Outcomes of Isolated Medial Patellofemoral Ligament Reconstruction after First-Time and Recurrent Patellar Instability: Recurrence, Return to Sport, and Osteochondral Injury

Data from the JUPITER Cohort

Jacqueline M. Brady, MD; Elizabeth R. Dennis, MD; Erick M. Marigi, MD; Bennett E. Propp, BS; Natalie Pahapill, BS; Haley Smith, BS; Matthew W. Veerkamp, BA; Simone Gruber, BS; Audrey Wimberly, MPH; Joseph T. Nguyen, MPH; JUPITER Study Group, **Shital N. Parikh, MD; Beth E. Shubin Stein, MD**

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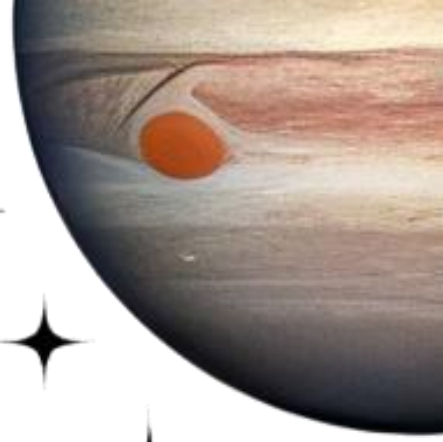

Justifying **P**atellar **I**nstability **T**reatment by **R**esults

- A hypothesis-driven, multi-center, multi-armed, prospective cohort study developed to obtain sufficient subjects to better describe clinical characteristics and predictors of clinical outcomes in the young patellar instability population
- 23 Surgeons
- 11 Academic Centers

Aided by a Grant from the Orthopedic Research and Education Foundation in Collaboration with the American Orthopaedic Society for Sports Medicine (AOSSM)

50 YEARS aossm 2022 ANNUAL MEETING JULY 13–17 • THE BROADMOOR COLORADO SPRINGS, CO

ANNOUNCING THE Historic $400k Sports Medicine Multicenter Research Grant IN CELEBRATION OF AOSSM's 50th ANNIVERSARY

Grant Recipient to be announced at the Annual Meeting, July 13-17

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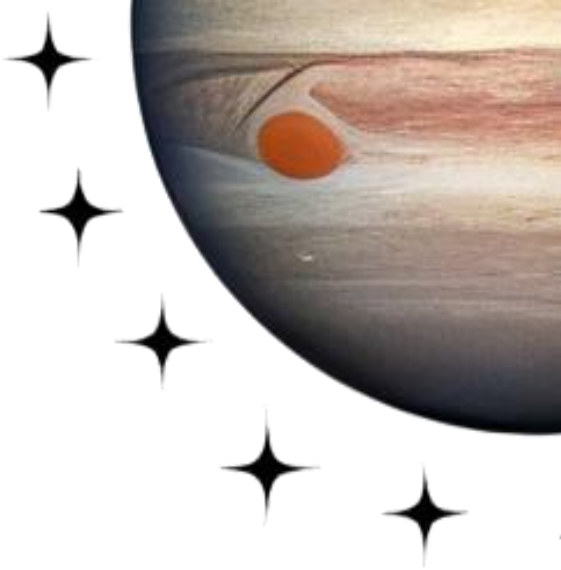
Purpose



- To determine how post-operative recurrent instability rates differ based on number of pre-operative instability events

- To determine the effect of concomitant osteochondral fracture treatment on outcomes for MPFL reconstruction after first-time dislocation

