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# MID-TERM CLINICAL AND RADIOLOGICAL OUTCOMES OF LATERAL MENISCAL ALLOGRAFT TRANSPLANTATION WITH SUTURE-ONLY FIXATION PLUS CAPSULODESIS

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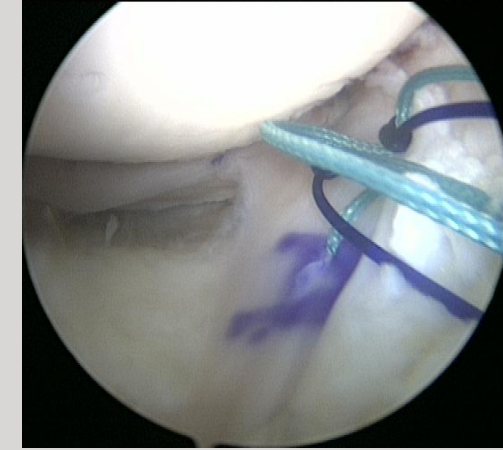
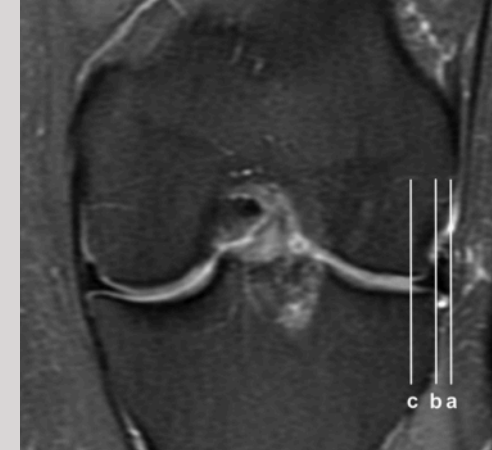
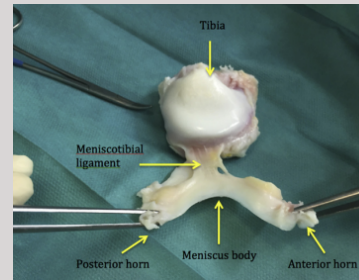
*Universitat Autonoma de Barcelona - Barcelona, Spain*

**ICATKNEE**  
Cirugía de Rodilla

# Disclosures

I do not have any conflict of interest related to this presentation

- *MAT is an effective reconstructive procedure to treat symptomatic post-meniscectomy syndrome.*
- *MRI studies have reported the **extrusion phenomena**.*
- *An extruded meniscus could decrease the resistance to hoop stress.*



Extrusion

- **Decreases tibial cartilage coverage and increase the incongruity with the femoral condyle**
- **Leading to failure in proper weight transfer and shock absorption**

Capsulodesis

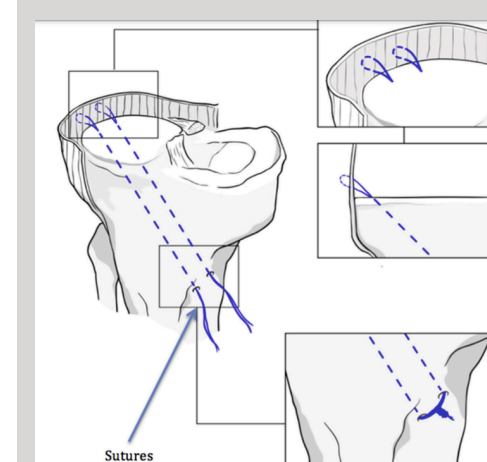
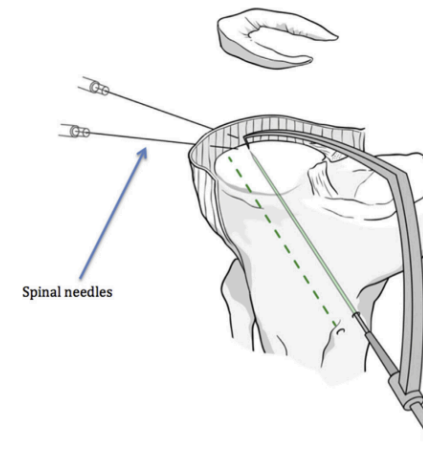
- **In 2017, the all-arthroscopic implant-free lateral capsulodesis technique was described**

## Technical Note

ARTHROSCOPY TECHNIQUES  
Companion to Arthroscopy:  
The Journal of Arthroscopic and Related Surgery

### Lateral Capsular Fixation: An Implant-Free Technique to Prevent Meniscal Allograft Extrusion

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*To evaluate graft survivorship and report the radiological graft extrusion and functional outcomes of LMAT performed with a soft tissue fixation technique + lateral capsular fixation (capsulodesis) through a mid-term follow-up*

