RECOVERY OF TEMPO-SPATIAL CHARACTERISTICS OF GAIT AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Background: Currently, there is little consensus regarding optimal rehabilitation in restoring gait after anterior cruciate ligament (ACL) reconstruction.

Purpose: To compare the recovery of tempo-spatial characteristics of gait in a standardized and individually accelerated home-based rehabilitation program during the first year after ACL reconstruction.

Study design: Randomized controlled clinical trial.

Methods: Twenty-six patients with unilateral ACL-injury were enrolled and underwent ACL reconstruction with hamstring tendon autograft. Patients were randomized to standardized or to individually accelerated rehabilitation. Accelerated rehabilitation had an individual progression and included additional neuromuscular training compared to standardized rehabilitation. Twenty-six subjects with no lower limb pathology volunteered for a control measurement. Maximal walking speed, step length, and injured-uninjured limb difference in single support time were measured prior to, 3, 6, 9, 12, 26, and 52 weeks after reconstruction with GAITRite® system.

Results: There were no significant differences between the rehabilitation groups in any of the gait variables. Maximal walking speed and step length increased and single support time asymmetry decreased significantly during the follow-up period. Healthy controls had no asymmetry in single support time, maximal walking speed was 192 cm/s, step length 84 cm. Before surgery injured subjects walked with a slower walking speed (p=0.007) compared to healthy controls. At three weeks after surgery the gait (speed 165 cm/s, step length 78 cm, side-to-side difference in single support time 4 %) differed significantly from the controls. The walking speed or step length did not differ from controls thereafter. The asymmetry in single support time was still present at 12 weeks after surgery. At 26 and 52 weeks after surgery the gait did not differ from the healthy controls.

Conclusions: The individually accelerated rehabilitation program did not result in earlier recovery of gait compared to the standardized rehabilitation program. At three weeks after surgery patients limp and walk with a slower speed compared with healthy controls. The complete recovery of tempo-spatial gait characteristics takes approximately half a year. The slow recovery of asymmetry found in this study, is supported by earlier studies. The simple tempo-spatial parameters used in this study give information about gait ability and its recovery, and are feasible measurements, as they take a couple of minutes in normal physical therapy clinic setting.

Keywords: Gait, ACL, Rehabilitation