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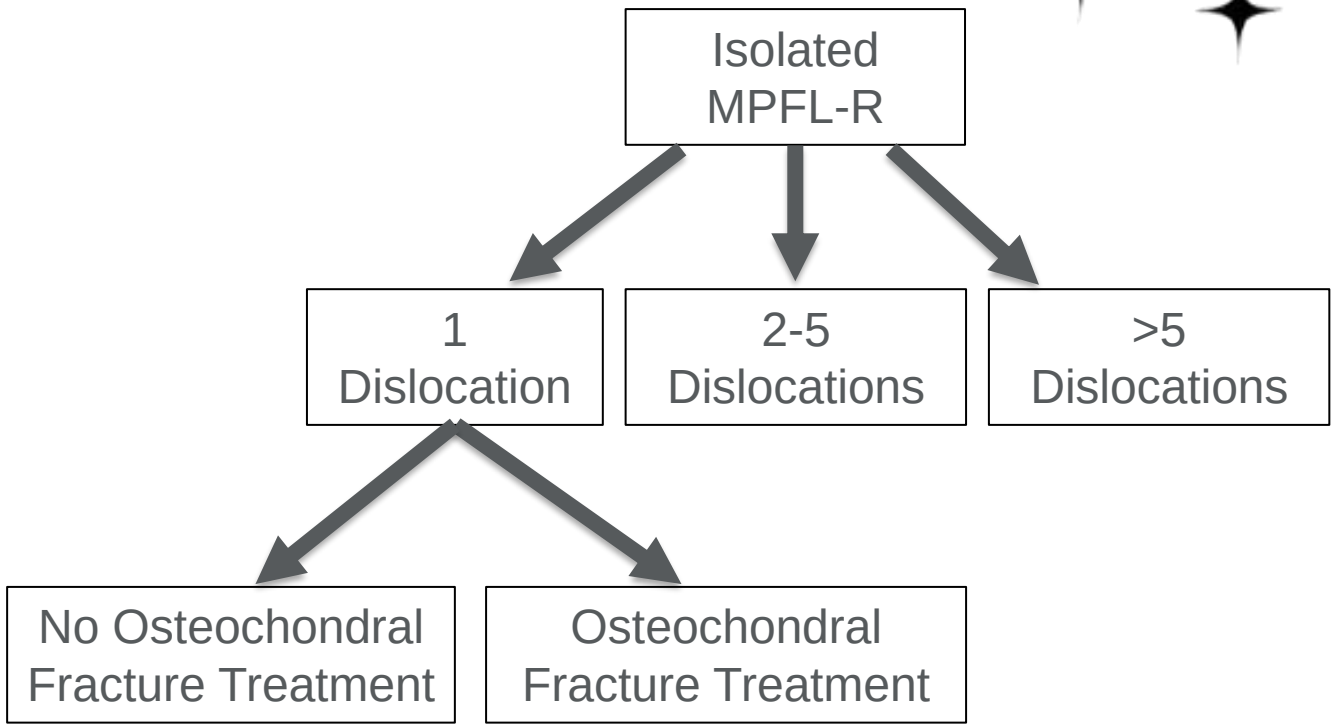
Methods

- 1505 patients underwent patellar stabilization surgery between December 2016 and September 2020
- Inclusion:
  - Isolated MPFL-R
- Exclusion:
  - Concomitant bony procedure (TTO, Trochleoplasty, Femoral/Tibial Osteotomy)
  - Less than 2 years of clinical follow-up
  - Revision surgery



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Baseline Data

- Patient Characteristics
  - Age at time of surgery
  - Sex
  - BMI
- Physical Examination
  - Beighton Mobility Index
  - Effusion
  - J-sign
  - Apprehension
  - Quadrants of Lateral Patellar Translation
  - Degrees of contralateral knee flexion/extension
- Imaging Parameters
  - Skeletal Maturity Status
  - Caton-Deschamps Index (CDI)
  - Tibial Tubercle – Trochlear Groove Distance (TT-TG)
  - Trochlear Depth
  - Sulcus Angle
  - Trochlear Bump
  - Trochlear Crossing Sign (Trochlear Dysplasia)
- Baseline PROMs
  - Kujala
  - KOOS
  - IKDC
  - HSS Pedi-FABS
  - Banff Patellar Instability Index (BPII)

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Outcomes

- Primary Outcome
  - Post-Operative Recurrent Instability
- Secondary Outcomes
  - Return-to-Sport Rates
  - PROMs at 1-, 2- and 5-years
    - Kujala
    - KOOS
    - IKDC
    - HSS Pedi-FABS
    - BPII

