Rate and timing of revision and contralateral anterior cruciate ligament reconstruction relative to index surgery

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Disclosures: Scott J Halperin (Jane Danowski Weiss Family Foundation Fund at Yale University School of Medicine)Meera M Dhodapkar (Richard K. Gershon, M.D. Fund at Yale University School of Medicine, Associate Editor Visual Abstracts North American Spine Society Journal), Jonathan N Grauer (Editor-in-Chief of North American Spine Society Journal).

Introduction

Following anterior cruciate ligament reconstruction (ACLr), ipsilateral anterior cruciate ligament (ACL) graft re-injury or contralateral ACL injury have been reported (referred to together as "subsequent" ACL injury). The rate and predictors of such subsequent ACL injuries have previously only been reported in relatively small patient cohorts and are of clinical interest. The current study utilized a large, national, multi-insurance, administrative database to assess subsequent ACLr and factors associated with its occurrence.

Methods

Using the 2015-2021 Q1 PearlDiver M151 database, the current study abstracted patients who underwent ACLr. To be included, all patients were followed for 3-years after initial ACLr. Patients who underwent a subsequent reconstruction (ipsilateral revision or contralateral) within 3-years were determined and timing assessed. Using univariable and multivariable logistic regression, the factors associated with requiring a subsequent ACLr and the factors associated with returning for ipsilateral versus contralateral ACLr were examined.

Results

In total, the current study identified 40,151 patients who underwent initial ACLr. Of these, subsequent ACLr was performed for 1,689 (4.2%) (Figure 1 and 2). These included ipsilateral revision for 1,018 (60.3%) and contralateral reconstruction for 671 (39.7%). Those returning for ipsilateral reconstruction did so sooner than patients with a contralateral reconstruction, especially in the first 6-months.

On multivariable analysis, the only factor independently associated with subsequent ACL surgery was younger age (OR up to 4.17 for 10-14 years old relative to 25-29, $p<0.0001$). Factors associated with returning for an ipsilateral revision ACLr as opposed to contralateral ACLr were earlier revision (OR 1.49, within 1.5-years relative to after 1.5-years, $p=0.0001$) and female sex (OR 0.62, relative to male sex, $p<0.0001$).

Discussion

The current study represents the largest patient cohort to examine rates of a subsequent ACL revision or contralateral ACLr in the first 3 years from their initial surgery. The overall rate of requiring a subsequent ACLr was found to be 4.2% with 60.3% being on the ipsilateral ACL. This information may be helpful for evolving injury prevention programs and patient counseling.

Significance/Clinical Relevance

The rate of ACL tears after an initial ACLr as well as the factors associated with it are important to patients and surgeons for postoperative planning to reduce subsequent injuries.

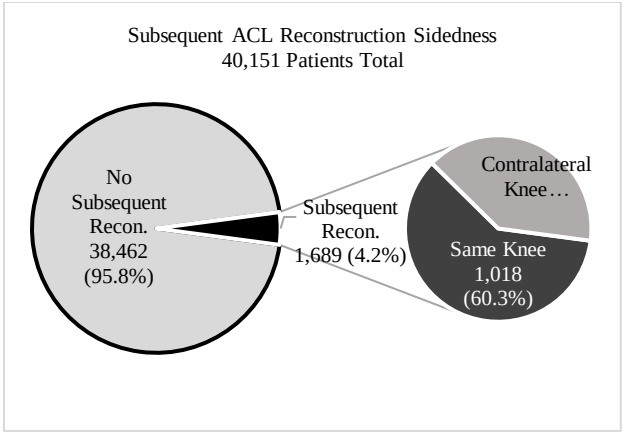

Figure 1: This graph depicts an expanding pie chart of patients who returned for subsequent ACLr and the sidedness of the subsequent surgery.

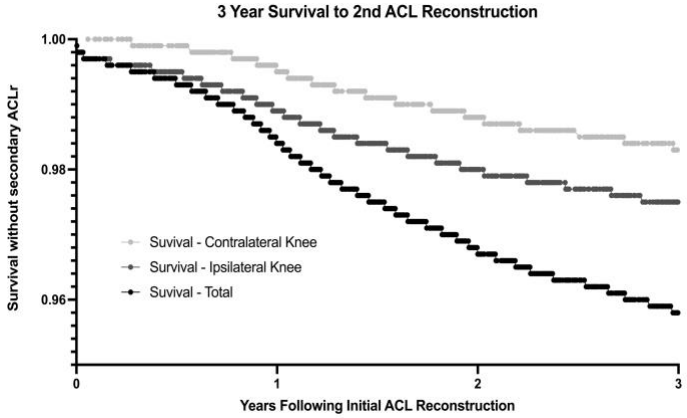

Figure 2: This graph shows the survival to subsequent ACLr over a 3-year period for patients who returned for the contralateral (light grey) and ipsilateral knee (dark grey). The total group (black) includes the whole patient cohort.