

U-shaped Bilateral Ileal Ureter Substitution for Failed Conservative Management of Retroperitoneal Fibrosis: A Case Report

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Abstract

Introduction: Retroperitoneal fibrosis (RPF) can cause bilateral chronic obstruction of the ureters. Definitive surgical management includes ureterolysis with omental wrapping or ileal ureter substitution. We present a case of bilateral ureteral obstruction from RPF in a patient with a large abdominal aortic aneurysm (AAA) managed with bilateral ileal ureter substitution in the U-configuration.

Case presentation: A 65-year-old man had medically refractory RPF with bilateral ureteral obstruction that failed ureteral stenting. He required bilateral nephrostomy tubes. Initially bilateral ureterolysis was considered, but given his large AAA and the proximity of the ureters to the aneurysm, ileal substitution was recommended. We attempted a "7" shaped configuration at first, but the natural lie of the ileal segment led us to perform a "U"-shaped substitution with the ends sewn to both renal pelvises and the middle portion sewn to the bladder dome. Postoperatively, the patient recovered well, and at two months followup, the patient has a stable serum creatinine and no hydronephrosis. He no longer requires ureteral stenting or nephrostomy tube drainage.

Conclusion: Bilateral ileal ureter substitution is a viable option for patients with RPF induced hydronephrosis who fail conservative management. The U-shape is a novel configuration that may facilitate this procedure.

Keywords: Bilateral; Ileal uréter; Retroperitoneal fibrosis; Aneurysm

Introduction

Retroperitoneal fibrosis (RPF) is a rare inflammatory disease that affects 1 of every 200,000-500,000 adults per year [1,2]. The cause is often unknown, but medications, malignancy, and vascular aneurysms are occasionally associated with RPF [3]. The fibrotic tissue associated with abdominal aortic aneurysms (AAA) can spread to both common iliac arteries and encase both ureters [4], leading to bilateral ureteral obstruction and hydronephrosis. Medical treatment options include prolonged oral immunomodulator drug therapy like steroids and tamoxifen [5]. Temporizing options include ureteral stenting or nephrostomy tube drainage. Definitive management requires bilateral ureterolysis with omental wrapping or ileal ureter substitution. We present an initial case of U-shaped bilateral ileal ureter substitution in a RPF patient with a large AAA.

Case Report

A 65 year-old man was referred for RPF-induced obstructive uropathy that failed conservative management. His past medical history is significant for coronary artery disease treated with coronary artery bypass graft surgery and a large 5cm AAA treated with endovascular stenting. He had a 1 year history of bilateral hydronephrosis and a rising serum creatinine despite treatment with ureteral stents. This prompted placement of percutaneous nephrostomy tubes and induction of long-term high dose corticosteroids. His baseline creatinine was 2.0 mg/dL. A CT scan of the abdomen and pelvis revealed the AAA with fibrotic tissue encasing both ureters (Figure 1). As expected, the ureters were very close to the aneurysm throughout its course. Oral therapy failed to show improvement and the patient could not tolerate the nephrostomy tubes and desired definitive surgical management. Options include bilateral ureterolysis with omental wrapping or bilateral ileal ureter substitution. Due to the proximity of the ureters to the aneurysm and the amount of fibrosis anterior to the ureters, ureterolysis had unacceptably high risks. We therefore offered ileal ureter interposition.

Preoperative urodynamics revealed a normal capacity bladder, adequate bladder function, and no outlet obstruction. Bilateral ureteral stents and nephrostomy tubes were also in place. A urine culture was obtained and culture appropriate antibiotics were administered perioperatively.

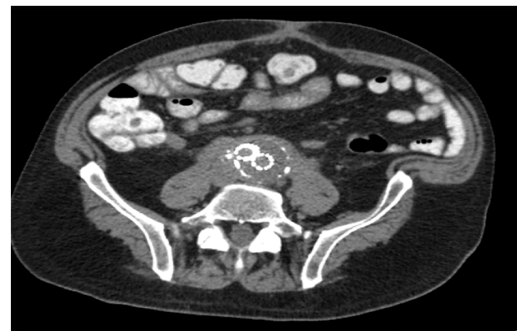


Figure 1: CT scan demonstrating dense fibrosis encasing the aorta and both ureters. Note the endovascular stent within the aortic aneurysm.

