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Case Report

Successful body flossing via indwelling nephrostomy allowing for primary realignment of bladder rupture and placement of a foley catheter into the urinary bladder

Tushar Bajaj, MD^{a,*}, Soraya Djadjo, BS^b, Shahab Hillyer, MD^c, Arman Froush, DO^d

^a UCLA—Kern Medical, Department of Medicine, Kern Medical, 1700 Mount Vernon Avenue, Bakersfield, CA 93306, USA

^b Ross University School of Medicine, Department of Medicine, 2300 SW 145th Avenue, Suite 200, Miramar, FL 33027, USA

^c Kern Medical, Department of Surgery, Kern Medical, 1700 Mount Vernon Avenue, Bakersfield, CA 93306, USA

^d Kern Medical, Department of Radiology, Kern Medical, 1700 Mount Vernon Avenue, Bakersfield, CA 93306, USA

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ABSTRACT

Vesicourethral anastomosis leaks are one of the most common short-term complications following radical prostatectomy. We present a case of a 67-year-old Caucasian male who presented to our Emergency Department (ED) with abdominal pain and urinary incontinence 10 days after a robotic-assisted laparoscopic prostatectomy. Interventional radiology initially performed successful nephrostomy placement for bilateral hydronephrosis. Vesicourethral disruption was managed via a multidisciplinary approach with urology and interventional radiology in which a novel approach to realign a bladder rupture and appropriately place a foley catheter in the bladder. Vesicourethral leaks are often managed conservatively. In a few cases, such as this one, mini-invasive intervention is often required to repair the disruption.

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* Corresponding author

E-mail address: tusharbajajMD@gmail.com (T. Bajaj).

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Introduction

Prostate cancer is one of the most common malignancies in men. The lifetime risk of being diagnosed in the United States with prostate cancer is approximately 11%, and the lifetime risk of dying from prostate cancer is 2.5% [1]. A great percentage of the male population is subjected to screening tests, making early diagnosis increasingly frequent [2]. Radical Prostatectomy (RP) is the gold standard for surgical management of localized prostate cancer [3]. RP, historically, was first attempted laparoscopically by Schuessler et al in 1992 [4]. Due to shortcomings, not limited to lack of 3-dimensional vision, the robotic approach was introduced. The first Robot-assisted laparoscopic radical prostatectomy (RALP) was performed in 2000 [5].

RALP has been since then a common approach for prostate cancer treatment. The vesicourethral anastomosis between the bladder neck and the membranous urethra for reconstruction of the lower urinary tract after removal of the prostate is a crucial point of RALP. Urinary leakage at the urethrovesical anastomosis is the most common short-term complications of RP but is usually self-limited and last about 2-3 days [6]. Persistent (not self-limiting within 2-5 days) vesicourethral anastomotic leaks (PVAL) is a rare occurrence with an unclear incidence, about which there is a paucity of published literature.

The objective of this case report is to demonstrate a novel management of successful vesicourethral anastomosis leak repair via “body flossing technique” (wire guidance from left flank to urethral meatus creating a connection and access) with primary realignment of bladder rupture and placement of a 20 French foley catheter into the urinary bladder via a multidisciplinary rendezvous procedure.

Case presentation

A 67-year-old Caucasian man with hypertension, diabetes mellitus type 2, chronic obstructive pulmonary disease, and prostate adenocarcinoma (GG 4 + 3, tertiary 5, mPT2pN0) status post robotic-assisted RP, was transferred to our institution for a higher level of care for persistent, excruciating, 10/10 abdominal pain with worsening pressure-like pain in the right and left lower abdominal regions and urinary incontinence. Patient started developing persistent abdominal pain after foley catheter was removed 10 days after the RP. Prior to presenting at our institution, the patient had a CT scan of abdomen and pelvis done and had the foley catheter reinserted, which alleviated the pain. Upon arrival, the patient was found to have pericatheter leakage of urine. A CT of the abdomen and pelvis without contrast at the previous institution revealed pneumoperitoneum with retroperitoneal air and fluid in the true pelvis with extravasation of fluid into the abdomen from the bladder wall as well as extravascular foley catheter in the peritoneum (Fig. 1). Of note, patient on admission was in diabetic ketoacidosis, acute kidney injury, and complained of intermittent nausea and vomiting. Urinalysis demonstrated large blood with red blood cells. The patient

