

ACL Update 2024

Jesse C. DeLee, MD

Adjunct Professor

UT Health

1

Dr. DeLee has no relevant financial relationships
with commercial interests to disclose.

2

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.



CME Accreditation

This live activity is designated for a maximum of .3 AMA PRA Category 1 Credit. Physicians should claim only credit commensurate with the extent of their participation in this activity.

3



Learning Objectives

1. To review the most recent research on Anterior Cruciate Ligament Reconstruction.
2. To review factors which influence the results of the Anterior Cruciate Ligament injury and reconstruction.

4

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

Comparative study of ACL Reconstruction with Hamstring vs Patellar
Tendon Graft in Young Women
(New Zealand ACL Registry)
Tiplady, A. et al

American Journal of Sports Medicine 51 (3):627 - 633, March 2023

- Primary ACL- 14,250
- Primary ACL in women 15 - 20 Y/O - 1,281
 - Hamstrings - 797 (63%)
 - Patellar Tendon - 464 (37%)
- Follow-up
 - Patellar Tendon - 2.9 Years
 - Hamstrings - 3.73 Years

5

- Graft Failures - 66 (5.2%)
 - Patellar Tendon 1.1%
 - Hamstring Tendon 7.7%
- Risk of Revision 6 x higher than Hamstrings vs Patellar Tendons
- No difference in morbidity between the two groups
- Largest number of patients showing a significant difference in graft failure rate among young women

6

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

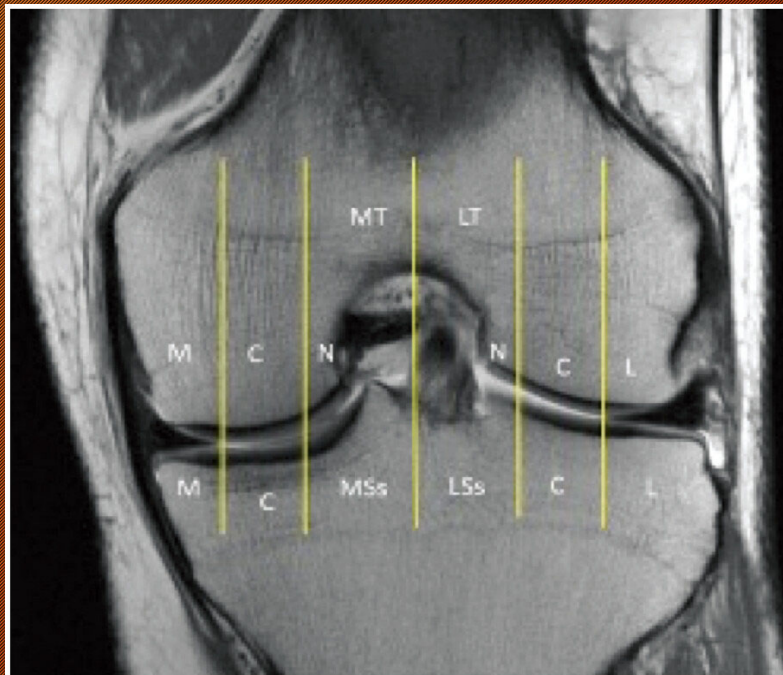
Examining the Distribution of Bone Bruise Patterns in Contact and Noncontact Acute ACL Injuries

Moran, J et al

American Journal of Sports Medicine 51 (5): 1155 - 1161, April 2023

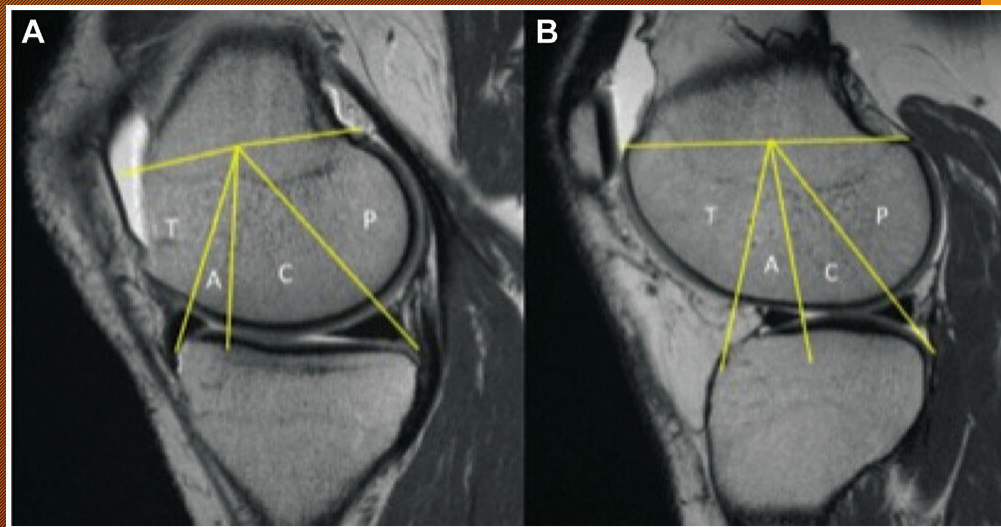
- 220 Patients underwent acute ACL Reconstruction
 - Clearly documented mechanism of injury
 - MRI within 30 days of injury
- 142 (64.5%) noncontact injury - 76 (35.5%) contact injuries
 - Contact group 69.2% male
 - Noncontact group 52.4% male

