



Joint perception and patient perceived satisfaction after total hip and knee arthroplasty in the American population

Matthew Varacallo^{a,*}, Rajit Chakravarty^a, Kevin Denehy^a, Andrew Star^b

^a Drexel University College of Medicine, Department of Orthopaedic Surgery, University Orthopaedic Institute, 245 N. 15th Street, MS 420, Philadelphia, PA 19102, United States

^b Division of Orthopaedic Surgery, Rothman Institute at Abington-Jefferson Health, Willow Grove, PA, United States

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ABSTRACT

Background: Total hip (THA) and knee arthroplasty (TKA) are two of the most successful procedures in orthopedics. Current evaluation trends focus on patient-reported outcomes. We sought to compare the changing WOMAC scores from various time points from pre-operative to 1-year follow-up between separate THA and TKA cohorts. In addition, we compared THA and TKA patients' joint perception, satisfaction, and function via a questionnaire.

Methods: One hundred elective THA (n = 50) and TKA (n = 50) patients at one institution were randomly selected and contacted between 2 and 4 years after the index surgery. A questionnaire assessed joint perception, satisfaction and function of their total joint. Clinical function scores utilizing the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) from the pre-operative, 3-month and 1-year post-arthroplasty visits were compared between groups.

Results: 78% of the THA group perceived their replaced joint as "native" vs 32% of TKA patients. 54% of THA patients (vs 16% of TKA patients) reported uninhibited function of their total joint. 24% of TKA patients noted to be least satisfied with their total joint compared to 2% in the THA group. Both groups demonstrated significant improvement in WOMAC scores after surgery, but the mean 3-month (12.4 (THA) vs 19.3 (TKA)) and 1-year (6.5 (THA) vs 14.1 (TKA)) follow-up WOMAC scores were significantly better in the THA group.

Conclusion: Evaluation of a patient's joint perception is a valuable tool that should be used to assess function in conjunction with validated clinical functional scores. Our data suggest further improvements in total knee implant design and implantation strategies are necessary.

1. Introduction

Total hip and knee arthroplasty (THA/TKA) are regarded by the medical community as two of the most successful life altering procedures available for patients^{1,2}. There are many ways to evaluate the success of these procedures including implant survival, complications, revision rates, and patient reported outcomes measures (PROMs)³.

Historically, the surgeon was the main judge in determining the success of a total joint arthroplasty (TJA) procedure^{4,5}. This evolved into the traditional era of measuring clinical success by the achievement of various benchmark parameters such as full range of motion and independent ambulation while remaining free from post-operative complications^{6,7}.

In the last few years, there has been a dramatic shift in clinical evaluation parameters across the entire healthcare industry. Patient

satisfaction data are now being directly tied to compensation⁸ and every subspecialty field has started to acknowledge this critical component in its evaluations. Studies in TJA outcomes have noted up to 10% of THA patients^{2,9,10} and 15–30% of TKA patients^{11–13} report dissatisfaction following elective surgery. Perhaps even more concerning, Harris et al. reported on the discordance between patient and surgeon satisfaction after THA and TKA, highlighting the need for TJA surgeons to consider patient reported outcomes as a critical element in the overall success of the procedure¹⁴.

The correlation between patient satisfaction and joint specific outcome scores has been well documented¹⁴. The Western Ontario and McMaster University Osteoarthritis Index (WOMAC) has been extensively utilized and remains a very reliable joint specific outcome score that has been shown to be responsive to change over time^{15,16}. In addition, it is one of the most widely used PROMs in the setting of THA

* Corresponding author.

E-mail addresses: matt.varacallo@tenethealth.com (M. Varacallo), rajit.chakravarty@tenethealth.com (R. Chakravarty), kevin.denehy@louisville.edu (K. Denehy), Andrew.Star@RothmanInstitute.com (A. Star).

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and TKA¹⁷ as it covers 24 total items across elements of pain, stiffness, and function¹⁶. In addition to WOMAC scores, patient reported joint perception following TJA has become a critical component in outcome measures¹⁸. Several authors have demonstrated that patients reporting their artificial joint as “natural” as opposed to “artificial” are more likely to report higher rates of satisfaction and have higher outcome scores⁴.

The purpose of this study was two-fold: First, we sought to investigate and compare the changing WOMAC scores from various time points from pre-operative to 1-year follow-up in separate THA and TKA cohorts. Second, utilizing a basic questionnaire, we compared post-operative patient-reported total joint perception, satisfaction rates, and function following THA and TKA.

