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Liu SH, Zhang YH, Niu HT, Tian DX, Qin F, Jiao W

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Vaginal enterocele after cystectomy: A case report

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Abstract

BACKGROUND

After undergoing radical cystectomy combined with hysterectomy, female patients may suffer from pelvic organ prolapse due to the destruction of pelvic structures, which mainly manifests as the prolapse of tissues of the vulva to varying degrees and can be accompanied by symptoms, such as bleeding and inflammation. Once this complication is present, surgical intervention is needed to resolve it. Therefore, preventing and managing this complication is especially important.

CASE SUMMARY

The postoperative occurrence of acute enterocele is rare, and a case of acute small bowel vaginosis 2 mo after radical cystectomy with hysterectomy is reported. When the patient was admitted, physical examination revealed that the small bowel was displaced approximately 20 cm because of vaginal enterocele. A team of gynecological, general surgery, and urological surgeons was employed to return the small bowel and repair the lacerated vaginal wall during the emergency operation. Eventually, the patient recovered, and no recurrence was seen in the half year of follow-up.

CONCLUSION

We review the surgical approach for such patients, analyze high-risk factors for the disease and suggest corresponding preventive measures.

Key Words: Acute enterocele; Complication; Pelvic organ prolapse; Prevention; Repair; Case report

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Core Tip: After undergoing radical cystectomy combined with hysterectomy, female patients may suffer from pelvic organ prolapse due to the destruction of pelvic structures, which mainly manifests as the prolapse of tissues of varying degrees in the vulva and can be accompanied by symptoms, such as bleeding and inflammation. Once this complication is present, we need surgical intervention to resolve it. So how to prevent and manage this complication is especially important. We review the surgical approach for such patients, analyzes high-risk factors for the disease and focuses on suggesting corresponding preventive measures.

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INTRODUCTION

Bladder cancer is the most common malignant tumor of the urinary system. The incidence rate in males is 3-4 times that in women. Although the probability of male cancer is far greater than that of female cancer, the possibility of myometrial invasion is greater in women[1]. The preferred choice of treatment for women with muscle-invasive bladder cancer is radical cystectomy and urinary diversion. However, for patients with locally advanced disease, it may be necessary to enucleate the uterus and bilateral adnexa and even a segment of the anterior vaginal wall for bladder removal, thereby reducing the likelihood of recurrence and metastasis after surgery. Given that destruction of the original structure of the pelvic cavity combined with the loss of some tissues, such as ligaments and fascia, leads to the absence of support for the vagina and vulvar region of the patient, the probability of developing pelvic organ prolapse (POP) after surgery increases.

In patients with an orthotopic neobladder, the presence of POP can lead to compression of the neobladder, triggering urinary retention and dysuria. POP causes patients to experience a reduction in quality of life, and surgical treatment is often indicated for patients with sexual needs. However, patients with acute enterocele are at risk of bowel rupture as well as mesenteric torsion, which subsequently triggers intestinal avascular necrosis, requiring timely multidisciplinary joint surgical intervention[2]. The patient's previous surgical history can indicate whether it is likely that various levels of intra-abdominal adhesions are present. In addition, the absence of pelvic tissues (muscles, ligaments, and vaginal supporting tissues) undoubtedly increases the difficulty of surgical repair. Two surgical approaches are available: transabdominal or transvaginal approaches using vaginal atresia[3] or posterior vaginal wall repair to reduce the probability of secondary POP after surgery. It has also been reported that pelvic mesh placement results in good outcomes. To reduce patient suffering and expense, we believe that preventive measures are needed to reduce the incidence of POP after radical cystectomy in women. Importantly, doctors need to understand the anatomy of the female reproductive system, reduce the damage to important ligaments and fascia during surgery, and preserve vaginal support as much as possible[4,5]. However, more important is adequate preoperative preparation and individualized postoperative care.

CASE PRESENTATION

Chief complaints

The patient was a 72-year-old woman who experienced sudden spontaneous small bowel bulging into the vagina during defecation at home and was transferred to our hospital 10 h after onset for treatment.

History of present illness

The patient suffered from excruciating abdominal pain and had assumed and maintained a hunched posture for over 10 h.

History of past illness

The patient was pregnant three times, gave birth two times, and miscarried once. Her height, weight and body mass index were 158 cm, 56 kg and 22.4 kg/m², respectively. The patient had no history of chronic disease. She underwent radical cystectomy, uterine and double adnexectomy and bilateral ureterolithotomy due to bladder malignancy two months prior. Postoperative pathology confirmed high-grade invasive urothelial carcinoma invading the deep muscularis without involvement of urethral resection margins and bilateral ureteral stumps.

