Hamstrings Tendons Harvest for Anterior Cruciate Ligament Reconstruction Decreases Muscular Performance and Dynamic Balance in Patients 12-36 Months Post-Surgery

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**Context:** Hamstrings musculature is a pivotal component of the knee joint dynamic restraint mechanism. Ipsilateral hamstrings tendons harvest as a primary autograft for anterior cruciate ligament (ACL) reconstruction has become prevalent among orthopaedic surgeons. However, limited evidence exist detailing ensuing knee joint functional performance capacity. **Objective:** To profile knee joint muscular performance and dynamic balance responses to ipsilateral semitendinosus and gracilis (STG) autograft ACL reconstruction in healthy, physically active patients 12-36 months following surgery. It was hypothesized that STG harvest would elicit flexor strength and endurance as well as dynamic balance deficiencies. **Setting:** A controlled athletic training research laboratory.

**Patients or Other Participants:** Thirteen (12 women, 1 man) patients (age = 21.2 ± 2.6 years, height = 1.7 ± 0.05 m, mass = 69 ± 13.3 kg, Tegner Activity Level = 6.9 ± 1.6) 29.6 ± 10 months post-surgery were matched to 13 (12 women, 1 man) healthy matched control participants (age = 21 ± 1.2 years, height = 1.6 ± 0.06 m, mass = 67.6 ± 10.8 kg, Tegner Activity Level = 6.3 ± 1.4). **Interventions:** The independent variable was the ACL reconstruction operative technique. Isokinetic strength and endurance were measured at angular velocities of 60 °/s and 240 °/s respectively using a reliable prone position method. Dynamic balance was assessed with a reliable single-leg stance reach task. Separate one-tail dependent and independent t-tests were calculated to determine within patient and between participant differences. Statistical significance was set at \( P \leq 0.05 \). **Main Outcome Measures:** Dependent variables included peak moment and total work normalized to body mass as well as time to peak moment, angle of peak moment and mean reach distances for the balance reach task, which were normalized to non-stance leg length. **Results:** All data were normally distributed. Patients demonstrated significant flexor strength deficits for the involved (0.95 ± 0.17 Nm/kg) compared to matched control (1.1 ± 0.17 Nm/kg) leg \( (P = 0.006) \). Patients also displayed significant flexor endurance decrements for the involved (22.1 ± 5 J/kg) compared to uninvolved (25 ± 4.6 J/kg, \( P = 0.001 \)) and matched control (27.7 ± 6.9 J/kg, \( P = 0.013 \)) legs. Furthermore, patients exhibited lesser anterolateral direction reach distances with the involved (67.8 ± 9.2 %LL) compared to uninvolved (71.9 ± 7.9 %LL, \( P = 0.006 \)) and matched control (73.7 ± 9.3 %LL, \( P = 0.050 \)) legs. All other measures were not significant \( (P > 0.05) \). **Conclusions:** Our findings indicate STG harvest decreases prone position flexor strength and endurance as well as dynamic balance reaching to the anterolateral direction in the involved leg. Further research is warranted to determine the efficacy of intervention protocols to reestablish functional performance capacity in patients 12-36 months post-surgery. **Word Count:** 450.