In the operating room, we made a midline laparotomy and mobilized the ascending colon and hepatic flexure along the course of the superior mesenteric artery, followed by mobilization of the descending colon and splenic flexure. This dissection exposes both renal pelvises and provides room for eventual placement of the ileal segment. We then isolated 40cm of ileum starting 10 cm proximal to the ileocecal valve. The GIA stapler (Covidien Surgical, Norwalk, CT) was used to transect the bowel, and the GIA and TA stapler (Covidien Surgical, Norwalk, CT) helped restore bowel continuity in a side-to-side fashion. The 40cm segment was subsequently positioned just

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anterior to the fibrotic retroperitoneum and posterior to the bowel anastomosis. We made a left colon mesenteric window near the left renal pelvis and incised the renal pelvis to match the diameter of the non-tapered ileum. The ureteral stent was removed and an end-to-side anastomosis (end of ileum to side of renal pelvis) was performed with braided absorbable suture in an interrupted fashion (Figure 2). The proximal ureter was then ligated. We attempted to bring the middle segment of our harvested intestine to the right renal pelvis. However, this was geometrically difficult due to the inferior mesenteric artery and its associated mesentery and the dense fibrosis surrounding the proximal ureter. The natural lie of our harvested intestine called for a similar end-to-side anastomosis on the right side. The middle segment of our ileal substitution graft was anastomosed to the bladder dome side-to-side, ultimately creating a U-shaped bilateral ileal ureter (Figure 3). This anastomosis was 4 cm. We did not place ureteral stents. We did insert an 18 French urethral catheter and bilateral peritoneal drains near but not on the ileopelvic anastomoses.

Postoperatively, the patient progressed as expected and was discharged home in one week. We clamped his nephrostomy tubes the day after surgery; the patient denied any flank pain and had good urine output from his urethral catheter. We performed a cystogram 6 days postoperatively which revealed no evidence of urinary leakage and the urethral catheter was subsequently removed. His nephrostomy tubes

and drains were removed the following day after verifying lack of flank pain and minimal drainage. At his two month office visit, the patient denied any significant voiding or gastrointestinal symptoms, and his serum creatinine remained at his baseline of 2.0 mg/dL. Followup ultrasound shows no hydronephrosis. He no longer requires ureteral stents or nephrostomy tubes.

Discussion

The management of hydronephrosis from RPF depends on the patient's preference and overall health. Ureteral stenting is usually the first-line treatment as patients may have flank/abdominal pain and azotemia from their obstruction and need urgent drainage. Thereafter, patients are started on a course of steroid therapy. Multiple regimens exist but we prefer high dose steroids for the first 2 months followed by serially lower doses as delineated by Kardar and colleagues [6]. This will eventually obviate the need for chronic ureteral stenting if successful. For patients who cannot tolerate or who fail steroid therapy, tamoxifen, methotrexate, azathioprine, cyclophosphamide, mycophenolate mofetil, and other immunomodulatory drugs can be considered [7].

Chronic ureteral stenting is also an option for patients who fail medical management and are unfit for or desire to avoid surgery. When bilateral single stenting fails, surgeons can consider placing bilateral double ureteral stents to obviate the need for nephrostomy tubes. Liu et al showed that placing two 4.7F ureteral stents in the ipsilateral ureter of patients who failed single 6F stent placement was successful for the treatment of persistent hydronephrosis in 3 of 4 patients (75%) [8]. When this fails, bilateral percutaneous nephrostomy tubes are required. Most patients will prefer surgery over permanent nephrostomy tubes. Many patients will prefer surgery over periodic ureteral stent changes.

