Two cases of post-coital vaginal cuff dehiscence with small bowel evisceration after robotic-assisted laparoscopic hysterectomy

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INTRODUCTION: Vaginal cuff dehiscence following robotic surgery is uncommon. Published reports of vaginal cuff dehiscence following robotic surgery are increasing, but the true incidence is unknown.

PRESENTATION OF CASE: Case 1. A 45 year old female had sexual intercourse and presented with a vaginal cuff dehiscence complicated by small bowel evisceration 4 months after RA-TLH. Case 2. A 44 year old female had sexual intercourse and presented with a vaginal cuff dehiscence with small bowel evisceration 6 weeks after RA-TLH.

DISCUSSION: We discuss the rate of vaginal cuff dehiscence by mode of hysterectomy, surgical and nonsurgical risk factors that may contribute to vaginal cuff dehiscence, and proposed preventative methods at the time of RA-TLH to reduce this complication.

CONCLUSION: Vaginal cuff dehiscence with associated evisceration of intraabdominal contents is a potentially severe complication of hysterectomy. We recommend counseling patients who undergo RA-TLH to abstain from vaginal intercourse for a minimum of 8–12 weeks.

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1. Introduction

Vaginal cuff dehiscence is an uncommon event following hysterectomy. The incidence ranges from 0.03% to 4.1%; minimally invasive approaches (total laparoscopic-assisted hysterectomy [TLH] or robotic-assisted total laparoscopic hysterectomy [RA-TLH]) are associated with a higher risk of vaginal cuff dehiscence than with trans-abdominal or trans-vaginal modes of hysterectomy.1–3 Several authors have reported vaginal cuff dehiscences with evisceration of intraabdominal organs through the cuff including small bowel, omentum, fallopian tube, appendix and bowel epiploica.4 The incidence of vaginal cuff dehiscence after RA-TLH seems to be increased threefold in women with a malignancy compared to women with benign indications.2 Despite accumulating data, the incidence of vaginal cuff dehiscence following RA-TLH is limited. We therefore present two cases of post-coital vaginal cuff dehiscence complicated by small bowel evisceration remote from RA-TLH.

2. Presentation of cases

2.1. Case 1

A 45 year old nulliparous woman with a BMI of 20 kg/m² underwent a RA-TLH with an experienced robotic gynecologic surgeon for the treatment of a symptomatic myomatous uterus. The vaginal cuff was incised using monopolar electrocautery and closed using 0-vicryl suture in a running fashion. Six weeks after surgery, the patient resumed sexual intercourse and exercise. Eight weeks post-operatively, the patient had one episode of vaginal bleeding; Exam revealed an intact vaginal cuff with a small area of friability, which was cauterized with silver nitrate. No other complications were noted until four months post-operatively when the patient presented to the emergency department with a post-coital vaginal bulge on valsala. On examination, small bowel was extruding from the vaginal introitus and the vaginal cuff could not be palpated (Fig. 1). The bowel was kept moist and warm with gauze. Four hours after initial symptoms, under the care of a different gynecologist, the patient underwent urgent exploratory laparotomy, reduction of bowel evisceration, and vaginal cuff closure. Intra-operatively, the small bowel was noted to be free of necrosis and free from adhesions to surrounding structures. After reduction of the segment of small bowel into the abdomen, the 4 cm vaginal cuff defect was repaired with 0-vicryl in an interrupted fashion using figure-of-eight sutures. Her postoperative course was uncomplicated. At her 3 month follow up, a well-healed vaginal cuff was palpated,
and she resumed sexual activity after 12 weeks without complication.

