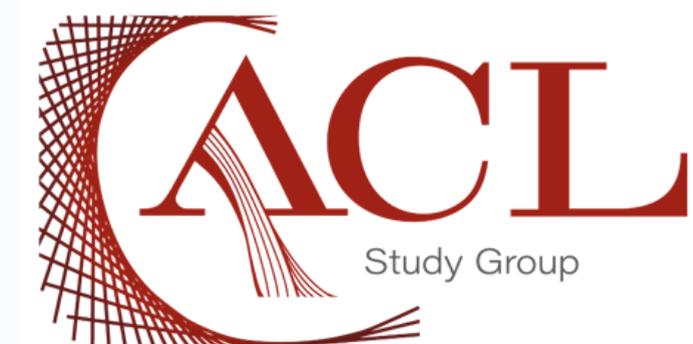


# Development and Validation of a Predictive Score for Indicating Lateral Extra-Articular Procedures in ACL Reconstruction: The FAST-LEAP score

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# Disclosures

**Consultant : Arthrex, FH ortho**

## **Acknowledgement**

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# Introduction



## Graft failure after ACLR

Wide rate reported, Major concern



LEAP are efficient to decrease this rate<sup>1</sup>



Where do we start ? Where do we stop ?



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## Develop a simple reproducible score to indicate the use of a LEAP

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# Design of the study

## Design

**Retrospective analysis of prospectively collected data**

## Surgical techniques

### Isolated ACLR

- Double bundle hamstring
- Quadruple bundle Semi T
- BPTB
- **N = 1721**

## Source

**FAST Cohort (NCT02511158)**

## Population

**2 782 patients      2018 - 2022**

### ACLR + LEAP

- ALLR (Gracilis double bundle)
- LET
- Modified Macintosh
- **N = 1061**

# Variables & Endpoint

**Age**

**Level of practice**

**Pivoting/contact sport**

**Tegner Score**

**Meniscal lesion and localization**

**BMI**

**Time before surgery**

**Endpoint : Re-rupture, Clinical evaluation + MRI**

# Statistics

## Univariate then Multivariate analysis

Independent risk factors of graft rupture

## Score construction

Based on the Odds Ratios

## Validation

ROC curve for the cut off

## Clinical implication

ARR and NNT

# Included population

## LEAP population

- Male
- Younger
- Competition
- Pivot
- Contact
- Shorter surgical delay
- Higher Pre op TEGNER

	ACLR (N=1721)	ACLR+LEAP (N=1061)	All (N=2782)	P-value
<b>Sex, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
Male	1047 (60.8)	737 (69.5)	1784 (64.1)	
Female	674 (39.2)	324 (30.5)	998 (35.9)	
<b>Age at surgery, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
<20 years	261 (15.2)	288 (27.1)	549 (19.7)	
[20-30[years	536 (31.1)	471 (44.4)	1007 (36.2)	
≥30 years	924 (53.7)	302 (28.5)	1226 (44.1)	
<b>BMI, N (%)</b>	1721	1061	2782	NS (Chi2)
<25	1171 (68.0)	751 (70.8)	1922 (69.1)	
>25	550 (32.0)	310 (29.2)	860 (30.9)	
<b>Sports level, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
Recreational	1163 (67.6)	414 (39.0)	1577 (56.7)	
Competition	558 (32.4)	647 (61.0)	1205 (43.3)	
<b>Pivot sport, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
Yes	1349 (78.4)	965 (91.0)	2314 (83.2)	
No	372 (21.6)	96 (9.0)	468 (16.8)	
<b>Contact sport, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
Yes	867 (50.4)	792 (74.6)	1659 (59.6)	
No	854 (49.6)	269 (25.4)	1123 (40.4)	
<b>Medial meniscus injury, N (%)</b>	1721	1061	2782	NS (Chi2)
Yes	510 (29.6)	281 (26.5)	791 (28.4)	
No	1211 (70.4)	780 (73.5)	1991 (71.6)	
<b>Lateral meniscus injury, N (%)</b>	1721	1061	2782	NS (Chi2)
Yes	367 (21.3)	254 (23.9)	621 (22.3)	
No	1354 (78.7)	807 (76.1)	2161 (77.7)	
<b>Delay injury - surgery, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
0-3 months	524 (30.4)	447 (42.1)	971 (34.9)	
> 3 months	1197 (69.6)	614 (57.9)	1811 (65.1)	
<b>Pre-Injury Tegner activity scale, N (%)</b>	1721	1061	2782	<.0001 (Chi2)
4-6	709 (41.2)	192 (18.1)	901 (32.4)	
7-10	1012 (58.8)	869 (81.9)	1881 (67.6)	
<b>Rerupture, N (%)</b>	1721	1061	2782	NS (Chi2)
Yes	116 (6.7)	53 (5.0)	169 (6.1)	
No	1605 (93.3)	1008 (95.0)	2613 (93.9)	