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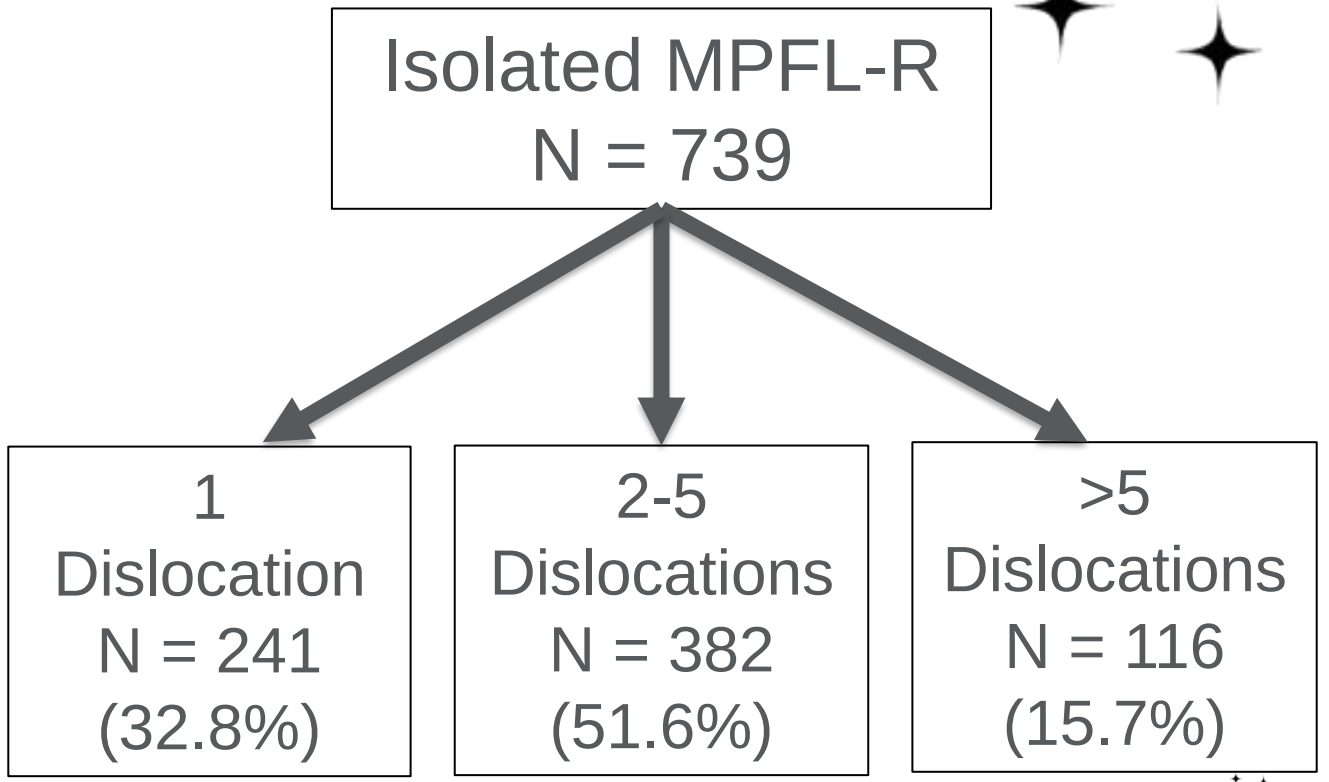
Results

- 739 knees
  - 59.5% Female
  - Mean Age: 15.6 yrs ± 3.3
- Pre-Operative Instability Events:
  - Mean 4.2 ± 9.4
  - Median 2



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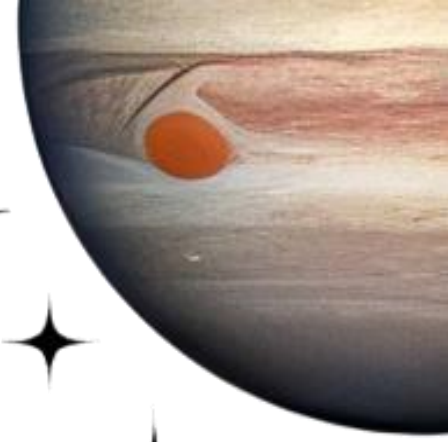
Pre-Op Characteristics



- No differences in patient demographics or radiographic parameters between groups
- More frequent effusion in first-time dislocators
  - p = 0.004
- More ligamentous laxity if > 5 dislocation events
  - p = 0.004 for total Beighton score
  - p = 0.013 for Beighton ≥ 5
  - Also more quadrants of lateral patellar translation if > 5 events
    - p = 0.0001

