Jordan University of Science and Technology

Graft Differences and Knee Biomechanics six Months After Anterior Cruciate Ligament Reconstruction

Authors: Zakariya Nawasreh, David Logerstedt, Kathleen White, Lynn Snyder-Mackler

Abstract: Background: Patients with Anterior Cruciate Ligament Reconstruction (ACLR) exhibit asymmetries in knee biomechanics six months after ACLR and differences exist between autograft types. However little is known about how potential donor site morbidity in autografts (Auto) after ACLR compared to allografts impacts knee biomechanics. The purpose of this study was to investigate knee biomechanics between semitendinosus-gracilis (STG) Auto and soft tissue allograft (Allo) in patients six months after ACLR. Methods: Forty-two patients underwent ACLR with either an Allo (n=26) or STG Auto (n=16). 3-D joint biomechanics were collected for the operated (OP) and nonoperated (NONOP) limbs during the stance phase of gait six months after ACLR. Joint excursions and external joint moments were calculated for comparisons between the OP and NONOP limbs. Two-way ANOVA (mean + standard error) was used to determine if limb differences existed between graft types. Results: There was no graft type x limb interaction for all measures (p>.12). There was no main effect of graft types for all measures (p>.12); Knee Flexion Excursion (KFE) (Allo: 16.49?+1.09?; Auto: 17.00? + 1.34?, p=0.78), external knee flexion moment at Peak Knee Extension (PKE) (Allo: 0.12+0.19 Nm/kg*m, Auto: 0.11 + 0.03 Nm/kg*m, p=0.962). There was a main effect of limb for KFE (OP: 14.7? + 0.95?, NONOP: 18.79? + 0.91?, p<.001) and external knee flexion moment at PKE (OP: 0.09 + 0.02 Nm/kg*m; NONOP: 0.14 + 0.02 Nm/kg*m, p<.001). Conclusion: Sagittal plane knee joint asymmetries exist six months after ACLR irrespective of graft type. Potential donor site morbidity from AUTO does not influence sagittal plane biomechanics compared to Allo.