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Clinical Outcomes And Risk Factors For Failure In Anterior Cruciate Ligament Reconstruction Combined With An All-Soft Tissue Lateral Extra-articular Tenodesis: A Retrospective Cohort Study

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Faculty Disclosure Information

- My disclosure(s) is/are: Consultant for Arthrex



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Background

Lateral Extra-articular Tenodesis Reduces Failure of Hamstring Tendon Autograft Anterior Cruciate Ligament Reconstruction: 2-Year Outcomes From the STABILITY Study Randomized Clinical Trial

Getgood et al. *The American journal of sports medicine* vol. 48,2 (2020): 285-297.

The failure rate of isolated ACL rec. vs ACL rec. is **16%, vs 3%**.

40% of the patients who underwent isolated ACL reconstruction had residual rotatory laxity.



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Background

LET protective function of intra-articular graft

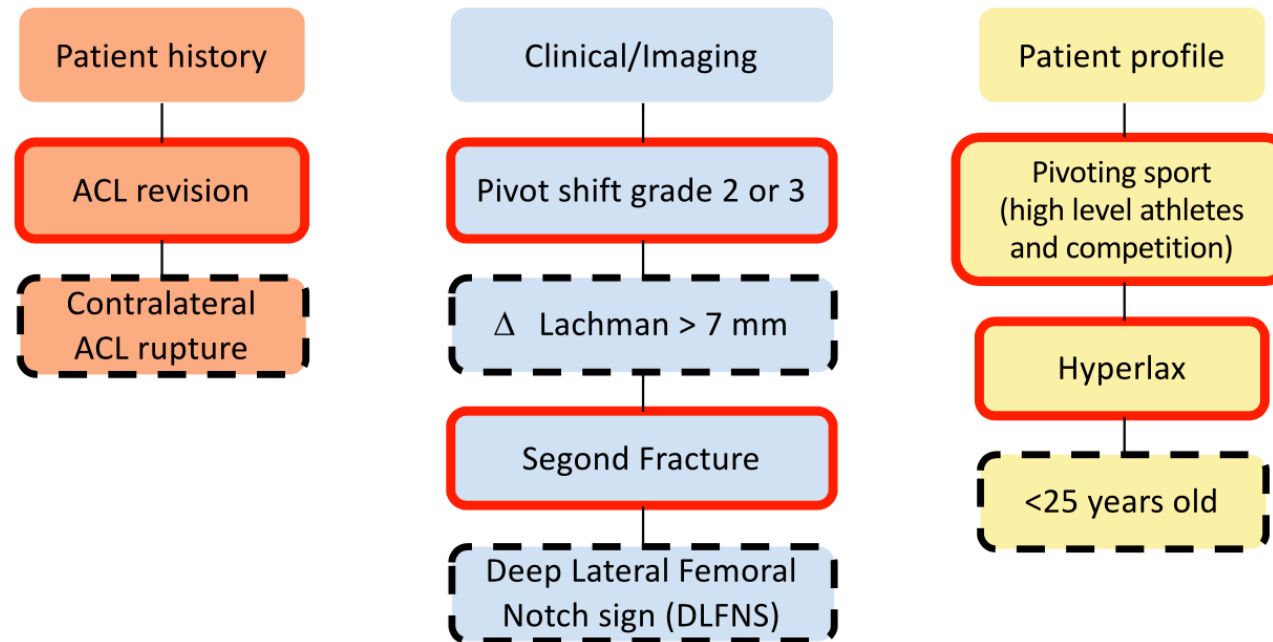
- Reduction in stress applied to the graft by 43% on average
- Reduction of force applied to the graft during rotational loads by 80%
- Improved intra-articular graft integration as assessed by MRI.

