There has been a renewed interest in primary repair as the treatment for certain patterns of ACL rupture. Historically, primary ACL repair was largely abandoned by the mid-1990s due to inconsistent clinical outcomes. However, careful analysis of the older data reveals that certain subgroups, especially proximal tears with good tissue quality, had better clinical outcomes than the group as a whole.

In light of the advances in diagnostic imaging, arthroscopic surgical technology, and rehabilitation approaches that have come to fore over the past several decades, primary ACL repair is a concept that is ripe for reevaluation. Using modern MRI imaging, we have the ability to preoperatively identify those tears that might be amenable to repair.

### Clinical Studies


- This is the first case series that described the 2-year follow-up results of patients with an acute, proximal ACL rupture, treated with the independent FiberTape® reinforcement repair technique.
- “A meaningful KOOS sport and recreation change and significant improvements in the KOOS, VAS-pain and VR-12 physical scores as well as a significant decrease of the Marx activity scale in comparison to preoperative scores are demonstrated.”
- “Two of the 42 patients (4.8%) reported an ACL rerupture that went on to have an uneventful reconstruction.”


- “Ten of eleven patients had good subjective and clinical outcomes after ACL preservation surgery at a minimum of 2 years ‘and a mean of 3.5 years’ follow-up.”
- “Preservation of the native ACL using the described arthroscopic primary repair technique can achieve short-term clinical success in a carefully selected subset of patients with proximal avulsion-type tears and excellent tissue quality.”
- The surgical technique is described using a Bunnell-type stitch to secure the ACL and anchoring to the femur wall using SwiveLock® anchors.


- The purpose of this study was “to compare clinical and radiologic results of primary ACL suture anchor repair and microfracturing with anatomic ACL single-bundle reconstruction in patients with acute proximal ACL avulsion tears.”
- “Proximal refixation of the ACL using knotless suture anchors and microfracturing restores knee stability and results in comparable functional outcomes to a control group treated with single-bundle ACL reconstruction. The results suggest that refixation of the ACL is a feasible treatment option in selected patients.”

- Case reported on a successful arthroscopic primary repair of a proximal ACL tear 11 years following the ACL injury.
- “The conditions, such as proximal tear location, sufficient tissue length, and excellent tissue quality, could potentially be more important for successful outcomes of arthroscopic primary ACL repair than acuity of the surgery.”


- “Second-look arthroscopy, examination and imaging at 3 months confirmed knee stability and complete ACL healing in both cases.”
- “Normal activities were resumed at 4 months, and excellent objective measures of function, without limb growth disturbance, were noted beyond 2 years.”
- ACL repair with *InternalBrace™* ligament augmentation in young children “negates the requirement and potential morbidity of graft harvest and demonstrates the potential for excellent outcome as an attractive alternative to ACL reconstruction, where an adequate ACL remnant permits direct repair.”


- Sixty-eight consecutive patients who underwent ACL repair with internal brace ligament augmentation were followed for a minimum of 1 year following surgery.
- “Improvement was seen over the study period in all KOOS and WOMAC domains with the majority of improvement seen in the first three months.”
- “The results were comparable to the literature on ACL reconstruction.”
- “This audit provides early functional outcome and failure data that demonstrates the technique of ACL repair with IBLA is comparable with early results from ACL reconstruction, with the greatest improvements seen in return to sporting activity.”


- "The clinical outcomes of arthroscopic primary repair of proximal ACL tears with suture anchors are excellent and are maintained at mid-term follow-up in a carefully selected subset of patients with proximal tears and excellent tissue quality.”

**Biomechanical Study**


- Following proximal ACL repair, gap formation of approximately one millimeter was measured after repetitious knee cycling with mean maximum failure load of 243 N.
- These findings are likely to be sufficient for careful early active range of motion (ROM) when extrapolating from other available studies.

**Technique Papers**


- Proposed modification of the Sherman classification of the different tear types.
- Discusses the surgical techniques and variations that can be used to treat these different tear types.

- "Repair of the acute proximal ruptured ACL can be achieved with the independent suture tape reinforcement ACL repair technique."
- "The independent suture tape reinforcement technique reinforces the ligament as a secondary stabilizer, encouraging natural healing of the ligament by protecting it during the healing phase and supporting early mobilization."


- "In this article, we described the technique of arthroscopic suture anchor primary repair of proximal ACL tears and we feel that this technique should be in the armamentarium of all orthopedic surgeons who treat ligament injuries of the knee. Although this technique is effective for all age groups, especially strong consideration should be given to using it for children given its conservative nature."
- "Primary repair is preferably performed in the acute setting because of better healing capacity and tissue quality."
- "Historical results of primary repair were mixed, and this could partially be attributed to inappropriate patient selection, relatively invasive surgery, and postoperative immobilization."
- "Better results of primary ACL repair are being reported due to improved patient selection that is enabled by magnetic resonance imaging, less invasive surgical techniques (i.e., arthroscopy), and rehabilitation focusing on early ROM."

**Systematic Reviews**


- "Discussed the history of ACL preservation."
- "Discussed how modern advances altered the risk-benefit ratio for ACL preservation."
- "Proposed our treatment algorithm for ACL injuries, which is based on tear location and tissue quality."


- "All studies reporting outcomes of open primary ACL repair published between the inception of PubMed, Embase and Cochrane and 2000 were identified."
- "Good outcomes were noted in the total cohort, and excellent outcomes were noted following repair of proximal tears. Positive correlation was found between the percentage proximal tears in the studies and percentage satisfied patients (p=0.010)."


- "Proximal ACL tear patterns showed better healing potential with primary repair than distal or midsubstance tears."
- "Some form of internal bracing increased the success rate of ACL repair."
- "Skeletally immature patients had the best outcomes."
- "ACL repair may be a viable option in young patients with acute, proximal ACL tears. The use of internal bracing, biological augmentation, and scaffold tissue may increase the success rate of repair."