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Predictors of goal achievement in patients undergoing hysterectomy

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ABSTRACT

Objective: The primary objective of our study was to identify predictors of goal achievement in patients undergoing simple hysterectomy for benign indications. We also sought to describe the goals of patients in this population.

Study Design: This was a prospective cohort study of patients undergoing hysterectomy for benign indications performed at a single academic institution. We documented patient-reported goals of treatment prior to undergoing hysterectomy in 57 patients, and assessed goal achievement and other patient-centered outcomes three months after surgery in 47 of the patients (82.5%). We compared patients who met all of their goals to those who did not, and used multivariate regression to identify predictors of goal achievement. We also characterized the general profile of goals for patients undergoing hysterectomy.

Results: We identified the primary surgical diagnosis of abnormal uterine bleeding (OR 6.5, 1.7–30.1, p = 0.006), as well as an increased feeling of being prepared for postoperative discharge (OR 11.9, 2.1–104.4, p = 0.005), to be independent predictors of patient goal achievement. Goal achievement was correlated with other patient-centered outcomes, including a higher sense of satisfaction and greater patient global impression of improvement. Goals related to symptoms were more commonly stated and more commonly achieved than functional goals.

Conclusion: Goal achievement in patients undergoing hysterectomy depends on the preoperative diagnosis and the patient's feeling of preparedness for postoperative discharge. Goal achievement should be considered as a useful patient-centered outcome. Patients undergoing hysterectomy have a unique profile of goals which should be considered and addressed in preoperative counseling.

Introduction

Hysterectomy is one of the most commonly performed procedures for women [1], experienced by 1 in 9 women during their lifetime [2]. Over 4 hysterectomies are performed annually. The most common indications for hysterectomy are leiomyoma, followed by abnormal uterine bleeding, endometriosis, and pelvic organ prolapse [1–3]. Given that treatment for these conditions is aimed at improving quality of life, knowledge pertaining to the patient's goals for her care and her perception of successful treatment is crucial for effective counseling and to maximize patient satisfaction.

Study of patient-centered outcomes in hysterectomy is largely limited to comparison of questionnaires before and after surgery. Patients who have previously underwent hysterectomy report high levels of satisfaction and improvement in symptoms [4]. Comparison of symptom questionnaires before and after surgery reveal improvement in symptoms, self-perceived health, and quality of life indices [5–8].

Several studies have evaluated goal achievement in patients undergoing surgery for pelvic organ prolapse and urinary incontinence, providing a significantly better understanding of patient-centered outcomes. Patient satisfaction after surgery for prolapse was observed to be more highly correlated with goal achievement than objective cure of prolapse [9], and decreasing patient satisfaction one year after surgery was strongly associated with decreasing goal achievement [10]. Goals are more likely to be met in patients undergoing surgical versus conservative management of prolapse [11], and goals related to symptoms are more common and more likely to be met than functional goals [12].

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The primary objective of this study was to identify predictors of goal achievement in patients undergoing simple hysterectomy for benign indications. The secondary objective was to describe the general profile of patient goals in this population in order to gain better insight into our patients' personal motivations and expectations surrounding hysterectomy.

Materials and methods

This study was approved by the Institutional Review Board at University Hospitals Cleveland Medical Center (Cleveland, OH, USA), and registered at ClinicalTrials.gov (Identifier: NCT02621710). We conducted a prospective cohort study including women undergoing hysterectomy for benign indications. All patients signed an informed consent prior to participation. Patients were recruited between March 2016 and January 2017 and followed up for three months after surgery. Women over the age of 18 undergoing hysterectomy for benign indications were included. Women were excluded if they underwent emergent hysterectomy or if they would not be able to complete postoperative follow up via telephone. Patients were recruited based on investigator availability and ability to contact patient prior to surgery.

All patients completed a preoperative goals assessment within one week prior to surgery, and completed standardized postoperative follow-up via telephone approximately three months after surgery. Demographics, clinical characteristics and perioperative details were collected from the medical record. We assessed age, race, BMI, parity, menopausal status, primary and secondary indications for surgery, prior treatment history, concomitant procedures, route of hysterectomy, perioperative complications, length of stay, and pathology results.

