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CASE REPORT

Vaginal Cuff Dehiscence and Small Intestinal Prolapse in a Middle-Aged Woman Due to Ring Pessary Use

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Objective: Vaginal cuff rupture is a rare but serious postoperative complication predominantly occurring after hysterectomy. Given that it can lead to partial or total evisceration, bowel strangulation, sepsis, and acute mesenteric ischemia. Any instance of this complication should be treated as a surgical emergency. In this context, we report a case of a vaginal stump following regular use of pessaries.

Case Report: A 50-year-old woman was admitted to the hospital with sudden onset of bowel-like prolapse from the vagina. She had a 7-year history of vaginal prolapse and had previously undergone repair surgery and laparoscopic hysterectomy for uterine fibroids. Following her hysterectomy, she began using a pessary due to recurrent prolapse. Clinical assessment revealed vaginal evisceration of the intestines, necessitating emergency surgery. She was discharged smoothly on the eighth day post-operation. Three months later, she underwent a laparoscopic sacrocolpopexy.

Conclusion: The utilization of pessaries may heighten the risk of stump rupture in patients following hysterectomy, thereby demanding more vigilant attention from gynecologists.

Keywords: pessary complications, vaginal evisceration, sacrocolpopexy

Introduction

Vaginal evisceration is defined as partial or complete separation at the edge of the vaginal vault or apex with extrusion of intraperitoneal contents.[1] It is a rare but serious postoperative complication that can occur following hysterectomy or pelvic floor surgery, with reported rates varying by the type of hysterectomy, ranging from 0.032% to 1.2%.[2] Reported risk factors include the surgical approach, suture materials, use of energy-based surgical devices and cuff closure technique. In addition, patient-related factors that affect tissue quality and wound healing, such as smoking, diabetes, age, BMI and postoperative incisional infections, chemotherapy or radiotherapy for malignancy, and factors that increase pressure on the vaginal cuff, also play a significant role.[3]

Pessaries are most commonly used to relieve the symptoms associated with prolapse and are considered part of the initial treatment for primary or recurrent prolapse.[4] Complications from pessaries are typically minor, such as bleeding, erosion or discharge. More serious complications, such as rectovaginal or vesicovaginal fistula, have also been reported with pessaries, often due to neglect of the pessary.[5]

In this article, we present the case of a patient who experienced vaginal cuff rupture with concomitant small bowel evisceration following regular use of a uterine pessary after laparoscopic hysterectomy, and we have reviewed the relevant literature.

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Case Report

A 50-year-old woman, gravida 3 para 2, with a body mass index (BMI) of 25.71 kg/m², presented to the emergency department with transvaginal bowel prolapse, which had developed immediately after she experienced a bout of coughing while squatting.

The patient's medical history revealed well-controlled hypertension and diabetes. She and her husband live apart, which results in infrequent sexual activity. In 2018, she underwent anterior and posterior vaginal wall repair for prolapse and then a total laparoscopic hysterectomy for leiomyoma in 2020. Due to the absence of prolapse symptoms at that time, the patient did not undergo reconstructive surgery. Since 2022, symptoms of prolapse have recurred. On gynecologic examination, the most distal end of the vaginal prolapse extended 3 cm beyond the hymen, indicating stage II vaginal vault prolapse (POP-Q C 0), stage I anterior prolapse (POP-Q Ba −2), and stage III posterior prolapse (POP-Q Bp +3). The patient wore a size four ring pessary with support and maintained proper wearing habits. She diligently removed it every 7–15 days for self-care, cleaning, and disinfection, and then refrained from wearing it for 1–2 days after removal. However, scheduled follow-up examinations were consistently overlooked. In the past year, she has noticed an increase in hot flushes, night sweats, and irritability.

Upon admission, on physical examination, the patient was hemodynamically stable with a pulse rate of 78 beats/min and a blood pressure of 118/74 mm Hg. Abdomen was soft, but tender on deep palpation without rebound tenderness. About 20cm of the intestinal loop was visibly protruding through the vagina, showing superficial congestion but remaining viable, with no evidence of necrosis or intestinal damage (Figure 1). The patient presented with a white blood cell count of 15.09 × 10(9)/L and a neutrophil percentage of 92.8%. Serum electrolytes, and urea were within normal ranges.

Figure 1 Vaginal herniation of intestines.

