Factors Associated with the Decision to Perform a Lateral Retinacular Release or Lengthening During Medial Patellofemoral Ligament Reconstruction in the JUPITER Cohort

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- Jupiter 1 & 2 – Enrollment (2017-2021)
  - Operative – 1404 subjects
  - Non-Operative – 629 subjects
- Jupiter 3 – 576 subjects
- Jupiter 4 (AOSSM Grant Funded Study) – 432 subjects

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Background

- Standard treatment for patellofemoral instability (PFI) is medial patellofemoral ligament (MPFL) reconstruction
- Concomitant lateral retinacular release (LR) or lengthening (LL) is considered for patients with tight lateral retinaculum
- **Limited literature on frequency of LR/LL and factors associated with decision to perform them**

Krebs, C et al. The medial patellofemoral ligament: Review of the literature. Journal of orthopaedics. 2018.

Aim

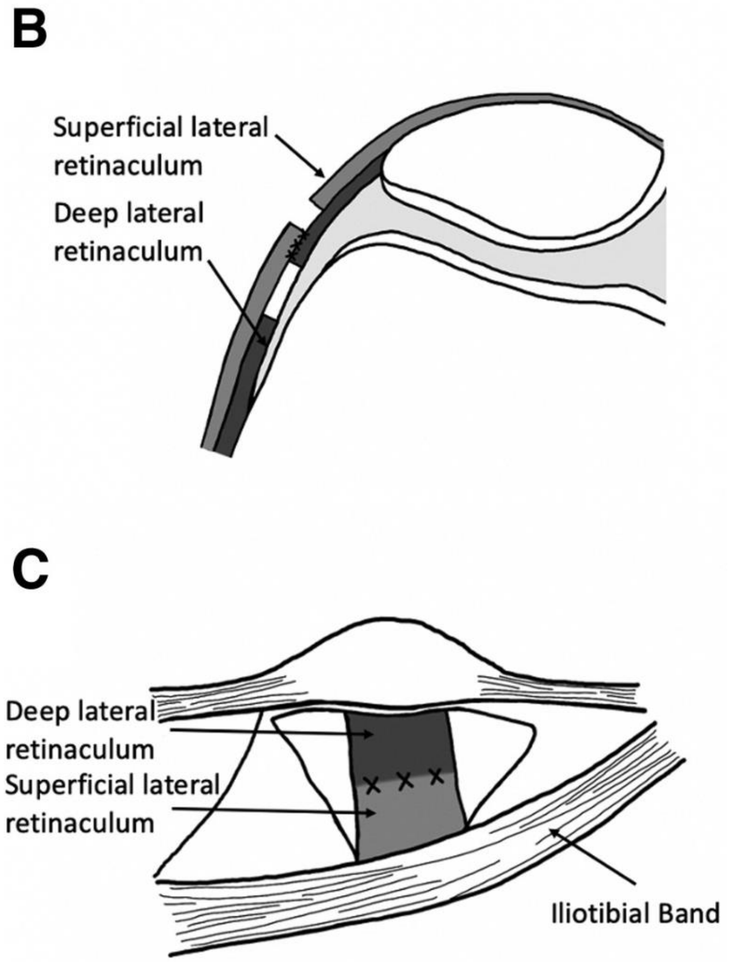
- Understand factors associated with the performance of LR/LL in patients undergoing primary MPFL reconstruction in a large, prospective, multi-center registry

Methods

- Patients who underwent primary MPFL reconstruction from 1/2017-7/2022
- Excluded revision PFI procedures, habitual, fixed, or congenital instability, and syndromic instability
- Procedures performed by 23 surgeons across US academic centers
- Radiologic parameters, concomitant procedures, pre-/intra-operative physical examination findings assessed between patients with vs without LR/LL

Results

- 428 surgical patients representing ~23% of the JUPITER cohort
- 22.9% LL/LR: LR (13.6%) or LL (9.3%)
- No differences in age, BMI, pre-operative instability events, or skeletal maturity between LR/LL cohort and rest of patients
- LR/LL group had greater patellar tilt angle (24.1±7.7˚ vs 18.5±16.7˚, p<0.001)
- Common concomitant procedures
  - Patellofemoral chondroplasty (41.8%)
  - Loose body removal (17.3%)
  - Tibial tubercle osteotomy (15.4%)



Ellsworth et al. Stepwise Lengthening of the Quadriceps Extensor Mechanism for Severe Obligatory and Fixed Patella Dislocators. Arthroscopy Techniques. 2021.