Within one week prior to surgery, patients were asked to list one to three goals they hoped to achieve in undergoing hysterectomy. This was an open-ended question in order to limit influence on patient answers. Patients either stated or wrote their goals, depending on preference. One investigator independently categorized goals as symptomatic (bleeding, pain or discomfort, bowel symptoms, urinary symptoms) or functional (related to overall health and well-being, quality of life, safety and recovery concerns, and removal of unwanted organs (Fig. 1). This categorization of goals was modified from that of Pilzek et al, who categorized goals of patients undergoing pelvic organ prolapse surgery as either symptomatic or functional in nature [12].

All patients were contacted via telephone three months after surgery to complete a standardized postoperative assessment, which was modified based on the assessment performed by Elkadry et al. in evaluating goal achievement and satisfaction surrounding incontinence surgery [9]. Our postoperative assessment is detailed in Fig. 2. Patients were asked to assess achievement of each of their goals on a 1–5 Likert scale. They were also asked to assess other patient centered outcomes including pain control, perceived preparedness for surgery and postoperative discharge, and patient satisfaction. Global assessment was made via the Patient Global Impression of Improvement (PGI-I).

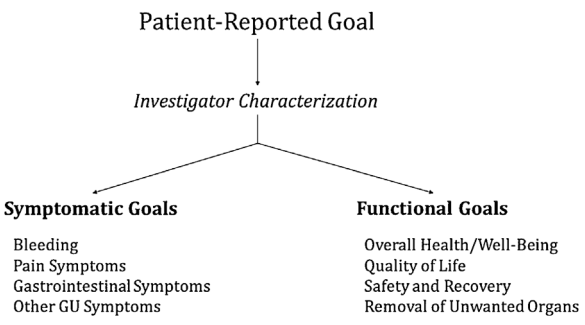

Fig. 1. Categorical characterization of patient-reported goals.

The primary outcome of the study was to determine factors associated with complete goal achievement at three months. Patients were grouped in a binary fashion based on complete goal achievement, which was defined as a score of 5 on the goal achievement Likert scale for all goals provided by the patient. Patient-reported goals were described by categorization of the preoperative goals and comparing post-operative goal achievement.

Means and standard deviations were used to present continuous variables with normal distribution while medians and ranges were used in skewed data. Categorical variables were presented as counts and percentages. Baseline characteristics were compared using *t*-test or Wilcoxon sum rank test for continuous variables according to the distribution, while Pearson $\chi 2$ test or Fisher exact test were used for comparison of categorical variables, accordingly. Logistic regression modeling was used to adjust for potential confounders. Adjusted odds ratios were used to identify independent predictors of complete goal achievement. All statistical analyses were two-sided with $p < .05$. Statistical analysis was performed using JMP statistical software (SAS Institute Inc, Cary, North Carolina, United States).

Results

Between March 2016 and January 2017, 62 patients were approached to join the study. The patients were selected based on investigator availability. A total of 57 patients were enrolled into the study and provided goals, and 47 of 57 (82%) completed postoperative follow-up. Ten patients were not able to be reached via telephone after three attempts.

Clinical and demographic characteristics are presented in Table 1. There was no difference in age, race, BMI and menopausal status between the two groups. The most common indications for hysterectomy were abnormal uterine bleeding (59.6%) and pelvic pain (25.5%), followed by pelvic organ prolapse (8.5%) and fibroids alone (6.3%). The most common routes of hysterectomy were laparoscopic (68%) and vaginal (17%). The most common perioperative complications were related to infection, blood transfusion, and urinary retention. The median length of stay was 1 day (1–5), and 39 patients (83.0%) stayed two days or less.

The primary outcome of the study was complete goal achievement, meaning the patient reported meeting all of her goals with a score of 5. All goals were met in 26 out of 47 patients (55.3%, 95% CI of 42.2–71.7%), and 21 patients (44.7%, 95% CI of 30.2–59.9%) did not meet at least one goal. Mean goal achievement score was 4.6 ± 0.7. Mean Likert score for maximum pain level was 2.7 ± 1.4, maximum fatigue was 2.9 ± 1.4, maximum depression was 1.9 ± 1.3, preparedness for surgery was 4.5 ± 0.9, and preparedness for postoperative discharge was 4.4 ± 1.1. Mean satisfaction was 95.8% $\pm$ 11.1, and mean PGI-I was 6.7 ± 0.7.

