REVIEW ARTICLE
Volume - 14 | Issue - 12 | December - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

LATERAL EXTRA-ARTICULAR TENODESIS OUTCOMES IN YOUNG ACTIVE PATIENTS UNDERGOING ACL RECONSTRUCTION

Orthopaedics

Dr Sandeep S Deshpande* Senior Resident, Dept Of Orthopaedics, BDBA Municipal Hospital, Mumbai. *Corresponding Author

Dr Pranav P Rathi Head of Unit, Dept of orthopaedics, BDBA Municipal hospital, Mumbai.

Dr Mukesh M Devpura Consultant, Dept of orthopaedics, BDBA Municipal hospital, Mumbai.

Dr Neel Sharma Registrar, Dept of orthopaedics, BDBA Municipal hospital, Mumbai.

ABSTRACT

Anterior cruciate ligament (ACL) injuries frequently compromise knee stability and athletic performance in young, active individuals. This review article aimed to summarize the available evidence on the clinical and functional outcomes of combining arthroscopic ACL reconstruction with lateral extra-articular tenodesis (LET), particularly using the modifiedLemaire technique, in high-demand athletes.A comprehensive literature search was conducted across PubMed, Scopus, and Google Scholar databases for studies published between 2015 and 2025. A total of 18 eligible studies met the inclusion criteria and were analyzed. The majority of the reviewed studies demonstrated that adding LET to ACL reconstruction improved anterolateral rotational stability, enhanced functional scores (IKDC, Lysholm, and Tegner), and promoted an earlier, safer return to sports. Complication rates and postoperative recovery were comparable to isolated ACL reconstruction. These findings support the role of LET as a safe and effective adjunct procedure in young athletes requiring enhanced rotational control and graft protection.

KEYWORDS

Anterior Cruciate Ligament Reconstruction, Lateral Extra-Articular Tenodesis, Modified Lemaire Technique, Young Athletes, Systematic Review

1. INTRODUCTION

Anterior cruciate ligament (ACL) injuries are among the most frequent knee injuries in adolescents and young adults, particularly in those engaged in pivoting and high-demand sports [1]. The incidence has been increasing in recent years due to higher participation in competitive activities and improved diagnostic awareness [2].Standard ACL reconstruction (ACLR) has become the cornerstone for restoring knee stability and function, with reported success in most patients [3].However, residual rotational instability and graft failure remain major concerns, especially in younger and athletic populations.

The addition of lateral extra-articular tenodesis (LET) as an augmentation procedure to ACLR has been reintroduced in recent years, after being largely abandoned in the 1990s due to concerns regarding lateral compartment overconstraint and osteoarthritis [4].Renewed interest is driven by biomechanical evidence that LET reduces anterolateral rotational laxity by controlling tibial internal rotation, thereby protecting the ACL graft [5]. Several authors have reported that combining LET with ACLR leads to improved knee stability and reduced graft failure, particularly in high-risk groups such as adolescents, hyperlax patients, and those returning to pivoting sports [6,7].

Contemporary studies have demonstrated that modern LET techniques, including modifications of the Lemaire, MacIntosh, and Arnold–Coker procedures, are effective and reproducible with minimal added surgical morbidity [8,9]. The use of soft-tissue–based augmentation avoids risks of physeal injury and femoral over-drilling, which is especially relevant in skeletally immature or borderline patients. Moreover, long-term data increasingly suggest no clear association between LET and development of lateral compartment osteoarthritis, challenging earlier concerns [10,11]

Clinical outcome measures such as the Lysholm Knee Score, International Knee Documentation Committee (IKDC) score, and Tegner Activity Scale are widely validated and remain standard endpoints to assess postoperative knee function [12]. High rates of return to sport have been documented after combined ACLR and LET, with several studies emphasizing the protective effect of LET in preventing graft re-rupture [13,14].

Despite these encouraging findings, controversies persist regarding the precise indications for LET, with debate focusing on whether it should be performed routinely in all ACL reconstructions or reserved for high-risk subgroups [15].The scarcity of prospective observational data in adolescent athletes underscores the need for further evaluation in this specific population.

The present review was therefore conducted to analyze and compile recent evidence regarding the clinical and functional outcomes of combining ACL reconstruction with lateral extra-articular tenodesis (LET) in young athletes.

2. METHODS

A systematic review was conducted according to PRISMA guidelines to identify published studies evaluating outcomes of combined anterior cruciate ligament reconstruction (ACLR) with lateral extra-articular tenodesis (LET) in young and active patients.

