

ACL rupture: Is delayed surgery actually better for patients?

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Anterior cruciate ligament (ACL) rupture presents a persistent clinical dilemma: should patients undergo immediate surgical reconstruction or attempt rehabilitation first, reserving surgery for those with ongoing instability? The choice carries significant implications for patient recovery, long-term knee health, and healthcare resource allocation. A recent systematic review and narrative synthesis, published in *Healthcare (Basel)*, synthesizes evidence from randomized controlled trials to clarify this complex decision.¹

KEY TAKEAWAYS

- **The Pivot:** Rehabilitation-first strategies with optional delayed surgery offer comparable long-term patient-reported outcomes to early reconstruction in acute ACL ruptures.
- **The Data:** Early ACL reconstruction more consistently improved mechanical stability and reduced instability episodes, but did not show consistent long-term superiority in patient-reported outcomes in acute cases.¹
- **The Action:** Consider a rehabilitation-first approach for acute ACL ruptures, particularly for patients prioritizing functional recovery over immediate mechanical stability, while ensuring timely access to delayed surgery if instability persists.

The optimal management of an anterior cruciate ligament rupture remains a topic of considerable debate among orthopaedic surgeons and sports medicine physicians. For decades, early surgical reconstruction (ACLR) was often considered the default, particularly for active individuals. But the potential for successful non-operative management, coupled with the risks and recovery associated with surgery, has fueled interest in a rehabilitation-first approach. This strategy involves a structured physiotherapy program, with surgery offered later if the patient experiences persistent symptomatic instability. The challenge lies in understanding the long-term implications of each pathway, especially given the high rates of crossover from rehabilitation to delayed surgery.¹

M. Biaß and R. Gnat conducted a systematic search and narrative synthesis of randomized controlled trial (RCT) cohorts, aiming to clarify the long-term outcomes of early ACLR versus rehabilitation-first management.¹ The review identified 27 reports representing three major RCT cohorts: KANON, COMPARE, and ACL SNNAP. These trials collectively enrolled patients with both acute and non-acute ACL injuries, comparing early ACLR plus rehabilitation against a rehabilitation-first strategy that allowed for delayed ACLR if needed. The authors prioritized six index reports for their synthesis, focusing on patient-reported outcomes, mechanical stability, instability episodes, meniscal procedure rates, and osteoarthritis-related outcomes.¹

Comparing Acute ACL Rupture Strategies

For patients with acute ACL rupture, the KANON and COMPARE trials provided the primary evidence. The KANON trial, a landmark study, did not demonstrate a consistent long-term superiority for early ACLR in patient-reported outcomes when compared to a rehabilitation-first approach.^{1,2} This finding challenged the prevailing assumption that immediate surgery was always the best course for functional recovery. Patients in the rehabilitation-first group often achieved satisfactory outcomes without surgery, or with delayed surgery if their knee remained unstable.^{1,2} The COMPARE trial, however, presented a slightly different picture. It reported a statistically significant 2-year subjective functional difference that favored early ACLR.¹ This difference, while statistically significant, requires careful clinical interpretation. The magnitude of this difference and its long-term persistence beyond two years were not consistently superior across all patient-reported outcome measures or follow-up durations. The review highlighted that while early ACLR did not consistently improve patient-reported outcomes over the long term, it more reliably improved mechanical stability and reduced the frequency of instability episodes.¹ This trade-off between subjective function and objective stability is a significant consideration for both clinicians and patients. For instance, a patient might report similar overall function but experience fewer 'giving way' episodes with early surgery. For a clinician, this might mean a more stable joint on examination, which could be reassuring. The management of sports injuries, particularly in high-demand athletes, often prioritizes this objective stability.

A significant factor complicating the interpretation of these trials is the high rate of crossover from the rehabilitation-first group to delayed ACLR. Many patients initially opting for rehabilitation eventually underwent surgery due to persistent symptomatic instability.¹ This crossover means that the trials effectively compared two management strategies (early surgery vs. rehabilitation with optional delayed surgery) rather than a pure operative versus nonoperative treatment. The implication is that a substantial proportion of patients in the 'rehabilitation-first' arm still ended up with surgery, albeit at a later stage. This makes it difficult to definitively attribute outcomes solely to non-operative treatment. The decision to proceed with delayed surgery often hinges on the patient's ongoing symptoms and functional demands, a process that requires careful shared decision-making. The quality of life after surgical fixation is a key consideration in such discussions.

Non-Acute Injuries and Long-Term Outcomes

The ACL SNNAP trial focused on a different population: individuals with non-acute ACL injury who presented with persistent symptomatic instability. In this specific cohort, a surgery-first strategy improved 18-month patient-reported outcomes.¹ This finding suggests that for patients who have already experienced a period of instability following an ACL injury, early surgical intervention may offer a more direct path to functional improvement. This distinction between acute and non-acute presentations is important for guiding treatment decisions. An acute injury might allow for a period of conservative management to assess the knee's intrinsic stability and the patient's ability to compensate, whereas a knee with established chronic instability is more likely to benefit from surgical stabilization.

