10 Prediction models for same-day discharge following benign minimally invasive hysterectomy

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OBJECTIVES: To develop prediction models for same-day discharge (SDD) following minimally invasive hysterectomy (MIH) using both clinical and nonclinical attributes and to compare model concordance of individual attribute groups.

MATERIALS AND METHODS: We performed a retrospective study of patients who underwent elective MIH for benign gynecologic indications at 69 hospitals in a statewide quality improvement collaborative between 2012 and 2019. Potential predictors of SDD were determined *a priori* and placed into attribute groups (Figure 1). To account for clustering of SDD practices among surgeons and within hospitals, hierarchical multivariable logistic regression models were fitted using predictors from each attribute group individually and all attribute groups in a composite model. Receiver operating characteristic (ROC) curves were generated for each model. To compare the concordance of each attribute group within the composite model, the area under the ROC curve (AUC) of the composite model was compared to that of a model from which a single attribute group was removed. The Hanley-McNeil test was used for comparisons, 95% confidence intervals (CI) for the AUCs were calculated, and a p-value of <0.05 was considered significant.

RESULTS: Of the 25,770 patients in our study, 5,411 (21.0%) underwent same-day discharge. ROC curves are presented in Figure 2. The composite model had an AUC of 0.777 (95% CI 0.770-0.784). Among models using factors from individual attribute groups, the model using intraoperative attributes had the highest concordance for SDD (AUC 0.715, 95% CI 0.707-0.722). Removal of intraoperative attributes from the composite model was associated with the largest decrease in the composite model AUC (Table 1). Models using surgeon and hospital attributes were second and third most concordant, respectively (AUC 0.678, 95% CI 0.670-0.685; AUC 0.659, 95% CI 0.650-0.667). Models using surgical timing and patient clinical, socioeconomic, and geographic attributes groups were poor (all AUCs <0.6). Even so, factors from each attribute group contributed incrementally to the concordance of the composite model, with the exception of patient geographic attributes.

CONCLUSION: Clinical and nonclinical attributes contributed to a composite prediction model with good discrimination in predicting SDD following MIH. Factors related to intraoperative, hospital, and surgeon attributes produced models with the strongest concordance. Attention to these attributes may aid efforts to improve utilization of SDD following MIH.

A. Intraoperative attributes
- Hysterectomy route
- Conversion to laparotomy
- Length of surgery
- Estimated blood loss

B. Surgeon attributes
- Annual hysterectomy volume

C. Hospital attributes
- Annual hysterectomy volume
- Metropolitan status
- Teaching hospital status

D. Patient clinical attributes
- Age
- Body mass index
- American Society of Anesthesiologists class
- Diabetes
- Chronic obstructive pulmonary disease
- Tobacco use
- Hypertension
- Personal history of DVT/PE
- Bleeding disorder

E. Surgical timing attributes
- Surgery start time
- Surgery day of week

F. Patient socioeconomic attributes
- Race
- Insurance type

G. Patient geographic attributes
- Distance from patient home to hospital

Figure 1. Attribute groups for potential predictors of same-day discharge.

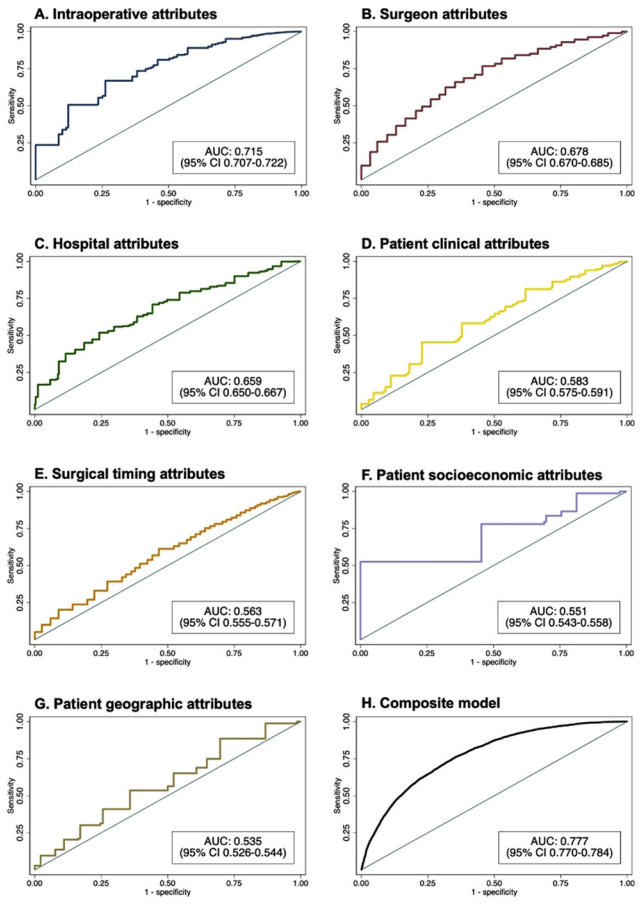

Figure 2. Receiver operating characteristic (ROC) curves for individual attribute groups (A-G) and a composite model (H). AUC: area under the ROC curve.