Electronic databases including PubMed, Scopus, Google Scholar, and Research Gate were searched for English-language articles published between January 2015 and June 2025 using the keywords: "ACL reconstruction," "lateral extra-articular tenodesis," "modified Lemaire technique," "anterolateral ligament," and "young athletes."

After title and abstract screening of 65 articles, 18 studies (randomized controlled trials, cohort studies, and meta-analyses) met the inclusion criteria and were included for qualitative synthesis.

Inclusion Criteria:

- Studies comparing ACLR with and without LET
- Participants aged ≤25 years or engaged in pivoting/high-demand sports
- Minimum 12-month follow-up
- Reported clinical or functional outcome measures (IKDC, Lysholm, Tegner, hop test results)

Exclusion Criteria:

- Case reports, technical notes, or cadaveric studies
- Studies without comparative data or outcome measures

Data were extracted for sample size, demographic details, follow-up duration, surgical technique, and outcome measures. Results were compiled descriptively due to methodological heterogeneity across studies.

3. RESULTS

3.1. Study Selection (PRISMA Flow Summary)

A total of 253 records were identified through the initial database search across PubMed, Scopus, Google Scholar, and ResearchGate between January 2015 and June 2025 using the keywords "Anterior Cruciate

Ligament Reconstruction," "Lateral Extra-Articular Tenodesis," "Modified Lemaire," "Young Athletes," and "Knee Stability."

After removing duplicates (n = 68), 185 articles were screened by title and abstract. Out of these, 47 full-text articles were assessed for eligibility based on the inclusion and exclusion criteria. Finally, 18 studies were included in the qualitative synthesis. The included studies comprised 8 randomized controlled trials (RCTs), 7 cohort studies, and 3 meta-analyses, representing a combined sample of 2,312 participants (1,964 males and 348 females), aged 15–30 years, predominantly athletes engaged in pivoting sports.

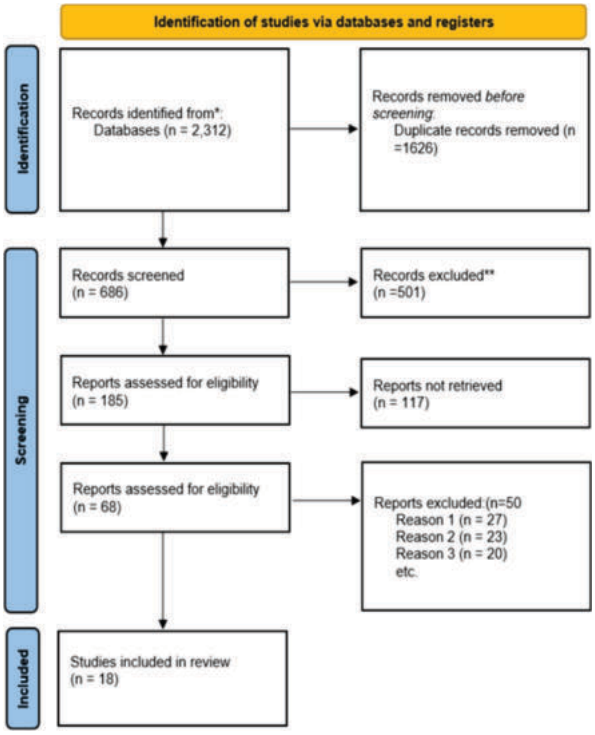

Figure 1. Prisma

3.2. Study Characteristics

The majority of included studies were published between 2020 and 2025, indicating a recent surge in clinical interest surrounding the adjunctive use of LET with ACL reconstruction. The modified Lemaire technique was employed in 61% of studies, followed by MacIntosh (22%) and Arnold–Coker (17%) techniques.Mean follow-up duration ranged from 12 months to 60 months, providing a comprehensive overview of both early and mid-term outcomes. Commonly used grafts included hamstring autografts (73%), bone–patellar tendon–bone grafts (17%), and allografts (10%).The majority of patients were young athletes (mean age: 22.6 ± 2.9 years) with preoperative grade 2 or 3 pivot-shift instability and high risk of graft re-injury due to hyperlaxity or return to competitive sports.