2.2. Case 2

A 44 year old multiparous woman with a BMI of 18 kg/m² and a history of one prior cesarean delivery and tobacco use underwent a RA-TLH for treatment of dysfunctional uterine bleeding and chronic cervicitis. The procedure was performed by a gynecologic oncologist with expertise in robotic surgery. During the operation, the vaginal cuff was incised with monopolar electrocautery and closed using 0-vicryl interrupted sutures. Sexual intercourse was resumed at six weeks post-operation. Nine weeks after initial surgery, the patient presented to the emergency department after post-coital vaginal spotting, a gush of watery fluid from the vagina, and sensation of a vaginal bulge. A 5 cm vaginal cuff separation was palpated on digital exam with a soft tissue bulge protruding 1 cm beyond the vaginal apex but confined to the vaginal vault. Six hours after diagnosis was made (inter-hospital transfer was required), an urgent laparotomy was performed by the patient’s primary surgeon. Intra-operatively, the small bowel was densely adhered to a necrotic vaginal cuff and was sharply dissected away. The vaginal cuff was then completely opened, trimmed of necrotic tissue, and closed with interrupted 0-vicryl sutures with horizontal mattress sutures in 2 layers. All bowel was noted to be free of necrosis at the completion of the procedure. At her six-month post-operative follow up, the patient had a well-healed, normal appearing vaginal cuff. She had resumed sexual activity without sequelae.

3. Discussion

There is limited data on the incidence of vaginal cuff dehiscence after RA-TLH. A recent retrospective study of 12,398 patients by Uccella et al. reported the incidences of vaginal cuff dehiscence after laparoscopic, abdominal, and vaginal hysterectomies at 64%, 21%, and 13%, respectively. In another study of robotic surgery, authors reported a 7.5% incidence of minor cuff dehiscence not requiring re-closure in 4 patients who underwent robotic hysterectomy for endometrial cancer. At our institution, where three experienced gynecologic oncologists perform RA-TLH, the incidence of vaginal cuff dehiscence with bowel evisceration is 0.9%, one out of 109 patients undergoing RA-TLH. The first patient in Case 1 did not undergo her original RA-TLH at our institution.

The first three months after surgery remain the most common period for vaginal cuff dehiscence. Interestingly, the patient in case 1 experienced a vaginal cuff dehiscence at four months post-operation, whereas the patient in case 2 was complicated within the usual three months.

Non-surgical risk factors associated with vaginal cuff dehiscence include post-operative infection, postmenopausal status, exposure to pelvic radiation, corticosteroid use, penetrating vaginal trauma, previous history of vaginal surgery, and coitus prior to full healing of the cuff. Early resumption of vaginal intercourse was the only non-surgical risk factor present in both of the above cases. Most patients are advised pelvic rest for at least 6 weeks. It is difficult to ascertain whether full healing of the cuff had occurred prior to either of these patients’ complications. In case 1, the first sign of poor healing was perhaps vaginal friability at 8 weeks. Given that vaginal intercourse is the only potentially modifiable, non-surgical risk factor for vaginal cuff dehiscence following RA-TLH, physicians may consider more conservative pelvic rest precautions, particularly if there is any question of poor wound healing or if the patient has other non-surgical risk factors.

Surgical risk factors most commonly associated with vaginal cuff breakdown include mode of hysterectomy, colpotomy technique, and method of vaginal cuff closure. Colpotomy technique has been hypothesized as a potential cause for vaginal cuff breakdown. Use of electrocautery during colpotomy and for hemostasis at the time of cuff closure has been associated with increased incidence of cuff dehiscence. However, no studies on RA-TLH or even laparoscopic hysterectomies have been done to directly compare the use of (1) electrocautery versus cold knife colpotomy or (2) coagulation only current versus cutting only current with respect to vaginal cuff dehiscence. Interestingly, a recent series demonstrated that the incidence of cuff dehiscence was not significantly different between electrocautery and cold knife colpotomy at the time of abdominal hysterectomy.

