

Case report

Renocolic fistula secondary to curative intent extended field radiotherapy for cervical cancer

Dhanalakshmi Thiyagarajan^a, Michael Hughes^{a,d}, Frank Tamarkin^b, Israel Zigelboim^{c,*}^a Lewis Katz School of Medicine at Temple University/St. Luke's University Health Network, 801 Ostrum Street, Bethlehem, PA 18015, USA^b Division of Urologic Surgery, St. Luke's University Health Network, 701 Ostrum Street, Bethlehem, PA 18015, USA^c Division of Gynecologic Oncology, St. Luke's University Health Network, 701 Ostrum Street, Bethlehem, PA 18015, USA^d Department of Urology, SUNY Upstate Medical University, 750 East Adams Street, Syracuse, NY 13210, USA

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1. Introduction

Fistulas between the gastrointestinal tract and kidney are uncommon and infrequently described in the literature. Rare reported cases of renocolic fistula have been attributed to chronic pyelonephritis (Zeller et al., 2013), xanthogranulomatous pyelonephritis (McDermott et al., 2013), trauma (Abdelaziz et al., 2014), tuberculosis (Marwah et al., 2012), autosomal dominant polycystic kidney disease (Iwashita et al., 2018), renal cell carcinoma (Auld and Keller, 2018; Swalchick et al., 1991), and radiofrequency ablation of renal cell carcinoma (Saenz Medina et al., 2010). Here we present a case of renocolic fistula developing shortly after curative intent chemoradiotherapy for cervical cancer. A PubMed search using the terms “renocolic fistula”, “radiation”, and “ischemic colitis” yielded no prior reports of renocolic fistula caused by radiation induced colitis.

2. Case

A 42-year-old Hispanic female presented to her gynecologist with a three-month history of abnormal genital bleeding. A cervical lesion was identified and biopsies were performed and demonstrated squamous cell carcinoma. On exam, the patient had a palpable barrel shaped cervix measuring 5 to 6 cm with evidence of left proximal parametrial nodularity, consistent with clinical stage IIB cervical cancer. Computed tomography (CT) with intravenous contrast and FDG-positron emission topography (PET)/CT scan demonstrated fluoro-deoxyglucose (FDG) avid cervical mass, pelvic and periaortic lymphadenopathy without

evidence of hydronephrosis or distant disease.

After counseling, the patient agreed to pursue curative intent radiotherapy with adjuvant weekly cisplatin chemotherapy. She went on to receive 5040 centigray (cGy) of high energy pelvic radiotherapy with additional 720 and 900 cGy boosts to metabolically active pelvic and para-aortic lymphadenopathy, respectively. Additionally, she received high dose rate brachytherapy consisting of four 610 cGy fractions. Her treatment was overall well-tolerated and delivered over 35 days.

On the last week of treatment, she was noted to have a mild elevation in serum creatinine (1.2 mg/dL, baseline 0.7–0.8 mg/dL). A renal ultrasound revealed a new moderate left sided hydronephrosis. She underwent cystoscopy with retrograde pyelography and left double-J ureteral stent placement. Examination of the bladder mucosa revealed no abnormality or lesions. Retrograde pyelogram demonstrated a proximal two-centimeter stenotic segment, just distal to the ureteropelvic junction with resulting proximal hydronephrosis (Fig. 1). There did not appear to be any evidence of distal ureteral obstruction.

PET/CT obtained three months after completion of therapy demonstrated resolution of FDG uptake in all pelvic and para-aortic lymph nodes and near resolution of cervical uptake.

Prior to the second stent exchange and eight months after initial placement, the patient presented with recurrent hydronephrosis on ultrasound. Radioisotope renal scan with Tc99m-MAG3 (mercaptoacetyltriglycine) revealed poor split left renal function (< 7%). Repeat cystoscopy with left retrograde pyelogram revealed relatively normal appearing ureter with only mild hydronephrosis. Retrograde pyelogram

* Corresponding author at: 701 Ostrum Street, Suite 502, Bethlehem, PA 18015, USA.

E-mail address: israel.zigelboim@sluhn.org (I. Zigelboim).

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Fig. 1. Retrograde pyelogram revealing a stenotic two-centimeter proximal segment of ureter located just distal to the ureteropelvic junction with hydronephrosis and dilation of the proximal ureter.



Fig. 2. Retrograde pyelogram revealing a significantly dilated and distorted left kidney collecting system with extravasation of contrast agent from the lateral midpole kidney and flowing distally into the descending colon.

demonstrated extravasation of contrast into what appeared to be the colon at the level of the splenic flexure (Fig. 2). With the injection of more contrast, there appeared to be a connection between the mid-pole calyx and descending colon. Contrast filled to outline the splenic flexure, with partial opacification of the transverse colon and a portion of the descending colon towards the sigmoid colon. No filling defects or narrowing of the ureter was appreciated. A double J stent was placed in the left ureter and the patient was referred for colorectal evaluation. Colonoscopy revealed a ten-centimeter area of inflammation and post-radiation mucosal ischemia with telangiectasia and radiation changes involving the descending and sigmoid colon. Within the area of ischemia, puckering was seen suggesting a fistula. There was no evidence of tumor or diverticular disease (Fig. 3). Biopsy showed focal hyalinization of the mucosal lamina propria, suggestive of ischemic colitis without any dysplasia or suggestion of malignancy.

