Patient Reported Outcome Measures and Return to Sport Testing 6 Months After Pediatric Arthroscopic Shoulder Surgery

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INTRODUCTION:
Readiness for return to sport (RTS) after surgery can be assessed using strength and functional performance testing. Patient-reported outcomes measures (PROMs) may be useful in predicting success in RTS testing. However, data regarding RTS testing and PROMs 6 months after arthroscopic shoulder stabilization in adolescent and young adult patients is limited. The purpose of this study was to observe if the results of strength and functional RTS testing, and 6-month postoperative PROMs associate following arthroscopic stabilization in adolescent and young adult patients with shoulder instability.

METHODS:
The medical records of adolescent and young adult patients who underwent arthroscopic shoulder stabilization at a single orthopedic surgery department and subsequent RTS testing at the institution's sports rehabilitation clinic between 2017 and 2024 were reviewed. Patient demographics, operative details, patient-reported outcome measures (PROMs) (Tegner, ASES, QuickDASH), and RTS testing results were collected. PROMs were obtained at the time of the RTS test. The recovery of muscle strength was defined by a limb symmetry index (LSI) ≥90% and considered a pass. The study examined RTS testing results and PROMs in pass and fail groups, and P-values were determined using Wilcoxon rank sum test. After identifying significant variables in the bivariate analysis, we ran multivariate regression adjusting for age and BMI, and predicted means with P- and model F-values were reported for these tests.
RESULTS:
A total of 59 patients were included (64.4% male, mean age 16.1, mean body mass index 25.58). 66.1% of patients underwent surgery on their dominant shoulder. RTS testing was performed at a mean of 6.36 months postoperatively. 98.3% of patients were cleared to RTS at a mean of 6.07 months post operatively. Between pass and fail groups, differences in pain, ASES, and QuickDash scores were identified in upper extremity Y-balance tests (UE Y-bal-comp), dynametric external rotation (ER) tests, and dynametric internal rotation (IR) tests. Between pass and fails groups in UE Y-bal-comp, post-operative ASES scores were higher among pass groups (p=0.005). Similarly, post-operative pain and QuickDash scores decreased in UE Y-bal-comp pass groups (p=0.0449 and p=0.0441, respectively). Post-operative QuickDash scores decreased in the grip strength testing pass group (p=0.0095). ASES score increased in dynametric ER testing pass groups (p=0.0438). QuickDash decreased in dynametric IR testing pass groups (p=0.009). In the multivariate analysis adjusted for age and BMI, the average difference in 6-month ASES between the UE Y-bal-comp pass and fail groups was 9.45 (P = 0.0021, F = 0.0125). The average difference in 6-month QuickDash between the grip strength pass and fail groups was -7.08 (P = 0.002, F = 0.0131).
DISCUSSION AND CONCLUSION:
Shoulder strength and stability deficits persisted in the surgical limb of adolescent and young adult patients up to 6 months after arthroscopic stabilization, and in certain RTS tests PROMs were associated with pass and fail. Postoperative QuickDash, ASES, and pain scores were found to be associated with objective shoulder strength and stability measurements.

Table 1. Patient Reported Outcome Measures Among All Patients At Time of Return To Sport Testing

	overall	
PROM	**N**	**Mean**
PROM Time From Surgery (months)	59	5.92
Pain	58	0.72
ASES	59	90.54
Quick DASH	59	5.05
Tegner (Current Level)	58	6.24
PROM = patient reported outcome measure		

Table 2. Comparison of Mean Patient Reported Outcome Measures Per Return to Sport Testing Component Between Pass and Fail Groups

	ue_y_bal_comp				
	Pass		Fail		
	N	Mean	N	Mean	p-value
PROM Time From Surgery (months)	35	5.87	24	5.98	0.2334
Pain	35	0.43	23	1.17	**0.0449**
ASES	35	93.94	24	85.58	**0.005**
Quick DASH	35	3.64	24	7.1	**0.0441**
Tegner (Current Level)	35	6.54	23	5.78	0.256
	grip_strength				
	Pass		Fail		
	N	Mean	N	Mean	p-value
PROM Time From Surgery (months)	44	5.84	15	6.14	0.3464
Pain	43	0.51	15	1.33	0.2168
ASES	44	92.66	15	84.33	0.0883
Quick DASH	44	3.2	15	10.47	**0.0095**
Tegner (Current Level)	44	6.16	14	6.5	0.6328
	dynametric_er				
	Pass		Fail		
	N	Mean	N	Mean	p-value
PROM Time From Surgery (months)	36	5.86	23	6	0.3627
Pain	35	0.71	23	0.74	0.934
ASES	36	91.96	23	88.32	**0.0438**
Quick DASH	36	4.68	23	5.63	0.1765
Tegner (Current Level)	36	6.47	22	5.86	0.3527
	dynametric_ir				
	Pass		Fail		
	N	Mean	N	Mean	p-value
PROM Time From Surgery (months)	26	5.8	33	6.01	0.4302
Pain	26	0.46	32	0.94	0.4538
ASES	26	93.19	33	88.45	0.1262
Quick DASH	26	2.71	33	6.9	**0.009**
Tegner (Current Level)	26	6.54	32	6	0.4485

Statistically significant values (P < 0.05) are in bold
ue_y_bal_comp = upper extremity y-balance test; PROM = Patient reported outcome measure; er = external rotation; ir = internal rotation.