Surgery for ineffective medical and endoscopic therapy includes ureterolysis with omental wrapping and ileal ureter interposition. Due to the density of the fibrotic tissue anterior to the ureter and the proximity of the ureter to the aneurysm, we chose bilateral ileal ureter substitution for our patient with AAA-associated RPF. We screened him for obstructive urinary tract symptoms, severe renal insufficiency, bladder dysfunction, inflammatory bowel disease, and abdominal/pelvic radiation prior to approving him for surgery. Having any of these could lead to worsening renal failure and/or bowel related short-term and long-term complications. Armatys et al describe a 7-shaped and reverse 7-shaped ileal segment configuration for bilateral ureteral reimplantation [9]. The disadvantage of this is technique is that it can be difficult to position the middle ileal segment to the renal pelvis. Also, the proximal ureters would need to be free of fibrotic disease and/or dissected free from fibrosis in order to facilitate the middle segment anastomosis. We found that the harvested ileal segment lies naturally in a U-configuration, and bringing end of bowel segment to renal pelvis is easier than bringing proximal ureter to the middle portion. The U-shaped bilateral ureteral reconstruction was chosen for this reason. To our knowledge, this is the first reported case of this unique reconstruction.

Multiple studies have confirmed the utility and reliability of ureteral replacement with small intestine [9,10]. However, we counsel patients preoperatively that the complication rate ranges from about 30 to 50%-minor mostly and major less often. Chung and colleagues followed patients for 6 years and found a complication rate of 28% (16 of 56 patients) in one series, with complications ranging from minor transient acidosis and pyelonephritis to permanent renal failure requiring nephrectomy [11]. Wolff et al found that 9 of 17 patients suffered from a complication during a mean followup time of about 15 years [12]. In general, most patients have preserved renal function,

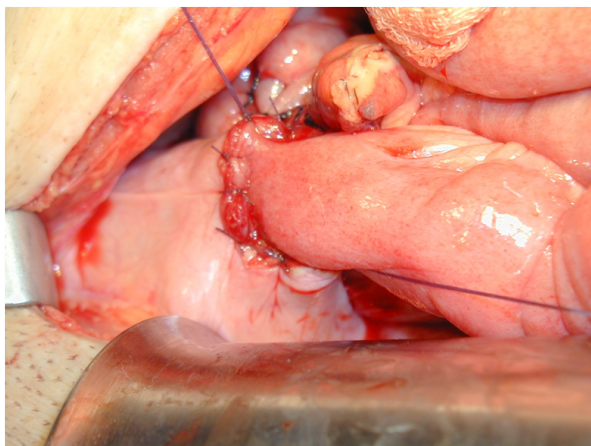


Figure 2: The end of a non-tapered ileal segment is anastomosed to a dilated renal pelvis with interrupted absorbable braided suture.

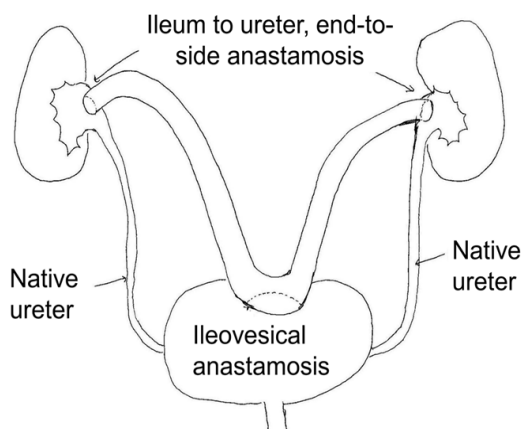


Figure 3: U-shaped configuration of the bilateral ureteral substitution surgery.

some develop kidney stones and urinary tract infections, and few get bowel obstruction and anastomotic strictures since collecting system-to-intestinal anastomoses are often extremely large.

Conclusion

Bilateral ileal ureteral interposition with a U-shaped bowel segment is a safe and viable option for patients with medically refractory retroperitoneal fibrosis. It may be the preferred configuration for patients needing bilateral ureteral replacement.

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