Paper 140

Title: ***O'Donoghue Sports Injury Award*** 10 Year Outcomes and Risk Factors after ACL Reconstruction: A Multicenter Cohort Study

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Objectives: Identify the patient-reported outcomes (IKDC, KOOS, Marx activity scale) and patient-specific risk factors from a large prospective cohort at a minimum 10-year follow-up after ACL reconstruction.

Methods: Unilateral ACL reconstructions were identified and prospectively enrolled between 2002 and 2004 from 7 sites in the Multicenter Orthopaedics Outcome Network (MOON). Patients pre-operatively d a series of validated outcome instruments, including the IKDC, KOOS, and Marx activity scale. At the time of surgery, physicians documented all intraarticular pathology, treatment, and surgical techniques utilized. Patients were followed at a minimum of 2, 6, and 10 years post-op, and asked to the same outcome instruments that they d at surgery (T0). Incidence and details of any subsequent knee surgeries were also obtained.
Multivariable regression analysis was used to control for patient demographic variables, surgical technique and pathology variables, and incidence of subsequent surgery, in order to identify factors associated with patient-reported outcomes 10 years after ACL reconstruction.

Results: A total of 1597 patients were eligible (57% male; median age 23 years). Ten-year follow-up was obtained on 83% (1320) [86% (1379) at 2 years, 86% (1375) at 6 years], while subsequent surgery data was obtained on over 90% of the cohort. Both IKDC and KOOS scores significantly improved after 2 years and were maintained at 6 and 10 years (Figure 1). Interestingly, Marx activity level scores dropped markedly over time, from a median score of 12 pts at baseline, 9 pts at 2 years, 7 pts at 6 years, to 6 pts at 10 years. The patient-specific risk factors for worse 10-year outcomes are shown in Table 1. The significant drivers of poorer outcomes were lower baseline outcome scores, higher BMI, smoker at baseline, history of medial meniscus surgery prior to ACL reconstruction, having a revision ACL reconstruction, grades 3-4 articular cartilage pathology in the medial, lateral and patellofemoral compartments, and having any subsequent ipsilateral surgery. Graft type (autograft BTB, autograft soft tissue, allograft), MCL or LCL pathology, and medial or lateral meniscus surgery at the time of ACL reconstruction were not found to be significant risk factors.

Conclusion: Patients are able to perform sports-related functions and maintain a high knee-related quality of life 10 years after ACL reconstruction, although activity level declines over time. Multivariable analysis identified several key modifiable risk factors that significantly influence outcome. This prognostic information will undoubtedly aid physician counseling of patients' expectations after ACL reconstruction at surgery and at 2 and 6 years to predict 10 year outcome.

Figure 1. 10-Year Patient-Reported Outcomes over Time (Population Medians)

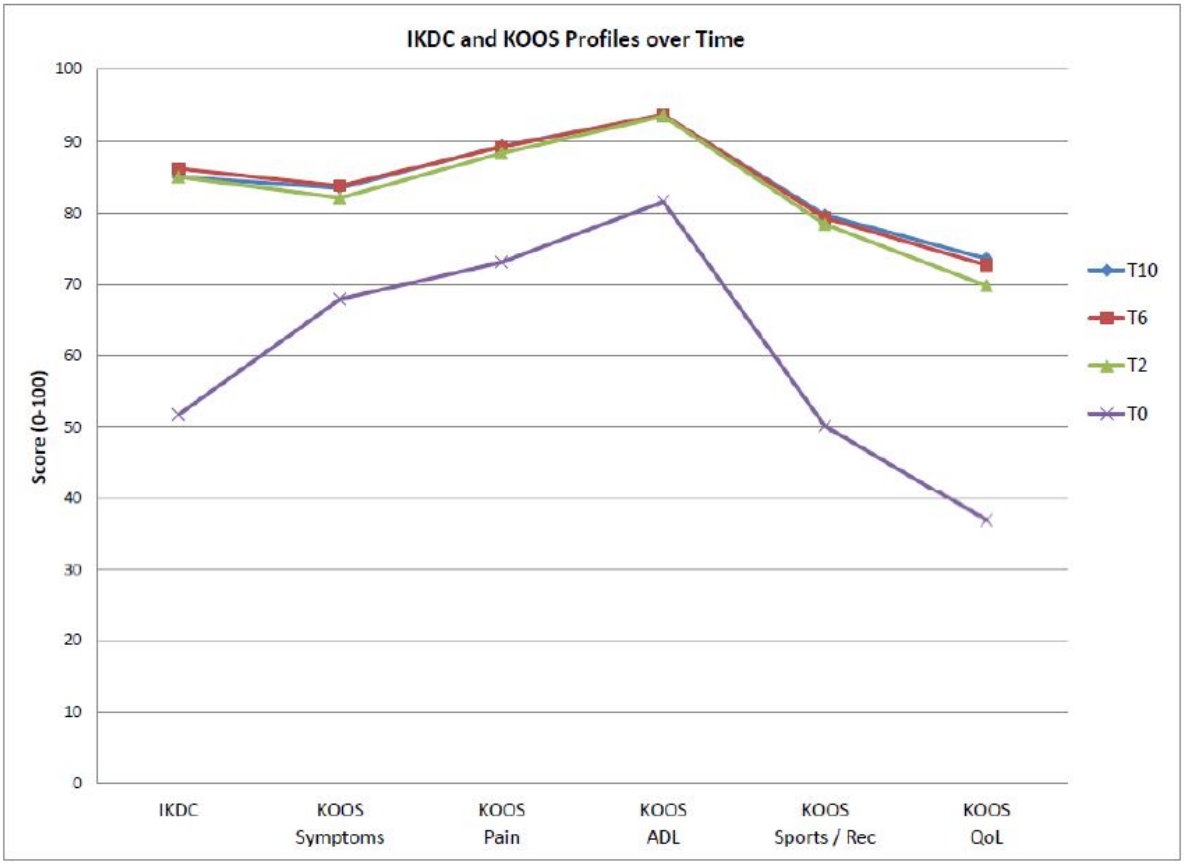

Table 1. Significant Predictors for Worse Outcome 10 Years after ACL Reconstruction

IKDC	KOOS Sports/Rec	KOOS QOL	Marx Activity Level
• Low baseline IKDC score	• Low baseline KOOS sports/rec score	• Low baseline KOOS QOL score	• Low baseline Marx score
• Low baseline activity level		• Low baseline activity level	• Low baseline activity level
	• Higher age	• Higher age	• Higher age
• Gender (female)	• Gender (female)		• Gender (female)
• Higher BMI	• Higher BMI	• Higher BMI	• Higher BMI
• Smoker	• Smoker	• Smoker	
• Lower education level			• Lower education level
• Revision ACLR	• Revision ACLR	• Revision ACLR	
• Previous medial meniscus surgery	• Previous medial meniscus surgery	• Previous medial meniscus surgery • Previous lateral meniscus surgery	• Previous medial meniscus surgery
• AC medial pathology (Grades 3/4)	• AC medial pathology (Grades 3/4)	• AC medial pathology (Grades 2/3/4)	
• AC lateral pathology (Grades 3/4)	• AC lateral pathology (Grades 3/4)	• AC lateral pathology (fracture lines)	
• AC patellofemoral pathology (Grades 3/4)	• AC patellofemoral pathology (Grades 3/4)	• AC patellofemoral pathology (Grades 3/4)	
			• High-grade laxity
• Subsequent surgery (IL knee)	• Subsequent surgery (IL knee)	• Subsequent surgery (IL knee)	