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Patient-perceived surgical indication influences patient expectations of surgery for degenerative spinal disease

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ABSTRACT

Objective: Patients frequently have misconceptions regarding diagnosis, surgical indication, and expected outcome following spinal surgery for degenerative spinal disease. In this study, we sought to understand the relationship between patient-perceived surgical indications and patient expectations. We hypothesized that patients reporting appendicular symptoms as a primary surgical indication would report a higher rate of having expectations met by surgery compared to those patients reporting axial symptoms as a primary indication.
Methods: Questionnaires were administered to patients who had undergone surgery for degenerative spinal disease at 2 tertiary care institutions. Questions assessed perception of the primary indication for undergoing surgery (radicular versus axial), whether the primary symptom improved after surgery, and whether patient expectations were met with surgery. Outcomes of interest included patient-reported symptomatic improvement following surgery and expectations met by surgery. Various factors were assessed for their relationship to these outcomes of interest.
Results: There were 151 unique survey respondents. Respondents were nearly split between having a patient-perceived indication for surgery as appendicular symptoms (55.6%) and axial symptoms (44.4%). Patient-perceived surgical indication being appendicular symptoms was the only factor predictive of patient-reported symptomatic improvement in our logistic regression model (OR 2.614; 95% CI 1.218–5.611). Patient-perceived surgical indication being appendicular symptoms (OR 3.300; 95% CI 1.575–6.944) and patient-reported symptomatic improvement (OR 33.297; 95% CI 12.186–90.979) were predictive of patients reporting their expectations met with surgery in both univariate and multivariate logistic regression modeling.
Conclusions: We found that patient-reported appendicular symptoms as the primary indication for surgery were associated with a higher rate of both subjective improvement following surgery and having expectations met by surgery. Studies such as ours point to the fact that while performing technically superlative operations is paramount, it may be equally important to address other factors that help determine patient perception of the surgery experience.

1. Introduction

Recently, various strategies have been implemented to work toward quality improvement in health care. One of these strategies is known as Pay-for-Performance, in which payments for health care are tied to performance and outcomes [1]. While at a fundamental level this strategy is straightforward, the assessment of performance is complicated, particularly in determining which measures define surgical success. Pay-for-Performance does, how-

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ever, incorporate several facets of the patient experience, including subjective patient satisfaction, to measure clinical outcomes [1]. As patient satisfaction is increasingly used to assess surgical outcomes by both payers and those assessing surgeon performance, patient counseling, along with setting and managing patient expectations of surgery, are increasingly important [2]. This is true because despite preoperative counseling, patient perception of the indications for and expected outcomes of spinal surgery can vary. In addition, patients frequently have misconceptions regarding spinal surgery, particularly related to the value of radiologic studies as well as the risk and effectiveness of various surgical interventions [3]. Given that spine surgery is often performed for quality-of-life indications, it makes sense that patient satisfaction be included as an important outcome metric. However, it is not clear which factors go into generating patient satisfaction aside from the technical success of surgery.

Given that patient expectations have been linked to patient satisfaction, patient misconceptions can clearly impact patient satisfaction [4–6]. What is not clear is the degree to which patients understand the indications for the surgical interventions they are undergoing and how these patient-perceived surgical indications affect patient expectations and satisfaction. In this novel study, we sought to understand (1) the indications for spinal surgery as perceived by the patient, and (2) the relationship between the outcomes after spinal surgery associated with particular patient-perceived surgical indications and whether the post-surgical patient expectations were met. We hypothesized that patients reporting appendicular symptoms as the primary surgical indication would report a higher rate of having expectations met by surgery compared to those patients reporting axial symptoms as the primary indication.

