

CASE REPORT

Infrequent Reservoir-Related Complications of Urologic Prosthetics: A Case Series and Literature Review

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DOI: 10.1002/sm2.85

ABSTRACT

Introduction and Aim. Complications related to inflatable penile prosthesis (IPP) and artificial urinary sphincter (AUS) reservoirs are rare, potentially life threatening, and poorly described in the literature. As more devices are implanted, the incidence of reservoir-related complications may increase, and it will be important to recognize the relevant signs and symptoms.

Methods and Main Outcome Measures. We present a case series of reservoir-related complications presenting to our institution for treatment. We also reviewed all accounts of reservoir-related complications within the urologic literature

Results. Three cases of reservoir-related complications are presented. Case 1 involves erosion of an intact AUS reservoir into the cecum of a patient with a history of myelomeningocele and bladder augmentation. Case 2 involves an IPP reservoir causing vascular compression, resulting in open exploration and repositioning of the reservoir. Case 3 involves intraperitoneal migration of a retained IPP reservoir to a subhepatic area, which was then removed laparoscopically. Literature review yielded descriptions of eight cases of intestinal complications, five cases of vascular complications, but zero reports of migration to a subhepatic area. Other notable complications include 20 reported cases of reservoir erosion into the bladder and inguinal herniation of the reservoir.

Conclusion. Complications involving urologic prosthesis reservoirs, although rare, can have serious implications for patients. A high index of suspicion and familiarity with treatment options is required in order to allow timely diagnosis and appropriate treatment. Patients with prior major abdominal surgeries seem to be more prone to intestinal complications of reservoirs and warrant special concern. **Cui T, Terlecki R, and Mirzazadeh M. Infrequent reservoir-related complications of urologic prosthetics: A case series and literature review. Sex Med 2015;3:334–338.**

Key Words. Prosthesis; Reservoir; Complication

Introduction

With the increase in prostate cancer awareness and detection, many men elect definitive management, often surgical. The number of radical prostatectomies has doubled from 2003 to 2009 [1]. Expectations regarding postoperative

quality of life are high, especially with regard to preservation of urinary continence and potency. Despite refinements in surgical technique and other treatment modalities, many patients will still develop subsequent urinary incontinence [2] and erectile dysfunction (ED) [2,3]. An increasing number of these patients are seeking prosthetic

implantation to more closely reproduce baseline status [4]. The inflatable penile prosthesis (IPP) and artificial urinary sphincter (AUS) are among the most valuable tools for the reconstructive urologist to manage patients with significant bother refractory to conservative measures. As the management of other medical comorbidities improves, the number of men considered for prosthetic surgery will likely increase, as will their available length of follow-up. Thus, with more devices and longer follow-up, especially if one considers more cases done by relatively infrequent implanters, the witnessed incidence of device-related complications may also increase.

Although complications such as infection, cuff and cylinder erosion, and mechanical device failure have been well documented [4–6], complications unique to device reservoirs are less well described. In one analysis of 400 IPP cases, the authors noted only six reservoir-related complications [7]. Descriptions of adverse events associated with AUS reservoirs (pressure-regulating balloons/PRB) are even more rare, with only one case report found on literature review [8]. The rarity of reservoir-associated complications has prompted many practitioners to recommend intentionally retaining the IPP [9] or AUS [10] reservoir during device removal. However, in the event of a rare complication, delayed diagnosis can have serious implications. Awareness of both the various pitfalls and effective management strategies is essential. Herein, we present a case series of reservoir-related complications that presented to our institution, along with a comprehensive review of the relevant peer-reviewed literature.

Case 1

A 19-year-old female with a history of myelomeningocele and neurogenic bladder was seen for labial erosion of her AUS pump. She had previously undergone bladder augmentation with creation of a catheterizable stoma and AUS placement at the bladder neck. At presentation, she was afebrile without systemic signs of infection. CT imaging demonstrated cecal erosion of the PRB, which was still in continuity with the remainder of the device (Figure 1). Antibiotic therapy was provided and, after discussion with the patient regarding the potential morbidity of an intra-abdominal operation to remove the entire device and repair the bowel and the detrimental impact to the likelihood of subsequent AUS placement, she underwent removal of the eroded pump only with capping of the cut tubing. The defect was irrigated and closed primarily. The patient was discharged on postoperative day 2 without complications. Two weeks later, the patient presented to the clinic with the PRB, which had been evacuated during a bowel movement (Figure 1). Subsequent imaging shows no infectious complications surrounding the AUS cuff, and the patient remained continent with no need for further interventions.

Case 2

A 71-year-old gentleman underwent IPP placement for refractory ED presumed secondary to diabetes and hypertension. He had a history of bilateral mesh-based inguinal hernia repair, and his device was placed via a penoscrotal approach with left-sided reservoir placement facilitated by perforating the fascia over the pubic tubercle. The tissue



Figure 1 (Left) AUS reservoir after being passed per rectum. (Right) Preoperative CT scan showing reservoir tubing (arrow) in the cecum.

