

**Case series – Small bowel obstruction secondary to retained male urinary and sexual prostheses reservoirs**

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**Introduction**

Small bowel obstruction (SBO) from retained inflatable penile prosthesis (IPP) or artificial urinary sphincter (AUS) implant reservoirs is an exceedingly rare event. There have been three such cases previously reported in literature.<sup>1-3</sup> We present two contemporary cases of prosthesis reservoirs implicated in SBO, including the first reported case of a SBO secondary to a retained AUS reservoir.

**Key Messages**

- These two cases of SBO due to IPP and AUS reservoirs show a potential danger of the “drain and retain” strategy, especially when reservoirs are placed intraperitoneal.
- It may be helpful to inform patient counseling on the rare risks of SBO after implant revision surgery.
- Innovative means of reservoir retrieval at explantation are needed to mitigate these risks.

**Case report 1**

A 75-year-old male with a history of hypertension, coronary artery disease, and IPP placement in 2001 and subsequent removal and replacement with 2-piece IPP in 2017 for device malfunction presented to the Emergency Department with drainage from a right groin wound. He first noticed a groin bulge in late 2020 and subsequently experienced drainage of foul-smelling, brown content in February 2021. Additionally, he reported abdominal pain and multiple episodes of biliary emesis without fevers, chills, shortness of breath, or urinary complaints.

Physical exam revealed abdominal tenderness in the right lower quadrant and periumbilical region, and a right groin wound draining feculent content with surrounding skin excoriations. The replacement IPP was noted to be in place. Computed tomography (CT) of the

abdomen/pelvis revealed a SBO with a transition within the terminal ileum from an endoluminal foreign body (Figure A). The foreign body was a lobulated radiodense structure measuring 5 x 3.5 cm with an anterior elongated radiodense component. Additionally, imaging showed a surrounding 5.5 x 2 cm rim-enhancing collection containing fluid and gas extending from the pelvic ileum into the right groin at the site of fistulous communication of the foreign body, bowel, and skin. This was consistent with a SBO with enterocutaneous (EC) fistula secondary to migration of a IPP reservoir into the small bowel.

The patient was started on antibiotics and a nasogastric tube (NGT). Two days later, diagnostic laparoscopy revealed a thickened terminal ileum and a right pelvic wall fistula with an additional loop of small bowel closely associated (Figure B). The small bowel was assessed and no intraluminal foreign body was identified. A colonoscope was then passed through the small bowel defect into the cecum, ascending colon, and retrograde into the terminal ileum. No foreign body was visualized. The small bowel fistula was resected and the small bowel was primarily anastomosed. A penrose drain was passed through the area of the fistula and skin to ensure ongoing drainage. Given the obstruction was relieved, it was believed the reservoir had migrated into the colon.

Post-operatively, he continued to have an ileus for two days. A repeat CT scan did not detect the implant reservoir, suggesting spontaneous passage of the reservoir through the feces. The patient was discharged and was feeling well at his post-operative visit.

## Case report 2

The second patient was an 81-year-old male with a history of diabetes mellitus, hypertension, prostate cancer treated with radiation in 2010, AUS placement in 2016 and urethral stricture disease managed with a chronic suprapubic catheter. In 2020, his AUS cuff was removed without replacement because of device erosion and infection. The reservoir was left in place due to difficulty of retrieval. One month later, he presented to the Emergency Department with abdominal distention, nausea, and vomiting. Physical exam revealed upper abdominal tenderness without guarding or rebound tenderness.

CT scan of the abdomen/pelvis revealed dilated loops of small bowel with an abrupt transition point in the right lower abdomen (Figure C). The reservoir was seen with a small residual portion of tubing extending to the transition point.

An NGT was placed and drained copious biliary fluid. Subsequent diagnostic laparoscopy revealed a bowel obstruction at the site of the AUS reservoir and tube, which appeared embedded into the small bowel wall (Figure D). The foreign bodies were retrieved and the affected bowel was resected and primarily anastomosed.

Post-operatively, he continued to have an ileus for four days. He was ultimately discharged and reported well at his post-operative visit. Final pathology noted the foreign body to be consistent with an AUS reservoir.

## Discussion

The widespread implementation of prosthetic devices has revolutionized the management of male sexual and urinary dysfunction. However, despite strides in infection-prevention, prosthesis infection remains the most feared complication.<sup>4,5</sup> Our series highlights a rare but potentially devastating complication of AUS and IPP placement. We have shown that a retained prosthesis reservoir can migrate into and through the small bowel, eliciting a SBO, bowel perforation, and fistula formation. In both cases, the original device was explanted and the reservoir left intact. This series represents the first description of this significant, long-term consequence of forgoing reservoir removal at time of prosthesis explant.

