Effect of High-Grade Pre-operative Knee Laxity on Outcomes of Anterior Cruciate Ligament Reconstruction

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AOSSM– Orlando, FL
July 9-12, 2015
Disclosures

1. Robert A. Magnussen
   a. I have no financial conflicts to report

2. MOON Funding
   a. National Institutes of Health/National Institute of Arthritis and Musculoskeletal and Skin Diseases
      • Grant number R01 AR05368406 (Kurt P. Spindler, PI)
      • Grant number K23 AR05239205 (Warren R. Dunn, PI)
      • Grant number K23 ARAR063767 (Robert A. Magnussen, PI)
   b. Center for Education and Research on Therapeutics (Agency of Health Research and Quality)
      • Grant number 5U18-HS016075 (Robert G. Marx, PI)
   c. Vanderbilt Sports Medicine Research Fund
   d. Vanderbilt Sports Medicine received unrestricted educational gifts from Smith & Nephew Endoscopy and DonJoy Orthopaedics
   e. Orthopaedic Research and Education Foundation
Introduction

1. The degree of knee laxity following anterior cruciate ligament (ACL) injury varies.

2. Patients with increased pre-operatively knee laxity may be at increased risk for poorer patient-reported outcomes or at increased risk for failure of ACL reconstruction\(^2\).

3. Some authors have suggested that patients with excessive pre-operatively laxity who undergo ACL reconstruction may benefit from the addition of extra-articular procedures to better control laxity\(^1,3\).
Hypothesis

1. Increased pre-operative knee laxity (Grade 3+ pivot-shift, Lachman > 10mm, or anterior drawer greater than 10mm) is associated with increased risk of revision ACL reconstruction and poorer patient-reported outcomes at two years post-operative.
Methods

1. MOON is a multicenter collaboration for the prospective collection of outcomes following ACL reconstruction
   a. Centers – Vanderbilt, Ohio State, Iowa, Colorado, Cleveland Clinic, Washington University, Hospital for Special Surgery

2. 1394 patients that underwent primary isolated autograft ACL reconstruction within 3 months of injury in the absence of collateral or PCL injury were identified from the cohort
Methods

1. Demographic data, physical examination findings under anesthesia at ACL reconstruction, information regarding other intra-articular pathology, pre-op and 2-year patient-reported outcomes, and information of subsequent revision were collected.

2. High-grade laxity was defined as:
   a. Lachman > 10mm different from contralateral
   b. Ant Drawer > 10mm different from contralateral
   c. Pivt shift: classified as 3+ (gross pivot)
Methods

1. Multiple logistic regression modeling was used to evaluate whether high-grade pre-operative laxity was associated with increased odds of undergoing revision ACL reconstruction within 2 years of the index procedure, controlling for patient age, sex, activity level, and graft type.

2. Multiple linear regression modeling was used to evaluate whether high-grade pre-operative laxity was associated with poorer IKDC or KOOS-QOL scores at 2 years post-operative, controlling for patient age, sex, BMI, and smoking status, baseline score, activity level, graft type, and the presence and treatment of meniscal tears.
Results

1. Two year revision data were available for 1333 patients (95.4%)

2. Patient-reported outcomes were available for 1205 patients (86.4%)

3. High-grade pre-operative laxity was noted in 395 patients (29.6%):
   a. High grade pivot-shift: 24.9%
   b. High-grade Lachman: 11.5%
   c. High-grade anterior drawer: 8.1%
Results – Revision ACLR

1. ACL graft revision was performed in 59 patients (4.4%)
2. High grade pre-laxity was not associated with significantly increased odds of ACL graft revision
   a. OR=1.47, 95% CI: 0.85 - 2.55, p = 0.17
Results – Patient-Reported Outcomes

1. Mean scores 2 years post-operative:
   a. IKDC score: 84.1 ± 14.4
   b. KOOS-QOL score: 75.1 ± 20.4

2. High grade pre-laxity was not associated with patient-reported outcomes 2 years post-operative
   a. IKDC: β = -0.33, p = 0.71
   b. KOOS-QOL: β = -0.51, p = 0.70
Conclusions

1. The presence of high-grade pre-operative knee laxity as assessed by physical examination under anesthesia (Grade 3+ pivot-shift, Lachman > 10mm, or anterior drawer greater than 10mm) is not associated increased odds of revision ACL surgery or poorer patient-reported outcome scores at 2 years following acute ACL reconstruction.
References