Prior to potential intervention for this fistula, a follow up PET/CT was obtained. This, unfortunately, demonstrated central pelvic recurrence and new retroperitoneal metabolically active lymphadenopathy. Because of recurrence of her cervical cancer, surgical plans to treat the

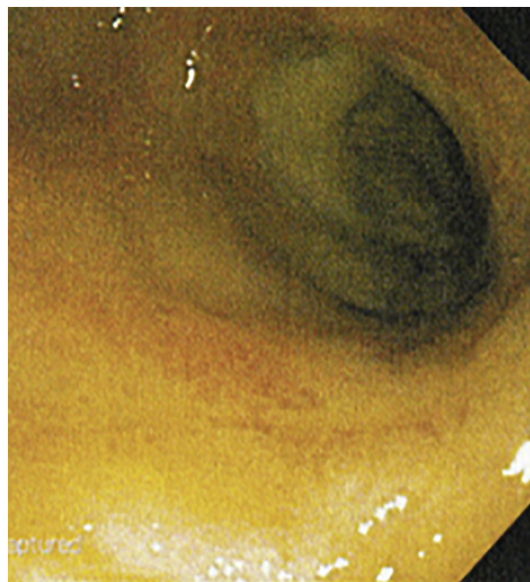


Fig. 3. Colonoscopy of descending colon showing healthy mucosa leading to green/necrotic mucosa. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

renocolic fistula were stalled, and the patient went on to receive palliative chemotherapy with Cisplatin and Paclitaxel. Unfortunately, her disease continued to progress. After four cycles and counseling, she opted for supportive care.

Interestingly and despite ongoing chemotherapy at the time, stent evaluation eight months after the fistula was initially identified, demonstrated complete resolution of hydronephrosis and no evidence of renocolic fistula (with ureteral stent drainage only) (Fig. 4).

3. Discussion

Cervical cancer is the second most commonly diagnosed cancer and third leading cause of cancer death amongst females in the developing world, the largest portion occurring in Asia, Africa, Latin America and the Caribbean. The large discrepancy in geographic distribution can be attributed to the availability of screening methods for precancerous lesions and human papillomavirus (HPV) infection. The Papanicolaou



Fig. 4. Retrograde pyelogram seven months following left ureteral stent placement, revealing persistent hydronephrosis and resolution of renocolic fistula.

test and HPV vaccine have led to a 65% decrease in the rate of cervical cancer over the past 40 years in Western countries. However, socio-economic factors have prevented the widespread use of these protective measures in less developed countries leading to the high worldwide mortality attributed to cervical cancer (Siegel et al., 2018). The recommended treatment of invasive cervical cancer is combined cisplatin-based chemotherapy and radiation therapy (Eifel et al., 2004). During treatment of cervical cancer, the distal ureters, bladder and proximal urethra are exposed to radiation due to their anatomic location; however, major complications of radiation therapy are relatively infrequent. The most common urologic adverse effects are radiation cystitis, acutely, and stricture formation, chronically (Elliott and Malaeb, 2011).

Although a rare occurrence, renocolic fistulization in general has been reported as remotely as 460 BCE by Hippocrates (1621). Renal disease is often the etiology of renocolic fistula when compared to colonic disease. The incidence of renocolic fistula has been declining due to modern diagnostic techniques, allowing earlier diagnosis and treatment of renal disease. Historically, reported cases were associated with chronic pyelonephritis and xanthogranulomatous pyelonephritis (Zeller et al., 2013; McDermott et al., 2013). Recently with the advent of percutaneous radiofrequency ablation of renal masses, a new mechanism of renocolic fistulization has been identified (Hippocrates, 1621). The treatment options for renocolic fistulas described in the literature include surgical intervention involving nephrectomy, colectomy and end colostomy (Wysocki et al., 2010); conservative management with insertion of a ureteral stent (Vanderbrink et al., 2007); and non-interventional conservative management (Morgan et al., 2012). However, there is no established optimal treatment strategy and management is usually individualized. In the case we present here, the patient's cervical cancer recurrence halted plans for potential nephrectomy and colectomy, and instead a conservative treatment choice of ureteral stenting was chosen.

We speculate the sequence of events leading to the occurrence of renocolic fistula in this patient likely began following her pelvic irradiation treatment leading to radiation-induced colitis. The subsequent colonic mucosal ischemia evident on colonoscopy that followed acted as a nidus for fistula formation with the adjacent kidney. This case highlights ureteral stenting for renocolic fistula as a reasonable option in cases that do not allow surgical intervention.

Conflict of interest

The authors have no conflicts of interest. All authors have approved the final article.

Author contribution

All authors contributed to the conception and writing of the manuscript. Drs. Frank Tamarkin and Israel Zigelboim contributed to this patient's clinical care and Dhanalakshmi Thiyagarajan and Michael Hughes additionally contributed by reviewing relevant literature.

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