Revision Anterior Cruciate Ligament Reconstruction With and Without Concomitant Lateral Extraarticular Tenodesis: A Multi-Surgeon Retrospective Chart Review

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INTRODUCTION:

The addition of a lateral extra-articular tenodesis (LET) procedure to an anterior cruciate ligament (ACL) reconstruction (ACLR) has been utilized to help protect the ACL graft while healing and provide additional rotational stability with eventual return to play. Current research demonstrates the addition of an LET to a soft tissue ACLR may mitigate the risk of graft failure and graft laxity postoperatively with some graft choices. However, there is limited short-term and long-term patient reported outcomes (PROs) of an isolated revision ACLR versus a revision ACLR with an LET.

METHODS:

A retrospective chart review of all revision ACLR cases from 2018 to 2022 at a multi-surgeon orthopedic practice was conducted. Patients were included if they had a revision ACLR with or without concomitant LET and excluded if they were under the age of 18 at the time of surgery. Demographic information, such as age, sex, body mass index (BMI) was collected. Additionally, PROs were collected at 6 months, 1 year, and 2 years postoperatively. These included International Knee Documentation Committee (IKDC), Knee Injury and Osteoarthritis Outcomes Score Junior (KOOS Jr.), Veterans Rand 12 (VR-12) Mental, VR-12 Physical, and Patient Reported Outcomes Measurement Information System (PROMIS) Pain. Multiple linear regression analysis was performed to evaluate the relationships between various predictor and clinical outcomes at each follow-up time point. A separate regression model was constructed for each combination of outcome variable and time point, enabling a detailed investigation of potential associations. The significance of predictors was assessed using p-values (significant is $p<0.05$). Re-rupture rates, reoperation rates, and postoperative complications were also recorded and compared between groups.

RESULTS: A total of 126 revision ACLR cases were included, 70 (56%) included an LET (mean follow-up was 14.9±7.0 months) and 56 (44%) were performed in isolation (mean follow-up was 15.6±7.5 months). In the revision ACLR LET cohort, 45 (64%) utilized autograft (40 BTB, 4 quadriceps, 1 hamstring) and 25 (36%) BTB allograft. In the isolated revision ACLR cohort, 21 (38%) utilized autograft (13 BTB, 8 quad) and 35 (63%) BTB allograft. There was a statistically significant improvement in IKDC and KOOS Jr. scores at 1 year postoperatively when an LET was added to a revision ACLR. A decreased BMI was a significant predictor of improved outcomes across all scores except VR12 Mental at all timepoints. Autograft was only a significant predictor of outcome over allograft with KOOS Jr. score at 6 months. One individual in the revision ACLR LET cohort and two individuals in the isolated revision ACLR cohort underwent a subsequent revision procedure ($p = 0.58$). The results are summarized in figure 1.

DISCUSSION AND CONCLUSION: Addition of an LET procedure to a revision ACLR may provide improved postoperative PROs. This study determined that addition of an LET to revision ACLR led to improved IKDC and KOOS Jr. scores at 1 year postoperatively when compared to isolated revision ACLR. Lower BMI continues to demonstrate significance in affecting PROs in revision ACLR whether or not an LET is added. No differences between groups were found by two years postoperatively with respect to re-rupture rates, reoperation, or postoperative complications.

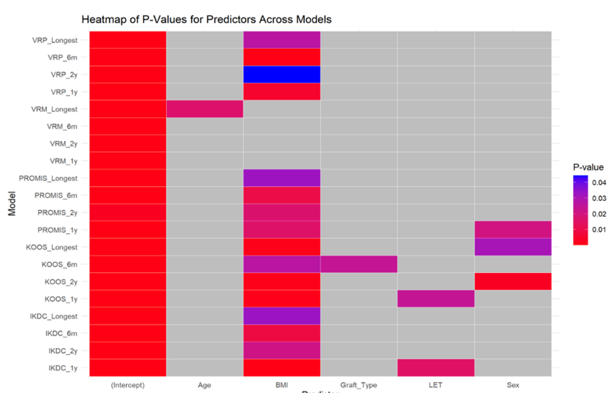

Figure 1. The heatmap visualizes the significance of different predictors across clinical outcomes and time points. The y-axis represents clinical outcomes at specific time points (e.g., IKDC_6m, KOOS_1y), while the x-axis represents predictors (e.g., LET, BMI, Sex, Age, Graft_Type). Each cell shows the p-value for a given predictor-outcome combination, with a color scale indicating the level of significance. Darker colors correspond to lower p-values (e.g., $p < 0.05$, indicating strong statistical significance), while lighter or neutral colors represent higher p-values (e.g., $p \geq 0.05$, indicating no significance).