

ACL Graft Tear or Contralateral ACL Tear: Which is Worse???

Robert A. Magnussen MD, MPH
MOON Group

OSU Sports Medicine
Department of Orthopaedics
Columbus, OH USA



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

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Graft Tears are common following ACL reconstruction

- Reported incidence
 - About 5-10%
 - Depends on population and other factors
- These numbers are too high!!!
- But these numbers are too low to easily model multiple predictors of re-injury and interactions without very large databases
 - Regression models require 8-10 “events” per predictor variable
 - 20 predictors x 10 events x 10 to 15 cases per event = 2000 to 3000 ACL reconstructions for modeling... very difficult to achieve
 - Some authors have used “second ACL injury” (graft tears + contralateral tears) as an outcome variable to increased power



Outcomes of Second Injury – Which is Worse??

- Much Less Data
- Which would you rather have??

Revision ACLR



Contralateral ACLR

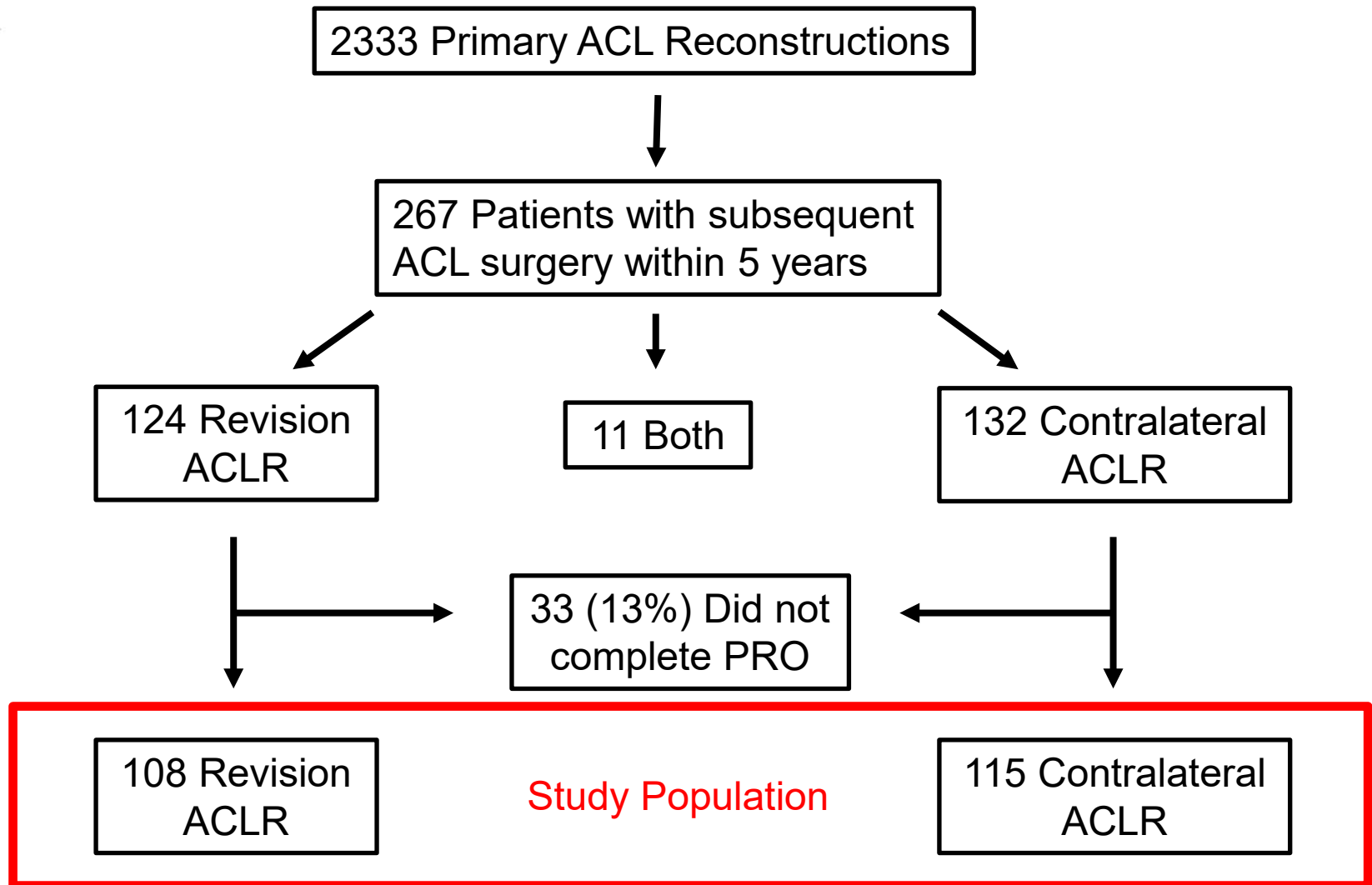


Goal of this study

- Evaluate Outcomes of Patients with a second cruciate ligament injury and reconstruction
- Compare outcomes of those who undergo revision ACL with those who undergo contralateral ACLR
- Hypothesis:
 - No differences in PRO's or Marx Activity Level will be noted between the revision and contralateral ACL groups



