

Abstract

Title: The effect of physiotherapeutic intervention on the change in thigh muscle volume after LCA surgery

Objectives: The aim of this work is to evaluate the effect of targeted physiotherapy intervention in patients after anterior cruciate ligament surgery in relation to thigh muscle volume.

Methods: Twenty probands participated in the research. The criteria for the selection of the probands were determined as follows: age, first surgery on the lower limbs and bone tendon bone (BTB) surgical approach. Probands were randomly divided into two groups of ten - research and control. The research group completed eight individual physiotherapy sessions, one of which lasted 45 minutes. In the 10th postoperative week, the probands were given additional device rehabilitation - Imoove. In total, this group completed nine physical therapy sessions over 9 weeks. The control group only had group exercise twice a week for 30 minutes. In total, this group completed eight group sessions over a period of 4 weeks. In addition to individual and group therapy, the probands underwent group exercise in the pool five times, magnetotherapy for the knee joint six times, and laser therapy for the scar six times. The following procedures were used to evaluate the effect of the applied therapy: an Academia50 handheld scanner was chosen to measure thigh muscle volume; diagnostic musculoskeletal ultrasonography and standardized diagnostic tools were chosen as additional assessments: anthropometry, goniometry, muscle test, weight distribution while standing on two scales, weight, height, vibration sensation; a standardized questionnaire - Lysholm knee score - was chosen for the functional assessment of the knee joint. Probands also kept a diary during postoperative rehabilitation, where they recorded daily food intake and daily movement.

Results: After 9 postoperative weeks, there were changes in thigh muscle volume in both groups of patients, but the results were not statistically significant. In the research group, there was a muscle increase in the thigh on both the operated and non-operated lower limb. In the control group, the increase in muscle volume was very low, almost negligible, and in some probands there was also a decrease in muscle volume. In both groups, there was a point increase in the Lysholm knee score between the 6th and 15th postoperative weeks, indicating an improvement in the functional status of the knee after LCA surgery. The results show that the inclusion of the proposed individual physiotherapy after anterior cruciate ligament surgery appears to be a more effective method than the existing, commonly used procedures in practice, in relation to the muscle volume of the thigh, which is important for achieving full muscle strength and restoring the muscle interplay of the lower limbs.

Keywords: surgery, anterior cruciate ligament, BTB approach, muscle volume, Lysholm knee score, ultrasound, 3D scanner