

## CASE REPORT

General Medicine

# A Foley folly: Unintended proximal urethral catheterization and balloon inflation causing urethral injury during suprapubic cystostomy exchange

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**Funding and support:** By *JACEP Open* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see [www.icmje.org](http://www.icmje.org)). The authors have stated that no such relationships exist.

**Abstract**

Urinary catheter dysfunction is a common emergency department presentation for patients with neurogenic bladders. Many of these patients have cystostomies requiring routine suprapubic catheter exchange. On complication of outpatient catheter replacement, patients are often sent to the emergency department (ED). We describe the case of an 81-year-old male presenting with painless hematuria and blood from the urinary meatus after undergoing routine cystostomy exchange. During Foley replacement, the suprapubic catheter entered the proximal urethra and the balloon was inflated while in the prostatic urethra, leading to urethral injury and cystic clot formation. Emergency physicians should be aware of this rare complication of suprapubic catheter placement.

**KEYWORDS**

cystostomy, Foley, hematuria, neurogenic bladder, suprapubic catheter, urethral catheterization

## 1 | INTRODUCTION

Bladder management is an important issue in patients with neurogenic bladder following a spinal cord injury or cerebral vascular accident. Choice of bladder management method is directed by specific goals including patient lifestyle, preservation of the upper urinary tract, and minimizing lower urinary tract complications.<sup>1</sup> Options include intermittent urinary catheterization, indwelling urinary catheter, and suprapubic urinary catheterization.<sup>1</sup>

Suprapubic catheterization is an effective and well-tolerated option for management of neurogenic bladder.<sup>1,2</sup> Benefits of suprapubic catheterization compared to indwelling urethral Foley include decreased rate of urinary tract infection, decreased urethral stricture formation, and less hospitalization.<sup>3</sup> Serious and exceedingly rare complications of a suprapubic catheter may occur, including bowel obstruction, delayed bowel injury, and ureter obstruction.<sup>4,5</sup> We present a rare

complication of suprapubic catheter exchange leading to inadvertent proximal urethral catheterization, prostatic urethral injury, and cystic clot formation. We detail the ED diagnosis and management, as well as subsequent complications resulting from the catheter misplacement.

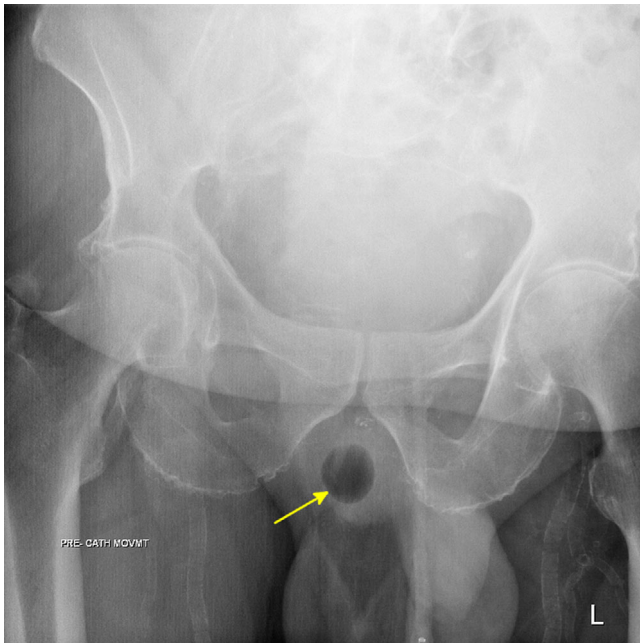
## 2 | CASE NARRATIVE

An 81-year-old male with a history of chronic suprapubic catheter secondary to neurogenic bladder was seen in the ED for evaluation of painless hematuria. Additional history was significant for previous cerebrovascular accident 3 years prior, hypertension, chronic kidney disease, and non-insulin-dependent diabetes. The patient was compliant with medications including clopidogrel. The patient had a cystostomy performed shortly after his cerebrovascular accident, and he had monthly suprapubic catheter exchanges by home health nurses