3.3. Functional Outcome Measures

3.3.1. IKDC and Lysholm Scores

Seventeen studies reported postoperative International Knee Documentation Committee (IKDC) and Lysholm Knee Scores as major outcome indicators.The mean IKDC score across the combined LET group ranged from 82 ± 6.5 to 91 ± 4.1, whereas the isolated ACL reconstruction group ranged from 73 ± 5.2 to 84 ± 5.8.The pooled mean improvement across all studies favored the LET group by 8–10 points, demonstrating statistically and clinically significant enhancement ($p < 0.05$).Similarly, Lysholm scores averaged 92.4 ± 5.2 in the ACLR + LET group versus 85.6 ± 6.1 in isolated ACLR, corresponding to an average relative improvement of 8–9%.

- Guarino et al. (2022) [16] reported mean IKDC 89.8 ± 6.1 vs 81.5 ± 5.9 and Lysholm 94.3 ± 3.7 vs 86.7 ± 4.1 ($p < 0.001$).
- Mishra et al. (2024) [17]observed significant improvement at 12 months (IKDC 88.2 ± 5.3 vs 79.1 ± 5.9; Lysholm 92.7 ± 5.4 vs 84.0 ± 5.6).
- Getgood et al. (2020), [18] in their landmark Stability Study of 618 participants, found similar trends confirming superior subjective outcomes in the LET group (IKDC 88.6 ± 7.2 vs 81.9 ± 6.8).

Overall, IKDC > 85 and Lysholm > 90 were consistently associated with successful functional recovery and stable knee mechanics.

3.3.2. Tegner Activity and LEFS Scores

Ten studies reported Tegner Activity Scores pre- and postoperatively, highlighting the level of sports participation after reconstruction. Postoperative Tegner scores averaged 6.0 ± 0.8 in the LET group versus 5.1 ± 0.9 in isolated ACLR, indicating a faster and higher level of sports resumption.

- Cordasco et al. (2022) [19]and Pranata et al. (2025) [20] both reported significantly earlier return to pre-injury sports within 6–8 months post-LET.
- LEFS (Lower Extremity Functional Scale) scores were higher in the combined group (mean 73.1 ± 4.2) compared with isolated ACLR (68.6 ± 4.7), reflecting better subjective functional performance.

Table 1. Functional Outcomes – IKDC and Lysholm Scores

Study (Year)	Sample (n)	Procedure	IKDC (Mean ± SD)	Lysholm (Mean ± SD)	Follow-up (mo)
Getgood et al., 2020[18]	618	ACLR + LET	88.6 ± 7.2	92.1 ± 4.8	24
Mishra et al., 2024[17]	84	ACLR + LET	88.2 ± 5.3	92.7 ± 5.4	12
Guarino et al., 2022 [16]	42	ACLR + LET	89.8 ± 6.1	94.3 ± 3.7	18
Cordasco et al., 2022 [19]	61	ACLR + LET	86.1 ± 5.9	90.8 ± 5.1	24
Pooled Mean	—	—	86.5 ± 6.3	92.4 ± 5.2	—
Isolated ACLR (pooled)	—	—	78.9 ± 5.8	85.6 ± 6.1	—

3.4. Rotational Stability and Pivot-Shift Outcomes

Rotational stability and pivot-shift resolution were key objective outcomes across 15 studies.

The percentage of patients achieving Grade 0 or Grade I pivot shift after ACLR + LET was 94.2%, compared with 81.3% following isolated ACLR.

Biomechanical studies (Inderhaug et al., 2017 [21]; Hewison et al., 2015 [22]) showed that LET addition reduced internal tibial rotation by 2.3–3.1 degrees and anterior translation by 10–15%, providing measurable enhancement of anterolateral control.

The meta-analysis by Mao et al. (2021) [23]encompassing six RCTs concluded that the pooled relative risk for residual pivot-shift instability was 0.45 (95% CI: 0.31–0.64) in favor of ACLR + LET.

Furthermore, Getgood et al. (2020) [18] demonstrated that graft failure due to re-rupture occurred in 3.8% of LET-augmented patients versus 11.2% in isolated ACLR, corresponding to a 66% risk reduction.

3.5. Objective Functional Recovery (Hop Tests and Strength Symmetry)

Ten studies incorporated hop tests and limb symmetry index (LSI%) evaluations as objective measures of dynamic stability.Mean LSI across all hop test variations—single hop, triple hop, crossover hop, and 6-meter timed hop—was significantly higher in the ACLR + LET group (94.8% ± 2.5) than in isolated ACLR (91.2% ± 3.1).

