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The feasibility and safety of same-day discharge after robotic-assisted hysterectomy alone or with other procedures for benign and malignant indications

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HIGHLIGHTS

- Same-day discharge was planned in 200 cases and 157 (78%) had successful same-day discharge.
- Forty-three (22%) patients required postoperative admission, 23 for medical reasons and 20 for non-medical reasons.
- Operative time, case ending before 6 pm, and use of intraoperative ketorolac were associated with successful same-day discharge.

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ABSTRACT

Objective. This study aimed to report the feasibility and safety of same-day discharge after robotic-assisted hysterectomy.

Methods. Same-day discharge after robotic-assisted hysterectomy was initiated 07/2010. All cases from then through 12/2012 were captured for quality assessment monitoring. The distance from the hospital to patients' homes was determined using http://maps.google.com. Procedures were categorized as simple (TLH +/− BSO) or complex (TLH +/− BSO with sentinel node mapping, pelvic and/or aortic nodal dissection, appendectomy, or omentectomy). Urgent care center (UCC) visits and readmissions within 30 days of surgery were captured, and time to the visit was determined from the initial surgical date.

Results. Same-day discharge was planned in 200 cases. Median age was 52 years (range, 30–78), BMI was 26.8 kg/m^2 (range, 17.4–56.8), and ASA was class 2 (range, 1–3). Median distance traveled was 31.5 miles (range, 0.2–149). Procedures were simple in 109 (55%) and complex in 91 (45%) cases. The indication for surgery was: endometrial cancer (n = 82; 41%), ovarian cancer (n = 5; 2.5%), cervical cancer (n = 8; 4%), and non-gynecologic cancer/benign (n = 105; 53%). One hundred fifty-seven (78%) had successful same-day discharge. Median time for discharge for these cases was 4.8 h (range, 2.4–10.3). Operative time, case ending before 6 pm, and use of intraoperative ketorolac were associated with successful same-day discharge. UCC visits occurred in 8/157 (5.1%) same-day discharge cases compared to 5/43 (11.6%) requiring admission (P = .08). Readmission was necessary in 4/157 (2.5%) same-day discharge cases compared to 3/43 (7.0%) requiring admission (P = .02).

Conclusions. Same-day discharge after robotic-assisted hysterectomy for benign and malignant conditions is feasible and safe.

Introduction

More than 600,000 hysterectomies are performed in the United States annually, and ever-increasing numbers are being completed using minimally invasive techniques [1–3]. In 2005, the US Food and Drug Administration approved the robotic surgical platform for gynecologic surgery. The benefits of minimally invasive surgery for both benign and malignant gynecologic conditions, including smaller incisions, decreased blood loss, decreased pain, shorter hospital stay and earlier return to activities, have been well documented [4–7]. The robotic platform offers the additional benefits of increased range of instrument motion, 3-dimensional stereoscopic visualization, and improved surgeon ergonomics [8,9].

For patients undergoing simple minimally invasive oophorectomies or ovarian cystectomies, same-day discharge has become routine.

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However, most gynecologists still admit patients overnight for observation after a laparoscopic or robotic-assisted hysterectomy. Concerns regarding patient safety, such as bleeding or identifying inadvertent injury to adjacent structures, are often cited as reasons for overnight admission after minimally invasive gynecologic surgery. Nevertheless, major bleeding should be detected prior to discharge from the postoperative unit, and injury to nearby organs is either identified at the time of surgery or not until several days later. Adequate pain control and nausea/vomiting are additional concerns. Several single-institution reports describe successful discharge within 12–24 h after laparoscopic hysterectomy for both benign and malignant conditions [10–14]; however, we are unaware of any studies reporting same-day discharge after robotic-assisted hysterectomy. The purpose of this study was to evaluate the feasibility and safety of same-day discharge for patients undergoing robotic-assisted hysterectomy alone or with other procedures for benign and malignant conditions.

Materials and methods

A same-day discharge approach after robotic-assisted hysterectomy was initiated at our institution in July 2010. After the Institutional Review Board approval, we identified all patients who were scheduled to undergo robotic-assisted hysterectomy with planned same-day discharge from that time until December 2012. Procedures were scheduled as same-day discharge at the discretion of the surgeon, and all cases discharged home from the post-anesthesia care unit (PACU) without requiring admission to the inpatient unit were classified as same-day discharge. All electronic medical records, including operative and pathology reports, postoperative unit records, urgent care center (UCC) encounters, as well as outpatient clinic notes, were reviewed.

Information collected from the records included age, body mass index (BMI), American Society of Anesthesiology (ASA) class, past medical history, previous pelvic and/or abdominal surgery, preoperative diagnosis, and surgical procedure. Simple procedures were defined as robotic-assisted hysterectomies +/− bilateral salpingo-oophorectomy (BSO), and complex procedures were defined as robotic-assisted hysterectomies +/− BSO with any of the following: sentinel node mapping, pelvic and/or aortic nodal dissection, appendectomy, or omentectomy. Perioperative data collected included estimated blood loss (EBL), amount of crystalloid infused, uterine weight, conversion to laparotomy, room time (time from patient entering the operating room to leaving the operating room), operative time (time from skin incision to completion of skin closure), time to discharge (time from patient leaving the operating room to time of discharge), and intraoperative or immediate postoperative complications. The distance (in miles) from the hospital to the patient's home was determined using an online service (http://maps.google.com).

