Summary: Similar functional outcome but impaired health related quality of life with bilateral ACL surgery.

Data:

Introduction: A patient with an ACL-reconstructed knee (ACLR), has a great risk of sustaining a new ACL injury in either knee. Paterno et al. reported that in an active, young population who returned to pivoting activities that 25.4% sustained a new ACL injury. 75% of these injuries were to the contralateral knee.

Data from the Swedish Knee Ligament Registry report a contralateral ACLR rate of close to 5% at a 5-year follow-up after primary ACLR. The purpose of this study was to identify pre-, intra- and postoperative risk factors associated with contralateral ACLR 2, compare knee laxity and functional knee outcome between primary and contralateral ACLR and 3, compare activity level, patient-reported knee function at a minimum of 5 years follow-up. Methods: 1, Primary ACLR, 2005-2014 (n = 5393) and occurrence of a contralateral ACLR within 5 years. Regression analysis [age, gender, body mass index, time from injury to surgery, pre-injury Tegner], intraoperative [graft type, meniscus injury, cartilage injury] and postoperative [lumb symmetry index (LSI) for quadriceps and hamstring strength and single-leg-hop test performance] as risk factors for a contralateral ACLR. 2, Same patients who underwent primary and contralateral ACLR (n = 326). The KT-1000 for knee laxity and KOOS for subjective outcome. 3, Bilateral strength and single-leg-hop test performance as risk factors for a contralateral ACLR.

Results: The overall incidence of a contralateral ACLR within 5 years was close to 5% at a 5-year follow-up after primary ACLR. The purpose of this study was to identify pre-, intra- and postoperative risk factors associated with contralateral ACLR, compare knee laxity and functional knee outcome between primary and contralateral ACLR and compare activity level, patient-reported knee function at a minimum of 5 years follow-up. For every patient with a bilateral ACLR, a control matched for age ≤ 2 years, gender, year of ACLR and pre-injury activity level or sport at the time of injury was identified. Results: 1, The overall incidence of a contralateral ACLR within 5 years was 4.7%. Multivariable analysis revealed that the risk of contralateral ACLR was significantly affected by age (OR 0.40; 95% CI 0.28 - 0.58; P = 0.001), time from injury to surgery (OR 0.48; 95% CI 0.30 - 0.75; P = 0.001) and single-leg-hop test (OR 1.56; 95% CI 1.04 - 2.34; P = 0.03). 2, The mean preoperative and postoperative anterior tibial translation (ATT) and ATT reduction were not significantly different for any of the five KOOS subscales at 2 years. 3, A total of 98 patients with a bilateral ACLR were less satisfied with their activity level and knee function (P < 0.05). Conclusion: The 5-year incidence of contralateral ACLR was 4.7%. Most important risk factors were good functional outcome at 6 months follow-up. Knee laxity and functional knee outcome after contralateral ACLR are comparable to those after primary ACLR but long term patient-reported knee function and health-related quality of life were inferior in patients with a unilateral ACLR compared to patients with a unilateral ACLR.

Category: Knee - Other

Qualitative Evaluation Of Reconstructed Anterior Cruciate Ligament Maturation after Anterior Cruciate Ligament Reconstruction Using Magnetic Resonance Imaging-Ultrashort Echo Time T2* Mapping

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Summary:

The healing process of the reconstructed anterior cruciate ligament (ACL) was evaluated using magnetic resonance imaging-ultrashort echo time T2* mapping. The T2* value of the entire reconstructed ACL at 6 months postoperatively was significantly higher than that of the entire reconstructed ACL at 9 and 12 months and the normal ACL. This indicates that the quality of the reconstructed ACL 6 months after ACLR was significantly different from that of the normal ACL.

Data:

Background The healing process of the reconstructed anterior cruciate ligament (ACL) after anterior cruciate ligament reconstruction (ACLR) is one of the important factors for return to sports. Magnetic resonance imaging-ultrashort echo time (MRI-UTE) T2* mapping can quantify T2* values in tissues with short T2 relaxation times, such as tendons and ligaments, which cannot be evaluated with conventional MRI. T2* values reflect the amount and arrangement of collagen in the tissue, with lower values in tissues containing dense collagen, and higher values in tissues with sparse collagen. This study aimed to observe the healing process of the reconstructed ACL after ACLR using MRI-UTE T2* mapping and compare its quality in each healing phase to that of a normal ACL.

Method Ten patients (10 females; mean ± SD age 18.4 ± 4.3 years) who underwent initial ACLR with autogenous hamstring tendon from 2018 – 2020 and 12 volunteers (6 males, 6 females; mean ± SD age, 30.8 ± 9.6 years) without any history of knee diseases or surgeries were recruited. Patients who underwent ACLR had MRI-UTE T2* mapping of the operated knee at 6, 9, and 12 months postoperatively, and volunteers underwent MRI-UTE T2* mapping of the right knee joint only once. T2* values of the reconstructed and normal ACLs were measured at the distal, middle, and proximal sites. The regions of interest of each site were measured at the areas unaffected by artifacts using a 10-mm circle. The mean T2* values measured at the three sites were defined as the T2* values of the entire tissue. The T2* values of the reconstructed ACL at 6, 9, and 12 months postoperatively and the normal ACL were compared using a one-way analysis of variance. Result The UTE-T2* values of the reconstructed ACLs were 13.1 ± 1.9 ms, 11.7 ± 1.5 ms, and 11.1 ± 1.3 ms, respectively, at 6, 9, and 12 months postoperatively, and the UTE-T2* value at 6 months postoperatively was significantly higher than those at 9 and 12 months (P < 0.01 vs. 9 months; P < 0.01 vs. 12 months). The UTE-T2* value of the normal ACL was 11.9 ± 2.4 ms, which differed significantly from the value obtained 6 months postoperatively of the reconstructed ACL (P < 0.01). Conclusion The T2* value of the entire reconstructed ACL at 6 months postoperatively was significantly higher than that of the entire reconstructed ACL at 9 and 12 months and the normal ACL. This indicates that the quality of the reconstructed ACL 6 months after ACLR did not reach that of the normal ACL.