7



8

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.



9

• Contact Injuries

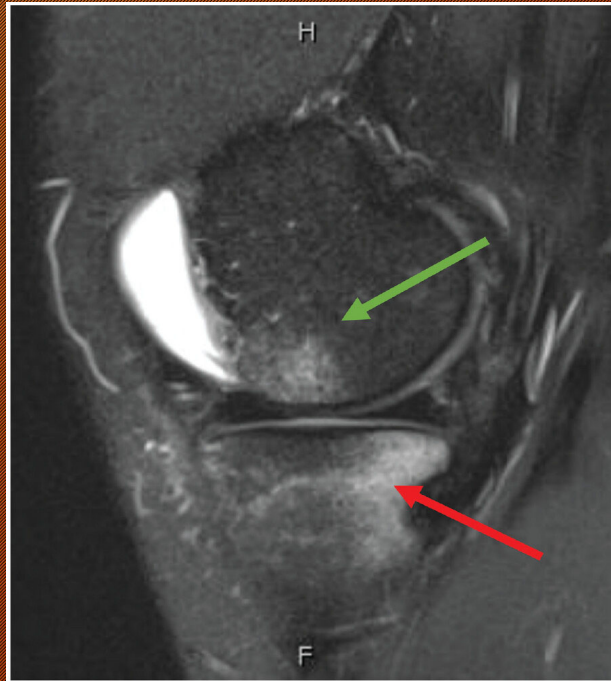
- Higher incidence of bone bruises involving LTP (89.7 vs 54.2)
- Higher incidence of combined LTP and LFC (82% vs 48.6%)
- Significantly more posterior LTP bruises compared to noncontact (85.9% vs 32.4%)

• Noncontact Injuries

- Higher incidence of bone bruises involving MFC (84.5% vs 62.8%)
- Higher incidence of combined MFC and MTP (66.2 vs 39.7%)

10

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.



11

Association Between Graft Type and Risk of Repeat Revision Anterior Cruciate Ligament Reconstruction *Heffner, M. et al*

American Journal of Sports Medicine 51 (6) 1434 -1440, May 2023

- 1,747 revision ACL reconstructions (rACLR) from 2005 - 2020 in Kaiser Permanente ACL Registry
- 70% lower risk for revision of a revised ACL reconstruction (rrACLR) when using an autograft (6.0%) compared to an allograft (13.9%)
- Reoperations for nonACL problems (i.e. meniscus, chondral, etc.) was equal in the autograft and allograft groups
- CONCLUSION: Use autograft tissue when possible for revision of a revised ACL (rrACLR)

