

## Comparison of MPFL Repair Versus MPFL Reconstruction for Refractory Patella Instability in Patients Under 18 Years Old

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**Background:** The medial patellofemoral ligament (MPFL) is the primary soft-tissue restraint against lateral patellar displacement. Surgery to address MPFL incompetence is the current gold standard for recurrent patellofemoral instability. In the young patient, controversy remains regarding the role of MPFL repair in the setting of recurrent patella instability.

**Hypothesis/Purpose:** Our purpose was to investigate subjective outcomes and complication profile of consecutive cohorts under age 18 undergoing MPFL repair or MPFL reconstruction. Our hypothesis was that the MPFL reconstruction group would have higher subjective outcome scores and a lower complication profile.

**Methods:** Following IRB approval, a retrospective review of prospectively collected data identified a consecutive cohort of patients undergoing soft tissue stabilization for recurrent patella instability. Surgery was performed by a single sports fellowship trained surgeon between 2011-2019. MPFL repair was performed on patients prior to November 2015 and MPFL reconstruction with allograft from December 2015 to present. Patients undergoing concomitant bony realignment procedures were included. Patient reported outcomes (PROs) were collected including PROMIS, KOOS, IKDC, Marx, Tegner, and SANE scores. Complications requiring re-operation (i.e., infection, stiffness, recurrent instability) were recorded. Results were analyzed statistically.

**Results:** The cohort was comprised of 43 patients (53 knees), with 15 males (34.9%), and 28 females (65.1%). The MPFL-Repair cohort had 22 patients (24 knees) and the MPFL-Reconstruction had 25 patients (29 knees). The average age of the MPFL-Repair cohort was 14.82 (range 10.5-17.8) and the average age of the MPFL-Reconstruction group was 15.59 (13.0-17.7). At final follow-up (minimum 6 months), there were no statistically significant differences between cohorts for KOOS Pain ( $p=0.4126$ ), KOOS symptoms ( $p=0.7990$ ), KOOS ADL ( $p=0.4398$ ), KOOS Sport Rec ( $p=0.3357$ ), KOOS QOL ( $p=0.8707$ ), Global Physical Health ( $p=0.9736$ ), Global Mental Health ( $p=0.1724$ ), Physical Function ( $p=0.8077$ ), Pain Interference ( $p=0.9740$ ), Mobility T-Score ( $p=0.0634$ ), Marx activity score ( $p=0.0844$ ), Tegner Score ( $p=0.0752$ ), IKDC ( $p=0.2646$ ), and SANE score ( $p=0.0811$ ). Regarding complications requiring re-operation, there was 1 knee in the MPFL-Reconstruction group (3.4%) that required further surgery (1 for fracture) and 9 knees in the MPFL-Iso cohort (37.5%) that required re-operation (1 for fracture, 8 for

recurrent instability). The difference in complication rate was statistically significant ( $p=0.0012$ ).

**Conclusion:** In patients under 18 years old undergoing surgery for refractory patella instability, both MPFL allograft reconstruction and MPFL primary repair demonstrated no difference in subjective outcome scores at midterm follow-up. MPFL primary repair had significantly increased rate of complication requiring re-operation, particularly recurrent patella instability requiring revision to MPFL reconstruction.

### Tables/Figures:

Table 1.1  
KOOS

Sub-scale	Surgery Type	>6 Months Post-op				N	P-value
		Mean	SD	95% CI			
				Lower Bound	Upper Bound		
ADL	Repair	89.45	16.07	82.32	96.57	22	0.4398
	Reconstruction	92.52	9.09	88.49	96.55	22	
Pain	Repair	85.85	15.84	78.83	92.88	22	0.4126
	Reconstruction	89.02	8.42	85.28	92.75	22	
Sport	Repair	66.59	29.54	53.50	79.69	22	0.3357
	Reconstruction	73.64	16.70	66.23	81.04	22	
Symptoms	Repair	81.73	16.35	74.48	88.98	22	0.7990
	Reconstruction	80.64	11.30	75.63	85.65	22	
QOL	Repair	60.82	26.10	49.24	72.39	22	0.8707
	Reconstruction	61.94	18.79	53.61	70.27	22	

Table 1.2  
PROMIS

Sub-scale	Surgery Type	>6 Months Post-op				N	P-value
		Mean	SD	95% CI			
				Lower Bound	Upper Bound		
Global Physical Health	Repair	50.39	10.37	44.40	56.38	14	0.9136
	Reconstruction	50.09	7.18	47.19	52.99	26	
Global Mental Health	Repair	56.73	8.11	52.05	61.41	14	0.1724
	Reconstruction	52.27	10.40	48.06	56.47	26	
Pain Interference T-Score	Repair	52.27	9.60	47.15	57.38	16	0.9740
	Reconstruction	52.17	8.22	48.85	55.49	26	
Physical Function T-Score	Repair	47.16	8.24	42.77	51.55	16	0.8077
	Reconstruction	47.78	7.99	44.62	50.94	27	
Mobility T-Test	Repair	50.06	8.98	43.15	56.96	9	0.0634
	Reconstruction	43.31	7.12	39.01	47.61	13	

Table 1.3  
Other

Variable	Surgery Type	>6 Months Post-op				N	P-value
		Mean	SD	95% CI			
				Lower Bound	Upper Bound		
Marx	Repair	7.10	6.12	4.24	9.96	20	0.0844
	Reconstruction	3.68	5.90	0.84	6.53	19	
SANE	Repair	62.75	28.55	47.54	77.96	16	0.0811
	Reconstruction	75.52	15.78	68.70	82.35	23	
Tegner	Repair	5.21	3.03	3.75	6.67	19	0.0752
	Reconstruction	3.68	2.00	2.72	4.65	19	
IKDC	Repair	70.04	19.62	59.59	80.50	16	0.2646
	Reconstruction	63.74	14.70	57.22	70.26	22	