Lateral Extra-Articular Tenodesis Augmentation Reduces Failure Rates in High-Risk Female College Athletes After ACL Reconstruction

Eugenia Lin, Kyle Williams, Collin Braithwaite, Joseph Brinkman, Sailesh Tummala, Alex Hoffer, Kostas J Economopoulos

INTRODUCTION: Anterior cruciate ligament (ACL) injuries remain prevalent across sports, particularly among female athletes who face elevated risks due to anatomical, hormonal, and neuromuscular factors. While ACL reconstruction (ACLR) techniques have evolved, persistent rotational instability and graft failure rates—especially in active populations—highlight the need for enhanced surgical approaches. Lateral extra-articular tenodesis (LET) has emerged as a potential solution, however, limited data exist on LET's effectiveness specifically in female college athletes, a high-risk subgroup. This study evaluates clinical outcomes, complications, and re-tear rates of LET-augmented ACLR in this population, hypothesizing reduced graft failure rates without compromising patient-reported outcomes.

METHODS: A retrospective review was conducted of female collegiate athletes who underwent primary ACLR with or without LET. Two cohorts were identified: those who underwent isolated ACLR and those who underwent ACLR with concomitant LET. Patients undergoing revision ACLR, multi-ligamentous knee reconstruction, concomitant osteotomy, or meniscal procedures other than debridement or repair were excluded. Outcomes included residual pivot shift, re-tear rates, International Knee Documentation Committee (IKDC) scores, Lysholm scores, return-to-sport rates, and complications. Independent t-tests and chi-squared tests were used to compare outcomes between groups.

RESULTS: There was a total of 104 patients in the final cohort; the ACLR cohort was comprised of 68 patients and the ACLR with LET cohort was comprised of 36 patients. The mean follow-up for both cohorts was 38.6 months (range, 24-73 months) and the mean age was 20.0 years old (SD ±1.9 years old). There were no significant differences in patient and clinical characteristics between the ACLR with LET cohort and ACLR cohort in terms of age (20.31 vs 19.9, P=0.184), sport played, graft types, or baseline IKDC or Lysholm scores. The ACLR with LET cohort had significantly lower body mass index (23.1 vs 24.8, P=0.008), higher Beighton scores (3.39 vs 1.20, P<0.001), and greater incidence of generalized ligamentous laxity (52.8% vs 13.2%, P<0.001) compared to the ACLR alone cohort, reflecting a higher-risk patient selection. Despite these differences, clinical characteristics at surgery were largely similar, except for smaller graft size and higher preoperative pivot shift grade in the ACLR with LET group. The ACLR with LET cohort demonstrated significantly lower failure rates (graft re-tear or positive pivot shift: 13.9% vs 22.0%, P=0.041), reduced postoperative pivot shift grade (mean 0.17 vs 0.50, P=0.047), and lower incidence of positive pivot shift (8.3% vs 26.5%, P=0.028), though graft rupture rates alone did not differ. The LET cohort returned to sport quicker (8.6 months ± 1.3) than the ACL cohort (9.8 ± 2.4, P=0.150). There were no significant differences in return-to-sport rates (88.9% vs 86.8%, P=0.758), IKDC or Lysholm scores postoperatively, or complications including arthrofibrosis, iliotibial band snapping, or constrained lateral compartments, except higher hematoma risk with ACLR with LET) at any follow-up time.

DISCUSSION AND CONCLUSION: The addition of LET to ACL reconstruction was associated with significantly lower rates of postoperative failure—defined as graft re-tear or persistent pivot shift—compared to standard ACL reconstruction alone. Importantly, these benefits were achieved without compromising patient-reported outcomes, return-to-sport rates, or introducing significant new complications, aside from a modest increase in hematoma formation. These results suggest that LET augmentation may be a valuable option for reducing rotational instability and failure risk in high-risk female collegiate athletes, supporting its selective use in this population.