Level V Evidence

Patient Understanding, Expectations, Outcomes, and Satisfaction Regarding Anterior Cruciate Ligament Injuries and Surgical Management

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Abstract: Patient satisfaction has become an increasingly important outcome metric in orthopaedics and medicine in general as many initiatives at both the state and national levels aim to improve the efficiency and quality of health care. Anterior cruciate ligament injuries are among the most common injuries in orthopaedics, with anterior cruciate ligament reconstruction (ACLR) surgery consistently reported as one of the most frequently performed procedures by orthopaedic surgeons. Patient-reported outcomes are frequently used to evaluate outcomes from the patient's perspective, and many physicians also ask patients about their satisfaction with treatment. A growing volume of literature has investigated the relation between preoperative patient expectations and postoperative patient satisfaction. The quality of online resources, patient expectations for ACLR, and factors associated with and/or predictive of either poor or good to excellent outcomes after surgery are described. This article critically reviews the orthopaedic literature on this important topic and identifies variables that influence patient expectations and satisfaction to help treating physicians better counsel and evaluate patients and ultimately improve outcomes of and satisfaction with ACLR surgery.

Introduction: What Is the Importance of Patient-Reported Outcomes and Patient Expectations?

There has been a recent influx of research investigating patients' understanding and perception of disease process and injury, expectations for the care they receive, and satisfaction with that care. The advent of the Affordable Care Act in the United States has brought forth an era in medicine in which patients are more active participants in the decision-making process related to their care, in addition to robust outcomes initiatives. This has led to the promotion of patient-centric quality measures such as patient-reported outcomes (PROs), which are obtained through patient surveys and are now regarded as an important part of medical decision making.[1-3]

Studies have shown that PROs can be a reliable measure of functional outcomes that correlate with clinician views.[4] In recent years, PROs have become one of the most common metrics to quantify subjective clinical outcomes in orthopaedics. PRO measures such as the Lysholm score, the Knee Injury and Osteoarthritis Outcome Score, the Cincinnati knee score, the Knee Outcome Survey, the Hospital for Special Surgery Score, and the International Knee Documentation Committee system are all validated metrics used to

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The authors report the following potential conflict of interest or source of funding: B.J.C. receives support from Aesculap/B.Braun, Cytori, Medipost, and National Institutes of Health (NIAMS and NICHD) (research support); American Journal of Orthopedics, Arthroscopy, Journal of Bone & Joint Surgery—American, Journal of Shoulder and Elbow Surgery, and Journal of the American Academy of Orthopaedic Surgeons *(editorial or governing board); American Orthopaedic Society for Sports Medicine, American Shoulder and Elbow Surgeons, Arthroscopy Association of North America, and International Cartilage Repair Society (board or committee member); Arthrex (IP royalties, paid consultant, research support); Athletico, Ossur, Smith & Nephew, and Tornier (other financial or material support); Carticept (stock or stock options); DJ Orthopaedics and Elsevier Publishing (IP royalties); Regentis (paid consultant, stock or stock options); Saunders/Mosby-Elsevier (publishing royalties, financial or material support); and Zimmer (paid consultant, research support).*

Received October 25, 2016; accepted January 17, 2017.

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0749-8063/161034/$36.00

http://dx.doi.org/10.1016/j.arthro.2017.01.049

evaluate outcomes of various knee operations.[5] PROs are now implemented into large orthopaedic databases for use in outcomes research that will likely contribute to the development of future practice guidelines and have wide-reaching effects on treatment decisions.[6,7]

Whereas PROs are useful to collect data on patients' symptoms and function, another important patient-reported measure, satisfaction, allows providers to account for the subjective patient experience. Several authors have shown that increased patient satisfaction is correlated with increased compliance, improved treatment outcomes across a variety of medical settings including orthopaedics, decreased risk of litigation, and higher patient ratings of the quality of care.[8,9] Patient satisfaction has taken on an important role in patient care because it is heavily related to quality of care, development of patient care models, and quality-improvement initiatives and has an impact on both health care economics and health care delivery.[10-13] Patient satisfaction is driven by many factors; however, one of the most important is the correlation between patients' expected outcomes and their actual outcomes after surgery.

Although there is no general consensus about the effect of patient expectations on patient satisfaction after surgery, results from multiple studies in the field of orthopaedics have suggested that an important effect exists for procedures such as back surgery,[14,15] rotator cuff repair,[16] hip arthroplasty,[17-19] and knee arthroplasty[20,21] in which a correlation has been found between overly optimistic patient expectations of postoperative outcomes and negative patient satisfaction. Unmet expectations have also been shown in the general medical literature to be a negative predictor of patient satisfaction.[22] As such, it is important to ensure that patients presenting for orthopaedic surgery have a realistic expectation of their postoperative prognosis to ensure optimal patient satisfaction. Given the prevalence of anterior cruciate ligament (ACL) tears, many investigators have begun to study to what extent patients' understanding of their injuries and their expectations and fears of treatment options—both surgical and nonsurgical—for these conditions ultimately affect their satisfaction with their orthopaedic care. Although they are not as numerous as the PROs, several well-designed, orthopaedic-specific metrics to quantify patient expectations and satisfaction, such as the Hospital for Special Surgery Knee Surgery Expectations Survey, have been reported.[23-25]

The purpose of this article was to review the orthopaedic literature regarding patient understanding of ACL anatomy, physiology, and injury; expectations for surgical management of ACL injuries; and satisfaction with surgical management. In addition, a secondary objective was to identify frequently reported correlations between subjective and objective patient factors and patient satisfaction and offer suggestions on how orthopaedic surgeons can use this information to improve satisfaction in their practices. It was our hypothesis that patients would generally have a poor understanding of their injuries.