After a multidisciplinary discussion with our team, colorectal surgeons and anesthesiologists, the patient underwent emergency surgery. The bowel loops were repeatedly washed with warm diluted povidone iodine and saline and gently returned to the peritoneal cavity with moist gauze to minimize further ischemia. After repositioning, we observed an irregular tear of approximately 6 cm in circumference at the vaginal stump surrounded by necrotic changes. The tissue was fragile and we closed the vaginal tear in two layers with absorbable sutures. Given the poor condition of the vaginal tissue and the necessity to monitor bowel recovery, further pelvic floor reconstruction surgery was deferred. Pathologic examination of the trimmed vaginal specimen revealed acute purulent inflammation of the squamous epithelium of the mucosa. The patient had a good postoperative recovery, regained bowel function within two days, and was discharged on the eighth day.

At the three-month postoperative follow-up, the patient's stump had healed well, but the prolapse recurred and prevented her from performing her daily work. Pelvic magnetic resonance imaging revealed a pelvic floor small bowel hernia (Figure 2). Due to the patient's recurrent prolapse, primarily involving a small bowel hernia, a laparoscopic sacrocolpopexy (LSC) was performed using a Y-shaped mesh. This procedure was accompanied by hernia sac trimming and transvaginal perineal reconstruction (Figure 3). The surgery was completed without complications with an estimated blood loss of 50 mL. After routine post-operative catheter removal, she was discharged smoothly.

Discussion

Vaginal evisceration was first described by Hypernaux in 1864.[6] In parallel with the widespread adoption of minimally invasive techniques, the incidence of vaginal cuff dehiscence has increased. In a retrospective study, the incidence rates of vaginal cuff dehiscence after laparoscopic, abdominal, and vaginal hysterectomy were 0.64%, 0.21%, and 0.13%, respectively.[7] Hur et al and Hamal et al reported similar trends, indicating a higher incidence of vaginal cuff rupture following laparoscopic hysterectomy.[8–10] In previous studies, it was believed that the risk of vaginal cuff dehiscence was higher after robot-assisted laparoscopic hysterectomy compared to traditional laparoscopic hysterectomy. However, more recent research does not support this view. Research findings indicate that the incidence of vaginal cuff dehiscence does not show significant differences following abdominal, laparoscopic, or robot-assisted hysterectomies.[11,12] This observation may be attributed to the increased experience of surgeons, the evolution of surgical techniques, and advancements in sutures.

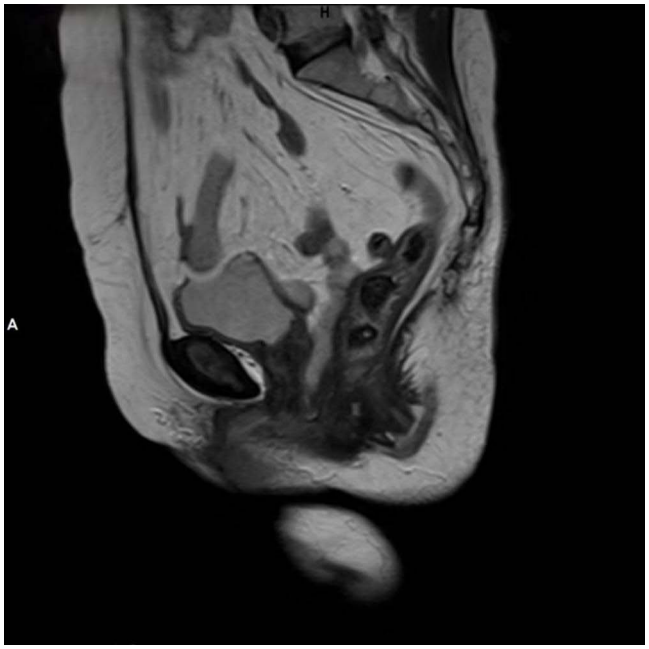

Figure 2 Magnetic resonance imaging revealed pelvic floor hernia.

