

Anterior Cruciate Ligament (ACL) Reconstruction with Hamstring Tendon is Associated with a Sixfold increase in Failure Rates Compared with Patella Tendon Grafts in Young Females: A Cohort Study from the New Zealand ACL Registry

Anika Tiplady¹, Hamish Love, Simon Young, Chris Frampton
¹Sports Doctors

INTRODUCTION: Young female athletes are a specific population group that is at high risk of primary anterior cruciate ligament (ACL) rupture and subsequent graft failure. Despite large numbers of ACL reconstructions being carried out in young females, there is limited analysis of outcomes in this group, leading to low levels of evidence for graft choice. This study utilizes ACL Registry data to analyze the effects of graft choice on graft survival and PROMS in females aged 15-20 years old.

METHODS: Prospective data captured by the New Zealand ACL Registry between April 2014 and March 2022 were reviewed. Females aged between 15-20 were included with a minimum follow up of 1 year. The primary outcome measure is ACL graft failure during the study period with the key independent variable being graft type, patellar or hamstring tendon autograft. This is summarized as the rate per 100 patient years and is compared between the two groups using the hazards ratio generated from a Cox-proportional hazards regression. Secondary outcome measures were Marx activity scores, and the Knee Osteoarthritis and Outcome Score (KOOS) patient-reported outcome measure.

RESULTS: A total of 1,261 primary ACL reconstructions in females aged 15-20 were reviewed. Hamstring grafts were used in 797 reconstructions (63%), and patella tendon graft used in 464 reconstructions (37%). There was no difference between the groups in terms of age, time to surgery, pre-injury Marx or KOOS scores. Patella tendon grafts were a larger diameter, 9.5mm vs. 8.1mm on average (p<0.001). Patients with a hamstring tendon graft had a graft revision rate of 7.6% compared with 1.1% in patients with a patella tendon graft (hazard ratio 6.1; 95% CI, 2.4-15.1; P<0.001). No differences were noted when comparing KOOS subscales between hamstring and patella tendon groups at 1, 2, and 5 years follow up. The patella tendon group had higher Marx scores at 12 months 8.6 vs. 7.3 (P<0.001). This difference did not persist at 2 and 5 years follow up.

DISCUSSION AND CONCLUSION: This New Zealand ACL Registry study on graft failure rates in females aged 15-20 years old demonstrates a 6.1 times higher ACL graft failure rate with hamstring grafts compared to patella tendon grafts.

