

Editorial Commentary: Preoperative Exercise, Workers' Compensation, Diabetes, Lateral Extra-Articular Tenodesis, and Return to Sport Determine Patient Satisfaction After Anterior Cruciate Ligament Reconstruction



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Abstract: Patient-reported outcome measures (PROMs) have been developed and used as the primary determinant of successful patient-centered results. The patient acceptable symptomatic state delineates an absolute value for PROMs indicating that patients are satisfied with their outcome. When this metric is used for anterior cruciate ligament reconstruction, patients reach a satisfactory outcome at between 6 and 8 months postoperatively, and more than 90% reach a satisfactory outcome at 12 months. Preoperative variables such as preoperative exercise, Workers' Compensation, and diabetes impact patient outcomes, whereas preoperative PROMs and use of the anteromedial portal technique for femoral tunnel drilling have a limited impact on satisfaction. Iliotibial band tenodesis shows a large impact on satisfactory outcomes; however, this result may be affected by patient demographic issues (selection bias). Ultimately, a "satisfactory" outcome is a very general term and may not necessarily apply to active athletes desiring a return to competitive sport. Thus, the patient acceptable symptomatic state should be interpreted in combination with a surgeon's experience. Ultimately, the success of a surgical procedure could be determined, in large part, based on the patient's individual preoperative expectations.

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Defining the success of orthopaedic surgery has seen an evolution over the past 20 to 30 years. Previously, surgical outcomes were based on physician-focused interpretations and evaluations, including physical examination and radiographic findings. Patient-specific measures were limited to ordinal data such as patient satisfaction and pain scales. Over time, more sophisticated patient-reported outcome measures (PROMs) have been developed and used as the primary determinant of successful patient-centered results.

Clinical studies evaluate the changes in PROMs seen after orthopaedic surgery to determine their significance. Initially, the goal of a study design is to assess for statistical significance between 2 groups: either

preoperative and postoperative values or different treatment arms. However, statistical significance is just the first step and does not represent clinical importance. Thus, further metrics have been developed to help ascertain clinically impactful outcomes. The minimal clinically important difference (MCID) identifies the smallest difference between outcome measures that patients interpret as clinically beneficial. Substantial clinical benefit (SCB) is the amount of change associated with considerable or optimal patient-perceived improvements.

Although changes in PROMs may be considered clinically significant, they may not necessarily correspond with a patient's perspective of a satisfactory or successful outcome. The patient acceptable symptomatic state (PASS) delineates an absolute value for PROMs by which a majority of patients will be satisfied with their outcome. PASS threshold values have been calculated for a number of different surgical procedures, including hip arthroscopy for femoroacetabular impingement,¹ biceps tenodesis,² and partial meniscectomy.³

The author reports no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

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0749-8063/201900/\$36.00

<https://doi.org/10.1016/j.arthro.2020.11.057>

In the study “The Patient Acceptable Symptomatic State in Primary Anterior Cruciate Ligament Reconstruction: Predictors of Achievement,” Beletsky, Lu, Polce, Nwachukwu, Okoroha, Chahla, Yanke, Forsythe, Cole, and Verma⁴ calculated the PASS thresholds for several PROMs after primary anterior cruciate ligament reconstruction (ACLR), including the International Knee Documentation Committee and Knee Injury and Osteoarthritis Outcome Score subscales. Of most interest, they calculated PASS achievement rates at 6, 12, and 24 months after ACLR for all PROMs. In the age of accelerated rehabilitation and return to play, only 50% to 79% of patients achieved PASS threshold values at 6 months. On average, PASS achievement rates occurred at between 6 and 8 months, with more than 90% of patients reaching a satisfactory outcome by 12 months. This study further affirms the preoperative conversation that I have with all my anterior cruciate ligament (ACL) patients: The recovery period is typically between 6 and 9 months but could potentially take a full calendar year.

Beletsky et al.⁴ also attempted to identify factors predictive of PASS achievement. Preoperative exercise was recognized as a positive prognostic factor for achieving satisfactory results, whereas Workers’ Compensation and diabetes were negative prognostic factors. The authors identified several preoperative PROMs as being predictive; however, all the odds ratios for these measures were near 1, essentially limiting their impact. Similarly, femoral tunnel drilling using an anteromedial portal was found to have statistical significance but limited clinical impact, with odds ratios of 1.05 and 1.08.

In contrast, concurrent iliotibial band tenodesis increased the likelihood of PASS achievement by a factor of 11. Although this is a significant value, some weaknesses in the study design place some uncertainty on these results. An iliotibial band tenodesis was performed in ACL patients with a grade 3 pivot-shift finding; however, the number of procedures performed in this cohort was not reported. Beletsky et al.⁴ did state that it was more likely to be performed in patients returning to pivoting or contact sports. Therefore, one can assume that these patients were likely younger, had higher preoperative functional scores, and progressed to a higher level of activity than the general population. These are all potential confounders that could skew any association between iliotibial band tenodesis and patient satisfaction. Still, anterolateral rotational instability is a relatively hot topic that needs continued research and reporting to elucidate clear indications and outcomes.

Although iliotibial band tenodesis procedures were included in this patient cohort, Beletsky et al.⁴ elected to exclude other concomitant procedures for injuries commonly associated with ACLR, including cartilage, meniscal, and ligamentous injuries. An isolated ACL injury occurs less than 10% of the time, with associated meniscal injuries prevalent in 60% to 75% of ACL

injuries; articular cartilage injuries, up to 46%; and complete collateral ligament injuries, 5% to 24%.⁵ Without these commonly associated pathologies, the generalizability of this study to the overall ACL population is somewhat limited. In the MOON (Multicenter Orthopaedic Outcomes Network) ACL cohort, it was found that a concurrent lateral meniscectomy or grade 3 to 4 articular cartilage lesions led to inferior outcomes after ACLR.⁶ It would be interesting to see how these associated pathologies and procedures would impact the PASS achievement rates.

Overall, the study by Beletsky et al.⁴ reported between 87% and 98% patient satisfaction at 1 year after ACLR. However, patient satisfaction is just 1 method of determining success after ACLR. Ardern et al.⁷ reported that 90% of patients achieved normal or nearly normal knee function when evaluated based on knee laxity and strength, as well as 85% when evaluated based on International Knee Documentation Committee activity-based outcomes. When the return to sport was evaluated in this same group, 82% of patients returned to sports participation in general, 63% returned to their preinjury level of participation, and only 44% returned to competitive sports. Thus, an active individual may not deem the ACLR a success if he or she cannot return to competitive sports, whereas a recreational athlete may be satisfied with having nearly normal knee function with the ability to return to sports at any level.

Ultimately, the success of a surgical procedure is going to be based on each patient’s expectations. The study by Beletsky et al.⁴ covers patients from a wide age group, each with his or her individual indications and goals for an ACLR. The generated PASS achievement rates provide a general overview of prognostic factors and expectations, which can be used as an evidence-based guideline to help optimize outcomes. As health care shifts to a more value-based system, these generalized guidelines and algorithms will continue to play a large role in the treatment of our patients. We, as orthopaedic surgeons, must be willing to use them but not allow them to replace our own experience and knowledge, as well as the expectations, goals, and beliefs of our patients.

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