

# The Addition of Lateral Extra-Articular Tenodesis with the Iliotibial Band during Anterior Cruciate Ligament Reconstruction in Athletes

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## Background

Anterior cruciate ligament (ACL) injuries are on the rise in sports across the board, and at all levels.<sup>1</sup> The ligament originates in the lateral femoral condyle and inserts in the anterior intercondylar area of the tibia.<sup>2</sup> The ACL restricts excessive anterior translation of the tibia and internal rotation of the knee joint itself. Disruption of knee stability due to ACL injury causes athletes great pain and time lost in sport. Most athletes elect to undergo ACL reconstruction surgery, but now when devising a surgical plan, the addition of the Lateral Extra-Articular Tenodesis (LET) with the Iliotibial band technique needs to be discussed.

Some indications for adding the LET technique are revision cases, high-grade pivot shifts, ligamentous laxity, and athletes returning to a high activity level.<sup>3</sup> During the LET procedure, a 4-6 cm incision extends from Gerdy's tubercle to the lateral femoral condyle. A 1-2 cm wide by 8-10 cm long strip of the posterior half of the Iliotibial (IT) band is harvested. The proximal end of the graft is whipstitched and passed medially to the lateral collateral ligament (LCL) and attached to the lateral femoral condyle at the insertion.<sup>4</sup> This procedure reduces anterolateral laxity by increasing stabilization in the joint.

## Objective

This research aimed to evaluate if the addition of Lateral Extra-Articular Tenodesis (LET) with the Iliotibial (IT) band during Anterior Cruciate Ligament Reconstruction (ACLR) in athletes is more advantageous when compared to an isolated ACLR. Specifically looking at patient outcomes, return to sport time, graft rupture, and laxity in knee post-surgical intervention.

## PICOT

In comparing athletes who undergo Anterior Cruciate Ligament Reconstruction (ACLR), does the addition of the Lateral Extra-articular Tenodesis (LET) procedure reduce the risk of reoperation and improve knee stability when returning to sport?

## Design & Methods

**Keywords:** Anterior cruciate ligament, lateral extra-articular tenodesis, iliotibial band, Physical activity, return to sport, laxity, elite athlete, pediatric population

**Inclusion Criteria:** Studies evaluating return to sport (RTS) time, re-rupture rates, patient reported outcomes, and/or knee stability. Patients with radiologic evidence of ACL rupture, patients undergoing isolated ACLR, patients undergoing ACLR with LET, and participation in Physical Activity

**Exclusion Criteria:** Not participating in Sports/Physical activity, studies published prior to 2018, studies not available as full text online, and studies regarding cost or other outcomes not directly patient related.

## Abbreviation Key

**ACL:** Anterior Cruciate Ligament  
**ACLR:** Anterior Cruciate Ligament Reconstruction  
**LET:** Lateral Extra-Articular Tenodesis  
**IT:** Iliotibial band  
**LCL:** Lateral Cruciate Ligament  
**RTS:** Return to Sport



Table 1. Summary of Evidence

Database	Yielded	Reviewed	Included in Analysis
Google Scholar	41,290	25	7
Valpo Summon	112	16	3
Total:	41,402	41	10

Table 2. Synthesis of Evidence

Level of Evidence	Included in Research
Systematic Review	2
Prospective Cohort	3
Retrospective Cohort	2
Randomized Control Trial	1
Other	2

## Results

- Return to original sport type for the ACLR revision with LET was 22/42 (52%), whereas an isolated ACLR revision was 11/36 (31%). The addition of the LET technique increases the rate of RTS type (basketball, softball, football, etc.) after an ACLR revision.<sup>5</sup>

- Subset analysis of RTS time with frequent pivoting and higher rates of ACL rupture (rugby, skiing) favored the ACLR with LET group (mean 6.9 ± 2 months; n=34); ACLR alone (mean 8.3 2.2 months; n=122) (P = 0.001).<sup>6</sup>

- 32 of the 338 elite athletes that underwent an isolated ACLR suffered a graft failure (9.5%). 4 of the 117 elite athletes that underwent A LLR with LET suffered a graft failure (3.4%), making this technique more efficacious. This data resulted in a 2.8 times reduced risk of graft failure.<sup>7</sup>

- One study followed athletes who underwent ACLR with LET for a minimum of 20 years and had satisfactory results in laxity control and did not develop osteoarthritis laterally.<sup>1</sup>

- Clinical results favor the addition of the LET technique with an ACLR in elite athletes to decrease the risk of re-rupture and increase stability.<sup>1</sup>

- It was found that LET in addition to HS autograft ACLR led to statistically significant reduction in graft failure (11% in HS ACLR alone vs 4% HS ACLR + LET, RR 0.67, 95% CI 0.36 to 0.83, p<0.001) and persistent rotary laxity at two years post operative.<sup>1</sup>

- In skeletally immature patients, it was determined that ACLR with LET is associated with high rates of return to sports and satisfactory functional outcomes. The most common complication of ACLR in skeletally immature patients is graft failure. However, this study did not demonstrate any cases of graft failure.<sup>8</sup>

- The most common complication of ACLR in skeletally immature patients is graft failure. However, a study analyzing the pediatric population, did not demonstrate any cases of graft failure.<sup>8</sup>

- There is clinical evidence that supports ACLR with LET to allow an athlete longevity in their respective sport.<sup>9</sup>

## Discussion

- Athletes who undergo ACLR with LET have better return to sport time, decreased laxity in the knee, and more satisfactory patient outcomes when compared to those who undergo isolated ACLR.

- Elite athletes who underwent ACLR + LET had a reduced prevalence of rotational instability in the early stage postsurgical period.<sup>1</sup>

- There is clinical evidence that ACLR with LET is a safe and effective surgical option for pediatric patients with ACL rupture.<sup>8</sup>

- The ACLR with LET gives the joint more anterolateral laxity and increases overall stability. The addition of LET resulted in a superior reduction of AP and rotational laxity compared with isolated intra-articular procedures.<sup>1</sup>

- Lateral extra-articular procedures at the time of ACLRs is directly related to better patient-reported outcomes and return to multi-directional sports after an ACLR.<sup>1,5,6,7,8</sup>

## Further Study

Although the addition of the LET technique in addition to ACL reconstruction has been shown to be efficacious for athletes at all levels and ages, there are gaps in literature in regard to graft type utilized. The studies examined did not address if there was a correlation between a specific graft type (allograft, autograft, hamstring, patellar, quadricep, etc.) and rupture of the initial reconstruction. There is a possibility that despite the utilization of the LET procedure, there could be a graft type that is associated with negative outcomes following an ACLR. Further studies will need to be conducted to ensure that there is no correlation between specific graft type failure and the two surgical techniques.

## Conclusion

Evidence supports the addition of lateral extra-articular tenodesis in athletes, including the pediatric population. Patients have a more favorable outcome and are able to return to sports that have frequent pivoting of the knee joint. Combined lateral extra-articular tenodesis with the use of the IT band during anterior cruciate ligament reconstruction should be discussed when devising a surgical plan for an athlete who suffered an ACL injury. This procedure helps athletes return to their pre-injurious activity level. The technique is safe and efficacious in professional, collegiate, and pediatric athletes.

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