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Radiation's hidden toll: A rare case of vesicovaginal and ureterovaginal fistulas in advanced cervical cancer

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Abstract
Background: Carcinoma of the cervix is a common malignancy of the female genital tract, managed primarily through radiotherapy, chemotherapy, and surgery. Radiation-induced fistulas (RIF) are a rare but serious complication in cervical cancer treatment, and synchronous occurrence of vesico vaginal (1-8%) and ureterovaginal fistulas due to radiation is exceedingly rare. The presence of HBsAg positivity in a patient doubles surgical risks and complicates the treatment. In cases of extensive tissue destruction, repair may be impossible, and urinary diversion such as an ileal conduit becomes necessary.
Case Report: A 46-year-old woman with stage IV-A cervical cancer, known case of HBsAg+, received chemotherapy and radiation. Despite aggressive treatment, residual cancer persisted, leading to extra-fascial hysterectomy with bilateral salpingo-oophorectomy, left pelvic lymph node dissection, and bladder repair. One month after surgery, the patient developed continuous urinary incontinence. CT pelvis confirmed the presence of left ureterovaginal and vesicovaginal fistulas and identified left pyelonephritis. Cystoscopy and Nephrogram revealed contrast filling vagina but not the bladder, confirming the diagnosis. Patient underwent percutaneous nephrostomy (PCN). After multiple attempts at conservative management, an ileal conduit was performed. A stoma was created, and a Foley's catheter was placed. Postoperatively, the patient improved, and the stoma was draining urine.
Conclusion: This case highlights the rare occurrence of synchronous vesicovaginal and ureterovaginal fistulas following radiation treatment for cervical cancer. The rarity of such cases, combined with the complexity of treatment, makes it particularly noteworthy. This case serves as a reminder of potential long-term complications of radiation therapy for cervical cancer, emphasizing the importance of vigilant monitoring and personalized care, which takes into account both physical and psychosocial impact on the patient.

Keywords: Vesico-vaginal fistula, uretero-vaginal fistula, ileal conduit, cervical cancer-IVa, HbsAg +

Introduction
Background: Carcinoma of the cervix is a common malignancy of the female genital tract, managed primarily through radiotherapy, chemotherapy, and surgery. Radiation-induced fistulas (RIF) are a rare but serious complication in cervical cancer treatment, and synchronous occurrence of vesico vaginal (1-8%) and ureterovaginal fistulas due to radiation is exceedingly rare. This is a condition that results in continuous urine leakage, profound decline in patients' quality of life, and subsequent social disadaptation. Around 4% of patients develop genitourinary fistula after radiation exposure [1]. Genitourinary organs are highly susceptible to radiation-induced fistula. Additional risk factors encompass adjacent malignancies and multiple pelvic surgeries. Concurrent chemo-radiotherapy is a standard nonsurgical treatment for cervical cancer, which significantly increases the risk of adverse effects. The pathophysiology of radiation-induced fistulas is rooted in chronic ischemia caused by endarteritis obliterans, leading to necrosis, fibrosis, and loss of tissues. Also, radiation damage to microvasculature in pelvic and abdominal organs can cause complications such as strictures and abscesses. The presence of HBsAg positivity in a patient doubles surgical risks and complicates the treatment. In cases of extensive tissue destruction, repair may be impossible, and urinary diversion such as an ileal conduit becomes necessary.

Case presentation
A 46-year-old woman with stage IV-A cervical cancer, known case of HBsAg+, received chemotherapy and radiation.

This included three sessions of interstitial brachytherapy (5Gy), and CTRT of 50 Gy administered in 25 fractions over five weeks. Concurrent chemotherapy involved cisplatin (60 mg/m²) and paclitaxel (260 mg). Despite aggressive treatment, residual cancer persisted, leading to extra-fascial hysterectomy with bilateral salpingo-oophorectomy, left pelvic lymph node dissection, and bladder repair. One month after surgery, the patient developed continuous urinary incontinence. On examination of the abdomen, soft, non-tender, continuous urine leak is present from the vagina.

Ultrasound suggestive of bilateral hydroureteronephrosis with thickened bladder wall. CT abdomen pelvis suggestive of left enlarged kidney with moderate hydroureteronephrosis, indicates pyelonephritis and confirmed presence of ureterovaginal fistula (Figure 1) and There is possible communication between the posterior wall of the bladder and vagina with surrounded by an extensive scar, which is indicative of vesicovaginal fistula (Figure 2). She was diagnosed with a left uretrovaginal and vesicovaginal fistula. This diagnosis highlights a complicated clinical situation that requires careful consideration and customized treatment strategies.