Articles were found by searching PubMed using the terms "patient understanding ACL," "patient expectations ACL," "patient satisfaction ACL," and "patient reported outcomes ACL." In addition, similar search terms were used within PubMed by removing "ACL" from the aforementioned search terms and replacing it with "orthopaedics" to gain a better understanding of the discussion in the broader orthopaedic community.

Background: ACL Injury, Surgical Reconstruction, and Patient Understanding

Given the growing incidence of ACL injuries and surgical management of these injuries, there is significant interest in helping patients understand their injuries and treatment options to set expectations and ultimately improve their satisfaction. Many patients turn to the Internet as their primary source of education on orthopaedic injuries. As of 2014, 87% of American adults were using the Internet,[26] with Krempec et al.[27] showing that in 2003, at least 45% of orthopaedic patients searched online for information about their condition before consultation. In a recent publication, Cassidy and Baker[26] conducted a review of academic articles evaluating online orthopaedic information from 2010 to April 1, 2015, by searching PubMed, MEDLINE, and Google Scholar using orthopaedic anatomic descriptors and 3 title words ("internet," "web," and "online"). Thirty-eight articles examining the quality and/or readability of online orthopaedic information were included in the analysis. Their results showed an overall poor quality of orthopaedic information on the Internet, leading to many misperceptions and poor understanding by the general public.[26] Furthermore, the surplus of information available online can often provide too many different sources of information, which has also been associated with decreased patient satisfaction.[28]

In recognizing the importance of providing access to high-quality online resources, many physicians and the American Academy of Orthopaedic Surgeons provide information directly on their respective websites to decrease confusion and provide patients with a reliable online resource of sound quality that is written and presented at an appropriate reading level for all patients (sixth-grade reading level).[29,30] Although high-quality, easily accessible online resources may augment patient-physician interactions, the ideal source of information for patients regarding their injuries and planned surgical procedures should be their health care providers. Providers have the privilege and

responsibility of educating each patient about his or her injury, treatment options, and prognosis through direct face-to-face, telephone, and E-mail discussions. In addition, good patient-physician communication has the added benefit of improving patient satisfaction.[31]

Patients' Understanding of ACL Injury

Until recently, a paucity of information existed on the public's perception of anterior cruciate ligament reconstruction (ACLR). Matava et al.[32] asked 210 individuals without knee conditions to fill out a survey designed specifically to measure a respondent's knowledge base and perception of ACLR with regard to anatomy, physiology, indications, operative technique, risks, recovery time, and overall benefits of the procedure. The authors showed a wide variability in the public's knowledge, with the majority of respondents, 65%, describing their knowledge of ACL injury and surgical management as "little" or "none." Furthermore, they discovered only 30% of respondents knew that there is a difference in risk of ACL injury between men and women, with women having a higher incidence of injury. In addition, 63% of respondents did not know that ACLR does not decrease the risk of progression to osteoarthritis, and older and less active individuals tended to have an overall weaker knowledge base on the topic. The most impactful finding reported by Matava et al. was that individuals' 2 primary concerns about ACLR surgery were return to sports and risk of osteoarthritis. The main purpose of the study by Matava et al. was to obtain a better understanding of what providers should reasonably expect patients to know, as well as to identify any barriers to patient understanding (education level, language barrier, technological savvy) to enhance patient-physician communication going forward.

Patient Expectations for ACLR

The impact of patient expectations on patient satisfaction has been gaining interest across orthopaedics, especially for high-volume procedures including ACLR.[33] Some investigators have found that higher patient expectations preoperatively have been associated with more dissatisfaction postoperatively.[15,20,21,34] These studies collectively have emphasized the importance of setting realistic expectations preoperatively with patients. Often, these can be difficult discussions to have because the planned procedure may only have a limited ability to return patients to their former functional status. No treatment is infallible or without risks; thus an adequate discussion must take place between the patients and their surgeons to ensure all parties have a full understanding of both the treatment options and the prognosis of those options. This information is important for patients to have preoperatively to make an appropriately informed decision on whether or not to pursue operative treatment. Medicine has evolved over the past century from a "paternalistic" approach to patient care toward a patient-centered model wherein patients serve as active participants in determining treatment plans and are empowered to ask questions, educate themselves, and ultimately gain a better understanding of their care, which directly influences their expectations.[35,36]

In a prospective cohort study of 181 patients undergoing either primary or revision ACLR surgery, Feucht et al.[33] administered a 5-item questionnaire designed to assess patient expectations and determine what factors are associated with those expectations. The authors reported that after surgery and suggested rehabilitation, patients expected a normal (38%) or nearly normal (62%) condition of their surgical knee. In addition, 98% of patients expected little to no increased risk of the development of osteoarthritis after ACLR. However, the most interesting findings of Feucht et al. were that the revision ACL cohort had significantly lower expectations than patients undergoing primary ACLR and that patients with higher preinjury activity levels had higher expectations for surgery.