*As a secondary aim, we investigated if the improvement in the functional scores was clinically relevant or not.*

## Hypothesis

- 1°: Lateral capsular fixation reduces the postoperative degree of allograft extrusion, keeping it stable over time, and did not affect functional outcomes at the mid-term follow-up
- 2°: Graft survival greater rate than 85% would be found at the 5-year follow-up

- Prospective observational study → 14 isolated lateral MAT
- January 2014 to February 2016
- Lysholm, Tegner, KOOS, VAS, MCID and PASS
- Coronal MRI: Extrusion minor / major (3mm)
- X-Ray: degree of osteoarthritis and coronal alignment

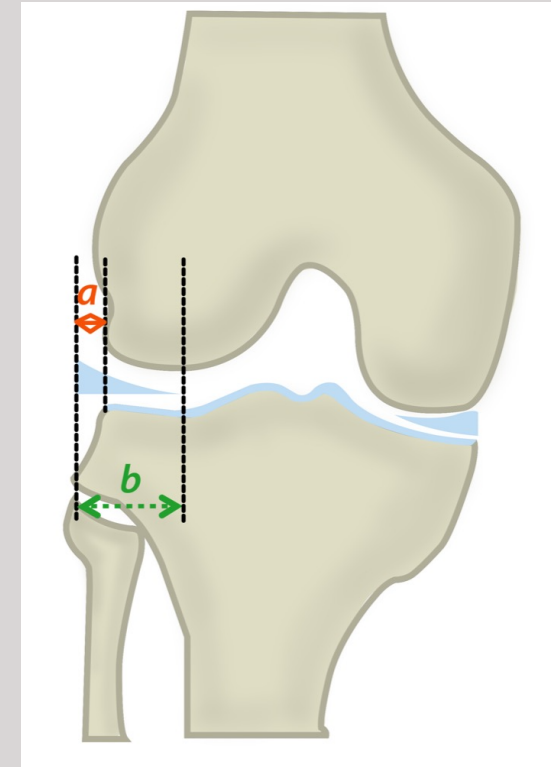
## Exclusion

- Concomitant surgeries:
  - ACL reconstruction
  - Osteotomies
  - Articular cartilage surgery
- Arthrofibrosis
- Patients with skeletal immaturity
- Prior joint infection
- Synovial disease and a body mass index greater than or equal to 30 kg/m<sup>2</sup>

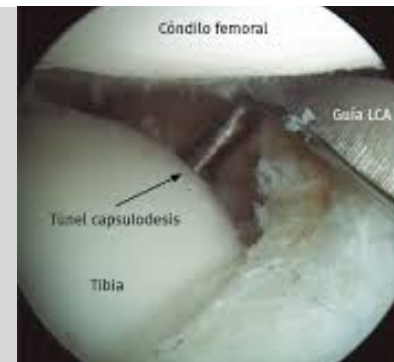
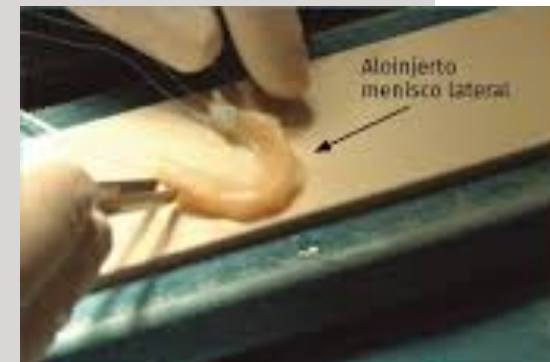
## Inclusion

Lateral post-meniscectomy syndrome with pain in the lateral knee compartment and joint effusions which did not improve with at least six months of non-surgical therapy

**100% only sutures + lateral capsulodesis**



Allograft sizing was matched with the donor's morphometric dimensions  
The lateral meniscal allograft was never exceeded a 5% mismatch in terms of width or length