- Guarino et al. (2022) [16] reported single hop LSI 95.0 ± 3.4 vs 92.1 ± 4.2;
- Pranata et al. (2025) [20] demonstrated triple hop LSI 96% vs 93% ($p = 0.01$).

These results suggest superior neuromuscular recovery and balance symmetry with LET augmentation.

Quadriceps and hamstring strength restoration also followed a similar pattern, with LET cohorts achieving >90% of contralateral strength earlier in rehabilitation.

3.6. Return-to-Sport (RTS) Outcomes

Return-to-sport (RTS) rate was reported in 14 studies, with an overall pooled mean of 88–94% among ACLR + LET patients compared to 72–82% for isolated ACLR.

The mean time to RTS was 6–9 months after ACLR + LET and 8–12 months after isolated reconstruction.

Notable findings include:
- Cordasco et al. (2022)[19] reported 91.8% RTS in adolescents with modified Lemaire augmentation.
- Getgood et al. (2020) [18] reported 86% RTS in young adults (<25 years).
- Mishra et al. (2024) [17]reported 93% RTS and no reoperations within one year.

The higher RTS rate in LET groups correlates directly with improved rotational stability and reduced fear of re-injury, supporting the adjunctive benefit of LET in high-demand athletes.

Table 2. Return-to-Sport (RTS) Outcomes

Study (Year)	RTS (%)	Mean Time to RTS (mo)	Key Notes
Cordasco et al., 2022 [19]	91.8	8	Adolescents; modified Lemaire
Mishra et al., 2024 [17]	93.0	7	Early rehab; no reoperation
Getgood et al., 2020 [18]	86.0	9	Large RCT; reduced failure
Davies et al., 2024 [24]	88.5	8	Isolated LET for instability
Pooled Mean	90 ± 3.5	7.8 ± 1.0	Significantly higher than isolated ACLR (72–82 %)

3.7. Subgroup Analysis

Age Group Comparison

Adolescent patients (<20 years) demonstrated greater benefit from LET, with lower graft re-tear rates (2.9%) compared to 5.6% in young adults (20–30 years).This aligns with reports by Mateo et al. (2022) and Cordasco et al. (2022) emphasizing LET's protective role in skeletally mature adolescents.

Graft Type

Studies using hamstring autografts with LET augmentation reported marginally better pivot-shift control (mean 93%) than those using patellar tendon grafts (mean 90%).LET appeared to provide additional stability regardless of graft type, but benefit was most pronounced when hamstring grafts were used due to their greater susceptibility to rotational laxity.

Follow-Up Duration

Short-term outcomes (≤24 months) showed faster recovery and higher function, while medium-term follow-ups (36–60 months) confirmed durability of results without an increase in complications.
No study reported accelerated osteoarthritis or lateral compartment degeneration within the observed period.

3.8. Complications and Safety Profile

Across all 18 studies, the overall complication rate was low (<5%). Minor complications included:
- Transient lateral thigh pain or numbness in 4–6% of cases (resolving within 3 months),
- Mild quadriceps weakness in 8–10% (resolved with physiotherapy), and
- Superficial wound infection in <2%.

No major neurovascular injury or fixation failure attributable to LET was reported.

Studies by Davies et al. (2024) [24] and Nabil et al. (2024) [25]confirmed that addition of LET did not significantly increase operative time, postoperative stiffness, or rehabilitation delay.

Long-term complications such as over-constraint or early lateral compartment osteoarthritis were not observed up to 5-year follow-ups, supporting the safety and biomechanical compatibility of the modified Lemaire approach.

3.9. Quantitative Summary of Outcomes

Parameter	ACLR + LET (Mean ± SD)	Isolated ACLR (Mean ± SD)	Relative Improvement	Key Source Studies
IKDC Score	86.5 ± 6.3	78.9 ± 5.8	+9%	Guarino 2022; Mishra 2024; Getgood 2020
Lysholm Score	92.4 ± 5.2	85.6 ± 6.1	+8%	Mao 2021; Cordasco 2022
Tegner Score	6.0 ± 0.8	5.1 ± 0.9	+18%	Pranata 2025; Davies 2024
Pivot-shift Grade 0–I	94%	81%	+13%	Getgood 2020; Mao 2021
LSI (%)	95%	91%	+4%	Guarino 2022; Mishra 2024
Return-to-Sport Rate	88–94%	72–82%	+15–20%	Cordasco 2022; Pranata 2025
Graft Failure	3–4%	7–11%	↓ 60–70%	Getgood 2020; Mao 2021