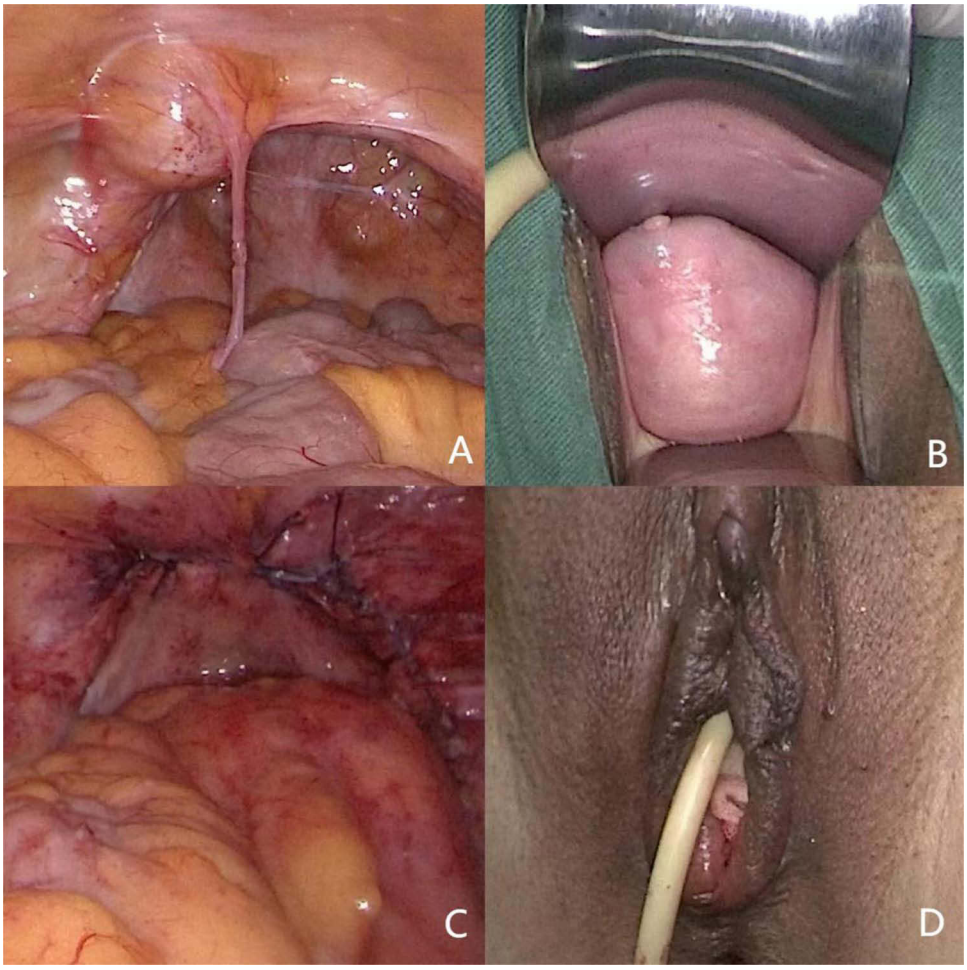

Figure 3 Pre- and post-operative images: (**A**) Preoperative laparoscopic image. (**B**) Preoperative vaginal image. (**C**) Postoperative laparoscopic image. (**D**) Postoperative vaginal image.

Regarding the timing of vaginal cuff dehiscence relative to the previous surgery, it can occur as early as 3 days postoperatively and as late as 30 years thereafter.[13,14] In premenopausal patients, dehiscence tends to occur early in the postoperative course (within the first 4 months) and is most commonly triggered by sexual intercourse, whereas in postmenopausal patients it can occur months to years after surgery and is often associated with pelvic organ prolapse.[2,15]

The surgical details of the previous procedure in patients with vaginal cuff dehiscence after total hysterectomy are the key focus of research. This includes aspects such as the surgical approach, the use of electrosurgery, suturing techniques, and the type of sutures employed. Some researchers have evaluated the depth of thermal injury to the vaginal cuff during hysterectomy using two types of electrothermal energy devices. They found no significant difference in the depth of injury between the two methods, which was only approximately 0.63–0.70 mm, nor were there notable differences in cuff-related complications.[16] Subsequently, a randomized controlled study by Taskin et al indicated that the incidence of vaginal cuff dehiscence between the monopolar coagulation group and the monopolar cutting group was not statistically significant when considering the method of vaginal cuff incision.[17] A separate study has demonstrated that double-layer suturing of the vaginal cuff is more effective than single-layer suturing in reducing complications, including vaginal cuff dehiscence.[18] Furthermore, Dojki SS indicated that there is no correlation between the incidence of vaginal cuff dehiscence and the use of either traditional figure-of-eight suturing or continuous double-layer suturing techniques.[19] Cannone et al concentrated on the suture aspect by comparing Vicryl (Polyglycolic acid 910) and Polydioxanone (PDS) in terms of the occurrence of vaginal cuff dehiscence following suturing, and found no significant discrepancy between the two.[20] Similarly, other researchers have reported comparable results when examining unidirectional barbed sutures in

comparison with conventional polyglactin 910 sutures.[21] In a systematic review conducted by Hafermann et al, barbed sutures were found to be an effective method for reducing surgical time, suturing time, and blood loss. However, they seem to have no impact on the occurrence of postoperative complications.[22] In addition to surgical factors, patient-related factors such as smoking, diabetes, age, comorbidities, malignancies, and radiation therapy can have an adverse effect on the healing of the vaginal cuff and logically impact the incidence of vaginal cuff dehiscence.[3]