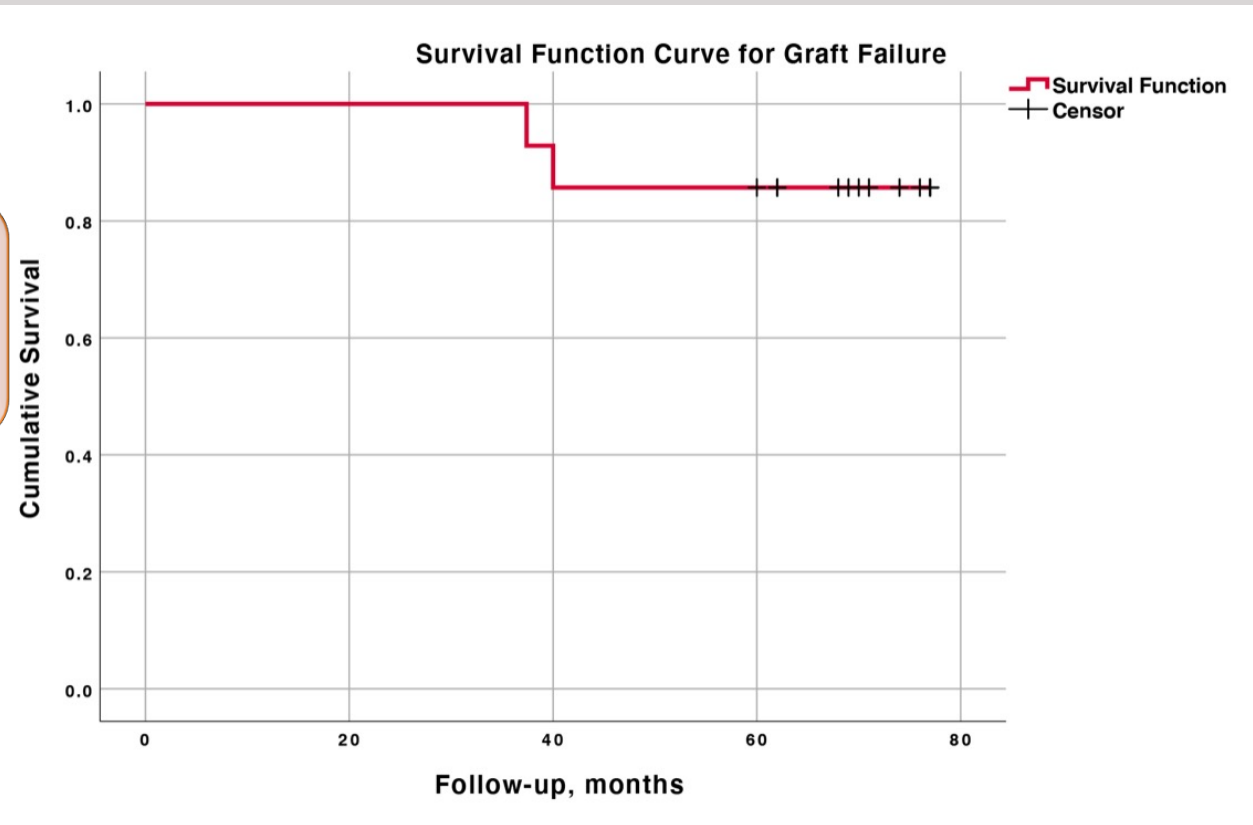


- Mean age of 40.93 years  $\pm$  7.03 at the time of transplantation
- Mean interval period between meniscectomy and painful symptomatology 11.43 years  $\pm$  8.78

- ***Eight (57.14%) on right knees***
- ***Six (42.86%) on left knees***

- Mean time to full weightbearing without crutches was 5.7 weeks (range, 4-6 weeks).
- Median range-of-motion of all patients was  $131^\circ \pm 8.7$  (120-140)
- Complications: 1 arthrofibrosis, 1 superficial wound infection

**Clinical  
Assesment**



**Survival rate of 85.7% was found after 6 years of follow-up.**

VARIABLE	PRE-OPERATIVE	2-YEARS	5-YEARS	p-VALUE (Preoperative vs 2 vs 5 years/ 2 years vs 5 years)
Carrying out sports activity, n (%)	4 (28.57%)	13 (92.86%)	12 (85.71%)	.0006/.548
Lateral interline pain, n(%)	14 (100%)	0 (0%)	1 (7.14%)	<.0001/.322
Positive meniscal maneuvers, n(%)	14 (100%)	0 (0%)	1 (7.14%)	<.0001/.322
KOOS, mean ± SD	52.03 ±2.95	91.3 ±7.3	88.07 ±4.70	<.0001/.175
Lysholm, mean ± SD	48.8 ±13.91	91.4 ±6.1	87.07 ±4.16	<.0001/.141
Tegner activity score	4 (3–5)	7 (6–8)	7 (6–8)	.876
Visual analog scale (0-10) score, mean ± SD	8.21 ±0.97	0.93 ±1.00	1.24± 1.08	<.0001/.531
Degree of satisfaction, mean ± SD (0-4)	N/A	3.8 ±0.42	3.57 ±0.65	.276
Patients who said they would repeat surgery, n (%)	N/A	14 (100%)	13 (92.86%)	.289