# Multivariate analysis

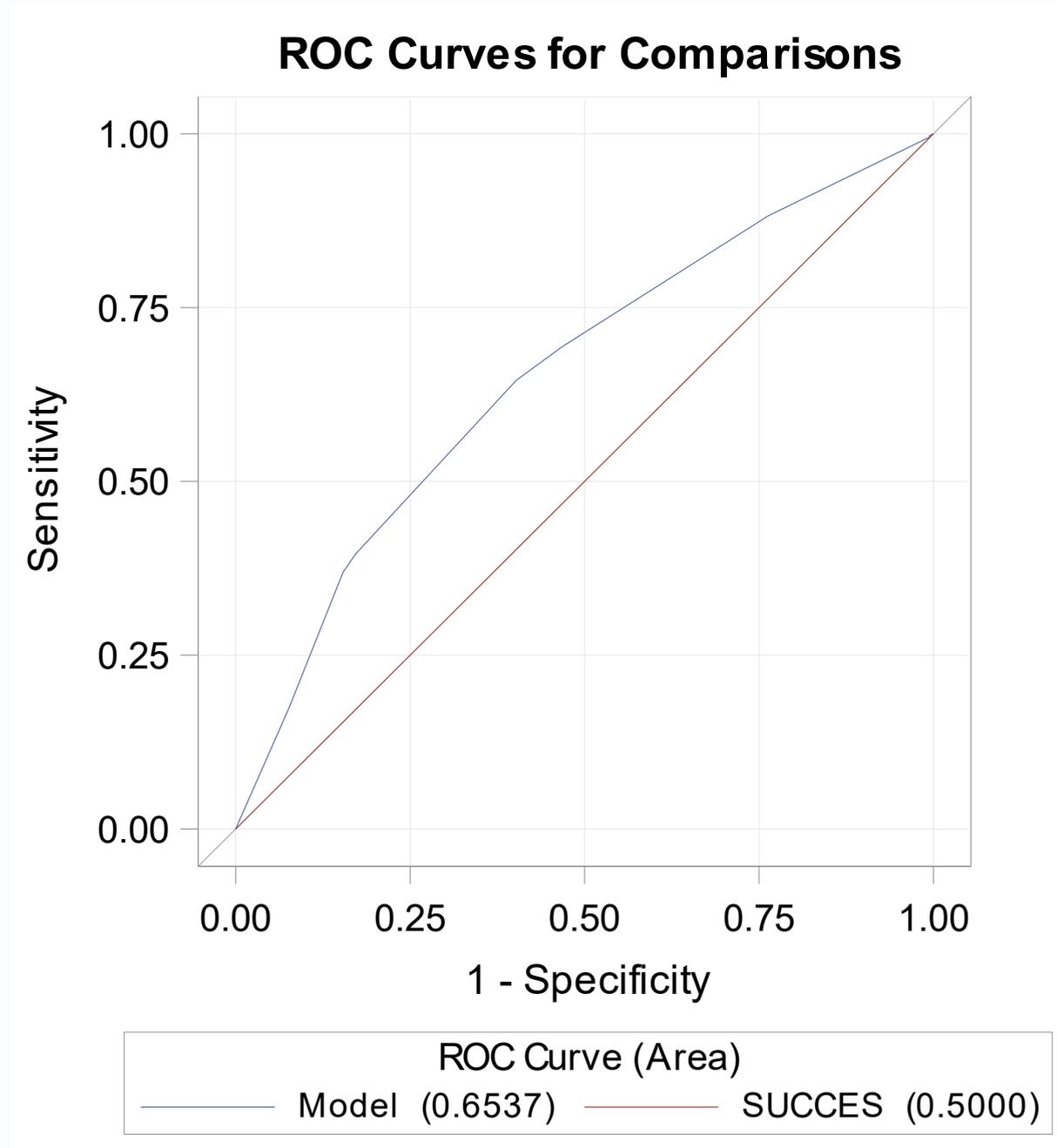
		Multivariate analysis (N=2782 observations)		
Factor	Comparison	Odds Ratio [95% CI]	P- value	Adjusted P-value
<b>Age at surgery</b>	<20 years vs ≥30 years	2.48 [1.57-3.92]	0.0007	<b>0.0005</b>
	20–29 years vs ≥30 years	1.72 [1.14-2.60]	0.5953	.
<b>Level of sport</b>	Competitive vs Recreational	1.59 [1.08-2.33]	0.0181	<b>0.0181</b>
<b>Preoperative Tegner score</b>	7–10 vs <7	1.77 [1.02-3.06]	<b>0.04</b>	<b>0.0017</b>
<b>ACLR ± LEAP</b>	Isolated ACLR vs ACLR+LEAP	2.12 [1.48-3.03]	<.0001	<b>&lt;.0001</b>
<b>Sex</b>	Male vs Female	1.14 [0.79-1.65]	0.4934	NS
<b>BMI</b>	<25 vs ≥25	1.18 [0.81-1.73]	0.3935	NS
<b>Pivoting sport</b>	<u>Yes</u> vs No	1.03 [0.56-1.89]	0.9265	NS
<b>Contact sport</b>	<u>Yes</u> vs No	1.13 [0.71-1.81]	0.6100	NS
<b>Medial meniscal lesion</b>	<u>Yes</u> vs No	0.93 [0.64-1.35]	0.6994	NS
<b>Lateral meniscal lesion</b>	<u>Yes</u> vs No	0.94 [0.64-1.38]	0.7628	NS
<b>Injury–surgery delay</b>	0–3 months vs >3 months	1.26 [0.90-1.76]	0.1732	NS