Clinical manifestations of vaginal cuff dehiscence include: pelvic or abdominal pain, vaginal bleeding, vaginal discharge, vaginal pressure or mass. Some patients were found only by physical examination. Vaginal cuff rupture can lead to life-threatening complications such as peritonitis, intestinal damage, necrosis, and sepsis, necessitating prompt intervention. Eoh et al summarized the treatment protocol for patients with vaginal cuff rupture.[23] For those who are hemodynamically stable with small dehiscence less than 1 cm, conservative management may be considered, but antibiotics should be used, and the presence of hematoma and abscess must be ruled out. However, if the dome is completely torn, there is evisceration of organs or severe bleeding with unstable vital signs, then emergency surgical intervention is necessary. Emergency management consists of the following steps: stabilize vital signs, administer fluid therapy, pack the bowel with moist saline sponges, administer antibiotics, and proceed to immediate surgery.[1]

Published literature has documented various surgical repair techniques such as transvaginal, abdominal, laparoscopic, robotic, or combined approaches, yet no standard has been established.[2,24] If the patient is stable and there is no clinical evidence of peritonitis or intestinal damage, a transvaginal surgical approach should be considered.[24] As in our case, the patient's intestinal viability was adequate, therefore we opted for a vaginal surgical approach, which saved operating time and cost. Abdominal approach is also commonly used because it provides optimal exposure for examination of intra-abdominal viscera and irrigation, drainage, and resection of non-viable bowel.[25]

One of the fundamental goals of suspension surgery is to restore apical support, with sacrocolpopexy (SCP) being recognized as the gold standard treatment for vaginal vault prolapse.[26,27] In the randomized controlled trial conducted by Menefee et al, both sacrocolpopexy (SCP) and transvaginal mesh (TVM) demonstrated superior outcomes for patients with vaginal vault prolapse after hysterectomy, with lower recurrence rates compared to transvaginal native tissue repair (NTR).[28] In addition, SCP had favorable anatomic outcomes including apical support and leading edge of prolapse compared to NTR and TVM. Therefore, it is prudent to select SCP surgery for the patient.

Siddiqui I reported the case of a 79-year-old woman with no history of surgery who experienced spontaneous vaginal evisceration two weeks after pessary insertion.[29] Subsequently, Rubin R described an 82-year-old woman who experienced vaginal evisceration immediately after pessary insertion and attributed the incident to vaginal atrophy and poor tissue quality.[30] Our case differs from these reports in that it is a middle-aged woman who had been using a pessary regularly for almost two years. A similar case was presented by Sinha A who documented a woman who experienced a cuff rupture one month after pessary use.[31] However, this patient had a pelvic infection following her hysterectomy, which was considered a contributing factor due to poor collagen quality in the vaginal vault, and did not emphasise the significant negative impact the pessary may have had during this period. In our case, there are several potential reasons for the vaginal cuff rupture following pessary use. In the first, the patient in our case presented with diabetes and obesity and was also in the perimenopausal phase. The decline in hormone levels is likely to have impaired the healing of the vaginal walls.[32] Furthermore, the pressure exerted by the pessary on the vaginal vault may have contributed to the formation of subtle ulcers. Additionally, vaginal inflammation resulting from pessary use, combined with a foreign body reaction, further compromised the integrity of the vaginal cuff, ultimately leading to its rupture during coughing.[33] As such, the use of a pessary in populations at high risk of vaginal rupture should be carefully considered.

This case report has several limitations. The follow-up period was relatively short, which hindered a comprehensive assessment of the long-term prognosis for the patient. Moreover, the study is based on a single patient, restricting the generalizability and reliability of the findings. The lack of large cohort studies also limits our ability to compare the incidence of vaginal cuff dehiscence between patients using the pessary and those who do not.

Conclusion

Although vaginal cuff rupture is rare, surgeons performing hysterectomies may encounter it and should be aware of its potentially life-threatening nature. Wearing a pessary after a hysterectomy may compress the area and affect blood supply,

increasing the risk of vaginal cuff rupture. It is therefore recommended that the application of a pessary in populations at high risk of cuff rupture should be approached with greater caution and monitored carefully. Timely assessment and surgical repair are essential to ensure bowel viability and reduce the risk of intraperitoneal infection and subsequent sepsis. The final surgical approach should be tailored to the patient's clinical presentation and the surgeon's expertise. Patients with vaginal evisceration combined with prolapse may also benefit from a staged surgical approach to ensure optimal postoperative outcomes.

Data Sharing Statement

The data used during this study are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate

The study was approved by the Ethics Committees of The First Affiliated Hospital of USTC [Approval number: 2024-RE-261] and the patient provided written informed consent.

Declaration of Patient Consent

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

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Disclosure

The authors declare that they have no competing interests.

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