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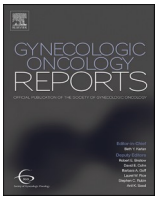

Case report

Application of a Malecot drain in the management of a vaginal cuff dehiscence: A case report and review of the literature

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ABSTRACT

Background: Vaginal cuff dehiscence (VCD) in the setting of acute infection is an uncommon but serious complication of total hysterectomy without clear guidelines for management. There is a need for further documentation of best practices around treatment, particularly when it comes to surgical drain utilization and placement.

Case description: We present a case of a 68-year-old with primary peritoneal carcinoma who underwent a robot-assisted total laparoscopic hysterectomy as part of an interval debulking surgery and had a VCD. The cuff was repaired vaginally in the operating room with placement of a Malecot catheter for pelvic abscess drainage.

Discussion: The literature is sparse in regard to clear guidelines for management of VCD. Surgical and expectant management approaches are dependent on patient stability, surgical experience, local practice norms, and evidence of intra-abdominal injury. Interventional radiology has become a primary source of drain placement in management of VCD and vaginal cuff abscess. Malecot drains are a low cost, and effective intervention for such management and an important resource for the gynecologic surgeon.

1. Introduction

Vaginal cuff dehiscence (VCD) is a known serious complication of total hysterectomy. It is defined as a partial or complete full-thickness separation of a previously intact vaginal cuff following hysterectomy. This outcome is considered a surgical emergency, as it places abdominal and pelvic organs at risk of prolapse and expulsion through the vagina. Sequelae can include bowel injury, infection, and hemorrhage, among others (Fuchs Weizman et al., 2015).

Fortunately, VCD is relatively uncommon with an incidence estimated between 0.14 % to 4.1 % depending on various patient and surgical factors (Hur et al., 2007; Kho et al., 2009). This rate may be increasing with rising popularity of minimally invasive approaches (Fanning et al., 2013; Matthews and Kenton, 2014; Uccella et al., 2011), so it remains important for gynecologists to understand VCD management. Unfortunately, literature regarding true incidence, risk factors, and optimal management approaches is sparse, with limited research coming primarily from case reports, case series and few retrospective studies (Cronin et al., 2012). As a result, there is no consensus on best practices for management of VCD, so approaches vary by provider based on learned techniques and best judgment. Variable treatment decisions include surgical approach for cuff closure, drain usage, and antibiotic duration, among others. Given the lack of large studies to guide such decisions, further documentation of practices, techniques, and materials for managing VCD is warranted.

We present a case of VCD following robotic assisted laparoscopic hysterectomy (RA-TLH). This patient was treated with vaginal repair of the dehisced surgical site with subsequent placement of a Malecot catheter for pelvic abscess drainage. There are no known studies to document proper usage of pelvic drains with this procedure and no previous reports about the utility of Malecot drains as a component of VCD management.

2. Case Presentation

The patient is a 68-year-old postmenopausal female with a past

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medical history of insulin-dependent type two diabetes (A1c 6.5 %), hypothyroidism, hypertension, and a body mass index (BMI) of 19.7 kg/m. She had no known surgical history and no history of tobacco use. She was diagnosed with Stage IIIC papillary serous carcinoma of primary peritoneal origin and underwent three cycles of neoadjuvant chemotherapy prior to surgical cytoreduction with RA-TLH, bilateral salpingo-oophorectomy, and omentectomy.

The patient began adjuvant chemotherapy following surgery on postoperative day (POD) 26. She subsequently presented repeatedly to the clinic for persistent nausea and vomiting which resolved within a week. On POD 36, the patient presented to an emergency room at a community hospital with vaginal bleeding. Hemoglobin on arrival was 11.7 gm/dL, WBC count was 14.9 K/uL and Albumin was 2.8 g/dL. The evaluating team was unable to visualize the vaginal cuff on exam and there was no resistance on bimanual exam, which was concerning for a vaginal cuff dehiscence. She also underwent CT Abdomen/Pelvis which noted large volume ascites that could be due to neoplasm, infection, inflammation, or a combination thereof. After four hours in this emergency room, her hemoglobin had dropped to 10.3 gm/dL. She was transferred to our institution for further evaluation.

Gynecologic oncology was consulted immediately upon arrival. On evaluation, the patient denied recent intercourse or anything in the vagina since surgery. At time of evaluation, she denied nausea or vomiting and her appetite returned to baseline. She also denied severe pain, chest pain, dyspnea, constipation, or diarrhea. On pelvic exam, normal external genitalia were visualized with blood present externally. On speculum exam, the vaginal cuff was disrupted with blood clots and purulent discharge noted. On bimanual, the vaginal cuff was completely dehisced with no evidence of bowel evisceration. Moist vaginal packing was placed in the vagina, Foley catheter was inserted, and operative evaluation was planned.