was stabilized and transferred to a direct observation unit. Interventional radiology subsequently performed successful nephrostomy placement for bilateral hydronephrosis (Fig. 2) 1 day after patient was transferred (28 days after the RP was performed). Furthermore, a multidisciplinary team consisting of urology and interventional radiology planned a novel approach to realign the bladder rupture and appropriate placement of a foley catheter in the bladder. Postprocedure, patient was started on broad spectrum antibiotics and eventually the cultures from the urine catheter, peritoneal fluid, and nephrostomy urine grew klebsiella pneumoniae. Patient was discharged POD4 with follow-up with primary care physician along with follow-up appointment in 4-6 weeks with outpatient urology during which foley catheter along with nephrostomy tubes were to be removed and cystogram with bilateral nephrostogram was to be performed. Patient went to clinic 4 weeks later, stated he could urinate on his own. Tubes and foley were removed, and a 3-view cystogram was performed, which showed no evidence of urinary bladder leakage. Repeat cystoscopy was scheduled in 6-8 weeks from clinic visit.

Procedure and technique

Informed and written consent was obtained from the patient after discussion of risks, benefits, and alternatives to the planned procedures. Preprocedure evaluation along with cardiovascular, respiratory, and airway status confirmed that the patient was, and remained appropriate candidate for intravenous conscious sedation. Adequate sedation was maintained with fentanyl, versed, and local anesthesia and vital signs and response to verbal commands during and post procedure were monitored and no complication was noted.

The patient was brought to the angiography suite and placed prone on the table where a timeout was performed to verify the patient's identity and the proposed procedure. The bilateral flanks were prepped and draped in the usual maximum sterile fashion. One percent% lidocaine was utilized for local anesthesia.

Following placement of bilateral nephrostomies, a 018 wire was navigated through indwelling left nephrostomy, into the urinary bladder and successfully externalized through the bladder defect into the perivesicular space using a catheter. Cystoscopy was performed and a 6 French ENSnare (MeritMedical) was navigated through the cystoscope, and utilized to snare the 018 wire (Fig. 3). The perivesicular wire was carefully externalized through the penile urethra via cystoscopy. A 4 French straight glide catheter was advanced over the 018 wire in a retrograde fashion for selective catheterization of left ureter. The 018 wire was then upsized to a 035 through the glide catheter (MeritMedical). Under continuous fluoroscopic guidance, utilizing the body flossing, the cystoscope was navigated into the urinary bladder, using the body floss as buddy wire, where exchange was made for a 20 French foley catheter. The retention balloon of a foley catheter was inflated with 40 cc of sterile water. Contrast was further injected into the foley catheter and images were obtained in the AP and left anterior oblique planes (Fig. 4).



Fig. 1 – CT abdomen and pelvis without contrast demonstrated in transverse (a), coronal (b), and sagittal views (c). The orange arrow demonstrates the tip of the foley catheter in the peritoneal cavity outside the bladder wall. (Color version of figure is available online.)

A 20 French with 30 mL balloon council tip catheter was placed over a Amplatz stiff wire that had been coiled into bladder through cystoscope under direct vision. Next the catheter was inflated with 40 mL of sterile water and bladder pulled down. A cystogram was done showing a large leak but contrast in bladder as well. An antegrade nephrostogram was also done from left access point (PCN site) reaffirming foley within native bladder. Once the foley was at the bladder neck, mild tension was placed on catheter to shorten the gap between the bladder and urethra, ultimately attempting to reduce urine leak. The patient had a pelvic drain and was maximally diverted with bilateral nephrostomy tubes essentially creating an environment for reepithelization.