12

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

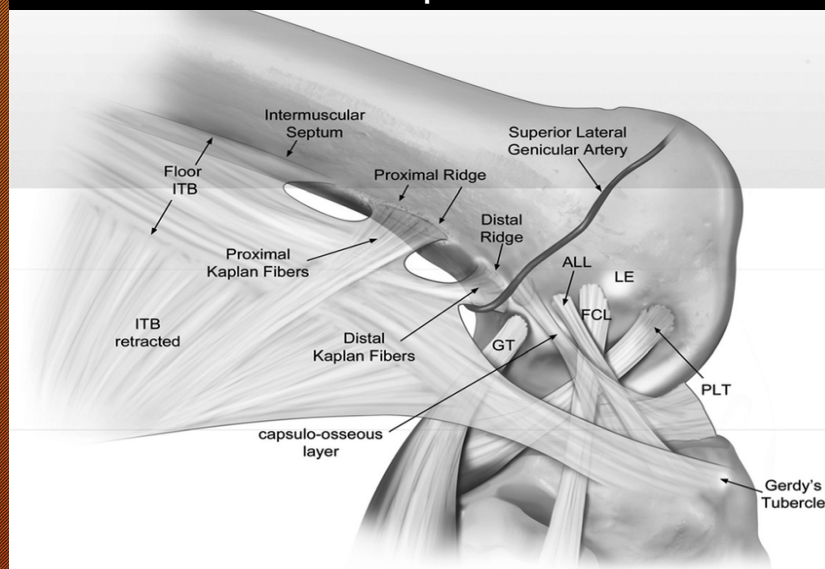
A Modified Lemaire Lateral Extra-articular Tenodesis in High Risk Adolescents Undergoing Anterior Cruciate Ligament Reconstructions with a Quadriceps Tendon Autograft.
Green, D.W., et al

American Journal of Sports Medicine 51 (6) 1441 -1446, May 2023

- Popularity of youth sporting activities resulted in an increase in the number of ACL injuries in children and adolescents.
- Younger age is a key risk factor for ACL retear
- 49 patients, age 11 - 16 with a follow-up of two years minimum
 - Quad tendon autograft and concomitant lateral extra-articular tenodesis (LET)

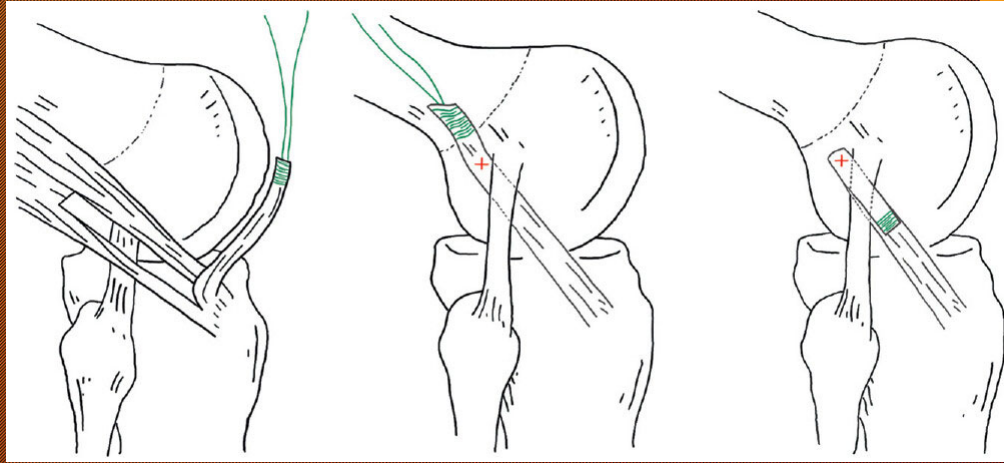
13

ALL And Kaplan Fibers



14

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.



15

- A meta-analysis by Mao et al in 2021 showed that patients with a combined ACLR and LET had a lower incidence of pivot shift, a higher activity level, and a lower risk of graft failure than ACLR alone
- None of the 49 patients in this high risk group (younger aged patients) suffered a re-tear of the ACL graft, and all returned to sports within the two year follow-up of this study.

16

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

Radiographic Incidence of Knee Osteoarthritis after Isolated ACL Reconstruction vs Combined ACL and ALL Reconstruction *Shatrov, J, et al*

American Journal of Sports Medicine 51 (7) 1686 -1697, June 2023

- Lateral extra-articular tenodesis (LET) abandoned in the 1980s due to poor outcomes
 - Mixed bag of procedures and techniques
 - Recent studies suggest the role of LET with ACL reconstruction to decrease the risk of secondary meniscectomy and graft failure
- Does the addition of LET with ACL reconstruction result in degenerative changes in the lateral compartment

17

- 270 patients (90 ACLR plus LET and 180 ACL alone) mean follow-up 104 months (8.6 years)
 - Lateral meniscectomy at the time of ACL reconstruction increases the risk of osteoarthritis in the lateral compartment 4.9 x
 - Isolated BPTB had a 66.7% medial patellofemoral joint space narrowing
- LET tight in extension provides rotational control and load sharing similar to the native knee
- This study showed no increased risk of osteoarthritis in the lateral compartment with the addition of LET

