

Original Article

Factors Influencing Same-day Hospital Discharge and Risk Factors for Readmission After Robotic Surgery in the Gynecologic Oncology Patient Population

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ABSTRACT **Study Objective:** To determine the factors that allow for a safe outpatient robotic-assisted minimally invasive gynecologic oncology surgery procedure.

Design: Retrospective chart review (Canadian Task Force classification II-1).

Setting: University hospital.

Patients: All patients (140) undergoing robotic-assisted minimally invasive surgery with the gynecologic oncology service from January 1, 2013, to December 31, 2013.

Interventions: Risk factors for unsuccessful discharge within 23 hours of surgery and same-day discharge were assessed using logistic regression models.

Measurements and Main Results: All patients were initially scheduled for same-day discharge. The outpatient surgery group was defined by discharge within 23 hours of the surgery end time, and a same-day surgery subgroup was defined by discharge before midnight on the day of surgery. One hundred fifteen (82.1%) were successfully discharged within 23 hours of surgery, and 90 (64.3%) were discharged the same day. The median hospital stay was 5.3 hours (range, 1–48 hours). Unsuccessful discharge within 23 hours was associated with a preoperative diagnosis of lung disease and intraoperative complications; unsuccessful same-day discharge was associated with older age and later surgery end time. Only 2 patients (1.4%) were readmitted to the hospital within 30 days of surgery.

Conclusions: Outpatient robotic-assisted minimally invasive surgery is safe and feasible for most gynecologic oncology patients and appears to have a low readmission rate. Older age, preoperative lung disease, and later surgical end time were risk factors for prolonged hospital stay. These patients may benefit from preoperative measures to facilitate earlier discharge. Journal of Minimally Invasive Gynecology (2015) 22, 219–226 © 2015 AAGL. All rights reserved.

Keywords: Gynecologic oncology; Robotic surgery; Same-day discharge

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Hysterectomy is 1 of the most common surgical procedures performed in the United States, with more than 600,000 hysterectomies performed annually [1]. The robotic surgical platform for minimally invasive surgery was approved for use in gynecologic surgery in 2005, and since that time the number of robotic surgeries has continually increased [2]. In 2009, the American Congress of Obstetrics and Gynecology produced a committee opinion stating that the surgeon should take into account both patient safety and cost-effectiveness of each route; however, this statement specifically excluded the use of the robotic platform for

gynecologic oncology procedures [3]. The benefits of a minimally invasive approach to hysterectomy are well documented and include shorter hospital stay, decreased blood loss, less pain, fewer wound complications, earlier return to baseline function, and improved cosmesis without compromise in oncologic outcomes [4,5]. Several studies have shown an advantage specifically for gynecologic oncology procedures with increased lymph node counts, decreased blood loss, and fewer overall complications, with these improvements most pronounced in the obese population [6–10].

Traditionally, hysterectomies have been performed as an inpatient procedure to control postoperative pain and monitor for postoperative complications such as bleeding, symptomatic anemia, and delayed return of bowel function. However, hospital stays after minimally invasive surgeries can be significantly shortened because of decreased postoperative pain, minimal blood loss, and faster return of bowel function. Subsequently, an increasing number of insurance companies are requiring minimally invasive surgeries be performed as outpatient procedures.

The University of Minnesota gynecologic oncology service implemented a same-day discharge policy for all minimally invasive hysterectomy patients in 2012. The purpose of this study was to determine the factors that allow for a safe outpatient robotic-assisted minimally invasive gynecologic oncology procedure.

Methods

Study Population

University of Minnesota Institutional Review Board approval was obtained for this study. All robotic hysterectomies performed at the University of Minnesota Medical Center by the gynecologic oncology faculty were identified through a query of the gynecologic oncology surgical database. A retrospective chart review of all patients undergoing a robotic hysterectomy between January 1, 2013, and December 31, 2013, was performed. Patients were excluded from analysis if there was preoperative documentation of a planned postoperative admission, the procedure was converted to laparotomy, the gynecologic surgery was performed in conjunction with surgery performed by another service (e.g., colorectal surgery or urology), or if a radical hysterectomy was performed because not all providers allowed same-day discharge after this procedure. Electronic health records (EHRs) were reviewed to collect demographic and health information such as age; body mass index (BMI); tobacco use; American Society of Anesthesiology class; comorbidities including diabetes, lung disease, heart disease, cerebral vascular accident, deep-vein thrombosis/pulmonary embolus (DVT/PE), chronic kidney disease, and previous surgeries; and surgical information including preoperative diagnosis, surgical procedure, postoperative diagnosis, intraoperative complications (e.g., urinary tract

injury, vascular injury, or transfusion), and postoperative complications (e.g., readmission, pneumonia, abscess, or DVT/PE). The distance from a patient's home to the hospital was categorized as either <60 miles or ≥ 60 miles to represent the geographic borders of the Minneapolis–St. Paul metropolitan area.

The outpatient surgery group was defined as discharge from the hospital within 23 hours of the end of surgery, which insurance companies generally accept as an outpatient procedure. A same-day surgery subgroup was defined as discharge from the hospital before midnight the day of surgery. Any subject who stayed in the hospital >23 hours was categorized in the inpatient surgery group.

Surgical Procedures

The surgical procedures were categorized as (1) < hysterectomy (adnexal surgery or trachelectomy), (2) hysterectomy \pm bilateral salpingo-oophorectomy, (3) staging (any of these procedures plus pelvic and/or para-aortic lymph node dissections \pm omentectomy \pm appendectomy), or (4) debulking (any of these procedures plus procedures to remove gross metastatic disease).

All surgeries were performed by 1 of 7 fellowship-trained gynecologic oncology surgeons. Surgeries were performed using the da Vinci S console platform (Intuitive, Sunnyvale, CA). A 5-port docking technique was used, and robotic monopolar and bipolar cautery were used. Vaginal cuff closure was performed using the robotic platform and either a polyglycolic acid or barbed V-Loc suture (Covidien, Mansfield, MA) per surgeon preference. Patients underwent preoperative transversus abdominis plane blocks with 0.25% bupivacaine with epinephrine per the pain control protocol at the University of Minnesota Medical Center unless there was a contraindication to this procedure. All patients were discharged with oxycodone 5 mg/acetaminophen 325 mg and ibuprofen 600 mg for pain control and senna for a stool softener unless they had a contraindication to these medications. Discharge criteria included stable and normal vital signs, the ability to maintain oxygen saturation levels >95% on room air, adequate control of nausea and vomiting, and adequate pain control with an oral regimen. Patients were scheduled for a postoperative clinic visit 1 to 3 weeks postoperatively per surgeon preference. The EHR was also assessed for any emergency room visits or telephone encounters indicating an admission to an outside facility because of postoperative complications within 30 days of discharge.

Statistical Methods

Patient demographic and clinical characteristics were summarized. Risks of not discharging to home the same day and discharging more than 23 hours after surgery were assessed by patient characteristics using logistic regression models. Demographic and preoperative characteristics considered included age, BMI, tobacco use, distance

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