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Greater patient confidence yields greater functional outcomes after primary total shoulder arthroplasty

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Background: Patient satisfaction is increasingly being tied to reimbursement rates, and patient satisfaction is often associated with improving functionality and decreasing disability postoperatively. This study sought to determine if a total shoulder arthroplasty patient's preoperative confidence in his or her ability to attain the level of activity desired would influence postoperative functional scores.

Materials and methods: Patients undergoing a primary total shoulder arthroplasty at a single institution were asked to complete a preoperative questionnaire with multiple items including baseline symptom severity measures and their confidence in reaching their level of desired functionality postoperatively (scored 0-10). Patients then completed an identical postoperative questionnaire at their follow-up visits. Associations between the patient's confidence in attaining treatment goals and functional outcomes was established by multiple linear regression models that were adjusted for gender, age, body mass index, baseline 12-Item Short Form Health Survey mental component scores, college education, smoking status, baseline functional scores, and length of follow-up.

Results: Patients had a high level of confidence that their outcome would match their expectations, with an average score of 7.8 (range, 0-10; 28.4% reported a full 10/10 confidence). For every 1-point increase in confidence, patients experienced an average increase in their function score of 2.7 points ($P = .039$) and improvement in their pain score of 2.0 ($P = .033$) according to the Penn Shoulder Score. There was no significant association with the patient's 12-Item Short Form Health Survey score postoperatively.

Conclusions: Patients with greater preoperative confidence actually have significantly better postoperative functional outcomes than their less confident peers even with adjustment for other known risk factors.

Level of evidence: Level I, Prospective Design, Prognosis Study.

Keywords: Confidence; function; outcomes; predictors; total shoulder replacement; joint arthroplasty

Total shoulder arthroplasty (TSA) can be expected to provide dramatic improvement in pain, function, and satisfaction for many patients.[7,8,23,27] Patient expectations have been increasingly linked to treatment outcomes, with positive expectations being associated with better outcomes and greater patient satisfaction.[12,16,19] Subjective measures

The Institutional Review Board of the Cleveland Clinic approved this study: No. 13-537.

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have greater correlation with patient satisfaction than objective measures after a TSA.[11] Postoperative patient-reported outcomes are affected by a variety of psychosocial factors, though, including the patient's expectations, sense of self-efficacy, and mental health.[2,26,29,31] For example, a history of depression or anxiety has been associated with less improvement of patient-reported outcomes and lower satisfaction.[9,28] Most of the research elucidating the relationship between functional outcomes and the arthroplasty patient's mental health or other psychosocial factors is obtained from the total hip and total knee arthroplasty literature.

The association between patients' confidence and outcomes after shoulder arthroplasty is not as well established. The aim of this study was to determine if there is an association between a TSA patient's preoperative confidence in his or her ability to attain a desired postoperative functional level and the patient's actual functional outcome or diminished symptoms by improvement in the patient's self-reported subjective scores postoperatively. The primary hypothesis of the study was that patients more confident in attaining their postoperative functional goals would actually have better functional outcomes and decreased symptoms.

Materials and methods

A consecutive series of patients undergoing primary TSA at a large health care system were asked to complete a questionnaire while awaiting their preoperative consultation visit with an orthopedic surgeon. The questionnaire was self-administered and contained numerous standardized surveys, including the global 12-Item Short Form Health Survey (SF-12), version 2, and the Penn Shoulder Score (PSS).[14,30] In addition to the standardized scales, patients were asked the level of functional activity they expected to achieve after their TSA on an ordinal scale of 5 items: perform self-care, work outside the house, perform light exercise, perform heavy exercise, or participate in sports. The patients were then asked on a scale of 0 to 10 to rate their level of confidence in their ability to attain their desired level of postoperative functionality. All of these data were collected as part of routine clinical practice in the orthopedic surgery department.[3] Patients were observed for a minimum of 6 months postoperatively as this was a time point at which a large portion of the patients' functional recovery would be achieved; only the most recent follow-up scores were used in the analyses.

Inclusion criteria for the study included the patient's undergoing a primary unilateral TSA between January 2008 and December 2010. Exclusion criteria included having had another surgery within 3 months before or after the index shoulder arthroplasty procedure, having not completed a baseline questionnaire within 6 months before the index shoulder arthroplasty surgery, and not completing a single follow-up questionnaire postoperatively.

The primary outcome of interest was the patient's postoperative functionality as assessed by 3 standardized measures: the PSS function subscore; the PSS pain subscore; and the SF-12, version 2, general health-related quality of life physical component summary (PCS) score. The PSS score is a percentage of available points such that scores range from 0 to 100, with a higher score indicating higher function and less pain.[14] The SF-12 is likewise scored from 0 to 100, with 100 indicating greater function.[30] The SF-12 is normalized to a median score of 50 with a standard deviation of 10 points.

The primary independent predictor of the patient's outcome was his or her baseline confidence in attaining the desired postoperative level of functionality (scored 0-10). The models also adjusted for a variety of variables known to affect a patient's functionality, including gender, age at the time of surgery, baseline body mass index (BMI), smoking status, education level (college degree or not), baseline SF-12 mental component summary (MCS) score, baseline functionality score (PSS function subscale score or PCS, depending on the model), and length of the patient's follow-up at the time of completing the postoperative questionnaire.

Statistical analysis

The patients' scores on the functional outcomes measures were analyzed with multiple multivariable linear regression models. All of the models analyzed the effect of the patient's preoperative confidence while controlling for the effects of the patient's age, gender, BMI, smoking status, education level, baseline score on that outcome, baseline MCS score on the SF-12 global health survey, and length of follow-up at the time the survey was completed. The statistics were performed with Stata SE (version 10; StataCorp, College Station, TX, USA).

Results

Of 467 eligible patients who underwent a primary TSA, follow-up data beyond 6 months postoperatively were available for 436 patients (93.4%). Slightly more than half of the patients were male (55.5%), the average age was 66 years, and the average BMI was 30.1 (Table I). Patients were ambitious in their postoperative physical goals, with more than half of patients hoping to attain at least light exercise. Most patients were very confident in achieving their desired level of physical activity. The average confidence score was 7.8 (of 10), with 28.4% reporting complete confidence (10 of 10).

Patients made dramatic improvements in their subjective health measures between their preoperative and postoperative scores. The PSS subscales were more sensitive to the improvements the patients experienced in their shoulder pain and function; as a result, the magnitude of change in the scales was much greater in the shoulder-specific scales than in the global health SF-12 score. Patients increased their PSS function subscale scores on average from 26.3 to 74.1 and their pain subscale scores from 37.8 to 80.4 (Table II). By contrast, the improvement in their SF-12 scores was more modest, from 36.0 to 40.6.

The patients' confidence scores were significantly associated with the amount of improvement in their postoperative functionality (Table III), despite adjustment for gender, age, BMI, SF-12 MCS score, college education,