Personal and family history

The personal and family history of the patient was unremarkable.

Physical examinations

The patient's temperature was 37.6°C, heart rate was 98 bpm, respiratory rate was 19 breaths per minute, blood pressure was 170/85 mmHg and oxygen saturation in room air was 99%. Physical examination after admission revealed that the small intestine had prolapsed approximately 20 cm, and its color was dark red (Figure 1). The initial diagnosis was vaginal enterocele (Aa6, Ba7, C9, AP-4, BP6 stage IV prolapse) according to the POP-Q system[6,7].

Laboratory examinations

Blood analysis revealed mild leukocytosis of $11.5 \times 10^9/L$, with predominant neutrophils (85%) and a normal hematocrit and platelet count. Prothrombin and partial thromboplastin times were normal, and the d-dimer value was 0.71 $\mu g/mL$. Serum C-reactive protein was normal, and the erythrocyte sedimentation rate was 32 mm/h. The blood biochemistry and urine analyses were normal. The electrocardiogram, chest X-ray and arterial blood gas results were also normal.

Imaging examinations

In the initial imaging evaluation with a pelvic computed tomography (CT) scan, the patient's uterus and bladder were not visualized. A partial small bowel herniation from the pelvic region was discovered (Figure 1B), and the abdominal CT showed no other abnormalities.

MULTIDISCIPLINARY EXPERT CONSULTATION

Wei Jiao, MD, PhD, Chief Doctor, Professor, Department of Urology, The Affiliated Hospital of Qingdao University, provided the following assessment: The patient underwent laparoscopic radical cystectomy and hysterectomy 2 mo earlier. Based on the patient's medical history and physical examinations, acute vaginal enterocele was considered.

Yu-Fang Xia, MD, PhD, Chief Doctor, Assistant Professor, Department of Gynecology, The Affiliated Hospital of Qingdao University, provided the following assessment: After undergoing radical cystectomy combined with hysterectomy, female patients may suffer from POP due to the destruction of pelvic structures. If the patient presents vaginal bacteria proliferation, damage to pelvic internal tissues due to inflammation resulting in edema can result in acute vaginal enterocele.

Guo-De Sui, MD, PhD, Chief Doctor, Assistant Professor, Department of Emergency Surgery, The Affiliated Hospital of Qingdao University, provided the following assessment: The patient's physical examination after admission revealed that the small intestine had prolapsed approximately 20 cm, and its color was dark red (Figure 1). We were concerned that the patient might have bowel rupture, and open surgical exploration was urgently needed.

FINAL DIAGNOSIS

The final diagnosis of the presented case was acute vaginal enterocele after cystectomy.

TREATMENT

The patient's exposed small bowel outside the vagina was dark red, and due to the risk of small bowel ischemic necrosis and rupture, we quickly performed open surgical exploration to ensure that the small bowel was free of mesangial torsion and necrosis. Intraoperatively, an abdominal median incision approximately 10 cm in length was made in the abdominal cavity for exploration. The patient had no obvious adhesion in the abdominal cavity. A small amount of ascites was observed in the pelvic cavity, and the sigmoid colon was palpable with a larger mass of hard feces. Intraoperatively, approximately 20 cm of the small intestine was dislodged from the vaginal stump. After being placed back and moistened with warm saline for 15 min, the dislodged small intestine exhibited good revascularization and peristalsis (Figure 2A). A small portion of the intestinal wall serosal layer was broken. We used 4-0 VICRYL (Ethicon) for suture repair. The patient's vaginal stump exhibited edema and inflammatory changes, and the suture was reinforced using 0-0 VICRYL (Ethicon) (Figure 2B). After washing of the pelvic cavity with warm saline and dilute iodophor, the pelvic floor wound was assessed to ensure that it was not bleeding. The incision was closed layer by layer.

