Outcomes of an overnight-stay unit for urogynecologic surgery: feasibility and risk factors for failure of next-day discharge

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Abstract

Objective: To evaluate outcomes of urogynecologic surgery patients with post-operative care in an overnight-stay unit.
Methods: A retrospective cohort study of women admitted to an overnight-stay unit at a Canadian tertiary care center.
Results: 1578 patients (96%) were discharged within 24 hours of surgery. Surgical approach included laparotomies (8.9%), major vaginal surgery (70.9%), and open retropubic procedures (2.1%) and 68.1% of patients had a hysterectomy. 101 patients (6.1%) were assessed in the emergency department within 7 days of surgery and 57 (3.5%) were readmitted to hospital within 30 days of their procedure. Multivariable regression identified the following as risk factors for failed next-day discharge: pulmonary disease (OR 3.26), longer operating time (OR 1.40 per hour, and intraoperative hemorrhagic complications (OR 22.64).
Conclusions: Admission to an overnight-stay unit with next-day discharge is feasible for most patients undergoing urogynecologic surgery.

Introduction

Most providers admit patients to hospital following vaginal reconstructive surgery, with many sources reporting average lengths of stay of over 48 hours for common procedures such as vaginal hysterectomy with apical suspension[1-3]. Short-stay surgical units are used in a number of other surgical disciplines[4-7]. However, data on the effectiveness of this approach and identification of risk factors for failure of these protocols are scarce, particularly in urogynecology, as reports of 'fast-track' vaginal surgery protocols have generally described small patient cohorts with no or very few hospital readmissions[8-11].

Qualitative research from patients underdoing enhanced recovery protocols suggests that patients appreciate certainty of being able to plan their post-operative course and appreciate efficiency of short hospital stays in order to minimally disrupt their scheduled activities[12]. Moreover, in-hospital sleep disruption precipitated by early morning assessments, recurrent blood sampling and high noise levels, has been identified as a hurdle to ease of surgical recovery amongst some patients[13] and short hospital stays may help to limit the duration of these disruptions for patients. With a growing older demographic of patients underdoing pelvic surgery, interventions to reduce cognitive decline and post-operative delirium may be particularly valuable. Familiarity of environment, mobilization and presence of family members have been shown to reduce the risk of delirium[14]. These interventions are well-suited to early discharge protocols and shorter length of stay targets.

Methods and Materials

- Retrospective cohort study of female patients who had urogynecologic procedures at a tertiary care centre
- Inclusion criteria:
  - 18 years of age or older at the time of procedure
  - Surgery between January 1, 2014 and June 30, 2018
  - Surgery performed by one of 7 fellowship trained surgeons
  - booked for overnight-stay unit admission prior to surgery
- Patients were deemed to have **failed next-day discharge** if they had:
  - Hospital stay beyond 10 a.m. on the day after surgery
  - Emergency room for assessment within 7 days of surgery
  - Readmitted to hospital within 30 days of surgery
  - Reoperation within 30 days of surgery
- A manual medical record review was completed for all patients with failed next-day discharge.
- Continuous variables are reported as mean ± standard deviation (SD) and were compared using *t*-tests. Categorical variables are reported as number (%) and were compared via Chi square tests.
- A prespecified multivariable logistic regression model was fit using patients with complete data to identify potential risk factors for failed next-day discharge, including variables previously suggested to influence hospital length of stay or need for reoperation.
- All analyses were performed using Stata 15.1. A two-tailed α level of 0.05 was used to define statistical significance.

Figure 1. Summary of flow through overnight stay unit

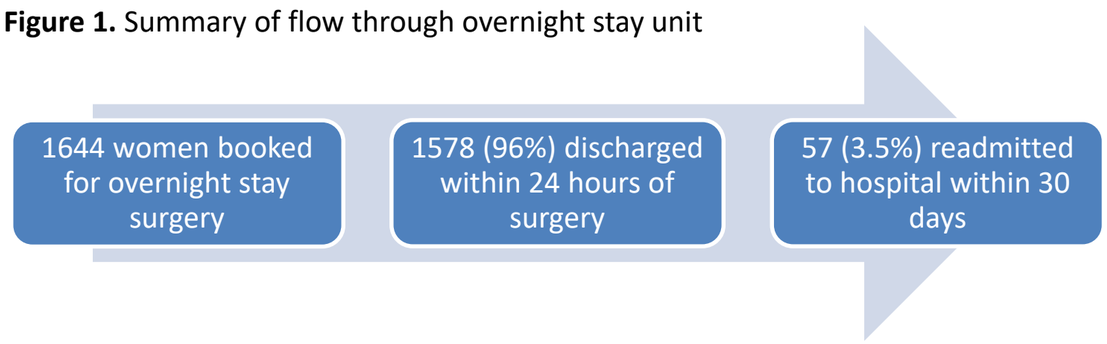

Table 1. Indications for failed overnight unit stay amongst overnight unit patients

	Patients (% of all overnight unit patients)
Emergency room assessment within 7 days	101 (6.1%)
Readmitted to hospital within 30 days of surgery	57 (3.5%)
Admitted to hospital from overnight stay unit directly from surgery Time to discharge 24-48 hours Time to discharge >48 hours	22 (1.3%) 44 (2.7%)
Return to the operating room within 30 days of surgery	21 (1.3%)

Results

- 4821 women underwent urogynecologic surgery during the study period
  - 62.7% (3022) were booked for day surgery
  - 3.2% (155) were booked for same day admission
  - 1644 (34.1%) were booked for overnight unit stay

Table 2. Characteristics of those having successful vs failed overnight unit stay.

