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The Influence of PRP on the Graft Healing in the ACL Reconstruction - A Prospective Study

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Summary:
The use of PRP in ACL reconstruction does not accelerate the remodelling and healing of the graft with the bone tunnel.

Abstract:
Introduction
The purpose of this study was to test the hypothesis that the injection of PRP into the bone tunnel of tibia and femur and into the articular ACL graft accelerates its healing and improves the function of the knee joint 3 and 12 months after surgery, compared with the controlled group.

Material and methods
40 patients were operated: the average age 31.3 years, 22 men and 18 women, 19 right and 21 left knees. 20 patients underwent ACL reconstruction with hamstring single-bundle technique with the injection of PRP, 20 patients underwent the same reconstruction without the PRP injection. After graft fixation with screws and the evacuation of liquid, 1ml of PRP, obtained from the peripheral blood of the patients, was injected into the each bone tunnel. 3 ml of PRP were injected into the articular portion of the graft. The patients underwent MRI 3 and 12 months after the operation. The swelling of the bones surrounding the tunnel (a sign of graft healing with the bone) and the signal intensity of the graft (a sign of its remodelling) were examined. The evaluation of the knee function was carried out 3 and 12 months after the operation with the help of IKDC score and Cincinnati.

Results
In the group with PRP was found bone edema in 18 of the 20 patients 3 months after injection; in the controlled group also at 18 out of 20 patients. The signal intensity of the graft in most cases increased (19 patients in the PRP, 18 patients in the controlled group; p = 0,949). Cincinnati score showed the average value of 72.7 (34-100;SO 18.7) 3 months after surgery in the PRP group, in the controlled group 73.4 (42-99;SO 16.3), p = 0,793. After 12 months, the function score in the PRP group improved to 97.5 (75-100;SO 12.8), in the controlled group to 95.1 (66-100;SO 13.1). The difference between the two groups was not statistically significant even 12 months after the operation (p = 0,885). IKDC score showed similar results. In the PRP group, IKDC value was 58.3 (31.0-87.0; SO 13.1) 3 months after operation; 79.6 (56.3-87.0;SO 14.5) (p = 0.002) after 12 months. The controlled group showed IKDC value of 52.7 3 months after surgery (18.0-78.1;SO18.4); 75.2 (56.3-87.0;SO 11.5; p = 0.03) after 12 months. There was no statistically significant difference found between the two groups 12 months after operation (p = 0,063).

12 months after operation, bone edema was found in 7 of 20 patients in the PRP group and in 9 patients in the controlled group, p = 0.751. The signal intensity of the graft was increased in 3 patients in group PRP and in 4 patients controlled group, p = 0.681).

Conclusion
The use of PRP in ACL reconstruction does not accelerate the remodelling and healing of the graft with the bone tunnel. Scoring systems showed a statistical improvement in joint function in both groups; comparing the results at 3

and 12 months after the operation. Between the two groups there was no difference, however. The proposed hypothesis was refused.