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Incidence of port site hernias and/or dehiscence in robotic-assisted procedures in gynecologic oncology patients

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HIGHLIGHTS

- Port site hernias and dehiscences in robotic-assisted gynecologic oncology procedures are rare.
- Fascial closure is unnecessary when using bladeless trocars up to 12 mm in diameter for robotic procedures.
- Additional information allows the surgeon to make decisions that benefit the patient.

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ABSTRACT

Objectives. The incidence of port site hernia and/or dehiscence using bladeless trocars is 0–1.2%. Robotic surgery uses additional port sites and increases manipulation of instruments, raising the concern for more complications. We sought to characterize the incidence of port site complications following robotic surgery when fascia was not routinely closed.

Methods. Robotically-assisted (RA) procedures performed for suspected gynecologic malignancy between 1/2006 and 12/2011 were retrospectively reviewed. Bladeless 12 mm and 8 mm robotic trocars were used. Fascial closure was not routinely performed except after specimen removal through the port site. The decision to close the fascia remained at the discretion of the surgeon.

Results. Data from 842 procedures were included. Mean patient age was 55.6 years. Mean Body Mass Index was 33.6 kg/m^2. RA-total laparoscopic hysterectomy (TLH) ± unilateral or bilateral salpingo-oophorectomy (BSO) ± lymphadenectomy (LND) accounted for 91.6% of procedures. Final pathology confirmed malignancy in 58.6% of cases, primarily endometrial cancer. In 35 cases, the specimen was removed through the port site; fascia was closed in 54.3% of them and no port site hernias or dehiscences occurred. Only one patient underwent a RA-TLH/BSO/LND for endometrial adenocarcinoma and had a port site dehiscence of the 8 mm trocar site. No port site hernias occurred.

Conclusion. Port site hernias and dehiscences are rare in RA gynecologic oncology procedures. When bladeless dilating trocars are used, routine closure of even up to a 12 mm port site is unnecessary, even in cases requiring removal of the specimen through the trocar sites.

Objective

Many gynecologists routinely use laparoscopic surgery for hysterectomy, salpingectomy, oophorectomy, lymphadenectomy (LND), and others. With the rapid increase in use of laparoscopic surgery across surgical specialties in the 1990s, complications unique to these procedures began to emerge [1]. Among the serious complications of laparoscopic surgery is trocar site herniation, which can lead to emergency surgery and increase a patient's operative morbidity and mortality. Since the first report of a trocar site hernia (TSH) in 1968, efforts have been made reduce the incidence of port site complications through technique improvement and development of new surgical instruments [2].

A major advance in laparoscopic surgery has been the transition from bladed trocars to radially dilating, non-bladed trocars. In a review of studies using bladed trocars, Tonouchi et al. found the prevalence of TSHs to be as high at 2.8% [3]. In contrast, the prevalence of port site hernias and/or dehiscences using bladeless trocars has been estimated to be as low as 0–1.2% [4–7]. Despite this reduction, there remains no consensus on whether the fascial defect from a five, ten, or twelve-millimeter trocar should be closed in order to further reduce the rate of hernia or dehiscence.

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The most recent evolution in laparoscopy is the widespread incorporation of the robot for minimally invasive procedures. Advantages of using robotic assistance include better visualization, easier manipulation of the instruments due to increased range of motion, and improved hand–eye coordination when compared to traditional laparoscopic surgery [8]. Gynecologic Oncology is a specialty that has widely adopted the da Vinci surgical robot (Intuitive Surgical, Sunnyvale, California, USA) as an alternative to traditional laparoscopy for many of its surgical procedures. In particular, robotic surgery provides a treatment option that lowers morbidity in women with multiple medical problems who would have otherwise undergone a laparotomy [9]. However, robotic surgery does require the use of additional ports, including eight-millimeter trocars. Robotic procedures also necessitate increased manipulation of ports and instruments. Taken together, there is concern for higher rates of port site complications. Therefore, we sought to characterize the incidence of port site hernias/dehiscences in patients undergoing robotically-assisted (RA) laparoscopic procedures who did not undergo routine fascial closure of the trocar sites.

