

## A Case Report of Large Bowel Obstruction in a Patient With an Inflatable Penile Prosthesis



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### ABSTRACT

**Introduction:** Inflatable penile prostheses (IPP) consist of 2 cylinders implanted into the corpora cavernosa, a pump placed in the scrotum, and a saline-filled reservoir traditionally placed in the space of Retzius. IPPs are used to treat refractory erectile dysfunction with few rare, but serious, complications. Cases of reservoirs causing erosion into the bladder, small bowel obstructions, vascular compression, and inguinal herniation have been described.

**Aim:** We highlight the importance of keeping a broad differential diagnosis when assessing patients with bowel obstructions.

**Methods:** A 68-year-old man with a previous IPP placement presented with left lower quadrant abdominal pain, constipation and obstipation for 5 days. On exam, he was afebrile, and noted to have a firm, distended, tympanic abdomen. CT scan showed a distended cecum at 11 cm, narrowing of the proximal sigmoid with adjacent inflammatory changes, and minimal peri-colonic air, suggestive of a localized perforation. The IPP reservoir was seen in the left iliac fossa, coinciding with the lead point of the obstruction, suggesting that the reservoir may have itself caused the obstruction. The patient was taken to the operating room for an emergent exploratory laparotomy, which revealed a mass in the colon abutting the IPP reservoir.

**Main Outcome Measures:** Considerations for IPP component explantation, factors considered for reintervention, and preservation of penile length with avoidance of penile fibrosis.

**Results:** A left colectomy with transverse colostomy was successfully performed and the IPP reservoir was explanted. Intraoperative frozen section revealed adenocarcinoma. Upon initial review of the imaging, it was thought that the IPP reservoir may have caused the obstruction, but intraoperatively, the colonic tumor was found to be the culprit.

**Conclusion:** Although complications related to IPPs, including bowel obstructions, have been previously described in the literature, treatment for large bowel obstructions must take into account all possible etiologies, including malignancy. **Atri E, Mallory C, Perez A, et al. A Case Report of Large Bowel Obstruction in a Patient With an Inflatable Penile Prosthesis. Sex Med 2021;9:100391.**

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**Key Words:** Inflatable Penile Prosthesis; Reservoir; Five-Step Technique; Adenocarcinoma; Bowel Obstruction; Large Bowel Obstruction

### INTRODUCTION

Inflatable penile prostheses (IPP) are implants placed surgically to treat erectile dysfunction. They consist of 2 cylinders placed in the corpora cavernosa, a pump in the scrotum, and a reservoir filled with saline in the space of Retzius (SOR) or the high submuscular space (HSM). They are generally safe and have few, rare complications. Cases of migrating reservoirs causing erosion into the bladder, small bowel obstructions, vascular compression, and inguinal herniation have been described in the literature.

In general, bowel obstructions more commonly involve the small bowel, but up to 25% can occur in the large bowel.<sup>1</sup> A large bowel obstruction occurs when the lumen of the colon

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becomes obstructed with dilation proximal to the obstruction. The etiology of the obstruction is often secondary to neoplasm, volvulus, or diverticulitis and rarely can be due to intussusception, hernia, or extrinsic compression, among others.<sup>2</sup> The current standard of care in cases of suspected bowel obstruction is an abdominal computed tomography (CT) with oral contrast to evaluate the etiology, severity and the transition point.<sup>3</sup> We present a case of a patient with a large bowel obstruction with an IPP reservoir adjacent to the obstruction, who was later found to have an adenocarcinoma of the sigmoid colon.

## CASE

This is the case of a 68-year-old man with a history of hypothyroidism, hypertension, hyperlipidemia, and erectile dysfunction. His surgical history includes a Coloplast IPP placed at an outside facility in the summer of 2017, approximately 2 years prior, via an infrapubic approach. The patient was sexually active and the device still functional at arrival. He presented from the emergency department in July of 2019 with left lower quadrant abdominal pain, abdominal distension and obstipation for 5 days. He did not report fevers, chills, nausea, or vomiting. On exam, he was afebrile, mildly tachycardic, and was noted to have a firm, distended, tympanic abdomen, with no signs of peritonitis.

