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Paper #73

Age, Gender, Symmetrical Isokinetic Quadriceps Strength and Single Leg Hop Test Performance are the Most Important Factors Affecting the Achievement of a Patient-Acceptable Symptom State After Primary Anterior Cruciate Ligament Reconstruction

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Summary:
Older age and female gender are the non-modifiable factors that consistently increase and decrease respectively the odds of achieving a patient-acceptable symptom state (PASS). Symmetrical 6-month isokinetic quadriceps strength and single leg hop test performance, are the modifiable factors that consistently increase the opportunity to achieve a PASS 2 years after primary ACLR.

Abstract:

Background

No previous studies have presented a complete overview of the patient preoperative, intraoperative and postoperative factors affecting the achievement of a PASS after primary ACLR.

Purpose

To determine patient preoperative, intraoperative and postoperative factors affecting the achievement of a PASS 2 years after primary ACLR.

Methods

Our database was used to evaluate outcomes for a total of 2335 patients with primary ACLR. The Knee Injury and Osteoarthritis Outcome Score (KOOS) was used to evaluate patients on 5 subscales (Pain, Other Symptoms, Activities of Daily Living [ADL], Sport and Recreation, and Quality of Life [QoL]) at 2-year follow-up. Additional preoperative, intraoperative and postoperative information was extracted from the database. The primary outcome was the achievement of a PASS for each KOOS subscale (Pain => 88.9; Symptoms => 57.1; ADL =100; Sport and Recreation => 75.0; QoL => 62.5). A multivariate logistic regression analysis was used to determine whether patient age, gender, time from injury to surgery, pre-injury Tegner activity level, graft type, cartilage injury, the presence of medial meniscus (MM) or lateral meniscus (LM) resection or repair, and the recovery of 6-month symmetrical (limb symmetry index [LSI]=> 90%) isokinetic quadriceps or hamstring strength and single leg hop test performance were factors associated with the achievement of PASS for each KOOS subscale 2 years after primary ACLR.

Results

Paper #73

The proportion of patients achieving PASS 2 years after ACLR varied between 45.6% and 93.6% among the KOOS subscales. Older age (=>30 years) and LSI=>90% for 6-month isokinetic quadriceps strength increased the odds of achieving PASS across all KOOS subscales. Female gender decreased the odds of achieving PASS on the Pain (OR, 0.76; 95% CI,0.62–0.94; P=0.01), ADL (OR, 0.79; 95% CI,0.64–0.97; P=0.02) and Sport and Recreation (OR, 0.72; 95% CI,0.58–0.89; P=0.003) subscales. The presence of a MM repair reduced the odds of achieving PASS on the Pain (OR, 0.59; 95% CI,0.36–0.96; P=0.03) subscale. Patients receiving hamstring tendon autograft over bone-patellar tendon-bone autograft showed an increased odds (OR, 2.02; 95% CI,1.31–3.10; P=0.001) whereas patients with a cartilage injury showed a decreased odds (OR, 0.73; 95% CI,0.55–0.97; P=0.03) of achieving PASS on the Sport and Recreation subscale. A LSI=>90% for 6-month single leg hop test performance increased the odds of achieving PASS on the ADL (OR, 1.37; 95% CI,1.09–1.71; P=0.005), Sport and Recreation (OR, 1.40; 95% CI,1.11–1.77; P=0.004) and QoL (OR, 1.28; 95% CI,1.00–1.63; P=0.04) subscales.

Conclusion

This study provides unique data, comprising a detailed analysis of patient preoperative, intraoperative and postoperative factors affecting subjective knee function after primary ACLR in a large cohort. Older age and female gender are the non-modifiable factors that consistently increase and decrease respectively the odds of achieving a PASS. Symmetrical 6-month isokinetic quadriceps strength and single leg hop test performance are the modifiable factors that consistently increase the opportunity to achieve a PASS 2 years after primary ACLR.

The results of the present study have significant implications for the clinical management of patients with ACLR. This information should be used to counsel patients about their expectations and to improve subjective knee function after primary ACLR.