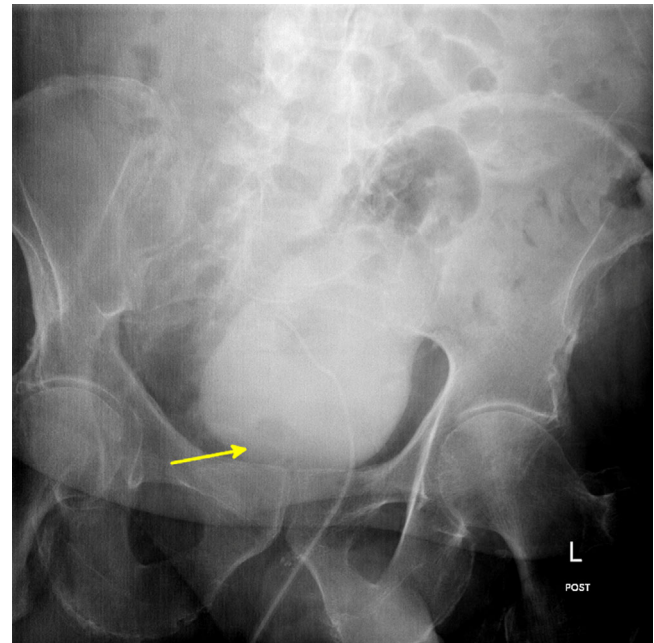
Supervising Editor: John J. Rogers, MD.

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**FIGURE 1** Initial cystogram scout image of the suprapubic catheter with arrow pointing to the air-inflated balloon within proximal urethra



**FIGURE 2** Cystogram after re-positioning of the suprapubic catheter with arrow pointing to the filling defect in the bladder floor representing blood clot

since that time. Two hours before arrival, the patient's catheter was exchanged by a home health nurse. At that time, the home health nurse noted blood-tinged urine return in the catheter collection bag as well as minimal bright red blood at the urethral meatus. The patient was then instructed by the nurse to present to the ED.

Upon arrival to the ED, the patient complained of red-tinged output from the suprapubic catheter as well as bright red blood at his meatus. He denied any abdominal or pelvic discomfort. He denied any pain during insertion of the catheter. He denied having a similar episode with previous catheter exchange.

Physical exam revealed frank blood at the meatus without significant active bleeding. The catheter collection bag was filled with red-tinged urine without obvious clot. Abdominal and pelvic exams were without tenderness or abnormal mass. Residual left lower extremity weakness was noted, consistent with the patient's history of cerebrovascular accident. The rest of the physical exam was unremarkable. Vital signs were stable.

Hematological testing revealed a white blood cell count of 10,000 cells/ $\mu$ L, a hemoglobin of 10.2 g/dL, and a hematocrit of 32%. Chemistry testing revealed a BUN of 20 mg/dL and creatinine of 3.28 mg/dL, consistent with patient's history of chronic kidney disease.

Bedside ultrasound demonstrated the Foley appropriately entering the bladder through the suprapubic fistula, with small volume of residual urine in the bladder. The suprapubic catheter was then irrigated by nursing noting flow of gross blood from the meatus and subsequent trickle of gross blood into urine collection bag. Urology was consulted and recommended a cystogram.

While in the radiology suite, an attempt made to inject water-soluble contrast into the suprapubic catheter was met with resistance.

Scout imaging performed by the radiologist demonstrated an air-inflated catheter balloon in the proximal urethra (Figure 1). The emergency physician was notified and responded to the radiology suite. The balloon was deflated, repositioned, and inflated with sterile water by the emergency physician. Ensuing cystogram confirmed proper placement of Foley in the bladder and demonstrated probable blood clot in the base of the bladder (Figure 2). The patient was subsequently admitted for further urological management and continuous bladder irrigation.

