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The Effect of Graft Selection on Patients' Subjective Readiness to Return to Sport After ACL Reconstruction

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INTRODUCTION

Patients who undergo ACL reconstruction with allografts may have an easier functional recovery compared to autograft patients.

This is due to decreased donor site morbidity and less muscle atrophy compared to autograft patients. This “easier” recovery may be perceived by patients and may result in a subjective earlier readiness for return to sports.

The purpose of this study is to determine if there is a difference in perceived readiness to return to sport (RTS) in the first year postoperative period between individuals who undergo ACL reconstruction utilizing bone-patellar tendon-bone (BTB) autografts or allografts.

MATERIALS & METHODS

This was a prospective, observational cohort study for patients aged 14-25 years old undergoing primary ACL reconstruction done either with BTB autograft or allograft.

Patients completed questionnaires postoperatively evaluating their perceived ability to perform various activities, and their responses were used to compare subjective ability to RTS.

FIGURES and TABLES

	Total Data N=59	Allograft N=16	Autograft N=43	P Value
Sex:				.308
Female	25 (42.4%)	9 (56.2%)	16 (37.2%)	
Male	34 (57.6%)	7 (43.8%)	27 (62.8%)	
Age (years)	20.1 (3.19)	19.8 (3.43)	20.2 (3.13)	.684
BMI (kg/m²)	24.7 (3.10)	23.6 (2.35)	25.1 (3.27)	.075
Laterality:				.868
Right	34 (57.6%)	10 (62.5%)	24 (55.8%)	
Left	25 (42.4%)	6 (37.5%)	19 (44.2%)	
Mechanism of Injury:				.741
Twist/Pivot	31 (54.4%)	9 (60.0%)	22 (52.4%)	
Jumping	5 (8.77%)	2 (13.3%)	3 (7.14%)	
Running	10 (17.5%)	2 (13.3%)	8 (19.0%)	
Direct Impact	4 (7.02%)	0 (0.00%)	4 (9.52%)	
Bend/Squat	2 (3.51%)	1 (6.67%)	1 (2.38%)	
Other	5 (8.77%)	1 (6.67%)	4 (9.52%)	

Table 1. Patient demographics. BMI = Body Mass Index; No (%), Mean (SD)

Follow-Up Time	Total Data	Allograft	Autograft	P Value
6 Week	1.36 (2.45)	1.77 (2.35)	1.23 (2.50)	.483
3 Month	5.08 (3.92)	4.36 (2.53)	5.34 (4.32)	.318
4.5 Month	8.62 (4.56)	9.00 (4.57)	8.54 (4.62)	.8
6 Month	11.7 (4.45)	13.7 (3.22)	11.0 (4.66)	.032
9 Month	13.9 (3.61)	14.9 (1.78)	13.5 (4.05)	.108
12 Month	15.2 (1.32)	15.2 (1.52)	15.3 (1.23)	.785

Table 2. Part 1 mean scores at all timepoints, Mean (SD), minimum 0, maximum score 16, For each activity (Running, Cutting, Decelerating, Pivoting), patients rated his/her perceived ability to participate using the following scale: 0 – less than one time per month, 1 – one time per month, 2 – one time per week, 3 – two or three times per week, or 4 – four or more times per week. Average total scores are shown

F/U Time	Total Data	Allograft	Autograft	P Value
6 Week	2.40 (1.67)	2.69 (2.14)	2.30 (1.51)	.548
3 Month	5.63 (2.41)	5.50 (2.38)	5.68 (2.45)	.808
4.5 Month	6.94 (3.02)	6.12 (3.27)	7.10 (2.98)	.453
6 Month	9.10 (2.44)	9.42 (2.19)	9.00 (2.54)	.59
9 Month	10.8 (2.42)	11.6 (1.16)	10.5 (2.70)	.063
12 Month	11.8 (0.67)	11.5 (0.78)	11.9 (0.59)	.173

Table 3. Part 2 mean scores at all recorded time points. For each activity, patients rated his/her perceived ability to participate in multiple activities listed on a custom survey using the following scale: 0 – less than one time per month, 1 – one time per month, 2 – one time per week, 3 – two or three times per week, or 4 – four or more times per week. Mean (SD), minimum 0, maximum score 12

RESULTS

Sixteen patients underwent ACL reconstruction with allograft while 43 patients received autograft. At 3 months those who received autograft reported higher perceived ability to cut ($P = .003$). At 6-months, patients who received allograft reconstruction reported higher perceived ability to run ($P = .033$), cut ($P = .048$), and decelerate ($P = .008$) as well as a higher overall perceived ability to RTS ($P = .032$). At all other times, there was no significant difference between cohorts' subjective readiness to perform activities.

DISCUSSION

The results of this study indicate that at times within the first year of recovery following ACL reconstruction, patients who receive allografts and autografts may have significantly different perceived ability to perform activities or RTS. However, while present at various times throughout the first year of recovery, any difference in perceived ability to perform activities or in overall RTS is no longer present at 12 months. This study does not implicate a subjective difference in ability to return to sport or ability to perform sport-like activities between autograft or allograft as being associated with an increased risk for re-injury in the first year following surgery.

REFERENCES

- Barrett GR, Luber K, Replogle WH, Manley JL. Allograft anterior cruciate ligament reconstruction in the young, active patient: Tegner activity level and failure rate. *Arthroscopy*. 2010;26(12):1593-1601. doi:10.1016/j.arthro.2010.05.014
- Engelman GH, Carry PM, Hitt KG, Polousky JD, Vidal AF. Comparison of allograft versus autograft anterior cruciate ligament reconstruction graft survival in an active adolescent cohort. *Am J Sports Med*. 2014;42(10):2311-2318. doi:10.1177/0363546514541935
- Scheffler SU, Schmidt T, Gangéy I, Dustmann M, Unterhauser F, Weiler A. Fresh-Frozen Free-Tendon Allografts Versus Autografts in Anterior Cruciate Ligament Reconstruction: Delayed Remodeling and Inferior Mechanical Function During Long-term Healing in Sheep. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*. 2008;24(4):448-458. doi:10.1016/j.arthro.2007.10.011
- Widner M, Dunleavy M, Lynch S. Outcomes Following ACL Reconstruction Based on Graft Type: Are all Grafts Equivalent? *Curr Rev Musculoskelet Med*. 2019;12(4):460-465. doi:10.1007/s12178-019-09588-w