

Paper #191

Only One Patient Out of Five Achieves Symmetrical Knee Function Six Months After Primary Anterior Cruciate Ligament Reconstruction

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Summary:

Age => 30 years, medial meniscus resection and medial meniscus repair reduce the chance, whereas the use of hamstring tendon autograft over bone-patellar tendon-bone autograft increases the chance of achieving symmetrical knee function six months after primary anterior cruciate ligament (ACL) reconstruction (ACLR).

Abstract:

Background

Return to sport (RTS) is often advocated six months after ACLR. However, post-surgical time alone is not sufficient to determine readiness for RTS. The achievement of a symmetrical knee function, such as symmetry in quadriceps and hamstring muscles strength and single leg hop test performance, is regarded as a key factor prior to RTS. Muscular asymmetries of the lower limb not only affect sport performance, they are also associated with an inferior subjective knee function and are known to be risk factors for ACL graft tears and knee re-injuries. To date, no previous studies have assessed the rate of patients achieving symmetrical knee function six months after primary ACLR, in a large cohort. In addition, a detailed analysis of patient factors affecting its achievement has not previously been presented.

Purpose

To assess the percentage of patients achieving symmetrical knee function six months after primary ACLR and to identify factors affecting its achievement, in a large cohort.

Methods

Patients who underwent primary ACLR at our institution, between 2000 and 2015, and were assessed with the isokinetic quadriceps and hamstring muscles strength tests and single leg hop test at the six-month follow-up were included. Demographic data, information on the graft used, cartilage injuries, and concomitant meniscal surgery were reviewed. Patients who reached a limb symmetry index (LSI) of => 90% in all three tests were considered to have achieved symmetrical knee function. A multivariate logistic regression analysis was used to determine whether patient age (=>30 years vs. <30 years), gender, time from injury to surgery (delayed >3 months vs. not delayed =<3 months), pre-injury Tegner activity level (high =>6 vs. low <6), graft type (HT vs. BPTB autograft), cartilage injury, and the presence of medial meniscus (MM) or lateral meniscus (LM) resection or repair were factors associated with the achievement of symmetrical knee function six months after primary ACLR.

Results

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A total of 3,541 patients (52.9% males) with a mean age of 28.1 ± 10.8 years had data available from all three tests. A number of 693 patients (19.6%) achieved symmetrical knee function, reaching a LSI of $\geq 90\%$ in all three tests. Age ≥ 30 years (OR 0.50; 95% CI, 0.41-0.61; $P < 0.001$), MM resection (OR, 0.75; 95% CI, 0.57–0.98; $P = 0.03$) and MM repair (OR, 0.63; 95% CI, 0.40–0.98; $P = 0.04$) were negatively associated, whereas the use of HT autograft (OR, 2.28; 95% CI, 1.51-3.45; $P < 0.001$) over BPTB autograft was positively associated with the achievement of symmetrical knee function six months after primary ACLR. No correlation was found between the achievement of symmetrical knee function and gender, time from injury to surgery, pre-injury Tegner activity level, cartilage injury and resection or repair of the lateral meniscus.

Conclusion

Only 19.6% of the patients achieved symmetrical knee function six months after primary ACLR. Age ≥ 30 years, MM resection and MM repair reduced the chance, whereas the use of HT autograft over BPTB autograft increased the chance of achieving symmetrical knee function six months after primary ACLR. This study clearly shows that most of the patients are yet to regain a symmetrical knee function six months after primary ACLR and, moreover, it identifies several factors affecting its achievement in a large cohort. The results of this study should be used to counsel patients about their expected functional recovery and to optimize rehabilitation and maximize knee function after ACLR.