups. Histological changes were observed between MFx/BMS-treated and MFx/PRP-treated groups versus untreated defects mainly in surface regularity and cell distribution. However, International Cartilage Repair Society score analysis did not support statistical differences between MFx/BMS-treated and MFx/PRP-treated groups versus MFx-treated group.

Conclusions:

These results provide evidence that the use of intraarticular BMS or PRP as coadjuvants to the microfracture technique in the treatment of acute chondral lesions is not associated with a significant improvement of hyaline cartilage regeneration.