Given the evidence of complete VCD and active infection, the patient was started on intravenous (IV) Cefazolin and Metronidazole and proceeded to the operating room within one hour. She was placed under general anesthesia, and physical exam findings from the emergency room were confirmed. Given no evidence of bowel evisceration or residual tumor the decision was made to proceed with vaginal cuff closure and forego diagnostic laparoscopy. A Malecot drain was placed in the middle of the cuff between the interrupted 0-Vicryl figures of eight sutures and appropriate drainage was noted. The Malecot catheter was cut to the level of the introitus to allow for drainage and ease of removal. The patient was then awakened and taken to the recovery room in stable condition with Foley and Malecot catheters in place.

Patient progress was monitored via pad counts, and IV antibiotics were transitioned to PO Augmentin. Immediately post-op, she experienced foul smelling vaginal bleeding via the Malecot drain similar to a heavy period, requiring six daily pad changes. On POD 1, the Foley catheter was removed, and spontaneous voiding trial was passed. On POD 2, she transitioned to PO Sulfamethoxazole/trimethoprim and Metronidazole due to surgeon preference for better tolerability of side effects and minimization of diarrhea. By POD 3, the patient remained afebrile with minimal drain output, less purulent material, and only 1–2 daily pad changes. Given her clinical stability and the decreased purulence and diminished drain output, she was deemed stable for discharge. The Malecot drain was removed at bedside, and the patient was discharged home with a seven-day course of PO Sulfamethoxazole/trimethoprim and Metronidazole.

Six weeks after cuff repair, the patient presented for her post-operative visit and was doing well. She described intermittent spotting for a few weeks following discharge but this had since stopped. On physical exam, the vaginal cuff was intact with minimal granulation tissue and no fluid or blood in the vaginal vault. There was no palpable mass or defect, and the patient was non-tender. At this visit, she decided to forgo the previously planned adjuvant cycles of chemotherapy given her complete pathological response and concerns about wound healing. There has been no additional follow up or patient-reported issues since this visit. She is scheduled for follow-up in four months to continue routine surveillance.

3. Discussion

We present here a typical presentation of VCD after RA-TLH in a 68-year-old female with primary peritoneal cancer. Given the lack of published guidelines and studies around VCD management, this is a valuable discussion of a common patient presentation with recommended surgical approach and additional management techniques. The novelty of this case is in the use of a Malecot catheter for pelvic drainage after cuff repair, a usage that has not been documented or studied extensively in the literature. This may be due in part to alternative intended uses for Malecot catheters and to the increased use of vascular interventional radiology for management of postoperative pelvic infections.

Our patient possessed many classically proposed risk factors for VCD including low BMI, diabetes, and postmenopausal status (Cronin et al., 2012; Eoh et al., 2023). Her clinical history was consistent with previously documented cases as well, as she underwent RA-TLH which tends to be associated with the highest risk for VCD (Cronin et al., 2012). She also had concomitant infection, history of malignancy, was receiving chemotherapy, and had a history of repeated Valsalva due to intractable nausea and vomiting, all of which are thought to further increase risk (Cronin et al., 2012). Her initial presentation was also typical, as she had experienced a sudden rush of vaginal bleeding which is the second-most common symptom experienced by approximately 33–90 % of women with VCD (Cronin et al., 2012). She did not have severe abdominal or pelvic pain despite that being described in the literature by 58–100 % of patients (Cronin et al., 2012).

Regarding appropriate management, each patient should be individually assessed to determine optimal strategies. These approaches may include open abdominal, vaginal, or laparoscopic surgery versus secondary intention (Cronin et al., 2012). Expectant management is reserved for partial VCDs with openings less than 1 cm (Eoh et al., 2023; Boersen et al., 2019; Ma et al., 2022). Other approaches depend on patient stability, surgeon experience, suspicion or presence of intra abdominal organ damage, or presence of bowel evisceration (Cronin et al., 2012). In the present case, a vaginal approach was utilized due to the minimally invasive nature of the initial operation, the patient's hemodynamic stability, and lack of organ evisceration at time of exam under anesthesia. While a vaginal approach is most common, there is no clinical evidence to suggest that one approach is preferred over others (Matthews and Kenton, 2014; Eoh et al., 2023). Ultimately, management should be decided based on best tissue approximation, strength of repair, and ability to assess and intervene for complications.

There is sparse data to guide choices around drain usage following initial total hysterectomy or secondary cuff closure for VCD. One article suggests utilizing vaginal drains when there is high concern for vaginal cuff abscess or hematoma (Matthews and Kenton, 2014), while another suggests utility with every hysterectomy to reduce occurrence of such complications (Hickey and Tao, 1984 Jun). In cases of superimposed infection, it is particularly reasonable to consider utilizing a pelvic drain as one would for management of other pelvic and abdominal infections. Further utility is suggested for patients presenting with heavy vaginal discharge (Ma et al., 2022). These decisions depend on provider experience, institutional practice norms, and patient characteristics to determine the optimal approach to promote healing.

