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Decompression of Hematocolpos Caused by Acquired Obstruction in Patient with Prior Radiation Therapy for Vaginal Cancer

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Abstract

Background: This report is intended to present a unique patient with acquired vaginal obstruction due to prior radiation therapy and subsequent development of hematocolpos. We present a method of surgical decompression for the hematocolpos as well as this patient's follow-up and prevention of re-epithelialization.

Case: One patient was recruited and consented for this case study. Pre-operative evaluation, including examination and imaging, intra-operative findings, and post-operative evaluation were reported in this study. After surgical evaluation and drainage of hematocolpos via incision and drainage, a foley balloon was placed to prevent re-epithelialization. Intra-operative fluid cultures yielded no growth. At her follow-up appointment, the foley balloon was removed and the vaginal canal was intact without agglutination or re-accumulation of hematocolpos.

Conclusion: This is a unique case of acquired obstruction from radiation therapy causing significant symptomatic hematocolpos. We offer a minimally invasive approach for decompression, evaluation of malignancy, and prevention of re-obstruction. Her post-operative appointment showed resolution of symptoms and patent vaginal canal. Long-term outcomes are still required, including monitoring for malignant recurrence, re-obstruction and stenosis, and sexual health. If re-epithelialization occurs, more definitive therapy will be required, including excision of the vaginal septum or hysterectomy.

Keywords: Hematocolpos; Decompression; Radiation therapy; Pelvic radiation

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Introduction

Hematometra is the accumulation of fluid in the uterine cavity and hematocolpos is the accumulation of fluid in the cervix. Hematometrocolpos more commonly occurs during two timepoints: puberty and menopause. At puberty, congenital anomalies from developmental failure of the Mullerian ducts begin to manifest as pelvic and abdominal pain as well as primary amenorrhea. The main causes of hematometrocolpos during puberty include imperforate hymen, distal vaginal agenesis, transvaginal septum, and uterine anomalies such as unicornuate uterus [1,2]. Treatment usually involves surgical dilation and long-term outcomes are optimal, however some potential complications can include tubal infection, endometriosis, infertility, and pelvic adhesions [3]. Hematometrocolpos in postmenopausal women is commonly caused by cervical stenosis. Other causes could be radiation or neoplasm in the lower uterine segment or cervix. Cervical stenosis can occur after radiation, ablation, cervical conization, or malignancy [4,5]. Concern arises when hematometra occurs in postmenopausal women who could obscure post-menopausal bleeding as initial signs of malignancy and delay care [6]. This case report explores the presentation of a patient with history of radiation therapy and new onset hematometrocolpos.

Case Report

A 52-year-old gravida 0 postmenopausal woman with a history of stage II adenocarcinoma of the vagina treated with whole pelvic radiation therapy and concurrent radio-sensitizing chemotherapy at 22 years old, presented with new onset of pelvic pain and abdominal fullness. She presented to her primary care physician for evaluation. On transvaginal ultrasound, the patient had an enlarged uterus measuring 5.0 cm × 8.2 cm × 6.7 cm with marked fluid distention in the endometrial cavity and endocervical canal as well as a small polypoid structure within the uterine cavity **(Figure 1)**. She had one prior transvaginal ultrasound in 2018 which was within normal limits. Further imaging was recommended, and a Computerized Tomography (CT) scan of the abdomen and pelvis again revealed an enlarged uterus with distention of the endometrial cavity and cervical canal with low attenuation **(Figure 2)**. There was no evidence of ascites or other intraabdominal pathology. At this time, she was referred to gynecologic oncology for evaluation due to concern for recurrent malignancy. After primary treatment of her vaginal cancer with whole pelvic radiation therapy and chemotherapy, the patient experienced radiation menopause at the age of 22. The patient was not treated with hormone therapy at that time. Additionally, the patient had intermittent usage of vaginal dilators in the interim.

The patient has a medical history significant for bipolar disorder, type II diabetes, asthma, congestive heart failure, hypertension, and left bundle branch block, which were all well-controlled on her medication regimen managed by her primary care physician. She has no surgical history. She denies in-utero diethylstilboestrol exposure. She has a family history of ovarian, breast, colon, and gallbladder cancer.