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Results

Recurrent Instability	1 Dislocation Event	2-5 Dislocation Events	>5 Dislocation Events	*P*
Post-Op Recurrent Instability	**26 (10.7%)**	**35 (9.2%)**	**21 (18.1%)**	**0.027**
Time to Recurrence (months)	24.6 ± 14.3	23.5 ± 18.5	26.1 ± 17.6	0.652
Returned to Sport	114 (91.9)	185 (94.4)	54 (94.7)	0.637

[a] **Continuous variables are reported as mean ± SD, while categorical variables are reported as No. (%).**

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PROM

- All PROMs except Pedi-Fabs improved from Baseline to 2-Years ($p < 0.001$)
- First-time dislocators had the lowest baseline PROMs other than Pedi-Fabs ($p < 0.05$ for Kujala, KOOS Symptoms, KOOS ADL, and BPII) of all three groups. These differences largely resolved at one year.
- Pedi-Fabs was significantly higher at baseline for first-time dislocators ($p = 0.002$), and remained higher at 1 year ($p = 0.026$)

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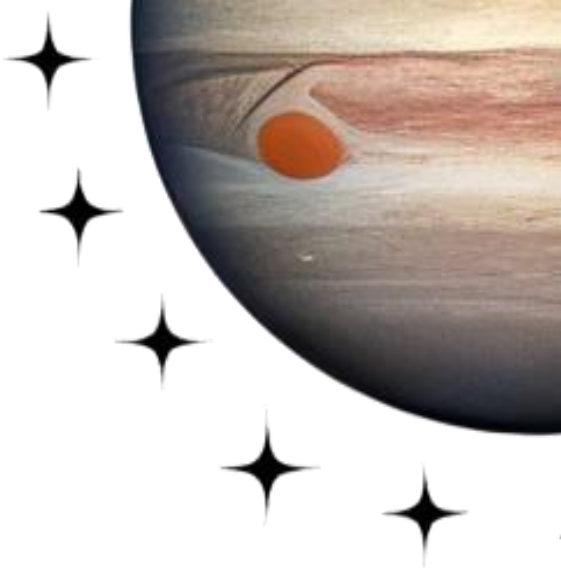
Osteochondral Injuries



- Those **without** osteochondral injuries were:
  - More likely to have **patella alta** (p = 0.001)
  - Less likely to have an **effusion** (p = 0.010)
  - More likely to have a **j-sign** (p < 0.0001)
  - More likely to have 3-4 quadrants of **lateral patellar translation** (p = 0.27)

- No difference in return to sport between groups (~90%)

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First-Time Dislocators +/- Osteochondral Fractures: PROMS

Variable		No Osteochondral Fracture	Osteochondral Fracture	P
Kujala				
	Baseline	**58.0 ± 20.3**	**43.9 ± 24.3**	**<0.001**
	1 year	88.6 ± 14.3	89.8 ± 12.0	0.865
KOOS Pain				
	Baseline	**68.9 ± 22.4**	**60.7 ± 25.3**	**0.034**
	1 year	92.4 ± 10.1	92.3 ± 9.6	0.993
KOOS Symptoms				
	Baseline	**66.5 ± 19.2**	**57.7 ± 19.4**	**0.003**
	1 year	87.0 ± 12.7	87.8 ± 13.0	0.775
IKDC				
	Baseline	**50.5 ± 21.2**	**39.0 ± 21.3**	**<0.001**
	1 year	84.6 ± 16.9	86.8 ± 14.5	0.534
Pedi-FABS				
	Baseline	**13.2 ± 10.9**	**17.0 ± 9.6**	**0.043**
	1 year	15.1 ± 8.5	15.7 ± 8.6	0.751

[a] Continuous variables are reported as mean ± SD.
Bold P value indicates statistically significant difference among compared groups (P < .05).

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Conclusions

- Isolated MPFL reconstruction serves as a durable surgical treatment option to address patellar instability (11.1%)
- Individuals with >5 pre-op dislocations had a significantly higher rate of post-op recurrent instability (18%) than those with 1 dislocation (10.7%) or 2-5 dislocations (9.2%)
- No differences in return to sport (~90%) across all groups
- Baseline PROMs were lowest for first-time dislocators
  - In particular, first-time dislocators with osteochondral fractures
  - All differences resolved post-operatively

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