When comparing the patients with complete goal achievement with those who did not, those who achieved all goals were significantly more likely to have a primary diagnosis of AUB (OR 3.6, 1.1–12.3, $p = .04$), a length of hospitalization of two days or less (OR 12.5, 2.0–112.3, $p = .01$) (Table 1), perceived preparedness for postoperative discharge of "prepared" or "very prepared" (OR 6.0, 1.1–33.0, $p = .03$), a maximum score of 7 on the PGI-I (OR 6.0, 1.1–33.0, $p = .03$), and significantly higher satisfaction scores (99.4% $\pm$ 2.2 vs 91.4% $\pm$ 3.4, $p = .03$) (Table 2). Basic demographic information, route of hysterectomy, and perioperative complications did not have a significant impact on the primary outcome of complete goal achievement (Table 1).

Personal goals: "My goal was achieved" (1 disagree strongly, 5 agree strongly)

Goal 1:

Goal 2:

Goal 3:

Maximum pain level (1 least severe, 5 most severe)

Maximum fatigue level (1 least severe, 5 most severe)

Maximum depression level (1 least severe, 5 most severe)

Preparedness for surgery (1 least prepared, 5 most prepared)

Preparedness for discharge (1 least prepared, 5 most prepared)

Percent satisfaction (0-100%)

PGI-I: "compared to before surgery, my current condition is" (1=very much worse, 4=the same, 7=very much better)

Fig. 2. Post-operative telephone assessment questionnaire template.

Table 1
Univariate analysis of clinical characteristics.

Clinical Characteristic	Met All Goals N = 26	Did Not Meet All Goals N = 21	OR (95%CI)	p
Demographics				
Age, y	46.0 ± 9.3	42.9 ± 7.5	–	.21‡
Caucasian	6 (23.1%)	8 (38.1%)	0.5 (0.1, 1.7)	.26
BMI, kg/m^2	31 (22-59)	29 (22-60)	–	.80†
Parity	2 (0-6)	3 (0-7)	–	.40†
Premenopausal	22 (84.6%)	18 (85.7%)	1.1 (0.2, 5.5)	.92
Surgical Indication				
AUB	19 (73.1%)	9 (42.9%)	3.6 (1.1, 12.3)	.04
Pelvic pain symptoms	5 (19.2%)	7 (33.3%)	0.5 (0.1, 1.8)	.33*
Fibroids	0 (0%)	3 (14.3%)	–	–
Pelvic Organ Prolapse	2 (7.7%)	2 (9.52%)	0.8 (0.1, 6.2)	1.00*
Surgical Approach				
Laparoscopic	19 (73.1%)	13 (61.9%)	1.7 (0.5, 5.7)	.41
Vaginal	5 (19.2%)	3 (14.3%)	1.4 (0.3, 6.8)	.72*
Abdominal	2 (7.7%)	5 (23.8%)	0.3 (0.05, 1.5)	.21*
Laparoscopic or Vaginal	24 (92.3%)	16 (76.2%)	3.8 (0.6, 21.7)	.12
Perioperative Details				
Experienced 1+ complication	6 (23.1%)	7 (33.3%)	0.6 (0.2, 2.2)	.43
Length of stay 2 days or less	25 (96.2%)	14 (66.7%)	12.5 (2.0, 112.3)	.01

Non-annotated P-values obtained via Pearson $\chi 2$.
* Fishers Exact.
‡ *t*-test.
† Wilcoxon sum rank.

Table 2
Postoperative follow up questionnaire results.