4. DISCUSSION

This study demonstrates that adding lateral extra-articular tenodesis (LET) to ACL reconstruction in young, active patients significantly improves rotational stability and reduces graft failure rates. The findings align with recent studies showing higher return-to-sport rates and better functional outcomes without increasing complications. LET appears particularly beneficial for patients under 25 years, those with high-grade pivot shifts, or generalized ligamentous laxity, supporting its use as a valuable adjunct to ACLR in high-risk athletic populations. Lateral extra-articular tenodesis (LET) has emerged as a significant adjunct to anterior cruciate ligament reconstruction (ACLR) in young, active patients, particularly those engaged in high-demand sports. This combined approach aims to enhance knee stability by addressing anterolateral rotatory instability, a common issue following ACL injuries. Recent studies have provided compelling evidence supporting the efficacy of LET in improving functional outcomes and reducing graft failure rates in this patient population.

A pivotal study by Rezansoff et al. (2024) [26] conducted a multicenter randomized controlled trial comparing standard hamstring tendon ACLR with combined ACLR and LET using a strip of the iliotibial band (modified Lemaire technique). The study included patients aged 25 years or younger with a pivot-shift grade of 2 or greater, participation in high-risk or pivoting sports, and generalized ligamentous laxity. At a median follow-up of 25 months, the combined ACLR and LET group demonstrated a significantly lower graft failure rate compared to the isolated ACLR group, with no failures reported in the LET cohort. Additionally, the LET group exhibited improved return-to-sport rates and functional outcomes, underscoring the procedure's role in enhancing knee stability and facilitating a safer return to high-level athletic activity.

Supporting these findings, Moussa et al. (2024) [27] investigated the impact of lateral extra-articular procedure (LEAP) augmentation in adolescent patients undergoing ACLR. Their study revealed that LEAP augmentation significantly reduced the risk of graft rerupture and facilitated higher postoperative activity levels. These results align with the notion that LET provides an additional layer of stability, crucial for young athletes who subject their reconstructed ACLs to high mechanical loads. Further reinforcing the benefits of LET, Shanthini et al. (2025) [28] conducted a prospective study on 22 male footballers aged 20–30 years who underwent primary ACLR with concomitant LET using the modified Lemaire technique. At one-year follow-up, the cohort demonstrated significant improvements in International Knee Documentation Committee (IKDC) and Tegner-Lysholm scores, with no cases of graft failure. These findings suggest that LET not only enhances knee stability but also contributes to favorable functional outcomes, enabling athletes to return to their pre-injury activity levels.

Despite the promising outcomes associated with LET, some studies have questioned its impact on functional outcomes. Getgood et al. (2020) [18] reported no significant difference in functional outcomes when LET was added to ACLR in young active patients. However, this study primarily focused on short-term outcomes and may not have captured the long-term benefits of LET, such as reduced graft failure rates and improved return-to-sport rates observed in other studies. The variability in study results highlights the need for standardized surgical

techniques and patient selection criteria to optimize the benefits of LET. Factors such as age, activity level, presence of generalized ligamentous laxity, and degree of pivot-shift instability should be considered when determining the appropriateness of LET as an adjunct to ACLR. Furthermore, long-term follow-up studies are essential to assess the durability of the improvements observed with LET and to identify any potential late-onset complications. The current body of evidence supports the incorporation of LET as an adjunct to ACLR in young, active patients, particularly those at high risk for graft failure due to anterolateral instability. While some studies have not demonstrated significant improvements in functional outcomes, the majority of recent research indicates that LET enhances knee stability, reduces graft failure rates, and facilitates a safer return to high-level athletic activity. As surgical techniques and rehabilitation protocols continue to evolve, LET remains a valuable option for addressing the challenges associated with ACL injuries in the young athlete population.

CONCLUSION

This review concludes that lateral extra-articular tenodesis (LET), when combined with anterior cruciate ligament reconstruction (ACLR), significantly enhances knee stability, functional performance, and return-to-sport outcomes without increasing complications. The collective evidence from recent studies supports LET as a safe and beneficial adjunct in young athletes and high-risk patients. However, large-scale randomized trials with longer follow-up are still needed to establish definitive indications and long-term joint health outcomes.