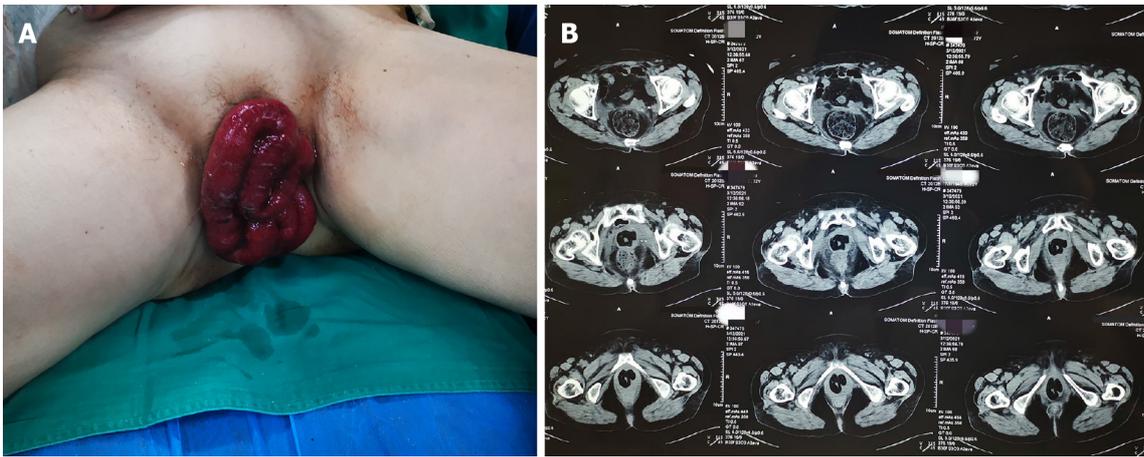


Figure 1 The small intestine had prolapsed. A: Vaginal enterocele appears dark red in color; B: Pelvic CT suggested partial small bowel prolapse into pelvic cavity.

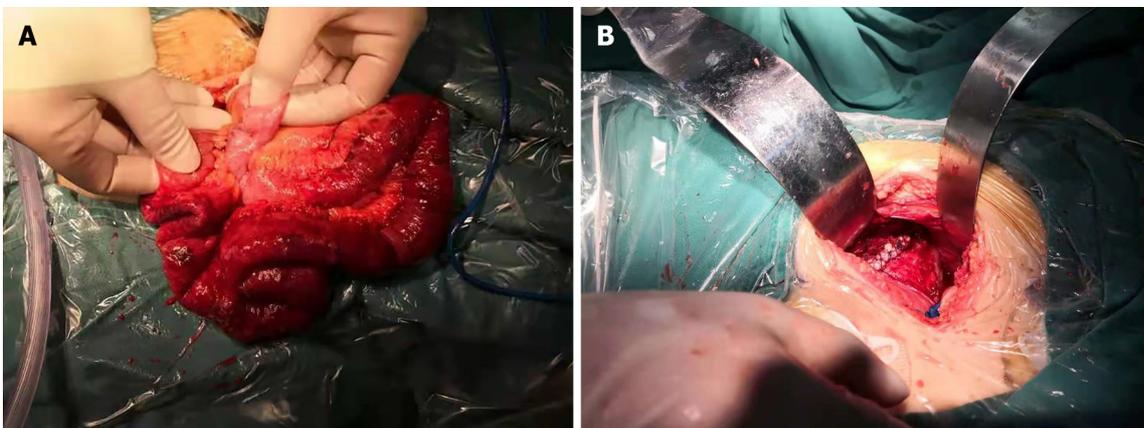


Figure 2 Open surgical exploration to ensure that the small bowel was free of mesangial torsion and necrosis. A: During the operation, the prolapsed small intestine was still active after hot compress with warm saline solution; B: The repaired vaginal stump was reinforced to the posterior vaginal wall using a figure of eight suture.

OUTCOME AND FOLLOW-UP

Postoperatively, we used cefoperazone sulbactam to prevent infection and observed that the patient's routine inflammatory indicators gradually recovered to normal levels 3 d after surgery. Routine blood tests returned to normal values before discharge, but mild anemia was noted. The patient began to flatulate on postoperative day 2 and defecate on postoperative day 3. The patient did not show symptoms such as intestinal root obstruction and intestinal necrosis during hospitalization. The patient recovered well and was discharged on the 5th postoperative day. During the follow-up assessment approximately 6 mo after the patient was discharged from the hospital, no new prolapse and no cancer recurrence were noted.

DISCUSSION

Currently, no definite incidence rate of POP after radical cystectomy has been reported. However, after radical cystectomy and hysterectomy, the rate of pelvic cavity structure prolapse is not minimal[8]. The patients mainly have chronic symptoms. Acute enterocele patients are rare, and clinicians lack relevant treatment experience. Both urgent and elective revision surgeries are difficult and require the skill of an experienced physician.