*Significant improvement at 6-year follow-up for all the scores, consistent from the first through to the second follow-up*

VARIABLE	PRE-OPERATIVE	2-YEARS	5-YEARS	p-VALUE (Preoperative vs 2 vs 5 years/ 2 years vs 5 years)
<b>Meniscal extrusion classification</b>	N/A	Minor extrusión 10 (71.4%)  Mayor extrusión 4 (28.6%)	Minor extrusión 9 (64.29%)  Mayor extrusión 5 (35.71%)	.703 minor / .700 mayor
<b>Graft extrusion percentage (%)</b>	N/A	24.65 ±15.49	28.80 ±11.43	.427
<b>Meniscal extrusion (mm)</b>	N/A	1.94 ±1.22	2.14 ±1.58	.710
<b>Degree of osteoarthritis (Ahlback), n (%)</b>	1.5 ±0.41 I (7/50%) II (7 /50%)	1.64 ±0.45 I (5/35.71%) II (9/64.29%)	1.85 ±0.54 I (3/21.43%) II (10/71.43%) III (1/7.14%)	Numerical data: .397/.273 I= .430/.433 II= .462/.697 III= -.322
<b>Joint space width (mm)</b>	3.00 ±1.20	2.84 ±1.11	2.69 ± 0.27	.717/.083
<b>Mechanical axis deviation, (°)</b>	-1.53± 1.16 (varus)	-0.75 ± 1.14	0.11 ± 1.17	.084/.152
<b>Patients with surgical, clinical or radiologic failure</b>	N/A	0 (0%)	2 (14.29%)	.154
<b>Reoperations</b>	NA	0	3	.075

*Mean absolute extrusion of 2.2 mm ± 1.6 and an extrusion percentage of 28.0% ± 11.43  
No difference in frontal mechanical axis and joint space narrowing between the pre-op value and the 1<sup>o</sup> and 2<sup>o</sup> follow-up*



## Monllau et al.

- **Meniscal extrusion in 28.8%**
- **No significant progression of osteoarthritic changes**
- **No significant decrease in tibiofemoral lateral joint space width**

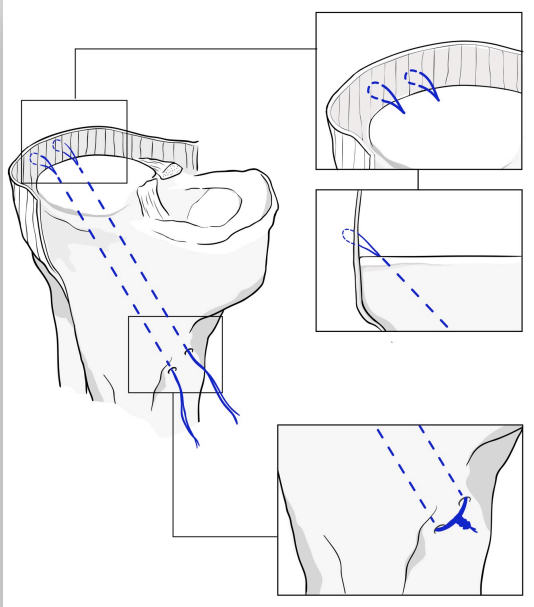
## Literature

- **Roumazeille et al.**
  - **Meniscal extrusion in 75%**
- Choe et al.
  - **Meniscal extrusion in 42%**
- Verdonk et al.
  - **Meniscal extrusion in 70%**
- Lee et al.
  - **Meniscal extrusion in 32%**

Choe J-S, Bin S-I, Lee B-S, et al. Learning Curve For Lateral Meniscal Allograft Transplantation: Preventing Meniscal Extrusion. *Arthroscopy*. 2021;37(11):3326-3334.

Lee D-H, Kim S-B, Kim T-H, et al. Midterm outcomes after meniscal allograft transplantation. *Am J Sports Med*. 2010;38(2):247-254.

Roumazeille T, Klouche S, Rousselin B, et al. Arthroscopic meniscal allograft transplantation with two tibia tunnels without bone plugs. *Knee Surg Sports Traumatol Arthrosc*. 2015;23(1):264-269.



- Capsulodesis reduces and maintains meniscal extrusion with a low index in LMAT fixed with a suture only technique in a mid-term follow-up.
- High graft survival index, low complication rate and good results in functional and satisfaction scales, without differences in the frontal mechanical axis and joint space narrowing between the preoperative value and the first and second follow-up periods.
- This surgical technique improves functional scores and this improvement is clinically meaningful for patients.



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