# *Small bowel perforation during suprapubic tube exchange*

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*Suprapubic tube placement is a common urological procedure with a low incidence of complications, including hematuria, catheter blockage, recurrent urinary tract infections, and rarely, injury to adjacent organs. Fortunately, most serious complications are discovered shortly after initial suprapubic tube placement and are readily corrected. Very few cases of delayed complications or injuries have been reported. We report a case of Foley perforation into the ileum during suprapubic tube exchange discovered more than 8 months after initial placement, and preceding numerous monthly changes that occurred without incident. While a rare complication, physicians should be conscious of the potential for delayed injury in patients managed with long term suprapubic tube placement.*

**Key Words:** catheterization, placement, suprapubic, urinary tract infection

## Introduction

Since the technique was first described in spinal cord injury patients by Cook in 1976,[1] suprapubic tube (SPT) placement has been frequently employed in the long term management of bladder drainage in patients unable to perform clean intermittent catheterization. The suprapubic catheter can be placed intraoperatively under direct visualization, percutaneously at the bedside, or in the emergency department using ultrasound guidance.[2] The main reported complications are generally mild and include hematuria, catheter blockage, recurrent urinary tract infection (UTI), vascular injury, and/or bladder calculi. Injury to surrounding organs such as bowel or peritoneum, leading to bowel obstruction, perforation, or peritonitis is very rare and tends to occur at the time of initial SPT placement.[3,4] However, there are few case reports of a delay in presentation or in diagnosis of bowel injury or compression following SPT insertion/exchange. We report on a case of bowel perforation following SPT change, which occurred more than 8 months following initial placement, after numerous uneventful monthly changes.

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## Case report

The patient is an 82-year-old female with a history of mixed urge and stress urinary incontinence; she previously underwent multiple unsuccessful treatments for this problem including two separate pubovaginal slings and multiple injections into the bladder muscle including Durasphere, collagen, and botulinum toxin. She was continuously incontinent, which significantly impaired her quality of life, and led her to request placement of an artificial urethral sphincter (AUS). A suprapubic approach was chosen over a vaginal approach secondary to the poor quality of her atrophic and grossly retracted vaginal mucosa. Postoperatively, she complained of difficulty voiding and required clean intermittent catheterization (CIC) four times daily with residuals of 500 cc-600 cc on each shift. Given her severe scoliosis, it was felt she would be unable to perform CIC by herself. Therefore, a SPT Foley catheter was placed under direct visualization using a flexible cystoscope at the bedside.

The patient tolerated this procedure without complication, and was managed with monthly SPT changes for the next 8 months. During this time the SPT was draining clear yellow urine. Her only complication was a febrile Klebsiella UTI treated with antibiotics and an event of catheter obstruction that resolved with irrigation. Two weeks prior to admission, the tube was changed in the office and irrigated well with clear urine. Per the patient's account, 3 days prior to admission a home nurse changed the tube with some difficulty, requiring increased pressure to place. The following morning the patient noted feculent material draining from the tube. The morning of admission, she called the office with complaints of some mild abdominal pain and subjective chills. She denied any fever, nausea, or vomiting, but did note a few episodes of diarrhea. On evaluation in the emergency department, she was found to be afebrile with a white blood cell count of 9.2 K/µl. Feculent material was seen draining through the SPT. On abdominal exam, she was mildly distended with focal lower abdominal pain and early voluntary guarding, but no frank peritonitis. On CT scan her bladder was distended, and moderate right hydronephrosis was noted. On serial sections, the SPT was seen entering loops of presumed ileum, crossing the midline, with the distal tip observed resting within a loop of ileum that was surrounded with an extensive fluid collection, Figure 1. This was confirmed with abdominal films obtained following injection of 50 cc of diluted Omnipaque through the catheter which demonstrated free flow of contrast material into the ileum, and extending into a number of mild to moderately dilated small bowel loops in the mid abdomen and pelvis, Figure 2.

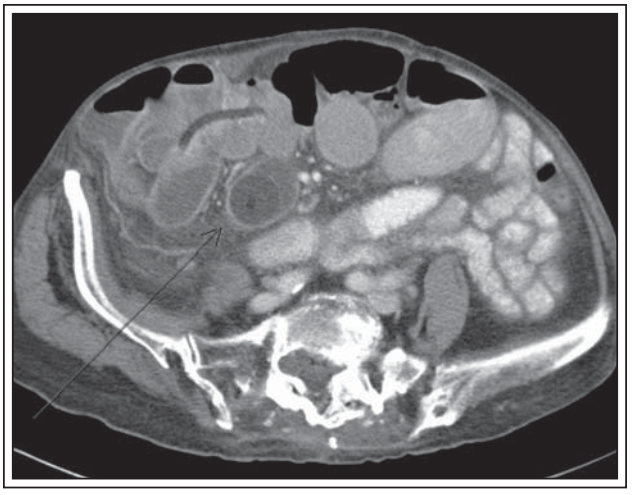

**Figure 1.** CT scan of the pelvis with arrow indicating catheter balloon in small intestine, the tubing seen traversing several loops of small bowel.

