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Knee objective stability and isokinetic thigh muscle strength after anterior cruciate ligament reconstruction: A randomized six-month follow-up study

Matjaz Sajovic

General and Teaching Hospital Celje, Slovenia

Purpose: The most frequently used grafts for intra-articular anterior cruciate ligament (ACL) reconstruction are the autologous patellar tendon (PT) or doubled semitendinosus and gracilis tendons (STG) autografts. There are still controversies about graft selection for primary ACL reconstruction.

Methods: A prospective, randomized study was conducted on 57 patients who underwent arthroscopically assisted ACL reconstruction between January 2010 and February 2011. In 29 patients ACL reconstruction was performed with hamstring tendon autograft (STG group), and in 28 patients the ACL reconstruction was performed with patellar tendon autograft (PT group). At 6 months follow-up, all patients have performed the isokinetic extensor and flexor muscles strength and KT-1000 measurements.

Results: In the STG group, the average deficit of peak extensor torque at angular velocity of 60°/s was 14.0%. The average peak flexor torque of the involved leg in the STG group was 96% of peak flexor torque of the uninvolved leg. In the PT group, the average deficit of peak extensor torque was 26.7% and the average deficit of peak flexor torque was minimal (1.4%). A statistical significant difference between the two groups in the extensor muscles power, while we did not find any statistical significant difference in flexor muscles power. The manual maximum KT-1000 arthrometer side-to-side difference was 1.7±1.7 mm for the PT group and 1.9±1.6 mm for the STG group (P=0.398). No significant correlation was found between the knee objective stability (KT-1000 measurements) and the isokinetic thigh muscle strength (extensors, Spearman's rho=0.057, P=0.671; flexors, Spearman's rho=0.094, P=0.489).

Conclusions: At 6 months after surgery, we found significantly lower average isokinetic quadriceps peak torque in the PT group compared to the STG group at angular velocity of 60°/s. However, at the same time we did not find significant difference in flexor muscle power comparing both groups. Significant differences were not found in knee laxity measurements between the two study groups. No significant correlation was found between the knee objective stability and the isokinetic thigh muscle strength.

matjaz.sajovic@triera.net