On presentation, her height was 5 feet 5 inches, weight 196 pounds (BMI 31.64 kg/m^2), blood pressure 116/83 mmHg, pulse 111 bpm and temperature 97.0˚F. On examination, she was in no apparent distress. There was tenderness to palpation in the middle and lower abdomen, without distention, mass, or ascites. Her external genitalia showed extensive erythema, likely from prior radiation therapy involving the inner thighs and labia. The vaginal introitus was completely obliterated/agglutinated with no palpable vaginal canal. There was anterior fullness appreciated on rectal exam beyond the vaginal agglutination point. The rest of the exam showed no significant abnormalities. Magnetic Resonance Imaging (MRI) of the pelvis was ordered to rule out metastatic recurrence and to assist in surgical approach.

Pelvic MRI showed an enlarged uterus measuring 10.8 cm × 3.9 cm × 5.4 cm without any focal uterine masses. There was significant distention of the endometrial canal measuring 3.2 cm and the endocervical canal measuring 5.1 cm in the antero-posterior dimension **(Figure 3)**. The T1 hyperintense complex fluid within the uterine cavity suggested hemorrhagic fluid. The ovaries, bladder, urethra, vagina, lymph nodes, bowel, and osseous structures were all normal and there was no free fluid. There were no other significant findings or evidence of metastatic malignancy. Discussion of surgical options was reviewed with the

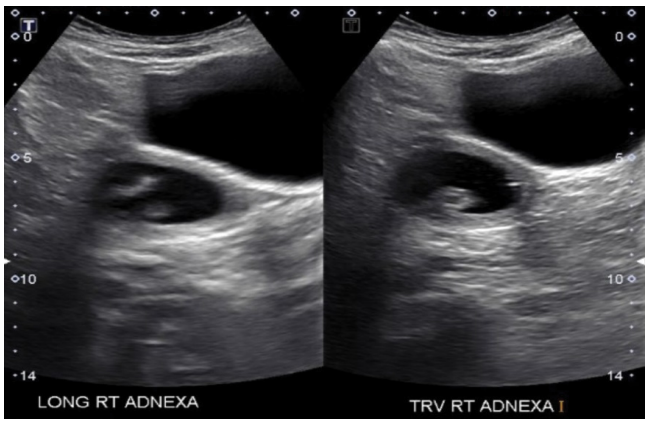

Figure 1 Transabdominal ultrasound depicting the patient's fluid-distended uterine cavity and associated intra-cavitary polypoid structure.

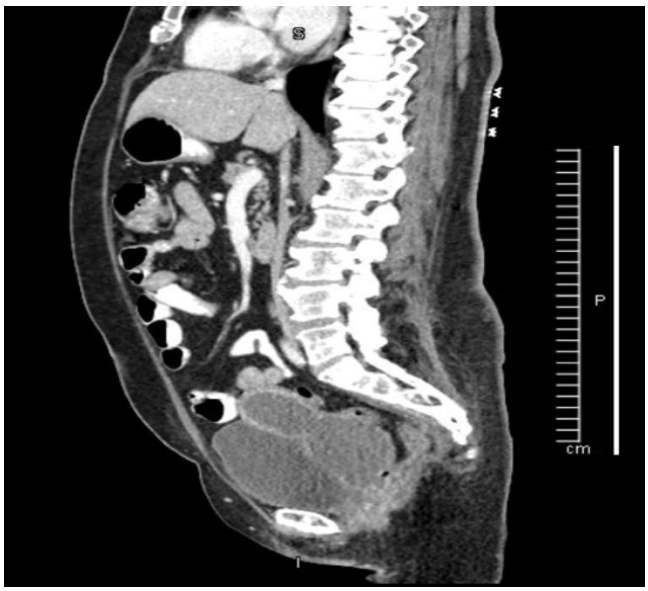

Figure 2 Sagittal CT confirming patient's fluid-distention of uterine cavity, cervix, and distal vagina.