- ✔ LEAP was a protective factor for graft re rupture OR 2.12

# LEAP Score

Factors		Points
Age	$\geq 30$ y.o	0
	20-30 y.o	2
	$< 20$ y.o	3
Level of practice	Recreational	0
	Competition	2
Preoperative Tegner score	$<7$	0
	7-10	2

# Validation of the score



- **AUC = 0.65**
- **Moderate discrimination capacity**
- **Cut off 4**
- **Se 83%**
- **Spe 40%**

# Impact of the score

**Score  $\geq 4$**   
1,720 patients (62%)



## Re rupture rate

**10.1%**

ACLR

**24**

NNT

**6.0%**

ACLR + LEAP

**72**

Potential re rupture  
avoided

**4.1%**

ARR

# Strength and limitations

## Strength

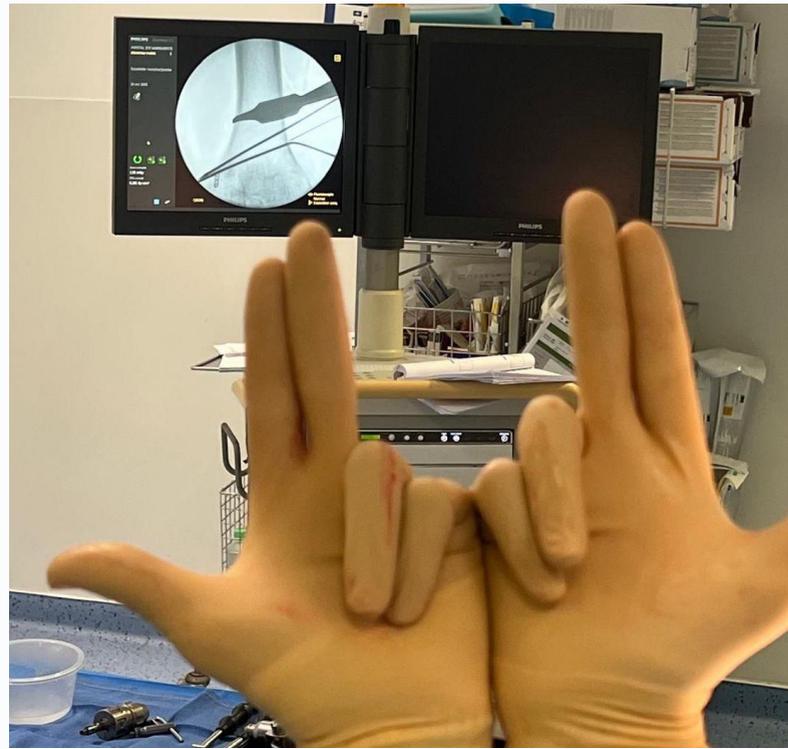
- **Large cohort (n=2782)**
- **Multivariate analysis**
- **Easy and reproducible score**

## Limitation

- **Retrospective design**
- **Lack of external validation**
- **Modest AUC (0.65) → Multifactorial risk**
- **No pivot shift or slope**



# Thank you for your attention



## Pr Matthieu Ollivier



Chirurgie du Sport



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