

# **Patellar Tendon Autograft is Associated with Difficulty Kneeling but Does Not Result in a More Painful or Symptomatic Knee Compared to Hamstring Tendon Autograft after Anterior Cruciate Ligament Reconstruction: Results from the New Zealand ACL Registry**

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## **INTRODUCTION:**

The bone-patellar tendon-bone (BTB) autograft is associated with difficulty kneeling following anterior cruciate ligament (ACL) reconstruction, however it is unclear whether it results in a more painful or symptomatic knee in the long-term when compared to the hamstring tendon autograft. The aim of this study was to identify the rate and risk factors for significant knee pain and difficulty kneeling following primary ACL reconstruction and clarify whether graft type influences the risk of these complications.

## **METHODS:**

Prospective data captured by the New Zealand ACL Registry between April 2014 and November 2019 was analyzed, allowing for a minimum follow-up of two years. Primary ACL reconstructions performed with either a BTB or hamstring tendon autograft were included. The Knee Injury and Osteoarthritis Outcome Score (KOOS) was analyzed to identify patients who reported significant knee pain, defined as a KOOS Pain subscale score of  $\leq 72$  points, and kneeling difficulty, defined as a patient who reported "severe" or "extreme" difficulty when they kneel. The rates of significant knee pain and kneeling difficulty were compared between graft types at 2-year follow-up via Chi-square test. Multivariate binary logistic regression was performed to produce odds ratios (OR) and 95% confidence intervals (CI) with adjustment for age, gender, Marx activity score, concomitant meniscal or cartilage injury and significant knee pain or kneeling difficulty prior to surgery. The secondary outcome measures were the absolute values of the KOOS Pain and KOOS Symptoms subscales which were compared between graft types via Mann-Whitney U test.

## **RESULTS:**

A total of 4492 primary ACL reconstructions were included for analysis. At 2-year follow-up, 9.3% of patients reported significant knee pain (420/4492) and 12.0% reported difficulty with kneeling (537/4492). Patients who reported significant knee pain or kneeling difficulty prior to undergoing ACL reconstruction were more likely to report both knee pain (adjusted OR = 4.10, 95% CI 3.23 – 5.19,  $p < 0.001$ ) and difficulty with kneeling after surgery (adjusted OR = 2.90, 95% CI 2.37 – 3.54,  $p < 0.001$ ). Patients who had a BTB autograft had a higher rate of kneeling difficulty compared to patients with a hamstring tendon autograft (21.3% versus 9.4%, adjusted OR = 3.12, 95% CI 2.52 – 3.87,  $p < 0.001$ ) but there was no difference in the rate of significant knee pain between graft types (9.9% versus 9.2%,  $p = 0.49$ ). Furthermore, there was no difference between graft types when comparing the absolute values of the KOOS Pain (mean score for BTB = 88.7 versus 89.0,  $p = 0.37$ ) and KOOS Symptoms subscales (mean score for BTB = 82.5 versus 82.1,  $p = 0.49$ ).

## **DISCUSSION AND CONCLUSION:**

After primary ACL reconstruction, significant knee pain (KOOS Pain subscale  $\leq 72$ ) occurs in 9% of patients and "severe" or "extreme" kneeling difficulty occurs in 12% of patients at 2-year follow-up. The use of a BTB autograft was the strongest predictor of post-operative kneeling difficulty, but it did not result in a more painful or symptomatic knee when compared to the hamstring tendon autograft.