On abdominal x-ray, the patient's cecum was found to be dilated to 11 cm. Abdominal and pelvic CT with contrast showed dilated large bowel and cecal distension to 11 cm. Sigmoid colon distal to this level was decompressed with minimal contrast observed distally in the rectum (Figure 1). The penile prosthesis

was visualized, with the reservoir located in the left iliac fossa, coinciding with the lead point of the obstruction, suggesting that the reservoir itself may have caused the obstruction. Urology was immediately consulted. There was a long segment of narrowing with adjacent inflammatory changes and minimal peri-colonic air which suggested localized perforation. No evidence of distant intra-abdominal free air or abscess were seen.

The patient was taken to the operating room emergently. A cystoscopy was first performed to place temporary ureteral stents. The cystoscopy otherwise showed no significant findings. An exploratory laparotomy was then performed. A hard mass was palpated in the descending colon near the IPP reservoir which was adherent to the colon. The reservoir was freed from its capsule. The tubing was then clamped using rubber-shod clamps and then cut, allowing us to remove the reservoir without allowing air into the prosthesis. The cut end of the tubing was then plugged using a Coloplast true-lock plug and then allowed to retract into scrotum to preserve the remainder of the prosthesis. Neither the cylinders nor pump had any signs of infection at time of exploration and were left in-situ to prevent penile fibrosis with the intention of subsequent revision.

The hard mass was then excised en bloc by general surgery and a frozen section sent to pathology. The small bowel was decompressed by performing an enterotomy and suctioning feculent material. The enterotomy was then closed using a stapler. The frozen section revealed adenocarcinoma of the proximal sigmoid colon, which was determined to be the cause of the obstruction. The patient had been obstructed for nearly 15 days prior to his presentation. A left colectomy with transverse colostomy creation was subsequently performed. Postoperatively, the patient was transferred to the intensive care unit for further care.



**Figure 1.** Initial CT scan showing a long, narrowed segment of the sigmoid colon with adjacent inflammatory changes abutting the IPP reservoir, and dilation of large bowel proximally, suggesting colonic obstruction. (Asterisks: reservoir, Arrows: sigmoid narrowing with inflammation).

Postoperatively his care was complicated with several notable issues. He developed a postoperative ileus and subsequent evisceration on POD #7. He was taken back to the operating room for emergent re-exploration abdominal washout and placement of a biological mesh, and wound vac. POD #19 he developed an intraabdominal abscess requiring Interventional Radiology drainage. Two months postoperatively, the patient developed penile pain and pump fixation to the scrotum concerning for infection. We promptly removed all remaining components of the IPP and implanted a malleable prosthesis. Nearly 5 months after initial presentation the patient had to undergo split thickness skin grafting of the anterior abdominal wound for wound closure. His last infectious complication was March of 2020 with another intraabdominal abscess. The malleable prosthesis remains in place to this date.

## DISCUSSION

We present a case of a patient with an IPP found to have a large bowel obstruction adjacent to his IPP reservoir. This case is unique in that although large bowel obstructions are commonly due to neoplasm, the initial etiology was thought to be the patient's IPP reservoir. In unique cases such as these intraoperative decision making is paramount. In these scenarios the patient most often would like to preserve the IPP if at all possible. Competing priorities must be taken into account including preventing penile fibrosis, managing infectious ramifications of a perforation, managing bowel obstruction, and in this case, cancer control. In this case, although the patient ultimately had the entire IPP explanted and exchanged for a malleable prosthesis, it was not necessary at immediate presentation where the priority was cancer control, managing the perforation and bowel obstruction, without overt signs of cylinder and pump infection.

