Sigmoid conduit-neovaginal fistula: a case report and literature review

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Total pelvic exenterations (TPE) are high morbidity procedures, with up to 38% of patients experiencing a major complication after TPE surgery. We report the case of a 69-year-old woman with a sigmoid conduit-neovaginal fistula who presented with new onset continuous vaginal leakage and decreased urostomy output 3 months post-op from a TPE. We highlight the presentation, diagnosis, conservative management, and surgical management of conduit-vaginal fistulas.

Key Words: total pelvic exenteration, sigmoid conduit, neovagina, conduit-vaginal fistula, presacral abscess

Introduction

A total pelvic exenteration (TPE) is an en bloc resection of numerous pelvic structures in the setting of advanced primary or recurrent gynecologic, urologic, and gastrointestinal cancers. The morbidity from receiving a TPE remains high, with up to 38% of patient's experiencing a major complication after surgery.[1-3] Frequently reported complications after TPE include infection, ureteral leaks, anastomotic leaks, gastrointestinal fistulas, small bowel obstruction, thromboembolic complications, ureteral stricture, stomal stricture, parastomal hernia, and nephrolithiasis.[4] Here, we present a case report of a woman who developed a sigmoid conduit-neovaginal fistula after undergoing a TPE.

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Case report

A 69-year-old female with a history of locally invasive vaginal squamous cell carcinoma, stage I endometrial cancer, and stage II ovarian cancer status-post external pelvic radiation therapy, chemotherapy, trans-levator total pelvic exenteration with partial removal of rectum and anus, descending colon takedown with end descending colon colostomy and sigmoid urostomy diversions, and neovagina reconstruction using acellular dermal matrix anteriorly and rectum posteriorly in October of 2019 presented 3 months postop for a follow up visit. Upon questioning, the patient reported new-onset continuous vaginal leakage as well as decreased urostomy output. Pelvic exam at this time revealed no visible fistulous tract formation or pooling of urine in the vaginal canal. CBC, BMP, osmolality, and coagulation panel were unremarkable with the exception of a mild hyperchloremic metabolic acidosis with a HCO3 of 20 mEq/L and a Cl of 110 mEq/L, creatinine elevation to 1.7 mg/dL, and eGFR decrease to 30 mL/min/1.73 m^2. CT urogram was performed and revealed bilateral hydronephrosis and

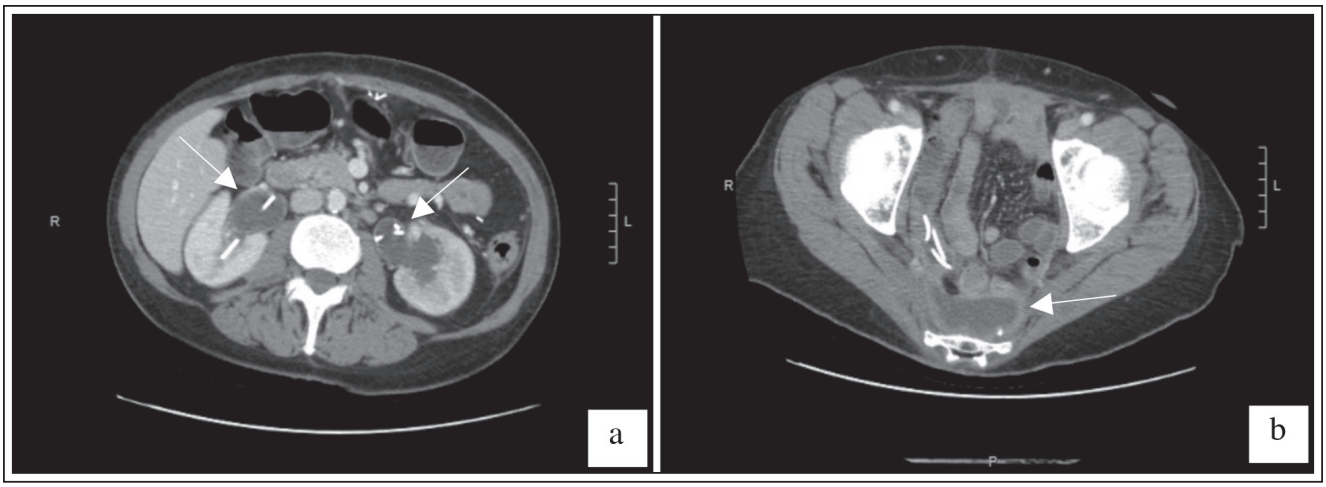

Figure 1. CT urogram demonstrating **(a)** bilateral hydronephrosis and hydroureter and **(b)** a 6.2 x 2.3 x 5.2 cm pre-sacral fluid collection.

