Increased Rate of Reoperation for Limited Range of Motion When Performing a Lateral Extraarticular Procedure in Primary ACL Reconstruction with Quadriceps Tendon Compared to Hamstring Tendon Grafts

Julian Feller, Kate Webster

INTRODUCTION: The addition of a lateral extraarticular procedure (LEAP) to both primary and revision ACL reconstruction (ACLR) has become increasingly common in recent years. Most of the reported research regarding addition of a LEAP to a primary ACLR relates to hamstring tendon (HS) grafts. Complication rates related to restricted range of motion (ROM) have been reported to be low. Our experience suggested that that rates of surgery for ROM complications were higher with the addition of a LEAP and particularly when using a quadriceps tendon (QT) graft.

METHODS:

In a single surgeon series, 586 patients underwent a primary ACLR with either a HS or QT graft between 1 January 2021 and 31 March 2023. Of these, 175 had an additional LEAP using a modified Ellison technique in an attempt to reduce the risk of graft rupture. The main risk factors used in deciding to add a LEAP were young age, family history, returning to pivoting sports, professional athlete and a previous contralateral ACLR. At 2 year follow-up the rates of reoperation for ROM problems (predominantly symptomatic Cyclops lesions) and graft rupture rates were compared between those patients who had LEAP and those who did not, and then by graft type and sex. Contingency analysis with risk ratios were calculated.

RESULTS:

547 (93 %) patients were followed up at 2 years. 16/163 (9.8%) patients who had a LEAP required further surgery for a ROM complication compared to 12/384 (3.1%) patients who did not have a LEAP (p=0.001). Patients who had a LEAP had 3 times the risk (Risk Ratio (RR)=3.1, 95%CI 1.5-6.4) of requiring further surgery for ROM issues compared to those with no LEAP.

10/53 (19%) patients who had a LEAP in combination with a QT graft required further surgery for a ROM complication compared to 6/110 (5.5%) patients who had a LEAP in combination with a HS graft P (p=0.01). A LEAP in combination with a QT graft had 3.5 times the risk (RR=3.5, 95%CI 1.3-9) of requiring further surgery for ROM issues compared to a LEAP in combination with a HS graft.

When subgrouping by sex, 9/42 (21%) of male patients who had a LEAP in combination with a QT graft required further surgery for a ROM complication compared to 3/52 (5.7%) male patients who had a LEAP in combination with a HS graft (p=0.02, RR=3.7). While a similar trend was seen in female patients [QT+LEAP 1/11 (9%) vs. HS+LEAP 3/58 (5%)], the numbers were too small for statistical analysis.

Graft rupture rates were similar between patients who did not have a LEAP (10/384: 2.6%) and patients who had a LEAP (6/163: 3.7%), p=0.5.

DISCUSSION AND CONCLUSION:

In our experience, the addition of a LEAP to a primary ACLR was associated with an increased risk of re-operation for ROM issues. It is unclear whether this was related to the use of the modified Ellison procedure. The difference was particularly apparent when using a QT graft compared to a HS graft, with QT grafts having 3.5 times the risk ratio for reoperation compared to HS grafts. Caution should be used when extrapolating the findings of the use of a LEAP in combination with a HS graft to other graft types.