

Pediatric ACL Reconstruction: Adding LET Resulted in Similar Return to Sport Without Increasing Pain Scores

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INTRODUCTION:

Anterior cruciate ligament (ACL) injuries are common in the pediatric and adolescent populations, and evidence suggests that the rate of graft rupture is higher than in adults. Concomitant anterolateral ligament (ALL) lateral extra-articular tenodesis (LET) at the time of ACL reconstruction has been shown to reduce the risk of graft rupture in adults, but there are limited studies in the pediatric population. Indications for performing an LET vary by surgeon but may include graft rupture, ligamentous laxity, and patient participation in year-round, pivoting sports. The objective of this study is to compare the presentation of patients treated with ACL reconstruction with and without LET, as well as to compare early patient reported outcomes between these two groups.

METHODS:

An IRB approved retrospective chart review was performed in patients younger than 18 years treated with either ACL reconstruction alone (CPT code 29888) or combined with an ALL lateral extra-articular tenodesis (LET) (identified with CPT code 27427). ACL alone patients were identified between the years 2018 and 2020, and ACL+LET patients were identified from the years 2017 to 2020. Patients with congenital ACL deficiency were excluded.

Variables recorded included demographic information, surgical information including graft types, and clinical characteristics including injury mechanism, ligamentous laxity, time to sports clearance, and PROMIS data. Descriptive statistics were calculated using Microsoft Excel. Bivariate statistics were calculated using Chi squared or t-tests as appropriate.

RESULTS:

440 patients were identified who met inclusion criteria. 365 were identified who had ACL reconstructions alone (44.1% female, median age 15), and 75 (48.0% female, median age 15) had concomitant LET. The Beighton score for the ACL+LET group (median=4; IQR=2-6) was significantly greater than that of the ACL alone group (median=2, IQR=0-2) ($p < 0.05$).

ACL+LET procedures were more commonly performed in revision surgery (18/75 patients; 24.0%) than were ACL only procedures (8/365 patients; 2.2%) ($p < 0.05$). At 3-6 months post surgery, PROMIS Physical Function Mobility scores were similar between groups, with an average of 39.2 in the ACL+LET group and 38.8 in the ACL alone group ($p = 0.80$). PROMIS Pain Interference scores were lower in the ACL+LET group ($p < 0.05$) at this timepoint. Clearance to sports was at an average of 11.6 ± 3.4 months for the ACL alone group and 11.5 ± 2.2 months for the ACL+LET group ($p = 0.86$).

DISCUSSION AND CONCLUSION:

Combined ACL reconstruction with LET may reduce risk of ACL re-rupture in pediatric and adolescent patients, but indications regarding when to offer both procedures have not been fully delineated. This study suggests that greater ligamentous laxity, as measured by Beighton score, as well as the patient requiring a revision reconstruction, may make surgeons treating pediatric patients more likely to offer both procedures. Furthermore, this study suggests that the addition of LET resulted in similar sport clearance times and postoperative mobility in this group. Additional study is warranted to further compare postoperative outcomes between these groups.

Characteristic	ACL + LET		ACL Alone	
	Cases, n	%	Cases, n	%
	75	100.0%	365	100.0%
Age (years, median, IQR)	15 (14-16)		15 (13-16)	
Beighton Score (median, IQR)	4 (2-6), n=69		2 (0-2), n=282	
Sex				
Male	39	52.0%	204	55.9%
Female	36	48.0%	161	44.1%
Race				
White	51	68.0%	236	64.7%
Black/African American	16	21.3%	71	19.5%
Asian	1	1.3%	13	3.6%
Other	7	9.3%	45	12.3%
Injury Mechanism				
Contact	15	20.0%	110	30.1%
Non-Contact	59	78.7%	255	69.9%
Unknown	1	1.3%	0	0.0%
Involving a Sport				
Yes				
Soccer	15	22.1%	95	26.0%
Football	14	20.6%	68	18.6%
Basketball	19	27.9%	64	17.5%
Others	20	29.4%	100	27.4%
No	7	9.3%	38	10.4%

Characteristic	ACL + LET		ACL Alone	
	Cases, n	%	Cases, n	%
	75	100.0%	365	100.0%
Primary	57	76.0%	357	97.8%
Revision	18	24.0%	8	2.2%
ACL Graft Type				
Autograft	74	98.7%	365	100.0%
Quadriceps Tendon	17	22.7%	205	56.2%
Hamstring	45	60.0%	125	34.2%
Bone - Patellar Tendon - Bone	12	16.0%	10	2.7%
Iliotibial Band	0	0.0%	25	6.8%
Allograft	1	1.3%	0	0.0%
Posterior Tibialis Tendon	1	1.3%	0	0.0%
ALL Graft Type				
Autograft	74	98.7%		
Iliotibial Band	69	92.0%		
Gracilis Tendon	5	6.7%		
Allograft	1	1.3%		
Posterior Tibialis Tendon	1	1.3%		
Meniscus Tear Present				
Yes	58	77.3%	290	79.5%
Lateral	41	54.7%	236	64.7%
Medial	28	37.3%	123	33.7%
No	17	22.7%	75	20.5%
PROMIS - Physical Function Mobility Scores (3-6 Months Post-Op) (mean ± SD)	39.2 ± 6.6		38.8 ± 6.3	
PROMIS - Pain Interference Scores (3-6 Months Post-Op) (mean ± SD)	38.6 ± 4.6		42.4 ± 9.7	
Clearance to Sports (mos, mean ± SD)	11.5±2.2		11.6 ±3.4	