Kinetic asymmetries during a vertical jump persist during initial year post ACL reconstruction
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Patients who are 18-36 months post-anterior cruciate ligament reconstruction (ACLR) have greater joint power asymmetries during a countermovement jump (CMJ), suggestive of residual neuromuscular deficits. Characterizing asymmetries in CMJ joint kinetics during the first year post-ACLR may provide insight into return to sport decision making.

**Purpose**: To identify between-limb differences in joint kinetics during a CMJ among athletes 4-12 months post-ACLR and determine if these differences are affected by time post-surgery.

**Methods**: Sixteen collegiate athletes within one year post-ACLR performed a CMJ while kinematics and ground forces were recorded. Sagittal plane work done at the hips and knees and work derived from jump power were calculated for each limb during the up and landing phases of the CMJ. Variables were compared between limbs (injured, INJ; non-injured, NON) and groups (4-8 months vs 8-12 months post-ACLR, n=8 for both) by 2-way ANOVAs.

**Results**: During the up phase, the between-limb difference in jump positive work was greater (p=.008) in the 4-8 month group (INJ, 3.35 ± 0.75 J/kg; NON, 4.25 ± 1.10 J/kg) than the 8-12 month group (INJ, 3.26 ± 1.08 J/kg; NON, 3.74 ± 0.71 J/kg). Positive work done at the hip by the INJ limb (0.128 ± 0.050 J/kg) was less than the NON limb (0.147 ± 0.043 J/kg) for the 4-8 month group, but the opposite was true for the 8-12 month group (INJ, 0.119 ± 0.046 J/kg; NON, 0.105 ± 0.037 J/kg) (interaction, p=.009). Positive work at the knee (INJ, 0.082 ± 0.050 J/kg; NON, 0.125 ± 0.048 J/kg) demonstrated a limb effect only (p<.001). During the landing phase, between limb difference in jump negative work was greater (p=.034) in the 4-8 month group (INJ, -2.58 ± 1.10 J/kg; NON, -3.61 ± 0.75 J/kg) than the 8-12 month group (INJ, -2.34 ± 0.71 J/kg; NON, -2.76 ± 1.08 J/kg). This was mainly reflected at the knee (p=.034), where between limb difference in total negative work was greater in the 4-8 month group (INJ, -0.067 ± 0.065 J/kg; NON, -0.160 ± 0.062 J/kg) than the 8-12 month group (INJ, -0.070 ± 0.031 J/kg; NON, -0.117 ± 0.038 J/kg).

**Conclusion**: Side-to-side deficits in jump power and joint kinetics were evident in both groups, but were more pronounced in those 4-8 months post-ACLR. Between group differences during the up phase of the CMJ appeared most related to the hip, while the landing phase was most related to the knee.

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