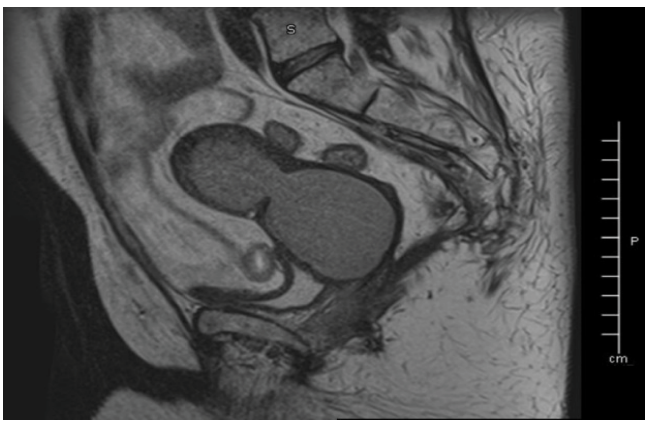

Figure 3 T2-weighted Pelvic MRI demonstrating fluid-distention of uterine cavity, cervix, and distal vagina.

patient and decision was made to schedule her for an incision and drainage of hematometrocolpos. This approach was intended to alleviate pelvic pain, identify and isolate the fluid behind the septum, and recanalize the vagina.

She was taken to the operating room for an exam under anesthesia, drainage of hematometra and hematocolpos, and cystoscopy. Cefazolin and metronidazole were given for surgical prophylaxis. In the operating room, under general anaesthesia via endotracheal intubation, the patient was found to have atrophic external genitalia and obstruction of the mid vagina with a 1 cm vaginal pouch appreciated on digital exam. The entirety of the procedure was performed under real-time ultrasound guidance. Ultrasound confirmed a distended distal vagina and uterine cavity filled with fluid. A nasal speculum was used to visualize the vaginal canal and spinal needle was inserted into the distended distal vaginal cavity under ultrasound guidance to ensure protection of bowel and bladder. Purulent fluid was aspirated. A size-11 blade was used to make a 2 cm cruciate incision in the agglutinated tissue to allow for drainage. Approximately 650 cc purulent fluids were suctioned from the vaginal cavity and uterine cavity. Vaginal cultures were collected at this time. As noted in prior imaging, the existing 2 cm polypoid structure was grasped with forceps under ultrasound guidance, removed from the uterine fundus, and sent to pathology. The cavity was copiously irrigated with saline-diluted betadine. An ultrasound assessment demonstrated complete decompression of the uterine and vaginal cavities. A size 24 foley catheter was placed into the vaginal cavity, and the balloon was inflated to allow continuous drainage and prevent closure. A rectal exam was performed showing no evidence of rectal injury. A cystoscopy was performed showing no evidence of bladder or ureteral injury. The estimated blood loss was 5 mL, and the patient tolerated the procedure well. There were no complications, and the patient was discharged home the same day with the foley catheter in place. She was given a prescription for seven days of doxycycline for infection prophylaxis.

The patient presented for her follow-up appointment on post-operative day eight. She had been recovering well without complication. Aerobic and anaerobic cultures taken intra-operatively yielded no growth, cytology showed few white blood cells without organisms or malignancy, and the biopsy resulted as a 1.8 cm × 1.1 cm × 0.5 cm endometrial polyp. On exam, her catheter was removed and there was an approximately 1cm visible opening in the mid-vagina, with minimal bleeding and no masses on palpation. She was prescribed vaginal estrogen cream and advised to return in two months for follow-up.

Discussion

Radiation therapy can cause scarring in up to 88% of cases and 38% of cervical and vaginal cancer cases stage IB to IV. Scarring due to radiation is caused by small vessel thrombosis, muscle necrosis, inflammation, denudation, and ulceration [7]. Risk factors for vaginal stenosis include higher radiation doses, age greater than 50 years, lack of compliance with dilator use, and concurrent chemoradiation treatment [8]. Radiation doses exceeding 80 Gy have been associated with 10%-15% increase in risk of vaginal toxicity such as vaginal necrosis and severe vaginal stenosis [9].

Vaginal stenosis is most likely to occur within the first year of radiation treatment but has been noted to occur as early as 26 days and as far out as 5.5 years from definitive pelvic therapy [10]. The upper vaginal mucosa has higher radiation tolerance than the mucosa of the lower vagina, and vaginal narrowing may begin while undergoing radiation therapy [11].

For patients who receive pelvic radiation therapy, standard of care is to implement regular use of vaginal dilators and application of vaginal estrogen to prevent vaginal scarring and closure of the vagina. In other cases, benzydamine, hyperbaric oxygen, and surgical reconstruction can be used [12]. In this case, the patient had not used vaginal dilators in the past, despite her history of radiation therapy.