Methods

A retrospective chart review of patients undergoing a RA procedure for suspected gynecologic malignancy between January 2006 and December 2011 was performed. Inclusion criteria identified all patients who underwent a combination of RA-total laparoscopic hysterectomy (TLH), unilateral or bilateral salpingo-oophorectomy (USO/BSO) with or without LND, or omentectomy (OMX) for benign or malignant pathology. All patients were included regardless of whether the specimen was removed through the vagina or port site. A maximum of five ports were typically used including two twelve-millimeter non-bladed trocars and two or three eight-millimeter robotic trocars. Fascial closure was not routinely performed with the exception of cases requiring removal of the specimen through the port site. The laparoscopic trocars were removed under direct visualization, but the intraperitoneal insufflation was not evacuated under direct visualization. The decision to close the fascia was left to the discretion of the surgeon. Port site hernias and/or dehiscences were diagnosed by physical exam and patient report at postoperative clinic visits or on follow-up surveillance imaging. Patients with malignancy were followed for a maximum of five years. Abstracted data included patient demographics, Body Mass Index (BMI), procedures performed, specimen removal site, fascial closure, and pathology.

Results

Data from 842 procedures met eligibility criteria and were included in this analysis. Patient demographics are outlined in Table 1. The mean age was 55.6 years and the majority of patients were Caucasian (77.3%). The mean BMI was 33.6 kg/m^2 (range 16.5–80). RA-TLH ± USO/BSO ± LND accounted for the majority of procedures (n = 771, 91.6%) (Table 2). A smaller proportion of patients underwent radical hysterectomy with LND ± salpingo-oophorectomy ± OMX (n = 27, 3.2%).

Both benign and malignant pathology was included in the analysis (Table 3). The majority of cases (58.6%) had confirmed malignancy on final pathology. The most common diagnosis was endometrial cancer, which represented 47.5% of all cases (n = 400). This total includes uterine papillary serous carcinoma and mixed malignant mullerian tumor. Cervical and ovarian cancers were also included, although combined they only composed 11.1% of the total malignant cases. A total of 349 (41.4%) benign cases were identified. Uterine pathology was again the most common, representing 22.6% (n = 190) of cases. Cervical and ovarian pathology comprised the remaining benign cases.

We examined the 35 patients undergoing RA-BSO ± OMX ± LND who required removal of their specimen through a port site (Table 4). Fascial closure was performed in 54.3% of cases, and the most common site of specimen removal was the lateral, upper abdominal 12 mm accessory port (74.3%). In decreasing frequency, other sites of specimen removal included an operative robotic trocar site, additional accessory port added during the procedure, and the camera port. There were no port site herniations or dehiscences in this group. Overall, only one patient (0.1%) who underwent a robotic-assisted procedure had a port site dehiscence. This patient underwent a RA-TLH/BSO/LND for stage 3A endometrial adenocarcinoma and had a port site dehiscence of the eight-millimeter trocar site which was repaired at the bedside in clinic. No port site hernias were noted.

Discussion

TSHs and dehiscences are rare complications of laparoscopic surgery, which often require additional procedures to correct. The true prevalence of TSH and/or dehiscence is difficult to determine due in large part to their asymptomatic nature [10]. Usla et al. found the prevalence of TSH to be as high as 5.2% [11]. However, this study excluded patients if the fascial defect was closed at the time of surgery. Patients were examined one week and one month postoperatively and several patients (17.5%) with TSH diagnosed on physical exam were asymptomatic throughout, further underscoring the low estimates of TSH prevalence [11]. Another reason port site hernias and/or dehiscences may be under-reported is that the majority of large studies identify the complication not on examination but only after surgical repair was required [10]. Despite the increased number of complications in the Usla study, the median estimate of TSHs is 0.5% [10].

Identification of risk factors associated with TSH has been a focus in the surgical literature for some time. These risk factors can be divided into technical and patient-related factors [3]. Technical risk factors include type of trocar, i.e. bladed or pyramidal, size of trocar, trocar placement, length of surgery, and fascial closure. Patient-related risk factors include obesity, nutritional status, and age.

Table 1
Patient demographics.

Characteristic	N (%)
Age	
Mean (yrs)	55.6
Range	23–91
Race	
Caucasian	651 (77.3)
African American	174 (20.7)
Other	16 (1.9)
Body Mass Index	
Mean (kg/m^2)	33.6
Range	16.5–80.0

Table 2
Procedures.

Robotically assisted procedure	N (%)
Total hysterectomies	771 (91.6)
Hysterectomy alone	70 (8.3)
With USO/BSO[a]	327 (38.8)
With lymphadenectomy	360 (42.8)
With omentectomy	14 (1.7)
Radical hysterectomy ± BSO	27 (3.2)
Total USO/BSO	35 (4.1)
USO/BSO alone	23 (2.7)
with lymphadenectomy	10 (1.2)
with omentectomy	2 (0.2)
Trachelectomy	4 (0.5)
Other[b]	5 (0.6)

[a] bilateral salpingo-oophorectomy.
[b] cystectomy, appendectomy, mass resection, myomectomy.