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Title: Comparing Clinical Outcomes between Quadriceps Tendon and Hamstring Tendon Autografts for Primary Anterior Cruciate Ligament Reconstruction in the Teenage Population

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Background

- Anterior cruciate ligament reconstructions (ACLR) are among the most common orthopedic procedures, especially in young patients participating in sports

- No consensus exists for the optimal graft choice for autograft ACLR between hamstring tendon (HT), bone-patellar tendon-bone (BTB) and quad tendon (QT)
  - Recent literature suggests QT and BTB may lead to better stability
  - Also, failure rates up to 28% have been reported with HT in young active males[1,2]

- In 2010, it was estimated that only 2.5% of ACLRs were using QT and by 2014 that number had increased to 11% and a recent informal survey has found that number might be closer to 20%.[3]

Purpose

- Assess whether QT autografts were effective for primary ACLR in a pediatric population compared to HT autograft
- The primary outcome was looking at the rate of re-tear following surgery as well as the time to failure
- Hypothesis: Patients who underwent ACLR with QT autografts will have similar or better outcomes to those with HT autografts

Materials & Methods

- A retrospective chart review of patients who have undergone primary ACL reconstruction under the age of 20 and had a QT or HT autograft
- Inclusion criteria: primary ACLR, follow-up of at least one year post surgery, complete demographic information available, and only hamstring autograft or quadricep tendon autografts used
- There were 170 eligible patients with HT autografts and 10 with QT autografts
- A 3:1 matching based on age, sex, ethnicity, smoking status and BMI
  - 40 patients included: **10 QT autograft and 30 HT autograft patients.**

Results

Most important finding: QT Autograft for primary ACLR in teenage patients demonstrated 10% Graft re-tear rate versus 33% in group of matched patients after HT autograft

Results – Patient Demographics split by Graft Type

Table 1: Patient Demographics split by Graft type				
		HT Autograft	QT Autograft	p-Value
Age in years, mean, (SD)		17.23 (1.43)	17.07 (1.76)	0.804
Sex	Male	15	4	0.721
	Female	15	6	
Ethnicity	Hispanic/Latino	0	0	n/a
	Not Hispanic/Latino	10	30	
Race	White	22	6	0.54
	African American/Black	7	3	
	Other	1	1	
Smoking Status	Current Smoker	1	0	1
	Former Smoker	0	0	
	Never Smoker	29	10	
Body Mass Index, kg/m^2 mean, (SD)		26.50 (5.2)	25.03 (4.14)	

Results – Outcomes at Last Follow-up by Graft Type

Table 2: Outcomes at last follow-up by Graft type				
		HT Autograft	QT Autograft	p-value
Time to Last Follow Up or Event in Years, mean (SD)		1.93 (1.54)	1.93 (0.45)	0.991
Medial Meniscal Tear	Yes	15	4	0.720
	No	15	6	
Lateral Meniscal Tear	Yes	18	4	0.074
	No	12	6	
Graft-retear	Yes	**10**	**1**	0.551
	No	20	9	
Contralateral ACL tear before	Yes	2	1	1.00
	No	28	9	
Contralateral ACL tear after	Yes	3	0	0.600
	No	27	10	

Results – Probability of Graft Survival stratified by Group

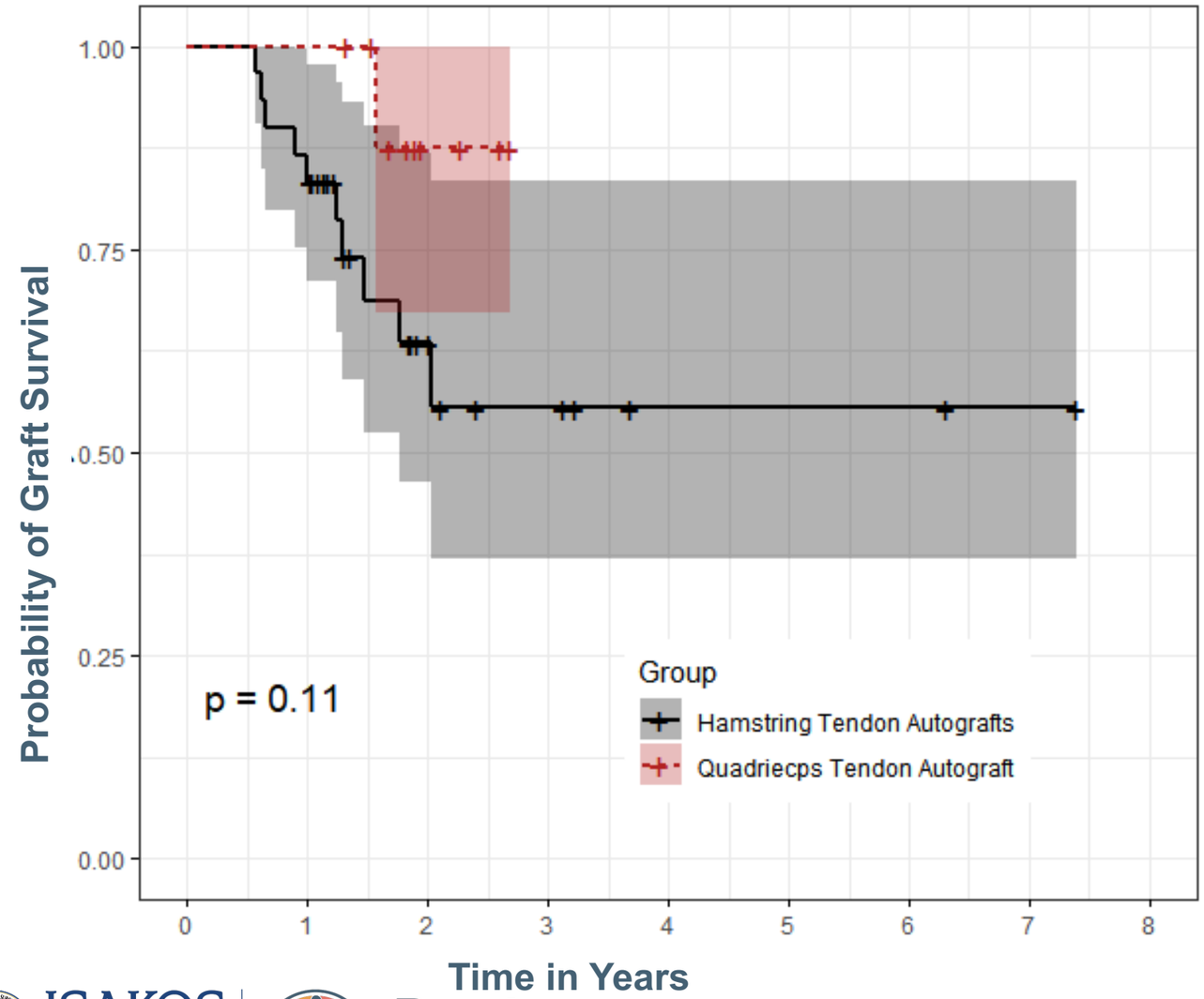

Figure 1: Kaplan-Meyer survival curve evaluating graft survivorship with QT and HT Autograft. There was no significant difference between the two types of grafts (p = 0.11)

Conclusions

- There was a higher percentage of retears in the hamstring group, 33%, compared to 10% in the quadriceps tendon group , however due to the small sample size there was no significant difference

- QT autografts can be utilized as an effective alternative for primary ACL reconstruction surgery in a teenage population

- Further prospective study is needed with larger sample size and longer follow-up to help mitigate biases and confounding variables

Thank You!

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