Survey Component	Met All Goals N = 26	Did Not Meet All Goals N = 21	OR (95%CI)	p
Maximum fatigue score (1-5)	2.6 ± 1.6	3.2 ± 1.0	–	.03
Maximum pain score (1-5)	2.3 ± 1.5	3.1 ± 1.2	–	.05
Maximum depression score (1-5)	1.7 ± 1.3	2.0 ± 1.3	–	.27
Prepared/very prepared for surgery	23 (88.5%)	17 (81.0%)	1.8 (0.4, 9.1)	.47
Prepared/very prepared for discharge	24 (92.3%)	14 (66.7%)	6.0 (1.1, 33.0)	.03
PGI-I = 7	24 (92.3%)	14 (66.7%)	6.0 (1.1, 33.0)	.03
% satisfaction	99.4 ± 2.2	91.4 ± 3.4	–	.03‡

PGI-I, Patient Global Impression of Improvement.
Non-annotated P-values obtained via Pearson $\chi 2$.
‡ *t*-test.

On multivariate logistic regression, patients who achieved all goals were more likely to have the primary diagnosis of AUB (aOR 6.5, 1.7–30.1, p = .006) as well as to feel "prepared" or "very prepared" for postoperative discharge (aOR 11.9, 2.1–104.3, p = .005) with an area under the curve for receiver operating characteristic (AUC-ROC) of 0.788 (Table 3).

All patients provided at least one preoperative goal for a total of 152 goals. The postoperative goal achievement assessment was completed for 124 of the goals (81.6%). The remaining 28 goals were of patients who were lost to follow up. Patients were more likely to have goals that were characterized as symptomatic (59.7%) compared to functional (40.3%) (OR 2.2, 1.3–3.6, p = .002). Rate of achievement of individual goals was 79.8%. Symptomatic goals were achieved 85.1% of the time, while functional goals were achieved 72.0% of the time (OR 2.23, 0.9–5.4, p = .07) (Table 4).

Of the 74 symptomatic goals, 29 were related to bleeding, 33 were related to pelvic pain and discomfort, 5 were related to bowel symptoms, and 7 were related to urinary symptoms. Goals related to bleeding were all achieved, and were significantly more likely to be achieved compared to the other goal categories (OR 21.3, 1.3–362.2, p = .001). Goals related to pain symptoms, bowel symptoms, or urinary symptoms were not significantly more or less likely to be achieved compared to all goal categories (Table 4).

Of the 50 functional goals, 21 were related to overall health and well-being, 13 were related to quality of life improvements, 11 were related to patient safety or recovery from surgery, and 5 were related to the removal of unwanted organs or concerning pathology. Goals related to overall health and well-being were achieved 57.1% of the time, which was significantly lower than all other goal categories (OR 0.2, 0.1–0.7, p = .007). Functional goals other than those related to overall health and well-being were not significantly more or less likely to be achieved compared to all goal categories (Table 4).

Conclusion

In our study, patients undergoing hysterectomy for the primary indication of AUB and those who felt more prepared for postoperative discharge were more likely to reach complete goal achievement. Patients who achieved all goals were significantly more likely to have a shorter hospitalization, and although not statistically significant, were more likely to have a laparoscopic or vaginal approach to their surgery. Patients were more concerned with symptomatic goals than functional goals. Goal achievement was strongly correlated with commonly used patient-centered outcomes of PGI-I score and patient satisfaction.

Limitations of our study include our small sample size. Although this may raise concerns regarding generalizability, it is the first study to prospectively identify patient goals and assess their achievement as a patient-centered outcome in this population. Furthermore, the women in our study were recruited from an urban tertiary care center and were similar in age and race. Desired goals and satisfaction with treatment may differ amongst populations and demographics. When calculating the power of this study based on the findings, the study had 80.4% power to test one study population with a dichotomous outcome utilizing type two error of 0.05, with an estimated incidence of complete goal achievement in this population to be 75%, considering our observed incidence of 57% complete goal achievement [13]. Additionally, survey data is susceptible to response bias, which we attempted to minimize by utilizing a validated tool in the PGI-I as well as a simple survey format that has been utilized in other studies [9].