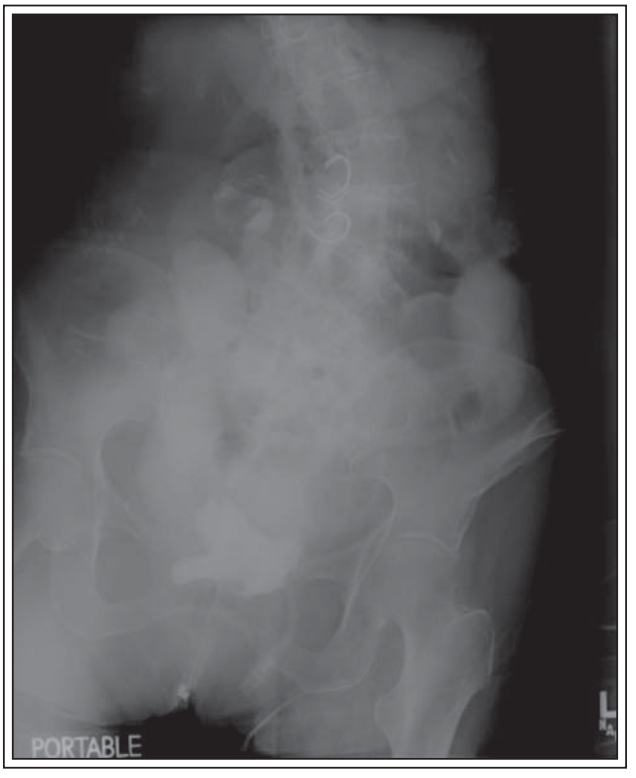


**Figure 2.** Abdominal x-ray following Omnipaque injection through SPT showing dilute contrast material extending into a number of mild to moderately dilated small bowel loops in the mid abdomen and pelvis.

She was admitted to the hospital, started on antibiotics, and taken to the OR for exploratory laparotomy. Intraoperatively, a loop of ileum was found densely adhered to the anterior abdominal wall just above the dome of the bladder. The SPT was found entering this portion of the ileum through a large 1 cm perforation with extremely denuded edges on the antimesenteric border of the ileum. The tubing was carefully withdrawn from the ileum, and approximately 7 cm of small bowel was resected, primarily re-anastomosed, and then oversewn. A new SPT catheter was placed under open visualization and the patient recovered well without further complications.

## Discussion

Suprapubic tube placement for the purpose of managing emergent, postoperative, or long term bladder drainage is a common urological procedure. Most common complications are usually mild, and include hematuria, catheter blockage, UTI, bladder calculi, vascular injury, exit site infections, and bowel obstruction.[3-6] Bowel perforation at the time of initial SPT placement is a rare, but serious, complication of SPT placement occurring in approximately 2.4%-2.7% of patients.[3,4] The incidence of delayed injury to the bowel is not known.

On literature review, we were able to identify four other cases of delayed bowel injury following SPT placement.[7-10] In three of the cases, the injury was discovered around the time of the initial catheter change 2-3 months following placement.[7-9] In the first case, the etiology of the injury was unclear.[9] In the second case, the perforation was discovered the day following a traumatic catheter change in which the existing catheter balloon had to be percutaneously punctured in order to facilitate the tube change.[7] In the third case, the perforated bowel was found adhered to the anterior abdominal wall at the site of a previous laparotomy scar.[8] A heavily fibrosed catheter tract was found traversing the bowel, leading the authors to postulate that the bowel had actually been perforated at the time of initial placement, and subsequently sealed by the inflammation, with leakage allowed at the time of the first tube change. In the final case, the authors describe a perforation which was discovered 3 months after SPT placement following the fourth tube exchange in a woman who had suffered repeated tube blockages.[10]

In our patient, the etiology of her injury remains unclear. The numerous unremarkable tube changes over the 8 months preceding her injury make it unlikely that the perforation occurred at the time of initial placement. In addition, her SPT was changed in the office ~8 weeks prior to the incident without any difficulty. It is possible that her poor tissue quality may have facilitated the injury during the last office or home health visits, in which catheter downsizing was needed and some resistance was encountered during the change. We also speculate that an occult injury to her peritoneum may have led to the bowel becoming adherent to the cystotomy site and abdominal wall, and gradually becoming fixed into position in the path of the SPT tract in the months following the AUS placement. The vigorous final tube change may then have been sufficient to result in perforation.

Our case illustrates the need for physicians to be aware of the possibility of delayed bowel perforation in their patients managed with suprapubic tubes, even if the tract has been matured for several months with regular changes. □

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