Higher Risk of Medial Meniscal Repair Failure Following Concurrent Anterior Cruciate Ligament Reconstruction with a Hamstring Tendon Autograft: Results from the New Zealand ACL Registry

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Summary:
The use of a hamstring tendon autograft increases the risk of medial meniscal repair failure following concurrent ACL reconstruction.

Data:
Introduction: Anterior cruciate ligament (ACL) reconstruction with concomitant meniscal injury occurs in up to 80% of cases. Meniscal repair is associated with improved long-term outcomes compared to resection, but is also associated with a higher reoperation rate. Knowledge of the risk factors for repair failure may be important in optimizing patient outcomes. The aim of this study was to identify the patient and surgical risk factors for meniscal repair failure following concurrent primary ACL reconstruction. Methods: Prospective data recorded by the New Zealand ACL Registry were reviewed. Primary ACL reconstructions with a concurrent repair of either a medial or lateral meniscal tear recorded between April 2014 and December 2018 were analyzed, allowing for a minimum follow-up of two years. Meniscal repair failure was defined as a patient who underwent subsequent meniscectomy, and was identified after cross-referencing data from the ACL Registry with the national database of the Accident Compensation Corporation (ACC), which is the New Zealand Government’s sole funder of ACL reconstructions and any subsequent surgery. The predictor variables of interest included age, gender, time from injury-to-surgery, graft type, femoral tunnel drilling technique, surgeon case volume and concomitant cartilage injury as recorded in the New Zealand ACL Registry. Failure rates were compared via Chi-square test. Multivariate Cox regression was performed to produce hazard ratios (HR) with 95% confidence intervals (CI) to identify the risk factors for meniscal repair failure. Results: A total of 2041 meniscal repairs were performed during concurrent primary ACL reconstruction (medial repair = 1235 and lateral repair = 806). The overall failure rate was 9.4% (n = 192). Failure occurred in 11.1% of medial (137/1235) and 6.8% of lateral (55/806) meniscal repairs. The risk of medial failure was higher with hamstring tendon autografts (adjusted HR = 2.00, 95% CI 1.23 – 3.26, p = 0.006) and in those with cartilage injury in the medial compartment (adjusted HR = 1.56, 95% CI 1.09 – 2.23, p = 0.015). The risk of lateral failure was higher when the procedure was performed by a surgeon with an annual case volume of less than 30 ACL reconstructions (adjusted HR = 1.92, 95% CI 1.10 – 3.33, p = 0.021). Age, gender, time from injury-to-surgery and femoral tunnel drilling technique did not influence the risk of meniscal repair failure. Discussion and Conclusion: When repairing a meniscal tear during primary ACL reconstruction, the use of a hamstring tendon autograft and the presence of cartilage injury in the medial compartment are factors that increase the risk of medial meniscal repair failure. Lower surgeon case volume was associated with an increased risk of lateral meniscal repair failure.

Category: Knee - ACL

Clinical Application of Machine Learning Models on Risk Analysis for Ramp Lesions in Anterior Cruciate Ligament Injuries

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Summary:
The prediction model of this study showed the feasibility of using machine learning models as a supplementary diagnostic tool for ramp lesions in ACL-injured knees.

Data:
Background: Peripheral tears of the posterior horn medial meniscus, known as “ramp lesions,” are commonly found in anterior cruciate ligament (ACL)-deficient knees, but frequently missed on routine evaluation. Purpose: To predict the presence of ramp lesions in ACL-deficient knees using machine learning methods.