

No. 7

The Effect Rupture and Reconstuction of Posterior Cruciate Ligament on Additional Degeneration of Articular Cartilage in Rabbits

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We well know about that the risk of additional injuries the knee articular cartilage increases over time after ACL rupture and the ACL-deficient knee could contribute to the development of arthrosis according to clinical studies and experimental researches. But how was the natural history of isolated injuries on PCL, it seemed to be that there were no a common idea about it. So that we studied and our research purpose was to investigate the effect of rupture and reconstruction of the PCL on the degeneration of articular cartilage in rabbit knee joints .Type of study: Experiment study. Method: Thirty-three rabbits (skeletally mature Newzealand white rabbit, average weight was 3.25 kg) were dvided into 2 groups. In experiment group 1, the PCL of right knee in 21 rabbits were resected and the contralaeral knee as control side only were performed with arthrotomy. In experiment group 2, the PCL of right knee in 12 rabbits were reconstructed after PCL were resected. After operation, The ribbitts were respectively killed at 6,12,26 weeks in group 1 and at 12,26 weeks in group 2, the changes of articular cartilage of knee joint were analyzed with the methods of ink staining ,histology, immunohistochemistry and scanning electron microscope (SEM). Results: In experiment group 1, atfter operation 26 weeks obvious degeneration of articular cartilage was seen and it was more serious than the control side of knee joints, the large area of fibrosis of cartilage could be seen in medial condyle, the fibrosis was deep into the deep layer of cartilage, type I and III collagen were detected in fibrotic cartilage. In experiment group 2, only a few specimens had mild injuries of cartilage, the degeneration of articular cartilage in medial condyle were slighter than group 1. Conclusions: PCL deficient knee could result in additional articular cartilage degeneration after isolated PCL rupture in rabbit knee joint and the cartilage

degeneration were gradually developed over time. We consider that instability of knee joint resulted from PCL rupture was the major factor in the factors related to additional cartilage degeneration and it might be the factor that facilitate other injuries. After PCL rupture, immediate PCL reconstruction could effectively prevent articular cartilage degeneration so that we recommend that PCL should be reconstructed in patients with PCL-deficient knee in the early stage.

Key Words: Knee joint, Posterior cruciate ligament, Cartilage, Rabbit