Traditionally, IPP reservoirs are placed in the Space of Retzius below the abdominal wall fascia.<sup>6</sup> In current practice, particularly in the setting of post-prostatectomy erectile dysfunction, the reservoir may be placed ectopically between the transversus abdominis or rectus muscle above and the transversalis fascia below.<sup>7-9</sup> However, migration of the reservoir in the abdominal cavity has remained a concern.

In cases of device explant or exchange, the existing reservoir is often emptied but not removed, termed the “Drain and Retain” strategy. This strategy is considered safe, without significant increase in complications during reoperative AUS or IPP surgery.<sup>10</sup> Furthermore, recent efforts have mitigated the risks of reservoir migration, including fixation and anchoring of the reservoir.<sup>11</sup>

Nevertheless, a retained reservoir may serve as a nidus for serious complications such as persistent and relapsing drainage from cutaneous fistulae, cellulitis of the overlying infected reservoir, chronic penile pain, and, as in our case, SBO.<sup>12</sup> In standard practice, a defective or infected implant reservoir is left in place as removal can be surgically challenging due to its location.<sup>13</sup> Recently, however, Staller et al.<sup>14</sup> described a novel approach for removal of a reservoir using laparoscopic instruments in which the a single penoscrotal incision is made and through the same incision, a lighted, hand-held retractor is used for visibility, and laparoscopic instruments are utilized to dissect the tissue surrounding reservoir and the attached tubing until the reservoir is freed. Through this technique, there is no need for a second incision in an infected field, which not only reduces the risk of exposure to infection but also improves postoperative pain control.<sup>14</sup> Therefore, through this novel approach, we encourage explantation of reservoirs, when possible, in order to avoid the risk of potential long-term complications with retained prosthetic components.

The first reported case describing a SBO secondary to migration of an IPP reservoir was in 1988 in which a patient presented 18 months after IPP placement with a SBO secondary to reservoir migration into the peritoneal cavity, where the reservoir incorporated into several loops of ileum warranting subsequent small bowel resection.<sup>2</sup> Another early case highlighted SBO caused by intraluminal migration of an IPP reservoir.<sup>1</sup> The patient was successfully managed by resection of the affected bowel loop and subsequent extraperitoneal reimplantation of the reservoir. Finally, a third case in 1992 reported an IPP reservoir eroding into both the large and

small bowel.<sup>3</sup> Despite these three cases bringing to attention this concern over the potential consequence of a migrated reservoir, including our two cases, there have since been less than five reported cases of SBO secondary to a migrated IPP reservoir.

In our cases, the previous device was removed secondary to infection or device malfunction/erosion. Both reservoirs were “drained and retained.” Our cases are unique for a multitude of reasons. First, we present both short- and long-term consequences of retained implant reservoirs. In the first case, the IPP was exchanged four years prior to presentation and in the second case, the AUS was exchanged one month prior. Additionally, the IPP-related SBO was associated with an EC fistula, bringing to light another potential long-term sequelae of a retained reservoir. Second, this is the largest series of retained reservoirs eliciting an SBO. Third, to our knowledge, case 2 is the first-reported case of an AUS reservoir causing an SBO. In these cases, the patients recovered following surgical exploration and bowel resection with primary anastomosis. Interestingly, despite the paucity of literature surrounding SBO with penile implants, the demonstrated similar complication with an AUS should raise awareness with any urologic implant.

### **Conclusions**

We present the largest case series of prosthetic implant reservoir related SBO and the first case of an AUS eliciting a SBO. With these findings, we encourage Urologists to counsel patients on this potential complication of an implant reservoir, particularly in the setting of removal and exchange procedures in which the reservoir is kept in place despite removal of the remaining implant. Additionally, General Surgeons and Urologists should maintain a SBO secondary to a prosthesis reservoir on their differential in patients with a sexual/urinary implant who are presenting with signs of bowel obstruction. We hope these findings highlight the need for novel techniques in managing retained implant reservoirs.

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## Figures and Tables

**Figure 1.** (A) *Case 1:* SBO with a transition within the terminal ileum due and an endoluminal foreign body in the cecum (consistent with a retained reservoir). (B) *Case 1:* Diagnostic laparoscopy revealing a thickened terminal ileum, walled-off perforation in the RLQ, thought to be due to reservoir entry into the small bowel. (C) *Case 2:* CT scan with dilated loops of small bowel with an abrupt transition point in the RLQ adjacent to the retained reservoir. (D) *Case 2:* Exploratory laparotomy revealing a SBO with the reservoir and tubing embedded into the small bowel wall.