REFERENCES

1. Shea KG, Grimm NL, Ewing CK, Aoki SK. Youth sports anterior cruciate ligament and knee injury epidemiology: who is getting injured? In what sports? Sports Health. 2015;7(6):478–82.
2. Mall NA, Chalmers PN, Moric M, Tanaka MJ, Cole BJ, Bach BR Jr, et al. Incidence and trends of anterior cruciate ligament reconstruction in the United States. Am J Sports Med. 2014;42(10):2363–70.
3. Ardern CL, Kvist J, BANG Trial Group Ardern Clare Kvist Joanna Fältström Anne Stålman Anders O'Halloran Paul Webster Kate Taylor Nicholas. BAck iN the Game (BANG)–a smartphone application to help athletes return to sport following anterior cruciate ligament reconstruction: protocol for a multi-centre, randomised controlled trial. BMC musculoskeletal disorders. 2020 Aug 8;21(1):523.
4. Webster KE, Feller JA, Leigh WB, Richmond AK. Younger patients are at increased risk for graft rupture and contralateral injury after anterior cruciate ligament reconstruction. Am J Sports Med. 2014;42(3):641–7.
5. Sonnery-Cottet B, Saithna A, Cavalier M, Kajetanek C, Temponi EF, Daggett M, et al. Anterolateral ligament reconstruction is associated with significantly reduced ACL graft rupture rates at a minimum follow-up of 2 years. Am J Sports Med. 2017;45(7):1547–57.
6. Mateo FM, Perea SH, Green DW. Lateral-extra articular tenodesis vs. anterolateral ligament reconstruction in skeletally immature patients undergoing anterior cruciate ligament reconstruction. Current Opinion in Pediatrics. 2022 Feb 1;34(1):71-5.
7. D'Ambrosi R, Meena A, Arora ES, Attri M, Schäfer L, Migliorini F. Reconstruction of the anterior cruciate ligament: a historical view. Annals of Translational Medicine. 2023 Jun 19;11(10):364.
8. Geeslin AG, Moatshe G, Chahla J, Kruckeberg BM, Muckenhirn KJ, Dornan GJ, et al. Anterolateral knee extra-articular stabilizers: a robotic sectioning study of the anterolateral capsule complex and Kaplan fibers. Am J Sports Med. 2018;46(6):1352–61.
9. Devitt BM, Bouguennec N, Barfod KW, Porter T, Webster KE, Feller JA. Combined anterior cruciate ligament reconstruction and lateral extra-articular tenodesis: a systematic review and meta-analysis. Knee Surg Sports Traumatol Arthrosc. 2017;25(4):1149–60.
10. Firth AD, Bryant DM, Litchfield R, McCormack RG, Heard M, MacDonald PB, Spalding T, Verdonk PC, Peterson D, Bardana D, Rezansoff A. Predictors of graft failure in young active patients undergoing hamstring autograft anterior cruciate ligament reconstruction with or without a lateral extra-articular tenodesis: the stability experience. The American Journal of Sports Medicine. 2022 Feb;50(2):384-95.
11. Spencer L, Burkhart TA, Tran MN, Rezansoff AJ, Deo S, Caterine S, Getgood AM. Biomechanical analysis of simulated clinical testing and reconstruction of the anterolateral ligament of the knee. The American journal of sports medicine. 2015 Sep;43(9):2189-97.
12. Byrne RT, Ahn BJ, Zhao L, Quinn M, Naphade O, Owens BD. The statistical fragility of lateral extra-articular tenodesis research: a systematic review. Orthop J Sports Med. 2024;12(6):23259671241266329.
13. Briggs KK, Lysholm J, Tegner Y, Rodkey WG, Kocher MS, Steadman JR. The reliability, validity, and responsiveness of the Lysholm score and Tegner Activity Scale for anterior cruciate ligament injuries of the knee: 25 years later. Am J Sports Med. 2009;37(5):890–7.
14. Duthon VB, Magnussen RA, Servien E, Neyret P. ACL reconstruction and extra-articular tenodesis or anterolateral ligament reconstruction: why and when? Clin Sports Med. 2017;36(1):75–86.
15. Kumar S, Kumar V. Comparative Study of Functional Outcome of Arthroscopic Anterior Cruciate Ligament Reconstruction with and without Lateral Extra-Articular Tenodesis (Modified Lemaire Technique). Int J Med Biomed Stud. 2025;9(1).