In our literature review, representative cases of acute and chronic POP after radical cystectomy (including cases treated with laparoscopic and robotic-assisted surgery) due to bladder cancer published in recent years were retrieved. Table 1 summarizes the patient's basic conditions, surgical approach, and follow-up in these cases. Most of the surgeries were performed using the vaginal approach. In addition, nonurgent repair surgery was supplemented with mesh reinforcement, and

Table 1 Vaginal enterocele case literatures review

Ref.	Case	Age	Surgery	Time to pop after surgery	Type and stage	Approach	Method	Relaspe	Follow up
Okada <i>et al</i> [13]	1	78	Cystectomy and Hysterectomy	3 mo	Stage III Anterior enterocele	Transvaginal	Suture with Polytetrafluoroethylene mesh	No	6 mo
Shaker [8]	1	75	Cystectomy and Hysterectomy	10 mo	Stage III Anterior enterocele	Transvaginal	Suture	No	4 mo
Stav <i>et al</i> [14]	1	70	Cystectomy	16 mo	Stage III Anterior enterocele	Transvaginal	Suture with polypropylene mesh	Yes	2 mo
	2	71	Cystectomy	18 mo	Stage IV Anterior enterocele	Transvaginal	Suture	No	10 mo
	3	69	Cystectomy, hysterectomy and Anterior vaginal repair	10 mo	Stage IV Anterior enterocele	Transvaginal	Suture	No	5 mo (Died)
	4	44	Cystectomy, ileal conduit and chemotherap	2 mo	Stage III Anterior enterocele	Transvaginal	Suture with bilateral ilio-coccygeal suspension	Three weeks later developed a colo-vaginal fistula	10 mo (Died)
	5	65	Cystectomy, ileal conduit	7 mo	Stage IV Anterior enterocele	Transvaginal	Colpocleisis	Yes	6 mo
Graefe <i>et al</i> [15]	1	67	Cystectomy, ileal conduit	8 mo	Stage IV Anterior enterocele	Transvaginal	Suture with Polypropylene mesh	No	16 mo
	2	76	Cystectomy, ileal conduit	12 mo	Stage IV Anterior enterocele and vaginal vault prolapse	Transvaginal	Suture with Polypropylene mesh	No	4 mo
Lin <i>et al</i> [2]	1	55	Robotic-assisted cystectomy with ileal conduit (previous hysterectomy)	4 mo	Stage IV with denuded anterior vaginal wall enterocele	Transvaginal	6 wk later native tissue repair, 52 wk later Suture with biological graft, 78 wk completion perineorrhaphy	Yes, 6 wk later vaginal wall dehiscence 52 wk later recurrent dehiscence 78 wk recurrent dehiscence	5 yr
	2	68	Robotic-assisted cystectomy with ileal conduit (previous hysterectomy)	1 yr	Stage II prolapse of the anterior wall and vault anterior vaginal wall prolapse	Transvaginal	56 wk later suture and reconstruction for an enterocele prolapsing, 80 wk later partial vaginectomy, 86 wk suture with biological graft	Yes, 56 wk later anterior vaginal wall prolapse, 80 wk later recurrent vaginal bulge. 86 wk later recurrent bulge	21 mo
	3	73	Robotic-assisted radical cystectomy, hysterectomy and ileal conduit	14 wk	Anterior vaginal wall prolapse	Transvaginal	Suture	NO	11 mo
	4	73	Robotic-assisted radical cystectomy hysterectomy	28 mo	Vaginal eversion and vaginal dehiscence	Transvaginal	Suture and colpocleisis, levatorplasty, perineorrhaphy	Yes, 4 mo later vaginal dehiscence	3 wk
	5	79	Robotic-assisted radical cystectomy hysterectomy	11 wk	Vaginal dehiscence and a window of thickened peritoneal tissue	Transvaginal	Suture and enterocele repair, colpocleisis and aperineorrhaphy	No	8 mo

polytetrafluoroethylene polymer composites were the mesh material most often used. Some scholars, such as Lin *et al* [2], have also chosen to use biological grafts. Zimmer and Wang [9] believed that the placement of mesh reduces the chance of POP recurrence to some extent and benefits patients in the long term. The placement of a matched mesh by surgical repair is currently the most popular surgical approach for treating POP. However, there is a possibility of recurrence postoperatively. In the case reported by Lin, some patients experienced a second or even third recurrence after repair and ultimately

opted for a more extreme complete vaginal suture procedure. Multiple recurrences of POP cause considerable harm to patients, both psychologically and physiologically, while also increasing their financial burden. We reviewed previous case reports and found that the main factors reported to be responsible are type of surgery and lack of judgment and corresponding preventive measures against the etiology of the disease. We propose some humble opinions in this regard.