All surgeons are fellowship-trained gynecologic oncologists who performed robotic-assisted hysterectomy alone or in conjunction with other procedures using the da Vinci® Si dual console platform. The setup required the use of 5 ports: a 12 mm camera port, 2 ports (8 mm) in bilateral lower quadrants, an 8 mm port inferior to the R subcostal margin, and a 10/12 mm assistant port inferior to the L subcostal margin. Standard robotic monopolar shears and bipolar forceps were used. Suture for vaginal cuff closure was either vicryl or V-Loc (Covidien, Mansfield, MA) based on surgeon preference. Intraoperative ketorolac and trocar site bupivacaine administration was at the discretion of the surgeon. Prior to fascial closure, positive pressure ventilations were administered to decrease residual pneumoperitoneum and reduce postoperative pain. All patients received a similar oral pain and bowel medication regimen, consisting of diclofenac 75 mg every 12 h, hydrocodone/acetaminophen 5 mg/325 mg 1–2 tablets every 4 h as needed, docusate 100 mg every 8 h as needed, and sennosides 8.6 mg every 12 h as needed. Prescriptions for these postoperative medications were given at the preoperative visit. There was no standard anti-emetic regimen. Patients were discharged home if they had normal vital signs, adequate oxygenation, no nausea, pain control with oral medications, and voided postoperatively. Nursing staff contacted all patients on postoperative day 1 to ensure a smooth transition home.

All patients had their first postoperative visit within 4 weeks of surgery. Electronic medical records were reviewed to ascertain if any postoperative UCC visit or hospital readmission occurred within 30 days of surgery, and the time to the visit was determined from the surgical date. Outpatient clinic notes were also reviewed to discern if patients had been evaluated at a local emergency room or admitted to their community hospital within 30 days of surgery.

Categorical variables were compared using the Chi-square test, and continuous variables were compared using the Mann–Whitney U or the Kruskal–Wallis test as appropriate. All statistical analyses were performed using SPSS Statistics 20.0 (IBM, Chicago, IL).

Results

Two hundred patients were scheduled for same-day discharge, robotic-assisted hysterectomy alone or with other procedures during the study period. Clinicopathologic characteristics of the overall cohort are presented in Table 1. The median age was 52 years (range, 30–78), BMI was 26.8 kg/m^2 (range, 17.4–56.8), and ASA class was 2 (range, 1–3). Fifty-eight (29%) patients met the definition of obesity (BMI ≥ 30), with 26 (13%) patients with a BMI ≥ 35. Medical comorbidities included hypertension (n = 33), coronary artery disease (n = 10), dyslipidemia (n = 35), heart murmur (n = 13), arrhythmia (n = 3), chronic obstructive pulmonary disease (n = 14), obstructive sleep apnea (n = 6), and diabetes mellitus (n = 10). More than half of the patients had a prior laparoscopy and/or laparotomy. Gynecologic cancer was the surgical indication in 47% of the cases, with 45% of the cases being categorized as complex. The median EBL was 50 mL (range, 5–800), and the median operative time was 136 min (range, 79–291). Three quarters of the patients received intraoperative ketorolac and

Table 1
Clinicopathologic characteristics of overall cohort (N = 200).

	Median (range) or N (%)
Age, y	52 (30–78)
BMI, kg/m^2	26.8 (17.4–56.8)
ASA class	2 (1–3)
Prior laparoscopy and/or laparotomy	109 (55)
Preoperative diagnosis	
Endometrial cancer	82 (41)
Cervical cancer	8 (4)
Ovarian cancer	5 (2.5)
Benign/preinvasive disease	105 (53)
Procedure type	
Simple[a]	109 (55)
Complex[b]	91 (45)
EBL, mL	50 (5–800)
Intraoperative crystalloid, mL	1700 (600–3000)
Intraoperative ketorolac	151 (76)
Trocar site bupivacaine	105 (53)
Uterine weight, g	116 (31.5–979)
Room time[c], min	196 (134–360)
Operative time[d], min	136 (79–291)
Time case ended[e], h:min	13:22 (9:53–22:03)
Distance from hospital, miles	31.5 (0.2–149)
Time to discharge, h	5.23 (2.4–95.1)

BMI, body mass index; ASA, American Society of Anesthesiologists; EBL, estimated blood loss.
[a] Simple procedure — robotic-assisted hysterectomy +/− bilateral salpingo-oophorectomy.
[b] Complex procedure — simple procedure in conjunction with any of the additional: sentinel lymph node mapping, pelvic and/or aortic lymph node dissection, appendectomy, omentectomy.
[c] Room time is the time from patient entering the operating room to leaving the operating room.
[d] Operative time is the time from skin incision to skin closure.
[e] Time to discharge is the time from patient getting out of the operating room to being discharged.