The patient tolerated the procedure well and left the suite in stable condition. There were no immediate or postoperative complications. All wire and catheter manipulations were per-

formed under fluoroscopic guidance. A urine specimen was obtained during the procedure and sent for microbiology and cytology.

Discussion

RP demands a high level of surgical expertise and experience as it is a challenging operation. Rupture of vesicourethral anastomosis has been demonstrated to however not be related to the surgeon's experience [7]. Urinary leakage at the urethrovesical anastomosis reaches an incidence of 0.3%-15.4% [8], creating the most common short-term complications of RP. Urinary leakage beyond the immediate postoperative period is usually self-limiting or can be re-

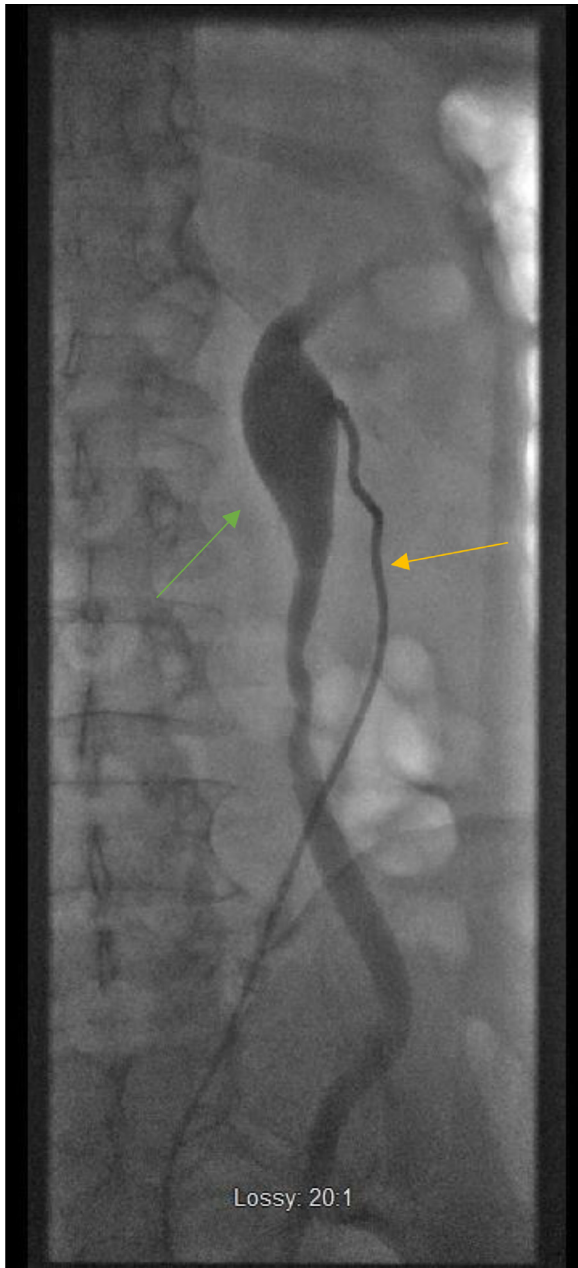


Fig. 2 – Nephrostomy placement with injection of contrast via catheter (orange arrow). Green arrow demonstrates patency of nephrostomy with contrast flow towards bladder. (Color version of figure is available online.)

solved with conservative measures, such as; passive drainage, catheter traction, and needle vented foley catheter suction [8,9].

Persistent urethrovesical anastomotic leakage is a rare occurrence with an unclear incidence, about which there is a paucity of published literature. The defect is commonly repaired through nephroureteral stent placed on intermittent suction, allowing the anastomosis to heal appropriately by diverting the urine away from the defect. We performed a novel solution to this uncommon complication; however, we discuss other methods used in similar presentation.



Fig. 3 – Cystoscope (blue arrow) performed with ENsnare (6 French MeritMedical) used to snare 018 wire (orange arrow). (Color version of figure is available online.)