hydroureter despite the presence of well placed bilateral internal ureteral stents and a new 6.2 x 2.3 x 5.2 cm pre-sacral fluid collection, Figure 1. Bilateral percutaneous nephrostomy (PCN) tubes were placed at this time, which was complicated by fungal urosepsis. Antegrade nephrostogram performed after PCN placement revealed contrast extravasation from the left side of the conduit into the pre-sacral retroperitoneal space. At 5 months postop from the TPE, loopogram was performed which revealed a long, tortuous course of the sigmoid conduit down into the pelvis with contrast extravasation from the butt end of the conduit into the neovagina consistent with a sigmoid conduit-neovaginal fistula, Figure 2. Looposcopy with glidewire placement resulted in the glidewire passing from the conduit into the neovagina. Vaginoscopy with glidewire placement resulted in the glidewire passing from the apex of the neovagina into the peritoneum. On physical exam, notable findings at this time included white discoloration at the neovagina apex consistent with radiation changes. The fistulous tract was very small and unable to be visualized with the naked eye.

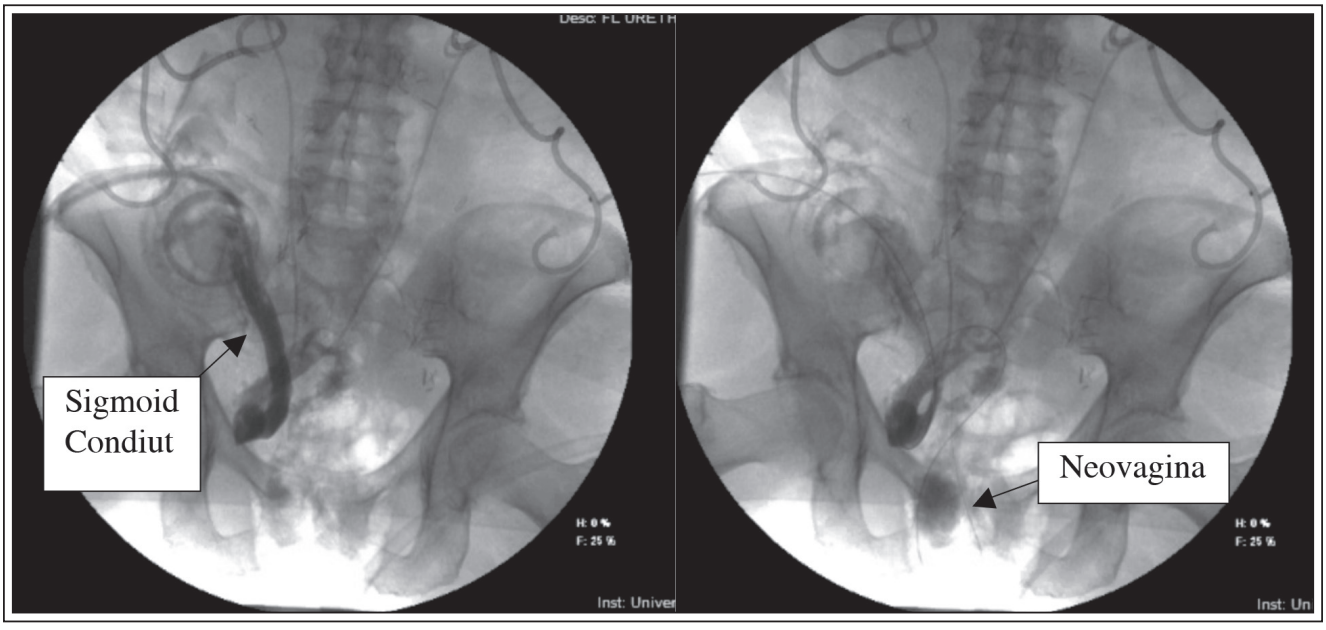

Figure 2. Loopogram of the sigmoid conduit displaying sigmoid conduit-neovaginal fistula formation.