We elected to utilize a Malecot catheter for pelvic and vaginal drainage given the evidence of infection in our patient and the ease of placing this drain (Fig. 1). While this practice is new to our institution, gynecologists have previously utilized Malecot drains for this purpose, particularly prior to the rise of vascular interventions. Malecot catheters are soft, flexible tubes of silicone or latex material with multiple fenestrations at the distal end. They are designed to be inserted into a wound or cavity to facilitate drainage of fluid or pus from the surgical site or affected area. They have a characteristic mushroom-like shape,

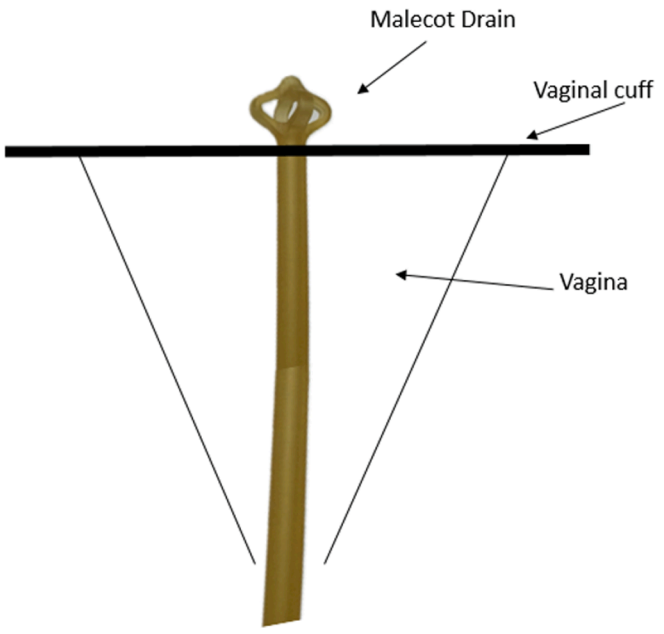

Fig. 1. Malecot drain use at the vaginal cuff photo courtesy: bria murray, MD.

which aids in anchoring the drain in place and preventing slippage. Malecot drains are commonly used for bladder drainage and post-surgical management after abdominal and urological procedures (e.g. cholecystectomy, nephrectomy, gastrostomy), as the catheter allows for continuous drainage until fluid output decreases or resolves. Malecot catheters have demonstrated utility for abscess drainage as well, as the tube facilitates the removal of purulent material, reduces pressure in the abscess cavity, and promotes healing (Hickey and Tao, 1984 Jun; Reynard et al., 2013; vanSonnenberg et al., 2001).

While anecdotal use among gynecologists is reported, it is valuable to document this practice to promote expansion given the efficacy and cost-effectiveness of this intervention. Compared with other drainage methods and materials, Malecot catheters are highly available due to widespread usage by other services and represent a low-cost and low-risk intervention. They are also user-friendly given ease of placement and removal by practitioners and are reportedly comfortable for patients, as there is no need to utilize gauze or sutures to secure the drain (Matthews and Kenton, 2014; Oh et al., 2022). Rather the Malecot catheter can be cut to be short enough that the end sits just inside the vaginal introitus, and the patient experiences vaginal bleeding similar to a period. It also drains spontaneously without need for a bulb or other bulky drainage system like with a Jackson-Pratt drain. While there are no formal recommendations for removal, we recommend removing the drain when the output tapers and, in the setting of documented infection, the purulent drainage resolves. Alternative studies recommend 24–48 h (Matthews and Kenton, 2014) or omit any recommendations regarding duration (Bleull et al., 2017).

Recommendations for follow up after VCD repair vary with some sources suggesting more frequent interval visits with speculum exams at each and others recommend more standard follow up at 6-week intervals. In our case, the patient was assessed at 6 weeks and was healing well without reported complications. It should be noted that the rate of repeat dehiscence events is low (Cronin et al., 2012), but appropriate follow-up examinations remain important particularly in patients with multiple risk factors.

Author contribution

There are no conflicts of interest. All authors equally contributed to the conception and design of the work as well as gave final approval of the version to be published. Bria Murray and, Caleigh E. Smith contributed to drafting the case report and literature review. Caleigh E. Smith was the writer. Jorge Alsina contributed to case report revision. Bria Murray contributed to sourcing and editing of figures. Paola A. Gehrig and Charles Landen and contributed to critical review of article.

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

CRediT authorship contribution statement

Bria Murray: Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Caleigh E. Smith:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Jorge Alsina:** Writing – review & editing, Data curation, Conceptualization. **Megan Howard:** Writing – review & editing, Data curation, Conceptualization. **Charles Landen:** Writing – review & editing, Data curation, Conceptualization. **Paola A. Gehrig:** Writing – review & editing, Supervision, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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