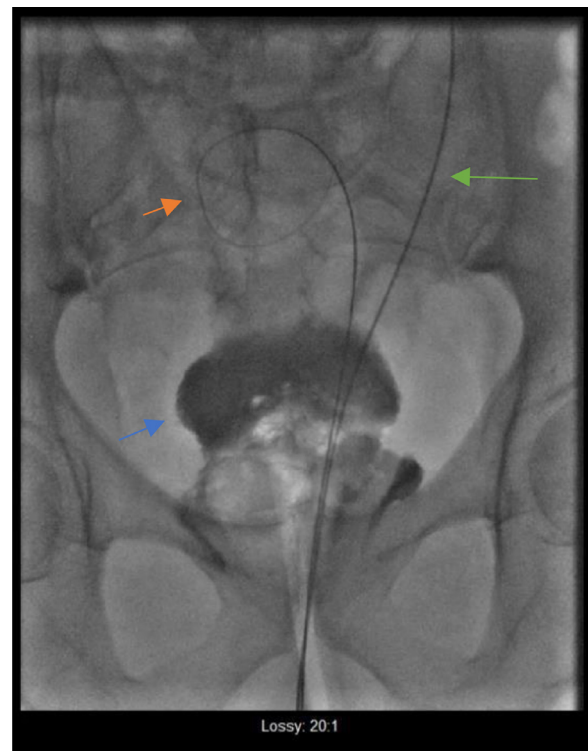


Fig. 4 – Contrast injected via foley catheter (blue arrow). Orange arrow demonstrating catheter with balloon. Green arrow demonstrating catheter from nephrostomy. (Color version of figure is available online.)

Yossepowitch et al describe exteriorization of ureteral stents via the urethra as temporary urinary diversion to allow to anastomosis healing. A technique in which in a partially distended bladder, a rigid 19Fr cystoscopy was used and a 5Fr single J ureteral stents was inserted over a hydrophilic guidewire under fluoroscopic guidance. Via the urethra and beside an 18Fr foley catheter, the 2 stents were exteriorized, urine output monitored for urine output of 50 mL before removal of Jackson-Pratt drains and before stent removal, cystogram was done to ascertain leak resolution that on average took 9 days [10]. In this case, though the RP was done laparoscopically, PVAL was a complication encountered in 4 of the 391 patients that underwent surgery between 2000 and 2006. Castillo et al describe repair of the anastomotic leak, endoscopically; in which 4 procedures were performed, using 2 extraperitoneal and 2 transperitoneal intracorporeal sutures, all without any complications with patients being discharged on postoperative day 4 [11].

In the last 2-10 years of PVAL, the practiced methods include; directing the flow of urine by endoscopically inserting 2 urethral catheters [6], similarly exteriorization of ureteral stents via the urethra to temporarily divert urine flow [8], injection of N-butyl-2-cyanoacrylate and by fibrin glue into the vesicourethral anastomotic gap via cystoscopy [12], or more recently, using a self-made fenestrated foley catheter [13].

Dall’oglio et al describe vesicourethral disruption repair by reposition foley catheter via cystoscopy with introduction of a guide-wire and fixing the catheter by using the artifice of insufflating the foley catheter’s balloon with a volume around 60 mL. The vesicourethral anastomosis was done with stitches with poliglactin 3-0 incorporating the urethra with the striated sphincter together [7].

Furthermore, in 2017, a case of anastomotic disruption along with persistent hematuria was encountered, which led to a novel management demonstrated by Charles et al. About 50% of the anastomotic suture was disrupted along the posterior rim upon visualization with a rigid 17Fr cystoscope was advanced into the bladder. To prevent further anastomotic disruption, 300 cc of clot from the bladder was evacuated through open cystostomy. Patient was discharged on postoperative day 2 after an 18Fr self-retaining suprapubic tube and 22Fr 3-way urethral catheter were placed, with his urethral catheter placed on traction for 4h, and urine cleared [3].

In conclusion, even though innovative procedures for vesicourethral disruption have been discovered via the last few years, one has yet to encompass multidisciplinary approach like the novel method discussed in this case report. We hope

to inspire other practitioners to consider our novel approach to PVAL with correction foley misalignment via nephrostomy and reconstruction of the primary bladder wall.

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