We have summarized the etiology of acute enterocele based on reported cases as follows: (1) Patients were discharged from the hospital with mixed hygiene strategies and occasionally lacked the necessary perineal care, had vaginal bacteria proliferation, had damage to pelvic internal tissues due to inflammation resulting in edema, and had difficulties in securing vaginal posterior wall sutures due to edema and the weakened state of inflammatory tissues (which result in slippage of sutures); (2) As was found in the patients in these cases, a history of constipation was present in some patients with increased pressure in the pelvic cavity during bowel movements leading to enterocele; and (3) Clinicians mainly focus on tumor recurrence and prognosis, and reexamination is mainly based on imaging and biochemical examination. Reexamination often lacks a meticulous physical examination, and early enterocele is easily overlooked. In response to the above pathogenetic factors, we have focused on proposing corresponding preventive measures. Expedite the patient's postoperative recovery and reduce the risk of postoperative infection. In addition to the proper use of antimicrobials, prophylactic measures are routine in surgical procedures, such as avoiding intraoperative hypothermia in patients, controlling perioperative blood glucose, and adhering to strict aseptic procedures[10]. Patients should be referred to gynecologic perioperative practice for anti-infection options when undergoing radical cystectomy and hysterectomy. The most notable of these strategies is the disinfection of the vagina preoperatively and intraoperatively, and we recommend the preoperative use of a 1:5000 potassium permanganate dilution by sitting in a bath and flushing the vagina once each morning and night. Intraoperatively, the scope of skin disinfection of the perineal area should be appropriately expanded, and the vagina should be rinsed again using dilute iodophors. Cleaning agents may also include chlorhexidine. The above approach has been used to reduce the number of bacteria on the skin of the perineal region and in the vagina with the aim of alleviating the inflammatory reaction in the vaginal wall tissue during and after surgery, thereby alleviating tissue edema and reducing the risk of suture slippage in the posterior vaginal wall after surgery. In addition, in the instructions before discharge, patients need to be reminded to pay attention to perineal hygiene postoperatively and to change their underpants on a regular basis. Postoperatively, increased abdominal pressure is one of the predisposing factors for POP and can be induced by coughing, laughing, improper movement, and constipation. Compared with extrinsic factors, such as coughing, laughing, and participating in sports, constipation is often overlooked by clinicians and patients[11].

In the present case, the patient had a long history of constipation with vaginal enterocele occurring during defecation and a large, hard fecal mass was palpable in the sigmoid colon on intraoperative exploratory laparotomy. We believe that constipation is a high-risk factor for acute vaginal enterocele. Therefore, it is important to correct constipation problems, and we recommend routine bowel preparation before surgery and propose individualized postoperative bowel movement management protocols for patients with a history of constipation[12]. Patients are encouraged to use glycerin enemas postoperatively. Softened stools facilitate expulsion, and osmotic laxatives, such as polyethylene glycol, may also be used if necessary. When patients are reexamined postoperatively, clinicians should emphasize physical examination unconstrained by imaging and laboratory test results, though they are important measures to detect early POP.

CONCLUSION

We report a case of a female patient who presented with a sudden, spontaneous small bowel bulging into the vagina. Exploratory laparotomy, small bowel recovery and vaginal repair were performed. Acute enterocele is a relatively intractable problem for surgeons once it occurs. If the patient has a history of surgery, adhesions in the abdominal viscera may be present, increasing the difficulty of surgery. According to the patient's actual situation, a transabdominal or transvaginal surgical approach can be taken. We have referred to the treatment methods of other scholars including Okada, Stav, and Graefe[13-15], which had good guiding significance for us. In our case, we chose the potentially cumbersome intraperitoneal approach because of additional concerns about revascularization of the patient's bowel. In addition, inflammation, adhesions and pain all contribute to increased local tissue oxidative stress in patients. Oxidative stress is one of the principal factors associated with mesh foreign-body reactions[16]. Therefore, we did not place meshes to prevent aggravation of inflammation. However, we found that mesh placement in cases without inflammation may benefit patients[17]. Acute vaginal enterocele causes great distress to patients both psychologically and physiologically while increasing the financial burden on patients. We believe that adequate preoperative preparation along with detailed postoperative education is one of the important means to prevent this complication. Other means of prevention await further study.

FOOTNOTES

Author contributions: Liu SH, Niu HT, Jiao W were the patient's urologists, reviewed the literature analyzed the data and contributed to manuscript drafting; Zhang YH reviewed the literature; Qin F and Tian DX contributed to manuscript drafting; Jiao W analyzed and interpreted the imaging findings; all authors issued final approval for the version to be submitted.

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