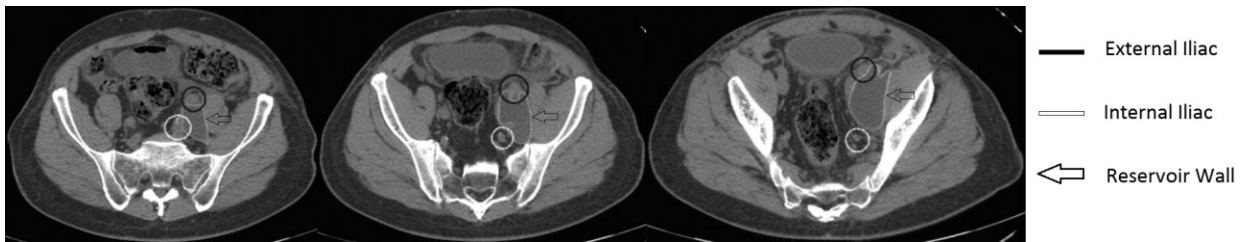


Figure 2 CT scan showing reservoir in close proximity to the left internal and external iliac vessels.

below the prior hernia repair was notably dense, but the remainder the operation was unremarkable. Three days later, he presented with left lower extremity swelling and pain. Duplex imaging and CT scan were negative for deep vein thrombosis (DVT); however, the reservoir was compressing the left external iliac vein. The reservoir was subsequently relocated to an ectopic location, and the patient has since done well (Figure 2).

Case 3

A 69-year-old gentleman presented with a chief complaint of right upper quadrant pain for the last 5 years. He had a history of prior IPP placement for postprostatectomy ED, but his device was later removed for malfunction, with the reservoir left in situ. A CT scan showed his reservoir located underneath the liver. He subsequently underwent laparoscopic removal without complication (Figures 3 and 4).

Discussion

Review of peer-reviewed literature yields only one prior report of erosion of PRB into pelvic viscera. In the case described by Yuan et al., a patient with

an AMS 800 in place for over 15 years underwent sacrocolpopexy for symptomatic vaginal prolapse and bladder outlet obstruction [8]. Preoperatively, the patient demonstrated no signs or symptoms of peritonitis and was without fever or leukocytosis. Surprisingly, during the operation, it was discovered that the PRB had eroded into the ilium. Management required exploration with bowel resection and enteroenterostomy, along with removal of the entire device. The authors theorized that the chronic nature of the erosion allowed the small bowel wall to heal behind the tubing as it slowly eroded through the bowel wall, thereby preventing enteric leakage into the peritoneal cavity.

Reports of eroded IPP reservoirs were more common within the literature, with 19 cases of erosion into the urinary bladder [7,11–13] and eight into the bowel [7,11–13]. The largest review evaluated over 2,000 prosthetic operations and found eight cases of erosions involving the reservoir [12]. The timing to postoperative presentation varied from days to years, with more delayed presentations often requiring more intensive intervention due to adhesions between the reservoir and visceral organs [12]. No cases, however, have ever been reported of a PRB or IPP reservoir being expelled per rectum.

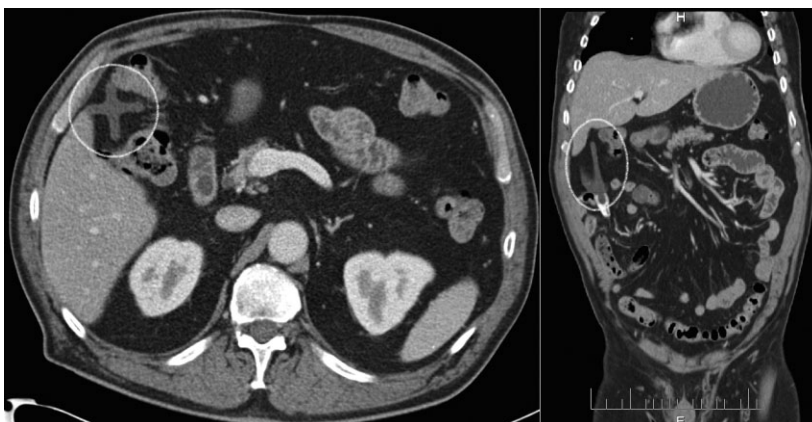


Figure 3 CT scan showing reservoir (circle) underneath the liver.