Relation Between PROs and Satisfaction

Recently, investigators have sought to better elucidate specific demographic, preoperative, and operative factors that significantly influence outcomes and satisfaction. In a seminal study seeking to understand what the determinants of patient satisfaction after ACLR are, Kocher et al.[10] conducted a prospective cohort study of 201 patients undergoing primary ACLR with a minimum of 2-year follow-up. The authors used a patient-reported ordinal grading scale from 1 to 10 to quantify satisfaction as the dependent variable and performed univariate and multivariate analysis across demographic, injury/preoperative, surgical, and postoperative data points to identify determinants of satisfaction. They reported no significant difference in demographic variables, most surgical variables, and many objective variables at follow-up. However, significant correlations were discovered between a few specific operative findings and postoperative findings and lower patient satisfaction (Table 1). These results reinforce the findings of a study by Sernert et al.[37] in 527 patients at an average 38-month follow-up, in which the strongest correlations of patient satisfaction were subjective measures such as pain, a sense of instability, and Lysholm score. Furthermore, Williams et al.[8] and Muneta et al.[38] reported strong correlations between patient-derived subjective knee rating scores and patient satisfaction in ACLR cohorts of 130 and 97 patients, respectively. Overall, these studies emphasize that specific surgical, subjective, and objective variables such as pain, swelling, knee locking, and concomitant meniscal injury are associated with patient satisfaction.

Table 1. Summary of Clinician Pearls: Common Patient Knowledge Deficits, Patient Concerns Leading Into Surgery, Patient Expectations for Surgical Outcomes, and Predictors of Poor Patient Satisfaction

Common Public Knowledge Deficits[32]	Primary Concerns With Surgery[32]	Expectations of Surgical Outcome[33]	Predictors of Poor Satisfaction[10,37]	Variables Not Significantly Affecting Satisfaction[10]
Women have a higher incidence of injury	Return to sport	Return to normal or nearly normal condition	Operative findings: lateral meniscal tear, osteophytes, lack of plica excision	Demographic characteristics: age, gender, chronicity, duration of FU
ACLR does not decrease risk of knee OA	Risk of OA	No increased risk of OA	Postoperative findings: persistent pain, swelling, locking, stiffness	Surgical variables: type of ACL graft; status of medial meniscus; PCL, LCL, and/or MCL status; arthrosis grade
Less active patients have weaker knowledge base		Expectations lower if revision ACLR	Flexion contracture, medial JLT	Objective postoperative variables: thigh girth, passive flexion, KT-1000 (MEDmetric) maximum difference, Lachman grade, reverse pivot shift, posterior drawer/sag, valgus/varus laxity, TTP around knee (not JLT)

ACL, anterior cruciate ligament; ACLR, anterior cruciate ligament reconstruction; FU, follow-up; JLT, joint-line tenderness; LCL, lateral collateral ligament; MCL, medial collateral ligament; OA, osteoarthritis; PCL, posterior cruciate ligament; TTP, tenderness to palpation.

Knowledge of these factors can be used by treating physicians when counseling patients to ensure the highest satisfaction for their patients.

Understanding and addressing patient-specific concerns and goals for treatment are essential to achieve a successful outcome from the patient's perspective. Often, patients have numerous questions regarding rehabilitation and postoperative management including use of a brace, progression of weight bearing, and postoperative pain management. In these instances, it can be helpful to have clearly defined, simple online materials including videos and pictures and/or physical handouts complete with pictures to provide to patients, in addition to counseling during preoperative office visits. Many patients find it difficult and overwhelming to understand and retain much of what they are told in physicians' offices; therefore, the use of quality, straightforward education materials written at the sixth-grade reading level or below should be an essential part of every orthopaedic surgeon's practice. More work still needs to be done on this important topic to further elucidate what presentation of materials and communication tools patients find most useful and improve outcomes going forward. Specifically, future work investigating PROs, including patient satisfaction, after ACLR should include an investigation of preoperative patient expectations and its influence on postoperative PROs.

Conclusions

Patients generally have a poor understanding of ACL injury, surgery, and factors that influence their prognosis. These patients often obtain information from the Internet that is highly variable and of questionable quality. PROs and patient satisfaction are highly correlated after ACLR surgery, but many preoperative, operative, and postoperative factors can affect patient satisfaction. Patients' understanding of their injury, treatment options, and prognosis directly influences their expectations for their care. Clinicians can have a positive impact on PROs and satisfaction by spending time with their patients, using electronic communication technologies, and ensuring each patient feels fully informed about what to expect.

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