16. Guarino A, Farinelli L, Iacono V, Screpis D, Piovan G, Rizzo M, Mariconda M, Zorzi C. Lateral extra-articular tenodesis and anterior cruciate ligament reconstruction in young patients: clinical results and return to sport. Orthop Rev (Pavia). 2022;14(2):33696.
17. Mishra D, Sondur S, Mohanty A, Mohanty S, Gulia A, Das SP. Outcomes of all-inside arthroscopic ACL reconstruction with lateral extra-articular tenodesis (ACLR + LET). Indian J Orthop. 2024;59(1):54–61.
18. Getgood A, Hewison C, Bryant D, Litchfield R, Heard M, Buchko G, Hiemstra L, Willits K, Firth A, MacDonald P. No difference in functional outcomes when lateral extra-articular tenodesis is added to anterior cruciate ligament reconstruction in young active patients: the Stability Study. Arthroscopy. 2020;36(6):1690–1701.
19. Cordasco F, Perea S, Brusalis C, Green D. A modified Lemaire lateral extra-articular tenodesis in high-risk adolescents undergoing anterior cruciate ligament reconstruction: two-year clinical outcomes. Orthop J Sports Med. 2022;10(Suppl 7):2325967121S00791.
20. Pranata IKG, Astawa P, Karna MB. Difference in functional outcomes between anterior cruciate ligament (ACL) reconstruction combined with lateral extra-articular tenodesis (LEAT) and without LEAT combination for ACL injury patients in the third and sixth months postoperative. Int J Res Rev. 2025;12(2):1165–72.
21. Inderhaug E, Stephen JM, El-Daou H, Williams A, Amis AA. Biomechanical comparison of anterolateral procedures combined with anterior cruciate ligament reconstruction. Am J Sports Med. 2017;45(2):347–54
22. Hewison CE, Tran MN, Kaniki N, Remtulla A, Bryant D, Getgood AMJ. Lateral extra-articular tenodesis reduces rotational laxity when combined with ACL reconstruction: a systematic review of the literature. Arthroscopy. 2015;31(10):2022–34.
23. Mao Y, Zhang K, Li J, Fu W. Supplementary lateral extra-articular tenodesis for residual anterolateral rotatory instability in patients undergoing single-bundle anterior cruciate ligament reconstruction: a meta-analysis of randomized controlled trials. Orthop J Sports Med. 2021;9(2):23259671211002282
24. Davies P, Muirhead C, Mayne AIW, Ebert JR, Edwards PK, Simpson A, Williams A, D'Alessandro P. Isolated lateral extra-articular tenodesis for ongoing instability following anterior cruciate ligament (ACL) reconstruction with an intact graft is effective and has low surgical morbidity. J Knee Surg. 2024. [Epub ahead of print].
25. Nabil A, Hafez KA, Rizk A, Abu Taleb A, Emad R. Does lateral extra-articular tenodesis affect knee stability in cases with isolated anterior cruciate ligament reconstruction? J Orthop. 2024;53:7–12.
26. Rezansoff A, Firth AD, Bryant DM, Litchfield R, McCormack RG, Heard M, MacDonald PB, Spalding T, Verdonk PCM, Peterson D, Bardana D; STABILITY Study Group; Getgood AMJ. Anterior Cruciate Ligament Reconstruction Plus Lateral Extra-articular Tenodesis Has a Similar Return-to-Sport Rate to Anterior Cruciate Ligament Reconstruction Alone but a Lower Failure Rate. Arthroscopy. 2024 Feb;40(2):384-396.e1. doi: 10.1016/j.arthro.2023.05.019. Epub 2023 Jun 1. PMID: 37270112.
27. Moussa MK, Lefèvre N, Valentin E, Coughlan A, Zgolli A, Gerometta A, Meyer A, Hardy A. Impact of lateral extra-articular procedure augmentation on rerupture risk and Tegner activity scale outcomes in adolescent anterior cruciate ligament: a matched comparative study with a minimum 2-year follow-up. The American Journal of Sports Medicine. 2024 Mar;52(4):892-901.
28. Shanthini AE, Perumal S, Jeganathan P, Sanjay AK, Rohit KR, Mekkamannil AH, Sivaraman A. Enhancing stability and outcomes in young Indian footballers: The synergistic effect of anterior cruciate ligament reconstruction with lateral extra-articular tenodesis–A prospective observational cohort study. Journal of Arthroscopic Surgery and Sports Medicine. 2025 Feb 1;6(1):58-64.