Methods – MOON Cohort



Methods

- Baseline Demographic Data and Intra-op Findings collected and compared between groups
- Patient reported outcomes compared between groups at 6 years s/p primary ACLR
 - minimum 1 year from second ACL surgery
- Patient reported outcomes compared between groups utilizing multiple linear regression models
 - Controlling for age, sex, smoking status, pre-operative knee laxity, articular cartilage status at primary ACLR, meniscus status at primary ACLR, sport, graft type and pre-operative PROMs



Results – Demographics at Primary ACLR

Demographics at Primary ACLR			
	ACL Revision Group	Contralateral ACL Group	Significance
Age - Years (Median, IQ range)	18.0 (15.0 – 23.0)	17.0 (15.0 – 24.0)	p = 0.97
Sex			p = 0.29
Male	72 (58%)	67 (51%)	
Female	52 (42%)	65 (49%)	
BMI – kg/m² (Median, IQ range)	23.0 (21.6 – 25.8)	23.3 (21.1 – 26.4)	p = 0.99
Grade 3 Lachman or Pivot			p = 0.87
Yes	52 (42%)	53 (40%)	
No	72 (58%)	79 (60%)	
Sport			p = 0.13
None	8 (6.5%)	11 (8.3%)	
Basketball	29 (23%)	48 (36%)	
Football	28 (23%)	19 (14%)	
Soccer	26 (21%)	26 (20%)	
Other	33 (27%)	28 (21%)	

Results – Intra-op findings at Primary ACLR

Intra-op Findings at Primary ACLR			
	ACL Revision Group	Contralateral ACL Group	Significance
Medial meniscus			p = 0.72
No tear	92 (74)%	92 (70%)	
PMM	17 (14%)	22 (17%)	
Repair	15 (12%)	18 (14%)	
Lateral meniscus			p = 0.038
No tear	83 (67%)	76 (58%)	
PLM	27 (22%)	47 (36%)	
Repair	14 (11%)	9 (6.8%)	
Medial Cartilage			p = 0.39
Grade 0/1	103 (83%)	103 (78%)	
Grade 2/3/4	21 (17%)	29 (22%)	
Lateral Cartilage			p = 0.87
Grade 0/1	108 (87%)	113 (86%)	
Grade 2/3/4	16 (13%)	19 (14%)	
Patellofemoral Cartilage			p = 0.99
Grade 0/1	109 (88%)	117 (89%)	
Grade 2/3/4	15 (12%)	15 (11%)	
Graft Type			p < 0.001
BTB autograft	37 (30%)	66 (50%)	
Hamstring autograft	49 (39%)	51 (39%)	
Allograft	38 (31%)	15 (11%)	

Results - Follow-up

- Time from Primary ACLR to revision
 - Revision – 1.3 years
 - Contralateral – 2.0 years
 - $p < 0.001$
- 87% completed PRO's
 - Mean time after second ACL surgery = 4.4 years
 - Minimum 1 year
- Insufficient number of third ACL injuries for meaningful analysis

Results – PRO's 6 years after Primary ACLR 4.4 years after Second ACLR

6 Year Patient-reported outcomes

	ACL Revision Group N = 108	Contralateral ACL Group N = 115	Significance
IKDC (Median, IQ range)	80.5 (67.8 - 89.7)	89.7 (78.8 - 96.0)	p < 0.001
KOOS-Pain (Median, IQ range)	91.7 (80.6 - 97.2]	94.4 (87.5 – 100)	p = 0.009
KOOS-QOL (Median, IQ range)	68.8 (50.0 - 81.3)	81.3 (59.4 - 93.8)	p < 0.001
Marx Activity Level (Median, IQ range)	8.0 (3.75 - 12.0]	9.0 (4.0 - 12.5)	p = 0.023

Conclusions

- Patients who undergo revision ACLR demonstrate poorer PROs and lower activity level than those who undergo subsequent contralateral ACLR within 5 years of primary ACLR
- So if you get to choose – tear your other ACL, not your graft!
- Use “subsequent” or “second” cruciate ligament injury as a single endpoint with caution



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Thank You