Attribute group	AUC, attribute group (95% CI)	AUC, composite model with attribute group removed (95% CI)	*p*-value, AUC of composite model vs. AUC of composite model with attribute group removed
Intraoperative attributes	0.715 (0.707-0.722)	0.719 (0.771-0.726)	<0.001
Surgeon attributes	0.678 (0.670-0.685)	0.771 (0.765-0.778)	<0.001
Hospital attributes	0.659 (0.650-0.667)	0.771 (0.765-0.778)	<0.001
Patient clinical attributes	0.581 (0.575-0.591)	0.771 (0.764-0.778)	<0.001
Surgical timing attributes	0.563 (0.555-0.571)	0.769 (0.762-0.776)	<0.001
Patient socioeconomic attributes	0.551 (0.543-0.558)	0.775 (0.769-0.781)	0.002
Patient geographic attributes	0.535 (0.526-0.544)	0.777 (0.770-0.784)	0.671

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11 Quality of life and symptoms following laparoscopic essure removal: a prospective multicenter study

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OBJECTIVES: The objective of this study was to compare quality of life and symptoms before and after Essure removal.

MATERIALS AND METHODS: This multicenter, prospective study evaluated patient-reported quality of life and symptoms before and 4 months after laparoscopic Essure removal for device-attributed symptoms. Quality of life was measured using the validated Short Form-8 questionnaire for health-related quality of life. Symptoms were measured using a study-specific questionnaire.

RESULTS: Essure removal was performed on 80 patients with device-attributed symptoms at 4 institutions between 2018 and 2020. The majority (n=53, 66.3%) underwent a laparoscopic hysterectomy and bilateral salpingectomy, and the remainder (n=27, 33.8%) underwent a laparoscopic bilateral salpingectomy alone. Indications for device removal were pain (n=73, 91.3%) and abnormal bleeding (n=42, 52.5%), in addition to several other patient-reported symptoms. 51 (63.8%) patients completed the postoperative questionnaire. Quality of life was significantly improved following Essure removal as measured by the physical and mental component summary scores (Table 1). Almost all symptoms were less commonly reported after Essure removal (Table 1). Subgroup analyses of patients who underwent a hysterectomy or a salpingectomy alone also demonstrated a significantly improved quality of life after the procedure. Symptoms were more likely to resolve following hysterectomy and salpingectomy compared to salpingectomy alone. Most patients (n=47/51, 92.2%) were satisfied with the results of their surgery.

CONCLUSION: Patients undergoing laparoscopic Essure removal for device-attributed symptoms report improved quality of life and symptoms following the procedure. While the relationship between the Essure device and adverse symptoms remains unclear, Essure removal may benefit those experiencing adverse symptoms and is associated with high patient satisfaction.

Table 1

	Preop	Postop	Postop vs. Preop	
SF-8 Questionnaire	mean ± SD	mean ± SD	mean difference (95% CI)	p-value
Physical Component Summary (PCS) Score	38.9 ± 9.1	49.0 ± 9.6	9.9 (7.0,12.9)	<.001
Mental Component Summary (MCS) Score	33.9 ± 11.9	47.5 ± 10.3	13.8 (10.4,17.2)	<.001
Symptoms	n (%)	n (%)	odds ratio (95% CI)	p-value
Fatigue	71 (88.8%)	24 (47.1%)	0.11 (0.05,0.28)	<.001
Bloating	70 (87.5%)	12 (23.5%)	0.04 (0.02,0.11)	<.001
Pelvic Pain	69 (86.3%)	7 (13.7%)	0.02 (0.01,0.07)	<.001
Brain Fog	62 (77.5%)	15 (29.4%)	0.12 (0.05,0.27)	<.001
Headaches	59 (73.8%)	18 (35.3%)	0.18 (0.08,0.40)	<.001
Painful Periods	56 (70.0%)	4 (7.8%)	0.04 (0.01,0.12)	<.001
Heavy Vaginal Bleeding	53 (66.3%)	9 (17.6%)	0.11 (0.04,0.26)	<.001
Weight Gain	52 (65.0%)	12 (23.5%)	0.16 (0.07,0.37)	<.001
Irregular Periods	48 (60.0%)	3 (5.9%)	0.04 (0.01,0.14)	<.001
Constipation	46 (57.5%)	16 (31.4%)	0.33 (0.15,0.73)	0.007
Vaginal Discharge	45 (56.3%)	6 (11.8%)	0.10 (0.03,0.26)	<.001
Painful Sex	44 (55.0%)	5 (9.8%)	0.09 (0.03,0.25)	<.001
Hair Loss	44 (55.0%)	11 (21.6%)	0.22 (0.10,0.51)	<.001
Skin Changes	41 (51.3%)	7 (13.7%)	0.15 (0.06,0.38)	<.001

Abbreviated symptom list

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