Long-Term Effects of Concomitant Lateral Meniscal Management on ACL Reconstruction Revision Rate and Secondary Meniscal and Cartilaginous Injuries

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Simultaneous meniscal tears are often present with anterior cruciate ligament (ACL) injuries, with the lateral meniscus (LM) more commonly injured than the medial meniscus in acute settings. During ACL reconstruction (ACLR), the meniscus may be repaired, resected, or left in situ based on the type of injury and patient goals, with repair often preferred due to potentially improved quality of life and decreased osteoarthritis rates. ACLR failure is problematic, influenced by patient factors, graft type, femoral notch size, concomitant knee pathology, and malalignment, leading to meniscal and knee cartilage damage and increased osteoarthritis risk. LM deficiency has been linked to persistent knee laxity and increased subsequent injury risk, but little data describe the risk of cartilaginous and meniscal damage after primary ACLR with different LM injury treatments. This study aims to investigate how different LM treatments—repaired, resected, or left in situ—during primary ACLR affect the odds of ACL revision and the cartilaginous and meniscal status at revision. METHODS:

This registry-based cohort study, approved by ethical boards in Stockholm and Sweden, utilized data from the Swedish National Knee Ligament Registry (SNKLR) which includes information on 90% of ACLR patients in Sweden since 2005. Patients aged 15 and older who underwent primary ACLR between 2005 and 2018, with at least 5 and 10 years of follow-up, were included, excluding those with prior knee surgeries or other specific injuries. The study compared two groups: those with isolated ACLR and those with ACLR and concomitant LM injury, further subdividing the latter into four treatment types: repair, resection, both, or left in situ. Data on patient demographics, injury specifics, and surgical characteristics were collected, with the main outcomes being ACL revision rates and knee status at 5- and 10-years post-surgery. Statistical analyses, including univariable logistic regression and AUC calculations, were conducted using SAS software to assess the impact of LM treatment on ACL revision and knee status. RESULTS:

In this study, baseline data were available for 31,705 out of 50,291 patients who underwent primary ACLR, with a mean age of 27.1 years, 56.1% male, and an average BMI of 24.5. At 5 years, 22,208 patients had follow-up data, and at 10 years, 11,058 patients were followed up. Revision ACLR occurred in 1,031 patients within 5 years and 568 within 10 years. Patients with concomitant LM injury left in situ had higher odds of revision ACLR at both 5 years (OR, 1.49) and 10 years (OR, 1.55), while those with LM repair had higher odds at 5 years (OR, 1.73). LM repair also increased the odds of concomitant meniscal injuries at 5 years (OR, 3.52) and 10 years (OR, 7.26), but no treatment group showed increased odds of concomitant cartilage injury at either time point.

DISCUSSION AND CONCLUSION:

This study found that both isolated ACL injuries and ACL injuries with concomitant LM injury treated during primary ACLR present a similar risk for cartilage injury in the long term (5 and 10 years). Interestingly, though, only the latter demonstrates a greater risk of cartilage injury within 2 years. Over 5 and 10 years, meniscal repair during ACLR is associated with an increased risk of revision and concomitant meniscal injuries, a risk not observed in shorter follow-up periods, suggesting that meniscal repair may not provide sustained benefits over time. Conversely, meniscectomy does not increase the risk of cartilage injury at 5 or 10 years and is associated with a lower risk of meniscal injury and ACL revision, raising questions about whether preserving the meniscus at all costs is always the best approach. The higher risk of revision when the LM is left in situ underscores the critical role of the meniscus as a stabilizer in the knee joint, emphasizing the need for careful consideration of treatment methods to optimize long-term knee stability and function.

Figures



Figure 1. Flowchart. ACLR, anterior cruciate ligament reconstruction; LM, lateral meniscus