During the admission, the patient continued to have worsening anemia with hemoglobin of 7.9 g/dL and a hematocrit of 25% by hospital day 3. The patient was taken to the operating room on hospital day 5 for cystourethroscopy, evacuation of clots, fulguration of bladder neck and trigone, fulguration of external sphincter and bulbar urethra, and exchange of suprapubic tube over guidewire. The urologist observed urethral inflammation with traumatic active bleeding in the pendulous urethra near the external sphincter. Continuous bladder irrigation was continued and clopidogrel was held for 7 days. Over the patient's hospitalization he was found to have urinary tract infection with concurrent extended-spectrum beta-lactamase bacteremia. The patient was treated appropriately and was discharged home in stable condition after a total hospitalization of 14 days.

### 3 | DISCUSSION

Although emergency physicians are adept at treating common urinary catheter-related complications including urinary tract infection, catheter migration may be a more foreign occurrence. Complications

of catheter migration include possible ureteral obstruction,<sup>4</sup> and in this case, urethral injury with hemorrhage.

Bedside ultrasound is typically a useful tool in determining correct Foley placement. In our case, bedside ultrasound was performed in the ED and showed the catheter appropriately entering the bladder through the suprapubic fistula, providing a false sense of reassurance. However, the cystogram demonstrated the suprapubic catheter had been incorrectly placed, with the balloon inflated in proximal prostatic urethra. During the patient's catheter exchange that morning, the Foley balloon was filled with air, contrary to common practice of inflation with sterile water. This aided in balloon visualization on cystogram scout imaging, contributing to the striking radiographic image (Figure 1). Rapid imaging allowed for diagnosis of inadvertent proximal urethral catheterization to be made and the emergency physician was able to urgently deflate and correctly reposition the catheter in the radiology suite.

One previous case of inadvertent urethral placement of a suprapubic catheter, although with a different presentation and hospital course, has been reported in a spinal cord injury patient; the patient had presented with no output from the catheter, no urethral bleeding or output, and severe abdominal pain due to a distended bladder.<sup>6</sup> In contrast, our patient presented with hematuria from the catheter, urethral bleeding, and no abdominal pain with a mostly decompressed bladder, demonstrating the varied presentation of patients with inadvertent urethral placement of a suprapubic catheter.

Adding to the knowledge from previous reports, our case demonstrates the need for proper technique of catheter exchange including confirmation of placement and stabilization to prevent migration. Care should be taken to assess for signs of incorrect placement including severe pain with balloon inflation, blood at the meatus, discharge of crystalloid from the meatus after Foley irrigation, and lack of clear urine return into collecting bag.<sup>6</sup> After insertion, properly securing the catheter to the abdominal wall is necessary to reduce the rate of complications.<sup>4,7</sup> Difficulty of insertion in the ED or a history of complicated exchanges may necessitate urology consult for exchange over a guidewire.<sup>8</sup> In our case, it is conceivable that these strategies could have prevented an insertion too deep ending in the prostatic urethra.

In the face of suprapubic catheter misplacement, we recommend first confirming catheter entry into the urinary bladder by ultrasonography. If the catheter is determined not to be entering the bladder, a false passage may have formed, and emergent urology consultation should be obtained. After confirmation of appropriate bladder entry, balloon placement confirmation is the next step. As opposed to urethral catheterization, which may have balloon inflation in the proximal urethra due to shallow placement, suprapubic catheters may have balloon inflation in the proximal urethra due to deep placement. Although urethral catheters would require catheter advancement, suprapubic catheters require catheter retraction. The catheter need not be completely removed or replaced. In the setting of hematuria

due to catheter misplacement, patients should undergo cystography to identify urologic injury with subsequent urologist consultation.

In summary, emergency physicians frequently treat patients with bladder dysfunction, including complications of urinary catheters. Because rare complications of suprapubic catheterization may occur, including misplacement and urethral injury, patients should be assessed for signs of incorrect placement. Bedside ultrasound and cystogram are valuable tools for the confirmation of placement, as well as diagnosis of complications.

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**How to cite this article:** Hatoum ZG, Alter SM. A Foley folly: Unintended proximal urethral catheterization and balloon inflation causing urethral injury during suprapubic cystostomy exchange. *JACEP Open.* 2020;1:798–800. <https://doi.org/10.1002/emp2.12059>