Results

Overall Cohort

Variable	Mean or Number (%)
Age (yrs) at surgery	16.7 ± 4.2 (9.5-33.8)
Female Sex	276 (64.5)
BMI	24.6 ± 5.9 (14.4-56.3)
Recurrent Dislocator	333 (77.8)
Skeletally Mature	302 (70.6)
Beighton Score ≥4	208 (48.6)

LR/LL vs No LR/LL

Variable	LR/LL	No LR/LL	P-value
N	98	330	-
Age (years) at surgery	16.9 ± 4.6	16.7 ± 4.0	0.808
Female Sex	55 (56.1)	221 (67.0)	**0.049**
BMI	24.4 ± 5.7	24.6 ± 6.0	0.713
Recurrent dislocator	80 (81.6)	253 (76.7)	0.299
Skeletally mature	70 (71.4)	232 (70.3)	0.830
Other Procedures			
TTO	35 (35.7)	31 (9.4)	**<0.001**
PF chondroplasty	34 (34.7)	145 (43.9)	0.103
Hemi-epiphysiodesis	6 (6.1)	6 (1.8)	0.023
Beighton Score	2.6 ± 2.7	3.8 ± 2.9	**<0.001**
≥4	35 (35.7)	173 (52.4)	**0.004**
Surgeon factors			
Sports fellowship	81 (82.7)	214 (64.8)	**0.001**
Peds fellowship	50 (51.0)	193 (58.5)	0.190
Time in practice (yrs)	18.6 ± 7.6	19.4 ± 8.0	0.475

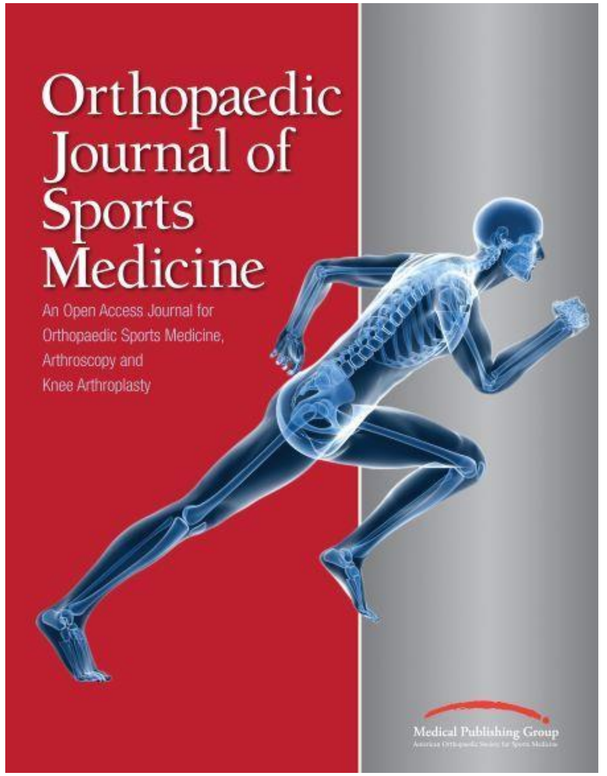
Multivariable results

- In sub-analysis of patients **without concomitant TTO**, the LR/LL sub-group had:
  - Lower Beighton score (2.9 ± 2.7 vs 3.6 ± 2.9, p=0.048)
  - Increased patellar tilt angle (24.2 ± 8.3˚ vs 17.9 ± 17.4˚, p<0.001)
  - More sports fellowship training (81.0% vs 64.5%, p=0.012)

Variable	Univariable	P-value	Multivariable	P-value
Age	1.01 (0.96-1.07)	0.610	0.95 (0.89-1.01)	0.092
Female sex	0.63 (0.40-1.00)	0.050	0.63 (0.37-1.10)	0.104
Tibial tubercle osteotomy	5.36 (3.08-9.33)	<0.001	5.23 (2.77-9.88)	**<0.001**
Beighton score	0.50 (0.32-0.80)	0.004	0.48 (0.28-0.83)	**0.009**
Lateral patellar apprehension	2.91 (1.28-6.61)	0.011	2.40 (1.00-5.75)	**0.049**
Increased lateral translation	1.71 (1.08-2.71)	0.23	1.13 (0.66-1.93)	0.669
Dislocatable in extension	1.80 (1.11-2.92)	0.018	1.58 (0.90-2.80)	0.114
Sports fellowship completion	2.58 (1.46-4.57)	0.001	2.99 (1.58-5.65)	**0.001**

Conclusion

- Addition of LR/LL in surgical management of PFI appears to be associated with:
  - Less ligamentous laxity
  - Surgeon completion of a sports fellowship
  - Concomitant TTO
  - Lateral patellar apprehension
  - Elevated lateral patellar tilt



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Thank you!

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