	Successful overnight stay (N=1469)	"failed" overnight unit stay (N=175)	P value
Age (years)	57.3 (SD 13.5)	54.9 (SD 14.6)	0.030
Body mass index>25	970 (70%)	105 (66.0%)	0.30
Medical comorbidities			
Diabetes mellitus	94 (6.4%)	13 (7.4%)	0.63
Cardiac	27 (1.8%)	4 (2.3%)	0.68
Pulmonary	22 (1.5%)	9 (5.1%)	<0.001
Procedure			0.004
Laparotomy	118 (8.0%)	29 (16.6%)	
Major vaginal surgery	1049 (71.4%)	108 (61.7%)	
Minor vaginal surgery	61 (4.2%)	8 (4.6%)	
Laparoscopy	212 (14.4%)	25 (14.3%)	
Open retropubic surgery	29 (2.0%)	5 (2.9%)	
Hysterectomy	998 (67.9%)	122 (69.7%)	0.63
Prolapse repair	876 (59.6%)	97 (55.4%)	0.28
Incontinence procedure	449 (30.6%)	54 (30.9%)	0.94
Duration of surgery (minutes)	103.7 (SD 44.4)	114.4 (SD 52.3)	0.003
Bleeding complication	3 (0.2%)	9 (5.3%)	<0.001
Other complication	24 (1.7%)	5 (3.0%)	0.30

- Women who had successful overnight unit stay had lower rates of pulmonary disease, shorter surgical procedure times, fewer perioperative bleeding complications and had fewer other (non-hemorrhagic) intraoperative complications. Women having successful discharge were also noted to be older (Table 2)
- Multivariable regression identified independent risk factors for failure of next-day discharge: pulmonary disease, prolonged operating room duration, and intraoperative hemorrhagic complications. Patients undergoing major vaginal surgery or laparoscopic surgery had lower odds of failed next-day discharge compared to those undergoing laparotomy although 80.3% of patients having laparotomy still had successful overnight unit stays

Table 3. Multivariable analysis of risk factors for failed overnight unit stay.

	Adjusted odds ratio (95% confidence interval)	P value
Age (per 10-year increase)	0.88 (0.76 - 1.03)	0.107
Procedure		
Laparotomy	1.00 (reference)	
Major vaginal surgery	0.47 (0.27- 0.81)	0.007
Minor vaginal surgery	0.83 (0.29 - 2.36)	0.728
Laparoscopic	0.50 (0.26 - 0.98)	0.044
Open retropubic dissection	1.03 (0.30 - 3.94)	0.967
Body mass index (per 5 kg/m^2 increase)	0.92 (0.79 - 1.02)	0.086
Diabetes	1.31 (0.65 - 2.65)	0.456
Pulmonary disease	3.26 (1.32 - 8.06)	0.010
Neuraxial anesthesia	1.39 (0.95 - 2.02)	0.090
Incontinence procedure	1.26(0.81 - 1.96)	0.301
Hysterectomy	1.09 (0.68 - 1.73)	0.724
Operating room duration (per 60 minute increase)	1.40 (1.10 - 1.79)	0.006
Hemorrhagic complication	22.64 (5.83 - 88.00)	<0.001
Non-hemorrhagic complication	1.29 (0.45 - 3.71)	0.637

Discussion

Hemorrhagic complications and prolonged operating room duration were identified as risk factors for failed next-day discharge and may serve as markers for more complex surgeries. These surgical factors may be less valuable for pre-operative patient selection of patients suitable for overnight unit stay but may prompt revaluation regarding suitability for overnight stay immediately after surgery. Age, hysterectomy, diabetes, non-hemorrhagic complications (which were mainly bladder injuries) and modality of anesthesia did not seem to be significant risk factors for failed overnight-unit stay.

Uncontrolled confounders may account for the higher rate of failure amongst minor vaginal surgery patients. Typically, patients having minor vaginal surgery are booked for day surgery and discharged within a few hours of the procedure. The surgeon/anesthesiologist's choice to admit a subgroup of these patients to the overnight-stay unit may be related to other comorbidities or sociodemographic issues precluding them from day surgery.

Conclusions

Overnight-stay unit is successful for most patients undergoing urogynecologic surgery, particularly for many women having major vaginal reconstructive surgery. Women with pulmonary comorbidities, prolonged length of surgery and hemorrhagic intraoperative complications may be at higher risk for failed next-day discharge and may benefit from a longer admission.

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