- Cavaignac et al. "Effect of Lateral Extra-articular Tenodesis on Anterior Cruciate Ligament Graft Incorporation. *Orthopaedic journal of sports medicine*

- Marom, Niv et al. "Lateral Extra-articular Tenodesis Reduces Anterior Cruciate Ligament Graft Force and Anterior Tibial Translation in Response to Applied Pivoting and Anterior Drawer Loads." *The American journal of sports medicine*

- Engebretsen, L et al. "The effect of an iliotibial tenodesis on intraarticular graft forces and knee joint motion." *The American journal of sports medicine*

LET indications



Minimal requirements for ACL + minimally invasive ALL reconstruction:
1 decisive criteria or 2 secondary criteria



Decisive criteria



Secondary criteria

Sonnery-Cottet, B. *et al.* Anterolateral Ligament Expert Group consensus paper on the management of internal rotation and instability of the anterior cruciate ligament - deficient knee



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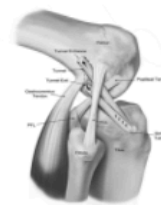
- Pediatric patients
- Age ≤ 25 years
- Pivot-shift grade $\geq 2+$
- ACL revision
- Pivoting sports
- Hyperlaxity/hyperextension
- Second fracture
- ACL chronic lesion
- Lateral femoral notch sign
- Associated meniscal lesions
- ALL lesion at MRI

Systematic Review



Biomechanical Results of Lateral Extra-articular Tenodesis Procedures of the Knee: A Systematic Review

Erik L. Slette, B.A., Jacob D. Mikula, B.S., Jason M. Schon, B.S., Daniel C. Marchetti, B.A.,
Matthew M. Kheir, B.S., Travis Lee Turnbull, Ph.D., and Robert F. LaPrade, M.D., Ph.D.