To our knowledge, no other study has analyzed goal achievement as a patient-centered outcome in hysterectomy, or described patient goals in this population. Carlson et al. prospectively monitored patient symptoms and quality of life markers [5]. They noted an improvement in physical and psychological symptoms, as well as patient-reported indices of mental health, general health, and activity. The outcomes measured in our study were generated by patients, focusing on their own personal goals, in order to perform an individualized assessment. We confirmed the high rate in achievement of goals related to symptoms, but observed a lower rate of achievement of goals related to overall health and well-being. Weber et al. performed an individualized assessment by preoperatively asking patients undergoing hysterectomy to state the most important expected benefit of surgery [6]. Similar to our results for patient goals, approximately 59% of expected benefits were related to relief of symptoms. However, unlike our study model, post-operative follow-up to explore this issue further was not performed.

Our primary outcome was to identify independent predictors of goal achievement. Patients who achieved all of their goals were significantly more likely to have the diagnosis of AUB as the primary indication for surgery. Knowing which patients are more likely to achieve their goals for surgery based on their diagnosis

Table 3
Independent predictors of complete goal achievement after multivariate logistic regression.

Predictor	aOR (95%CI)	p
AUB Primary Diagnosis	6.5 (1.7, 30.1)	.006
Prepared/Very Prepared for Postoperative Discharge	11.9 (2.1, 104.3)	.005

Table 4
Characterization of patient goals.

Goal Characterization	Number of Goals (N = 124)	Rate of Achievement (%)	OR (95%CI)	p
Symptomatic Goals	74	85.1	2.2 (0.9, 5.4)	.07
Bleeding	29	100	21.3 (1.3, 362.2)	.001*
Pain symptoms	33	75.8	0.7 (0.3, 1.9)	.5
Gastrointestinal symptoms	5	80.0	1.0 (0.1, 9.5)	1.0*
Other GU symptoms	7	71.4	0.6 (0.1, 3.4)	.63*
Functional Goals	50	72.0	0.45 (0.18, 1.09)	.07
Overall health/well-being	21	57.1	0.2 (0.1, 0.7)	.007
Quality of life improvement	13	84.6	1.4 (0.3, 6.9)	.74*
Patient safety/recovery	11	72.7	0.6 (0.2, 2.6)	.69*
Removal of unwanted organs	5	100	3.0 (0.16, 55.5)	.37*

GU, genitourinary.
Non-annotated P-values obtained via Pearson $\chi 2$.
* Fishers Exact.

may be beneficial to patient counseling and expectation setting. Improving our ability to preoperatively predict which patients will achieve their goals may help clarify the risk to benefit ratio for providers and patients. We also found that patients who achieved all of their goals were significantly more likely to recall feeling prepared for postoperative discharge. This emphasizes the importance of perioperative communication and education regarding the patient's recovery. Effective and ongoing communication with the patient may significantly improve her perception of hysterectomy as a successful therapy.

We attempted to describe patient goals in this population in order to better understand and utilize goals as a patient-centered outcome in hysterectomy. Just over half of patients met all of their goals. We found that patient goals are more likely to be related to symptoms as opposed to functional goal categories. Although it was not statistically significant, there was a trend toward higher goal achievement with symptomatic goals versus functional goals. This is similar to the results of Srikrishna et al, who found increased rates of goal achievement in prolapse surgery for symptomatic goals (94%) compared to sexual function goals (65%), and in incontinence surgery for symptomatic goals (90%) compared to sexual function goals (65%) and body image goals (40%) [14]. Patient goals related to improvements in overall health and well-being were among the most commonly voiced by our patients, but were significantly less likely to be achieved compared to other goal categories. Most goals in this category pertained to improved energy levels, improved ability to lose weight, and improved mental health. This may represent unrealistic patient expectations regarding the benefits that a hysterectomy may provide, again emphasizing the importance of clear communication when counseling patients regarding hysterectomy.

Our study identifies patient characteristics and factors impacting goal achievement in hysterectomy. We have characterized patient goals, and identified goal achievement as a useful patient-centered outcome. Future research studies should focus on strengthening our understanding of the personal motivations and expectations held by our patients. Goal achievement should be considered as a useful patient-centered outcome in other areas of gynecology that impact the quality of life of our patients, including both surgical and non-surgical therapies that we offer.

Conflict of interest

The authors report no conflict of interest.

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