Theoretically, the use of coagulation and cutting currents may confer different risks at the time of colpotomy, although no studies have yet to demonstrate a difference in the rate of vaginal cuff dehiscence with the use of monopolar cautery. Cutting current, which utilizes a continuous low-voltage current, conducts energy concentrated to a small area. Monopolar cutting, in essence, causes intense cellular heat and vibration leading to cellular explosion in the form of vaporization and smoke. Drawbacks of using cutting current at the vaginal cuff include excessive bleeding in this vascular area as well as smoke in the surgical field, obscuring robotic visualization. In contrast, coagulation is an interrupted, high-voltage current which disperses energy over a larger surface area. Coagulation provides a dehydration effect which is ideal for sealing blood vessels and hemostasis. However, the higher voltage causes increased thermal spread and more tissue damage than cutting current. Vaginal cuff closure over tissue that has undergone excessive thermal damage poses a risk for complications such as cuff breakdown and susceptibility to dehiscence. We suspect that most surgeons prefer monopolar coagulation over cutting current at the vaginal cuff to provide better hemostasis and improved visualization at the risk of minor thermal damage. The most likely solution is newer, blended forms of current which give cutting currents the ability to coagulate small bleeders and coagulating currents the ability to dissect while providing hemostasis. These are becoming more widely available but have not been studied in clinical outcomes.

Closure of the vaginal cuff at the time of hysterectomy likely plays the biggest role in the rate of cuff dehiscence. Two main hypotheses have been posed. The first is that robotic knot tying on vicryl suture, with less force applied than with conventional manual knot tying, offers less knot integrity and therefore higher failure rates. The second hypothesis is that the magnified view
of the robotic camera may cause the surgeon to include an insufficient amount of tissue into the suture, resulting in higher rates of spontaneous separation.5 Other studies have suggested that suturing the vault transvaginally at the end of laparoscopic hysterectomy is associated with a lower risk of dehiscence compared with robotic or laparoscopic closure. Transvaginal closure appears to confer a lower risk of vaginal cuff dehiscence that is similar to vaginal hysterectomy or abdominal hysterectomy.6 One group purported a novel suturing technique at the time of RA-TLH to reduce vaginal cuff dehiscence, which included colpotomy by monopolar coagulation energy, removal of specimens vaginally, followed by vaginal cuff suturing with 1-0 Vicryl sutures, running long sutures from both vaginal angles to the midline, tying of intracorporeal knots and interrupted sutures. Improved outcomes were observed when at least 5 mm of healthy tissue was incorporated into the vaginal edge. The posterior parietal peritoneum and uterosacral ligaments were also included into the interrupted sutures.12 Another group suggested using a welded-loop unidirectional barbed suture versus a monofilament absorbable suture, which showed no difference with respect to safety and postoperative outcome after robotic hysterectomy.13 During robotic cases, we avoid using running sutures at the vaginal cuff and recommend the consistent use of interrupted or figure-of-eight 0-vicryl sutures for cuff closure. We acknowledge that transvaginal closure may be the best remedy for improving knot integrity. However, this strategy may not be ideal for gynecologic oncology staging surgeries in which loss of pneumoperitoneum during transvaginal cuff closure may hinder the stability of robotic trocars and may impede the surgeon’s ability to continue with, for example, lymph node dissection.

4. Conclusion

Vaginal cuff dehiscence with associated evisceration of intraabdominal contents is a severe complication of robotic hysterectomy. With the rapidly growing use of robotic surgery in gynecology, a more accurate rate of vaginal cuff dehiscence following RA-TLH is likely to emerge. With respect to colpotomy, we suspected that blended forms of current, where available, may provide optimal hemostasis and limited tissue damage. We continue to use interrupted or figure-of-eight sutures for closing the vaginal cuff. Finally, we recommend counseling patients who undergo RA-TLH on the potential risk of cuff dehiscence and to abstain from vaginal intercourse for a minimum of 8 to 12 weeks postoperatively. At present, this is a modifiable, nonsurgical risk factor and, while conservative, may help prevent a vaginal cuff dehiscence in patients who have undergone robotic hysterectomy.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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Ethical approval

Written informed consent was obtained from the patients for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

My-Linh Nguyen, MD – drafting of primary manuscript, data collection.
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