The review also examined rates of meniscal procedures and osteoarthritis-related outcomes. These secondary outcomes did not consistently favor early ACLR.¹ This is a significant point, as concerns about meniscal injury progression and the development of osteoarthritis are often cited as reasons for early surgical intervention. The data from these RCT cohorts do not provide strong evidence that early surgery offers a protective effect against these long-term complications.¹ This suggests that the timing of surgery, within the context of these two management strategies, may not be the sole

determinant of future meniscal health or the onset of osteoarthritis. Other factors, such as the initial severity of the injury, concomitant injuries, and individual biological responses, likely play a more significant role. Clinicians often refer to resources like the Oxford Handbook of Rheumatology for guidance on managing degenerative joint conditions.

Interpreting the Evidence and Limitations

The authors of the systematic review emphasize that these randomized trials should be interpreted as comparisons of management strategies rather than of 'pure' operative versus nonoperative treatment approaches.¹ This distinction is vital because the high crossover rates mean that many patients in the rehabilitation-first groups ultimately underwent surgery. Therefore, the trials do not definitively answer whether non-operative treatment is superior to operative treatment, but rather whether a strategy that prioritizes rehabilitation first, with surgery as a backup, is comparable to a strategy that prioritizes early surgery. The pragmatic nature of these trials, reflecting real-world clinical practice where patients can choose delayed surgery, makes their findings highly relevant to clinical decision-making. The risks of injury in high-impact activities are a constant concern, regardless of the initial management strategy.

A key limitation of the available evidence is the persisting uncertainty over truly long-term outcomes. While the review synthesized evidence across available follow-up durations, the natural history of ACL injury and its sequelae, such as osteoarthritis, can extend over many decades. The follow-up periods in the included RCTs, while substantial, may not fully capture the lifetime risk of these complications. Further, the interpretation of randomized evidence is complicated by the frequent treatment crossover, as noted. This makes it challenging to isolate the specific effects of initial surgical versus non-surgical intent. The patient populations in these trials were also heterogeneous, encompassing varying activity levels and concomitant injuries, which can influence outcomes and complicate generalizability. For instance, a professional athlete's needs and outcomes may differ significantly from those of a recreational sports enthusiast. The outcomes of revision procedures are also an important consideration for patients who may face multiple surgeries over their lifetime. The risk of bias assessment for the primary RCT reports, conducted using Cochrane RoB 2, indicated varying levels of methodological quality. While the authors prioritized index reports for synthesis, inherent biases in patient selection, outcome reporting, and the challenges of blinding in surgical trials can influence results. For example, patient expectations and perceptions of recovery can be influenced by whether they underwent surgery, regardless of objective functional improvements. The subjective nature of patient-reported outcomes, while clinically important, can also be susceptible to these biases. The systematic review itself, while comprehensive, is a narrative synthesis, which means it did not perform a meta-analysis of pooled data. This approach can be appropriate given the heterogeneity of trial designs and outcome measures, but it means that quantitative comparisons across trials are not possible. The conclusions drawn are based on a qualitative assessment of consistency across studies, rather than a statistical pooling of effects. This means that while trends are identified, precise effect sizes are not provided for all comparisons. The evidence base, while robust for randomized trials, still leaves room for further research, particularly on very long-term outcomes and specific patient subgroups. The management of post-operative complications is a broader area of concern in any surgical context.

CLINICAL IMPLICATIONS

The persistent uncertainty surrounding ACL rupture management means clinicians must engage in careful shared decision-making. For acute ruptures, the evidence suggests that a rehabilitation-first approach, with

timely access to delayed reconstruction, can yield patient-reported outcomes comparable to immediate surgery. This challenges the notion that early surgical intervention is universally superior for functional recovery.

But, early reconstruction does offer more consistent improvements in mechanical stability and fewer instability episodes. This trade-off is important for patients with high functional demands or those who prioritize a 'stable' knee sensation. It means that while many patients may do well without immediate surgery, those who continue to experience instability will likely benefit from delayed reconstruction.

For non-acute ACL injuries with ongoing symptomatic instability, the picture is clearer: a surgery-first strategy appears more effective in the mid-term. This distinction highlights the importance of patient selection and timing. Clinicians should assess the chronicity of the injury and the patient's current symptoms when guiding treatment decisions, rather than applying a one-size-fits-all approach. The Oxford Handbook of General Practice provides a concise overview of such complex clinical decisions.

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REFERENCES

1. Vermeijden HD, Yang XA, Rademakers MV, Kerkhoffs GMMJ, van der List JP, DiFelice GS. Early and Delayed Surgery for Isolated ACL and Multiligamentous Knee Injuries Have Equivalent Results: A Systematic Review and Meta-analysis. *Am J Sports Med.* 2023;51(4):1106-1116. doi:10.1177/03635465211069356
2. Filbay SR, Roemer FW, Lohmander LS, et al. Evidence of ACL healing on MRI following ACL rupture treated with rehabilitation alone may be associated with better patient-reported outcomes: a secondary analysis from the KANON trial. *Br J Sports Med.* 2023;57(2):91-98. doi:10.1136/bjsports-2022-105473

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