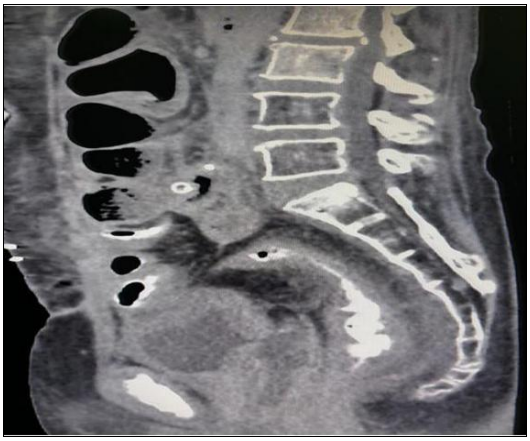

Fig 1: Sagittal CT scan showing pelvis

Fig 2: Axial CT image showing pelvis

Cystoscopy showed mucosal edema with low low-capacity bladder and ureteric orifices on both sides couldn't be visualized (Figure 3). Nephrogram revealed contrast filling vagina but not the bladder, confirming the diagnosis. The patient underwent percutaneous nephrostomy (PCN), but there was decreased output from PCN due to persistent urinary leakage.

Fig 3: Cystoscopic view of urinary bladder

After multiple evaluations, the patient underwent open surgery, and an ileal conduit was created. During the procedure, removal of accumulated fluid and intestinal adhesions was done. Made it difficult to locate the left ureter, but it was traced from the lower pole of the left kidney. A Bricker's anastomosis was made where the ileal loop was anastomosed end-to-end to bilateral ureters (Figure 4). A stoma was created, and a Foley's catheter and drain were placed.

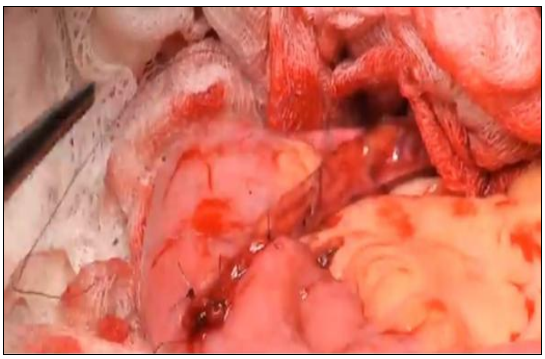

Fig 4: Intraoperative view showing fistula repair

Post-operatively, the patient developed subacute intestinal obstruction, which was resolved, and the patient was discharged. In the 3-month follow-up, the ileal conduit was draining urine well, and urinary incontinence had decreased.

Discussion

Genitourinary fistulas are the most common complication of cervical cancer treatment, especially in patients who have undergone radiation therapy. Radiation exposure makes tissue friable and decreases healing capabilities, which makes them more vulnerable to the formation of fistulas [3]. Regardless of their size or location, radiation-induced genitourinary fistulas are categorized as complicated fistulas [2, 3].

Diagnosis of genitourinary fistula depends upon clinical assessment (history and physical examination) and targeted imaging studies [1]. Assessment of the size and location of the fistula is critical before surgical interventions. More efficient surgical planning is facilitated by improved preoperative diagnostic procedures. Urinary leaking from the vagina usually makes genitourinary fistula patients easy to identify [4].

A patient who had previously been treated with radiation for cervical cancer has complex sequelae, like Pelvic fluid accumulation, signs of infection, and intestinal swelling and

edema. This condition emphasizes the need for a multidisciplinary approach.

Minimally invasive techniques (laparoscopic or robotic) are most commonly adopted for surgical fistula repair [5]. Unfortunately, surgeon finds radiation-induced fistulas to be especially difficult. This kind of fistula develops from fibrosis of the lamina propria of the bladder wall, which is accompanied by obliterative arteritis in the radiated area and modified giant fibroblasts. Which causes atrophy and necrosis of bladder epithelium? Increased stress in the scarred, fibrous bladder and vaginal walls results in fistula formation. This is followed by the rupture of the afflicted ulcerated area and the development of fistulous canals [6, 7]. This case deviates from standard treatment due to radiation-induced fibrosis, abdominal adhesion. It is necessary to conduct more research on the variables that predict the surgical success of VVF.

Conclusion

This case highlights the rare occurrence of synchronous vesicovaginal and ureterovaginal fistulas following radiation treatment for cervical cancer. The rarity of such cases, combined with the complexity of treatment, makes it particularly noteworthy. RIFs are resistant to spontaneous healing, and their management often requires meticulous and tailored surgical intervention. Successful management requires a comprehensive clinical and radiological evaluation, as demonstrated in this case. Use of ileal conduit diversion after failed conservative treatments highlights the importance of timely surgical intervention. Patient's HBsAg-positive status complicates it further, emphasizing the need for a multidisciplinary approach. This case serves as a reminder of potential long-term complications of radiation therapy for cervical cancer, emphasizing the importance of vigilant monitoring and personalized care, which takes into account both physical and psychosocial impact on the patient.

Conflict of Interest

Not available

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