

Paper #166

Conversion Rates and Timing to Total Knee Arthroplasty following ACL Reconstruction: A United States Population-Based Study of Over 100,000 ACL Reconstructions

Jacob Bobman, MD, UNITED STATES
Cory Mayfield, BS, UNITED STATES
Nathanael Heckmann, MD, UNITED STATES
Aaron Gipsman, MD, UNITED STATES
Hyunwoo "Paco" Kang, MD, UNITED STATES
Omid Jalali, BS, UNITED STATES
Erik Mayer, BS, UNITED STATES
George F. R. Hatch III, MD, UNITED STATES
Seth C. Gamradt, MD, UNITED STATES
Alexander E. Weber, MD, UNITED STATES

University of Southern California
Los Angeles, CA, UNITED STATES

Summary:

Patients across all age groups had excellent long-term survival rates following ACLR, though increasing age and patients who underwent a concomitant microfracture or allograft procedure required a TKA at higher rates.

Abstract:

Introduction

Anterior cruciate ligament (ACL) injuries are extremely common and may predispose patients to post-traumatic osteoarthritis. ACL reconstruction (ACLR) is commonly performed to restore knee stability and prevent secondary meniscal and osteochondral pathology. Despite stabilization with ACLR, the natural history of an ACL tear for many patients is post-traumatic arthrosis and ultimately may require total knee arthroplasty (TKA). However, limited data exists that explores the conversion rates between ACLR and future TKA. The purpose of this study is to investigate ACLR conversion rates and timing to TKA in a large population-based cohort study.

Methods

We analyzed California's Office of Statewide Planning and Health Development (OSHPD) data from 2000-2014 who underwent primary ACLR. Exclusion criteria included prior distal femur or tibial plateau trauma, prior osteotomy, inflammatory arthropathy, osteonecrosis, skeletal dysplasia, age <18, multi-ligamentous knee injuries, and prior patellar tendon or quadriceps tendon repair. Failure was defined as conversion to TKA. Subgroups were analyzed on the basis of concomitant procedures with ACLR: osteochondral autograft, osteochondral allograft, meniscus transplant, synovectomy, chondroplasty, microfracture, meniscus debridement, and meniscus repair; and further subdivided based on age at the time of surgery. Ten-year survival was performed using Kaplan-Meier analysis with significance defined as $p < 0.05$.

Results

Preliminary data identified a total of 114,427 ACLR procedures (41,126 male, 73,266 female, average age = 32.21

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±0.04 years) with an overall 2, 5, 10 and 15 year survival rate of 99.30%, 98.15%, 95.17% and 90.52%, respectively. As patient age increased, the survival decreased (Figure 1). Of the patients identified, 50,427 underwent an isolated ACLR with no other concomitant procedure (20,093 male, 30,315 female, avg age = 31.03±0.05 years) with 1,748 (1.49%) eventually requiring a TKA (821 male, 927 female, avg age 54.4±0.24 years), 10-year survival of 96.07%. This isolated ACLR demonstrated worsening 15-year survival rates with increasing age (18-30yr at 99.48%; 31-40yr 97.89%; 41-50yr 89.63%; 51-60yr 83.26%; >60yr 77.42% failure rate). In regard to concomitant procedures, there were 55,359 meniscal debridements, 10,495 meniscal repairs, 5,945 synovectomies, 4,582 chondroplasties, 3,728 microfractures, 855 underwent osteochondral allografts, 616 osteochondral autograft, and 63 meniscal transplants (Table 1). Ten-year survivorship based on concomitant procedures were computed and stratified according to age (Table 1). Patients with an isolated ACLR and patients with a concomitant meniscal repair had the highest 10 year survival (96.07% and 98.91%, respectively), while patients undergoing microfracture or osteochondral allograft had the lowest 10 year survival (89.83% and 89.60%, respectively).

Conclusion

Patients across all age groups had excellent long-term survival rates following ACLR. Increasing age and patients who underwent a concomitant microfracture or allograft procedure required a TKA at higher rates. These findings will help provide surgeons with information to aid in surgical decision-making when selecting appropriate concomitant procedures. In addition, these findings aid in counsel patients about the likelihood of needing a total knee arthroplasty following ACLR.