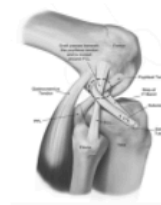
Lemaire



McIntosh



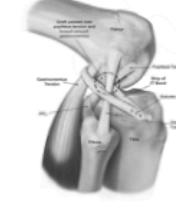
Losee



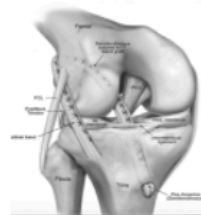
Arnold-Coker



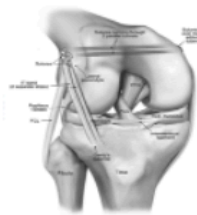
Ellison



Wilson-Scranton



Zarins-Rowe



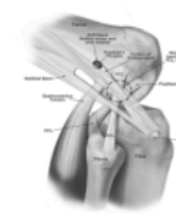
Andrews



Benum



Muller



Mod. Andrews



Marcacci-Zaffagnini

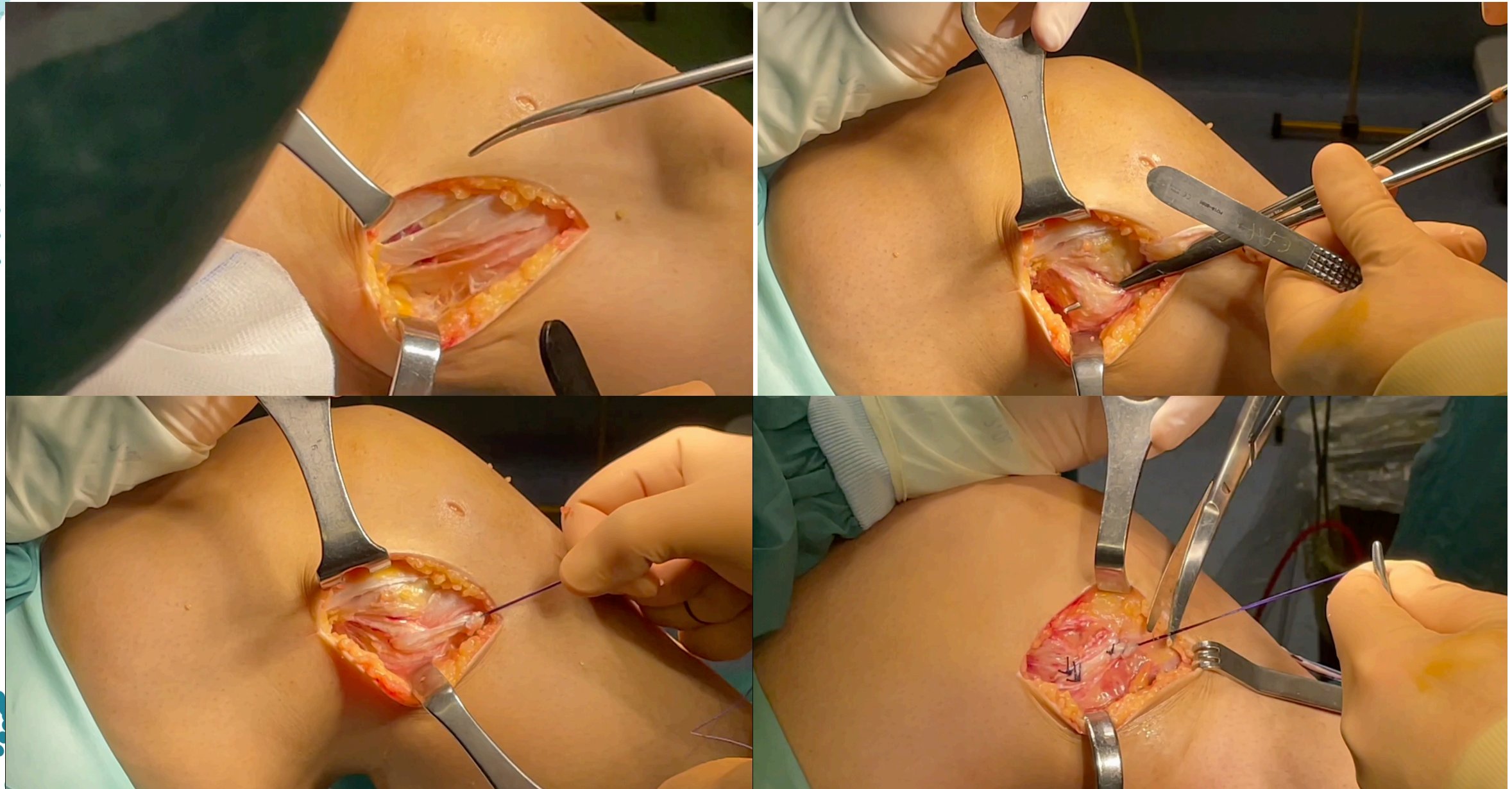


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Coker-Arnold technique



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Population

A total of **328 patients** underwent ACL reconstruction with Machintosh modified Coker-Arnold in a period between January 1st 2013 and July 1st 2022.

Demographic data	Total population (n=328)
Age, mean \pm SD (interval), years	25,9 \pm 10,5 (13-62)
Sex, n (%)	
Male	244 (74,4%)
Female	84 (25,6%)
Side, n (%)	
Right	171 (52,1%)
Left	157 (47,9%)
Timing, n (%)	
Acute	98 (29,9%)
Chronic	230 (70,1%)
Follow up, mean \pm SD (interval), months	72,4 \pm 30,3 (24-131)

Results

Clinical results

Failure rate, n (%)	11/328 (3,4%)
Non failure-related reintervention	26/328 (7,9%)
Lachmeter, mm \pm SD	1,45 mm \pm 1,04

The following were identified as risk factors for failure:

- **High TAS (OR=6,82; C.I. 95%: 1,3- 35,75; p=0,009)**
- **Chondral lesions (OR=5,89; C.I. 95%: 1,44-23,98; p=0,005)**

PROMs

Patients (n = 328)

KOOS, mean \pm DS	93,9 \pm 8,8
Sintoms	93,9 \pm 8,7
PASS, n (%)	315 (96,1%)
Pain	93,5 \pm 9,6
PASS, n (%)	304 (92,7%)
A.D.L.	95,8 \pm 6,6
PASS, n (%)	261 (79,6%)
Sport	91,6 \pm 14,2
PASS, n (%)	309 (94,4%)
Q.o.L.	91,9 \pm 14,5
PASS, n (%)	303 (92,4%)
KDC, mean \pm DS	90 \pm 11,2
PASS, n (%)	300 (91,5%)
Lysholm, mean \pm DS	92,3 \pm 10,7
TAS pre-op, median	7,0
TAS post-op, median	6,0



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Conclusions

- ACL reconstructions associated with Coker-Arnold anterolateral tenodesis lead to better clinical outcomes.
- The failure rate in the study population (n = 328) is: 3,4%
- The risk factors for ACL rec failure are:
 - a high level of sports activity, particularly athletes who participate in pivoting sports at an high level of activity are more at risk.
 - the presence of chondral lesions



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**AZIENDA OSPEDALIERO-UNIVERSITARIA
SANT'ANDREA**

Thank You!



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prof.edoardomonaco