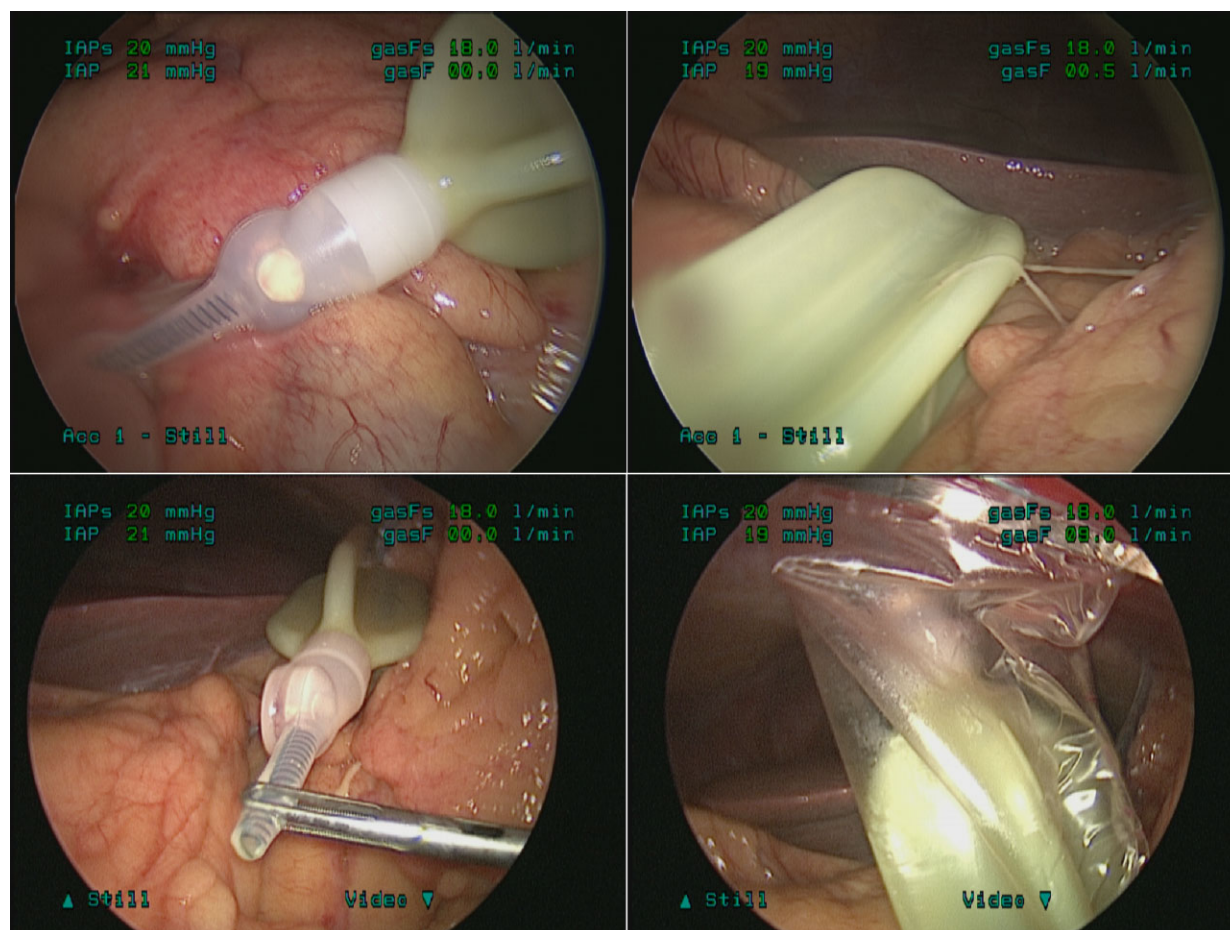


Figure 4 Intraoperative photos of laparoscopic reservoir removal.

There have been six reported cases of IPP reservoirs compressing the external iliac vein and resulting in lower extremity edema, reduced venous flow, or DVT [7,14–18]. Of these five cases, four involved either prior radiation therapy or intraabdominal surgery. Both of these factors have been associated with increased risk of other device complications, such as infection and erosion [7]. Brison et al. have described a situation very similar to that of case 2. In both instances, scar tissue from a prior abdominal surgery seems to have been related to lateral displacement of the IPP reservoir [16]. In select situations with prior radiation, pelvic trauma, or extensive pelvic surgery [19], using a separate inguinal incision [20] or ectopic placement of the reservoir [21] may be preferred.

Ectopic placement of the IPP reservoir has garnered significant interest in recent years due to the number of men presenting for ED following robotic-assisted laparoscopic radical

prostatectomy (RALP). RALP can often eliminate the potential space of Retzius, making conventional reservoir placement problematic. Placement of the reservoir in a submuscular pocket in the abdominal wall was first described by Perito and Wilson in 2011 [20]. A recent review of this technique noted two instances of bladder injuries (0.07%), eight of reservoir herniations (0.29%), and two of autoinflation (0.07%) [22]. Both Coloplast and American Medical Systems have introduced low-profile reservoirs which may facilitate ectopic placement. Coloplast recently received FDA approval for ectopic placement of their Titan™ IPP reservoir, the first device to be approved for this purpose [23].

Conclusion

Complications involving urologic prosthesis reservoirs, although rare, can have serious implications for patients. Patients with prior abdominal surgery

may be more prone to intestinal reservoir-related complications and warrant special attention. A high index of suspicion and familiarity with described presentations may facilitate more timely diagnosis and treatment. Dissemination of information from high-volume centers will continue to be valuable in helping urologists devise optimal strategies of management.

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Conflict of Interest: The author(s) report no conflicts of interest.

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