18

SPIN in the Abstracts of Meta-analyses and Systematic Reviews: Quadriceps Tendon Graft for Anterior Cruciate Ligament Reconstruction *Gulbrandsen, M.T. et al*

American Journal of Sports Medicine 51 (8) 2079 - 2084 July 2023

- SPIN - Reporting bias that misrepresents research

Type of Spin
1: Conclusion contains recommendations for clinical practice not supported by the findings
2: Title claims or suggests a beneficial effect of the experimental intervention not supported by the findings
3: Selective reporting of or overemphasis on efficacy outcomes or analysis favoring the beneficial effect of the experimental intervention
4: Conclusion claims safety based on nonstatistically significant results with a wide confidence interval
5: Conclusion claims the beneficial effect of the experimental treatment despite high risk of bias in the primary studies
6: Selective reporting of or overemphasis on harm outcomes or analysis favoring the safety of the experimental intervention
7: Conclusion extrapolates the review's findings to a different intervention
8: Conclusion extrapolates the review's findings from a surrogate marker or a specific outcome to the global improvement of the disease
9: Conclusion claims the beneficial effect of the experimental treatment despite reporting bias

19

- ACL Reconstruction very common - debate continues over optimal treatment
- Medline search for ACL treated with quad-tendon graft revealed 13 articles of 986 that met the inclusion criteria
- All studies were found to be low or critically low quality by AMSTAR - 2 assessment (focuses on critical steps that must be taken for meta-analysis to maximize quality and minimize bias)
- 7 / 13 (53.8%) contained one of the nine SPIN types. The most prevalent was Type 3 "selective reporting or over-emphasizing the efficacy of outcomes or favoring the beneficial effect of the treatment"

20

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

The Effect of Aspiration and Corticosteroid Injection After ACL Injury on Postoperative Infection Rate *Cantrell, W.A. et al*

American Journal of Sports Medicine 51 (14) 3665 -3669, December 2023

- 693 Patients with BPTB ACL from 2011 - 2020
 - 273 received post-injury and preoperative aspiration and corticosteroid injection
 - 420 received no injections
- Infection rates reported in other large series of ACLR varies from 0.48 to 0.61%. English National Health Service reports 0.25% infection in 13,491 cases
- There were no infections (defined as requiring a surgical washout) in either group in this study, suggesting that steroid injection did not affect the infection rate

21

Predictors of Return to Activity at Two Years After ACLR Among Patients with High Preinjury Marx Activity Scores

MOON Knee Group (Multicenter Orthopaedic Outcomes Network)

American Journal of Sports Medicine 51 (9) 2313 - 2323 July 2023

- Rates of returning to preinjury activity levels after ACL reconstruction vary widely throughout the literature
- This is a study of all unilateral ACLR's between 2002 and 2008
- All patients had a preinjury Marx activity score between 12 to 16 (this is high preactivity score)
- Return to activity is defined as a decrease in the Marx activity score of less than 2 points of the initial score

22

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

Marx Activity Scale is based on Running, Deceleration, Cutting and Pivoting

MARX SCALE (ENGLISH VERSION)

Please indicate how often you performed each activity in your healthiest and most active state, in the past year. Kindly put a (Z) mark on the appropriate space after each item.

	Less than one time in a month	One time in a month	One time in a week	2 or 3 times in a week	4 or more times in a week
Running: running while playing a sport or jogging	0	1	2	3	4
Cutting: changing directions while running	0	1	2	3	4
Deceleration: coming to a quick stop while running	0	1	2	3	4
Pivoting: turning your body with your foot planted while playing sport. For example: skiing, skating, kicking, throwing, hitting a ball (golf, tennis, squash), etc.	0	1	2	3	4

23

- 1,188 patients included in the study (all patients preinjury Marx scores were 12 - 16 indicating a high level of activity
 - 466 patients (39.2%) returned to the preinjury level of activity
 - 722 patients (60.8%) were not able to return to the preinjury level of activity
- Graft type, revision ACL, medial or lateral meniscus injury, articular cartilage injury, high grade knee laxity were not predictors of a patient's inability to return to the presurgery activity level
- Female gender, smoking at the time of ACLR, fewer years of education, higher limit of preinjury Marx activity scores were predictors of a patient's inability to return to preactivity levels

24

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.

CONCLUSION OF STUDY

- Two years after ACLR, 60% of patients with high preinjury Marx activity scores do not return to their preinjury level of activity

25

Thank You

26

This presentation is the intellectual property of the author.
Contact them for permission to reprint and/or distribute.