2. Methods

This study was approved by the Institutional Review Boards at the two participating hospitals. We began with all patients with spinal pathology presenting to spine clinic between December 1, 2013 and August 1, 2015, and seen by one neurosurgeon at either of the participating hospitals. We excluded all patients who had not already had a surgical intervention. Next, we excluded all patients who had undergone surgical intervention for a non-degenerative pathology (e.g., tumor, trauma, infection), leaving all patients who had undergone spine surgery for cervical/thoracic/lumbar disc disease or stenosis (degenerative spine disease). The study was explained to these remaining patients, and they were asked to participate by filling out a questionnaire. All patients who agreed to participate were included in the study. Patients were administered a standard questionnaire (Fig. 1). Only questionnaires filled out completely and according to the instructions were included. If patients presented on multiple dates and filled out the questionnaire on multiple occasions, only the questionnaire completed at latest follow-up visit was included. Each patient who filled out at least one questionnaire was considered a unique survey respondent.

Outcomes of interest were patient-reported symptomatic improvement following surgery, and patient-reported expectations met by surgery. Various factors were assessed for their relationship to these outcomes of interest.

Variables of interest included responses to the questionnaire and demographic data abstracted from the medical record including age, sex, duration of follow-up, and operation performed. Follow-up time was considered time from operation until the date the questionnaire was administered.

Statistical analysis was performed using commercially available software (SPSS version 22; IBM Corporation, Somers, NY). Student *t* test (continuous variables) and chi-square test or Fisher exact test (categorical variables) were used to compare differences in groups partitioned by the outcomes of interest. Univariate and multivariate logistic regression modeling was used to evaluate factors for their ability to predict the outcomes of interest. We planned a priori to include all significant variables from univariate analysis with $p < 0.05$ in our multivariate analysis. For all tests, p-value < 0.05 was considered statistically significant.

Table 1
Descriptive statistics for survey respondents.

Patient Characteristics	No. Patients
Unique respondents	151
Surgery type	
Back	110 (72.8%)
Neck	41 (27.2%)
Surgery indication	
Appendicular symptoms	84 (55.6%)
Axial symptoms	67 (44.4%)
Sex	
Male	68 (45.0%)
Female	83 (55.0%)
Age (yrs) at surgery, median (IQR)	53 (23)
Follow-up (mos), median (IQR)	7 (35)
Surgery met expectations	108 (71.5%)
Subjective improvement	114 (75.5%)
Institution	
Michigan	114 (75.5%)
University of Missouri-Kansas City	37 (24.5%)

Table 2
Comparison of factors between those patients reporting subjective improvement in symptoms and those reporting no improvement.

Factor	Improved	Not Improved	p-Value
Surgery indication			0.012
Appendicular	70 (83.3%)	14 (16.7%)	
Axial	44 (65.7%)	23 (34.3%)	
Expectations met			<0.001
Yes	101 (93.5%)	7 (6.5%)	
No	13 (30.2%)	30 (69.8%)	
Surgery performed			0.144
Decompression only	65 (80.2%)	16 (19.8%)	
Decompression and fusion	49 (70.0%)	21 (30.0%)	
Sex			0.898
Male	51 (75.0%)	17 (25.0%)	
Female	63 (75.9%)	20 (24.1%)	
Age (yrs), median (IQR)	49 (28)	48 (25)	0.648
Follow-up (mos), median (IQR)	7 (73)	15 (81)	0.470

3. Results

During the study period, there were 151 unique survey respondents. Table 1 demonstrates the baseline characteristics of the cohort. The majority of respondents underwent back surgery (72.8%). Interestingly, the respondents were nearly split between having a patient-perceived indication for surgery as appendicular symptoms (55.6%) and axial symptoms (44.4%). The median age at surgery was 53 years and the median follow-up duration at the time of survey response was 7 months. The majority of patients were seen at one of the participating hospitals. Overall, approximately 3 out of every 4 patients reported having symptomatic improvement and the same number reported having their expectations met with surgery.

Table 2 compares factors analyzed between those patients reporting subjective symptom improvement and those that did not report symptom improvement. There was a significant difference in patient-perceived indication for surgery between those that