2. Methods

Approval was obtained from the Institutional Review Board (IRB) prior to conducting this study. We identified all patients that underwent a primary elective THA or TKA from 2009 to 2011 by a single surgeon at a single institution. We excluded bilateral TJA patients, any cases associated with other procedures, and any TJA procedure that was not elective (i.e. traumatic). Fifty patients were selected at random from each of the elective THA and TKA groups, yielding 100 patients in total. These patients were contacted by phone by an orthopedic resident between 2- and 4-years out from their procedure and each was asked to answer a questionnaire assessing their joint perception, satisfaction and function after undergoing the replacement (Table 1). In terms of patient satisfaction, the questionnaire asked each patient to rate his or her level of satisfaction on a scale of 1–10. Lower scores (=1–6) were associated with some level of patient dissatisfaction while higher scores (=7–10) were considered “overall satisfied” with the TJA.

Additionally, clinical function scores using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) from the pre-operative visit as well as the 3-month and 1-year post-operative follow-up time points were compared between the THA and TKA groups. The overall scores were compared in addition to the magnitude of score changes from the pre-operative period to each of the follow-up time points (Fig. 1). In addition, the post-operative time points were compared to one another (Fig. 1).

The two groups were compared using the Student *t*-test and the chi-square test for continuous and categorical variables, respectively. Distribution parameters (means, standard deviations (SDs), frequencies, and proportions) were used to describe the study patient sample. Patient demographics (age, gender, BMI) and clinical variables (ASA scores and tourniquet times) were collected from individual chart reviews (Table 2). Data were analyzed using SPSS Statistical Software (IBM Corporation 2012, Somers, NY, USA).

Table 1
Patient questionnaire assessing total joint perception, satisfaction, and function.

Questions	Answer Choices
Question 1: “How do you perceive your hip or knee after undergoing total hip or knee replacement?”	#1: Like a native or natural joint #2: Like an artificial joint with no restriction #3: Like an artificial joint with minimal restriction #4: Like an artificial joint with major restriction #5: Like a nonfunctional joint
Question 2: “How do you rate your satisfaction after undergoing the total joint arthroplasty on a scale from 1 to 10?”	A score of 1 indicating the worst possible and a score of 10 indicating the best possible result
Question 3: “How would you rate the function of your joint after replacement?”	#1: I can do anything #2: I can do most things #3: I feel limited #4: I feel severely limited

3. Results

The mean ages were similar between the TKA and THA cohorts (67.12 +/- 8.6 years and 63.14 +/- 8.7 years, respectively; *p* = 0.226) (Table 2). By comparison, the TKA cohort was comprised of more females (72% vs 38%, *p* < 0.001), had higher ASA scores (*p* = 0.008), and mean BMI values were higher (31.6 +/- 7.2 vs 28.7 +/- 4.5, *p* = 0.02) than the THA cohort (Table 2).

Both the THA and TKA groups were found to have a similar mean pre-operative WOMAC scores of 46.8 and 45.9, respectively (*p* = 0.832, Fig. 1). However, the mean 3-month and 1-year post-arthroplasty WOMAC scores were significantly better in the THA group (12.4 and 6.5, respectively) compared to the TKA group (19.3 and 14.1, respectively) at both time points (*p* = 0.014 and *p* = 0.047, respectively) (Fig. 1). The relative changes in WOMAC scores from the pre-operative to each of the post-operative visits, 3-month (“D1”) and 1-year (“D2”), favored greater relative score changes in the TKA group, but this difference did not reach statistical significance (Fig. 1). Likewise, the relative change between the 3-month and 1-year post-operative visits (“D3”) were also similar between cohorts (Fig. 1).

78% of the THA group perceived their replaced joint as a “native/natural” joint with no restriction vs 32% of the patients in the TKA group (*p* = 0.003, Fig. 2). Furthermore, 46% of the patients who underwent TKA reported their perception of some level of restriction in their artificial joint compared to just 12% reporting restriction in the THA cohort (*p* = 0.002, Fig. 2).

With respect to patient satisfaction, 24% of the TKA cohort expressed some level of dissatisfaction compared to just 2% of patients undergoing THA (*p* = 0.003, Fig. 3). 98% of THA patients were “overall satisfied” with their surgery (Fig. 3).

54% of THA patients reported uninhibited function (“I can do anything”) in response to the questionnaire compared to only 16% of the TKA cohort (*p* = 0.002, Fig. 4). Almost one-third of TKA patients reported some level of limitation in function (Fig. 4). Patients’ perception and self-reported satisfaction and function scores corroborated with their WOMAC clinical function scores.

4. Discussion

THA and TKA remain two of the most successful, cost-effective orthopedic procedures¹⁹. As volume and popularity continue to increase, TJA surgeons are challenged to improve results in terms of PROMs and patient satisfaction rates after surgery^{12,15}. While we still lack a generalized definition of success following TJA, several clinical variables have been shown to play important roles in TJA outcomes. Some of these variables are system-based (e.g. hospital and/or surgeon case volumes) while many are patient-related (e.g. socioeconomic status, medical comorbidities, and preoperative patient expectations)^{11, 20–22}. There has been a trend in the literature focused on assessing the

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