Several IPP reservoir complications have been described<sup>4-7</sup> including bowel obstructions, erosion, and iliac vein compression. Major abdominal or pelvic surgeries and/or inflammatory processes are likely predisposing risk factors for bowel erosions.<sup>7</sup> Small bowel obstructions due to reservoir migration are more likely than large bowel obstructions.<sup>5,6</sup> The decision to remove the reservoir in the setting of bowel obstruction is up to the discretion of the surgeon. In the case of our patient, with the reservoir abutting the site of obstruction in the setting of suspected perforation, the reservoir was explanted due to concern of field infection. However, the reservoir can be maintained for an urgent laparotomy if there is no gross contamination of the field. Furthermore, pain over the reservoir site or other signs suggestive of infection should lead to reservoir explantation. If the reservoir is found intraperitoneally, chances are more likely that it will be removed than if it's placed in a HSM space. In order to avoid inadvertent intraperitoneal reservoir placement, during a HSM approach it is critical to have the patient in Trendelenburg during dissection.

In our case the Coloplast true-lock plug was used to plug the tubing to the remainder of the device. Should this not be readily available, surgeons may simply tie off the tubing using a nonabsorbable suture such as a 2-0 silk.

Given the pump was not fixed to the scrotum and there were no findings to suggest cylinder or pump infection the remainder of the device was left in-situ to prevent penile fibrosis and to limit operative time in the acute presentation. In the case above, it is difficult to know whether the remainder of the device components were seeded at initial presentation and took 2 months for infection to declare itself given ongoing antibiotic coverage or whether it was a result of ongoing infectious complications; it was most likely a combination of both factors. At explantation of the remaining IPP device, the patient's penile length was preserved by replacing it with a malleable prosthesis. Should he desire, the malleable could be exchanged for a 3-piece once again. It is reasonable to reintervene for IPP revision once the patient has medically dealt with the ramifications of his current new diagnosis. This may be several to many months after initial presentation.

Due to the rare but serious complications of SOR reservoir placement, the alternate use of HSM reservoir placement has become an alternative approach. Baumgarten et al have described a five-step technique using the HSM reservoir placement to minimize complications. The technique consists of first accessing the external inguinal ring, then developing the lower HSM pocket, followed by the upper HSM pocket, reservoir delivery, and finally confirming placement and connecting.<sup>8</sup> In their series, 561 virgin IPP placements by a single surgeon were reviewed. HSM placement was used in 430 patients and SOR in 131. Revision surgery was required (due to bladder erosion, vascular injuries, herniations, or bowel obstructions) in fewer of the HSM cases (2.3%) compared to SOR (4.6%). After the 5-step technique was introduced, there was an even greater decrease in complications requiring revision surgery (1%) compared to the original SOR method (5.3%).

Bowel obstruction from IPP reservoir migration is rare, and unlikely to result in large bowel obstruction. Common etiologies of large bowel obstruction include neoplasm, volvulus, and diverticulitis among others. It is important to keep a broad differential when assessing a patient with large bowel obstructions. In our case, imaging showed that the IPP reservoir was adjacent to the large bowel obstruction, and initially considered the main cause. Without expanding the differential and adequately exploring the colon intraoperatively, the malignancy could have been missed.

## CONCLUSION

Our case of a patient with a large bowel obstruction adjacent to his IPP reservoir highlights a few important points. Upon initial review of the patient's imaging, it was thought that the IPP reservoir may have caused the obstruction, but intraoperatively, the colonic tumor was found to be the culprit. This highlights the importance of keeping a broad differential diagnosis when assessing patients with bowel obstructions. Competing priorities must be

managed to each individual case when performing an exploratory laparotomy with an IPP when the reservoir is involved. In this case we discuss points to consider regarding IPP component explantation, factors considered for reintervention, and preservation of penile length with avoidance of penile fibrosis.

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## STATEMENT OF AUTHORSHIP

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