Figure 3. Complete prolapse of the neovagina.

At 9 months postop from her TPE, the patient was taken to the operating room to surgically repair the fistula. Notable physical exam findings at this time included a parastomal hernia alongside her colostomy and complete neovaginal prolapse, Figure 3. Bilateral antegrade nephrosogram performed intraoperatively revealed significant left ureteral stenosis at the anastomotic site. In the OR, exposure was obtained by creating a midline vertical incision. Exploration of the abdomen revealed a presacral abscess with dense adhesions involving the bowel, sigmoid conduit and neovagina. Small bowel enterotomies formed during lysis of adhesions were resected and reanastomosed. The fistulous portion of the sigmoid conduit was separated from the rest of the conduit using a GIA stapler. The left and right ureters were scarred into pelvis requiring reimplantation into the sigmoid conduit secondary to the conduit revision. The parastomal hernia was repaired primarily without mesh given the pelvic infection. The prolapsed neovagina was suspended with a fascia lata sacrocolpopexy and perineorrhaphy was performed. Postoperative course was complicated by hypotension treated with IV fluids and pressors, fever and associated presacral abscess treated with Meropenem, and hemoglobin drop to 6.0 g/dL treated with two units of packed red blood cells. The remainder of the patient's hospital course was uncomplicated and the patient was discharged on postoperative day 9. At 6 months postop from the fistula repair, the patient had no indication of fistula recurrence.

Discussion

Risk of fistula formation increases in the setting of inflammation, iatrogenic manipulation, malignancy, and trauma.[5] TPE result in a higher risk of fistula formation, given the surgical inflammation, postoperative infectious inflammation, and prior history pelvic radiation commonly seen in this patient population. Fistulous complications after TPE more commonly involve the bowel rather than the urinary conduit system.[4] In our case report, a 69-year-old woman with numerous risk factors for fistula formation including a prior history of pelvic radiation, TPE, and postoperative pelvic abscess formation developed a sigmoid conduit-neovaginal fistula.

After a TPE, patients with conduit-vaginal fistulas can present with new onset continuous vaginal leakage and decreased urostomy output. On speculum exam, pooling of urine or visualization of the fistulous tract in the vaginal canal can be observed. Diagnosis of conduit-vaginal fistulas can be confirmed through CT urography or loopogram with contrast, which shows contrast extravasation from the urinary conduit into the vagina, looposcopy or vaginoscopy, which allows for direct visualization of the fistulous tract, or the dye test, which shows methylene blue solution instilled into the conduit extravasating into into the vagina.

Conservative management of urinary conduit-vaginal fistulas with prolonged urinary catheter drainage or endoscopic injection of sealing agents are generally less effective for long-term management of vesicovaginal and neobladder-vaginal fistulas.[6] In a published case report of two ileal conduit-vaginal fistulas, non-operative management with observation, conduit foley catheter placement, and fulguration of the fistulous tract using electrocautery and sclerosing agent (Sotradecol 3%) resulted in a resolution of leakage with fistula recurrence 2-8 months later.[7] In our patient, we showed that separation of the fistulous portion of the sigmoid conduit from the rest of the conduit was successful in fistula repair and recurrence prevention at 6 months postop. Though this patient was without recurrence at 6-months postop, her risk of fistula recurrence remains high and she will need to be monitored closely for recurrence in the long term. Interpostion of labial, omental, or peritoneal flap materials between the fistulous organs has been shown to decrease the risk of vesicovaginal and neobladder-vaginal fistulas.[8,9] Future studies are needed to investigate the efficacy of similar flap techniques for decreasing fistula recurrence in urinary conduit-vaginal fistulas. □

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