Severe vaginal stenosis can cause an acquired obstruction and may result in accumulation of blood and fluid above the occlusion in the endocervical canal or endometrial cavity. With minimal accumulation, patients can remain asymptomatic, however persistent formation of fluid may cause significant dilatation of the pelvic structures and thus result in discomfort and require urgent surgical interventions.

It is important to consider the type of incision to use for a patient with vaginal stenosis due to pelvic radiation. Similar surgical scenarios would include patients with a transverse vaginal septum or imperforate hymen. There are several approaches for treatment of a transverse vaginal septum including horizontal incision, septum resection with or without skin graft repair, double mucosal flap, double cross plasty, abdominal resection via laparoscopy, or vaginoscopic resection [13-19]. Each method has individualized intended benefits including repair cosmetics, prevention of re-epithelialization, and sexual function. Imperforate hymen is another form of congenital septum, usually noted in puberty. Per the American College of Obstetricians and Gynecologists (ACOG), the standard of care for treatment of imperforate hymen is a cruciate or a U-shaped incision with resection of hymenal remnant [20]. This minor procedure typically results in good long-term outcomes and a low likelihood of re-epithelialization. One important distinction between similar surgical scenarios and this case is that stenosis from pelvic radiation is atrophic and dense. The tissue quality would provide specific challenges in making the incision and, more importantly, increase the risk of re-epithelialization.

Incision and drainage was performed to alleviate this patient's hematometra, over abdominal drainage or definitive hysterectomy. This minimally invasive approach allowed for both diagnosis and treatment. Patient had adequate sampling of the endometrial cavity to rule out malignancy and her symptoms were relieved with decompression. Draining the purulent fluid vaginally, instead of abdominally or via hysterectomy, minimized any risk of malignant dissemination via surgical spill into the peritoneal cavity. Similarly, in case of infectious etiology, the vaginal drainage decreased risk of peritonitis which could have resulted from abdominal approach. Conservative management

was employed for this patient, and a definitive hysterectomy was discussed in case of malignancy on final histologic evaluation or in case of recurrent hematocolpos.

During the procedure, a foley balloon was inserted into the vaginal canal to prevent re-epithelialization. Re-epithelialization with closure of the vaginal canal is a likely outcome after this procedure. One study [21] measuring the long-term outcomes of vaginal septum resections showed 11% of patients presented with re-obstruction and 7% with vaginal stenosis. Of note, all patients in this study who presented with re-obstruction had undergone abdominal resection. After their procedure, 74% of these patients were sexually active, 35% had dyspareunia, and 36% had dysmenorrhea. If re-obstruction were to occur in the case presented, further management would be discussed with the patient including large resection of the fibrotic vaginal tissue and use of hyperbaric oxygen to induce angiogenesis. Another option at this point would be hysterectomy for definitive surgical management.

Conclusion

In conclusion, we present a unique case of acquired obstruction from radiation therapy causing significant symptomatic hematometrocolpos. Vaginal stenosis is a common side effect of radiation therapy and is usually prevented by use of vaginal dilators and estrogen cream. However, this patient developed an obstruction due to lack of prophylactic treatment. This case offers a minimally invasive approach to decompress the hematocolpos, to evaluate and rule out malignancy, as well as describe steps to prevent vaginal stenosis in the future. A cruciate incision was performed with placement of foley balloon for prevention of re-epithelialization. At her post-operative appointment, the patient had resolution of symptoms, the foley balloon was removed, and the vaginal canal was patent. Long-term follow-up and outcomes are still required, including monitoring for malignant recurrence, re-obstruction and stenosis, and sexual health. If re-epithelialization occurs in this patient, more definitive therapy will be required, including excision of the vaginal septum or hysterectomy.

Statement of Ethics

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. This case report follows designated ethical guidelines as outlined by Equator Network. No Ethical Review Board required for this single-patient case study.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Author's Contribution

Adam Elwood: Conceptualization, investigation, data curation, writing-original draft, writing-review and edit, visualization, project administration.

Eugenia Girda: Methodology, validation, investigation, writing-original draft, writing- review and edit, visualization, supervision, funding acquisition.

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