Case – Identification and management of a retained foreign body presenting with obstruction

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KEY MESSAGES

- Retained foreign bodies are rare but can result in significant patient morbidity.
- These are often treated successfully with either retrograde or percutaneous methods.
- All device packaging should be appropriately discarded to prevent retained foreign body.

INTRODUCTION

Although accounts of retained ureteral stents are found readily in the literature, other upper tract foreign bodies are less commonly described.[1] Iatrogenic strings, wires, and fibers can serve as a nidus for stone formation, with management usually consisting of endoscopic retrograde or antegrade techniques.[2] These patients typically present with infection or obstruction as result of the retained foreign body.[3] We describe a case of disposable packaging resulting in a febrile obstruction.

Case report

A 52-year-old woman with a history of recurrent urolithiasis originally underwent a right-sided stent insertion for an obstructing febrile 12 mm proximal ureteric stone in July 2021. She subsequently received two rounds shockwave lithotripsy, with apparent stone clearance prior to stent removal in September 2021. Followup ultrasound identified persistent hydronephrosis on the right side, and she was brought to the operating room for ureteroscopy (URS). Multiple impacted stones were identified in the distal and proximal ureter, as well as a stricture in the proximal ureter. The stones were treated with laser lithotripsy; however, due to the degree of impaction and edema, she was brought back for a second-look URS to assess the stricture and to determine further management of that in December 2021.

During this operation, the residual small stones in the proximal ureter were treated successfully. A balloon dilation was performed on the proximal stricture using a Boston Scientific balloon dilator. There was trouble placing the stent at the end of the case, with the proximal end unable to form a good curl in the renal pelvis. Despite this, the stent appeared radiographically to be in the correct position both proximally and distally. It was removed two weeks later without issue.

Inadvertently, as part of ongoing investigation of her ureteric stricture, a MAG3 Lasix renal scan was ordered in March 2022. This demonstrated no evidence of right-sided obstruction, but a differential function of 34% on the right and 66% on the left.

In May 2022, the patient presented with fever, dysuria, and new imaging findings of significant right-sided hydronephrosis secondary to what appeared to be a retained portion of a ureteric stent. Abdominal computed tomography (CT) (Figure 1) revealed a radiopaque cylinder several centimeters in length (Figure 2). Given the patient's septic presentation, a stent was placed alongside the ureteric foreign body to achieve urinary drainage. She was treated with intravenous antibiotics. At the time, her creatinine was found to be elevated to 96 from a baseline of about 70.

Once cleared from an infection standpoint, retrograde management was attempted on what was thought to be a retained piece of stent. Flexible ureteroscopy was not successful in removing the foreign body due to the stiffness of the foreign body and the

presence of a flared edge that was difficult to safely pull through the ureter using a basket. Ultimately, she required a percutaneous procedure. Once antegrade access was obtained, the foreign body was easily removed using graspers. It was clear that the foreign body, a piece of clear plastic with a trumpeted end, was a component of the packaging for the Boston Scientific balloon dilator (Figure 3) that had inadvertently been inserted along with the dilator during her procedure in December 2021. It is theorized that instead of pulling off the packaging and discarding it, it was instead pulled up, off the balloon, but still on the length of the device.

Following an overnight stay in hospital, the patient had a full recovery and was discharged home. She had her stent removed two weeks later without issue. Her creatinine returned to her baseline level of about 65–70. She continues to do well without stone recurrence, hydronephrosis, or urinary tract infection as of December 2022.

DISCUSSION

The majority of upper urinary tract foreign bodies are from prior percutaneous or retrograde interventions.[3] Presenting symptoms can include flank pain, hematuria, or infection, as in our patient.[4]

There have been a number of foreign bodies described in the literature but few of these relate to device packaging.[5-9] Sener et al describe a similar case in which a guidewire introducer was placed, leading to a ureteric stricture that required operative intervention.[10] Other described foreign bodies include stent fragments, laser fiber fragments, broken guidewires, retained suture pieces, broken scope tips, and fragments of drains. Management of an upper tract foreign body should proceed from less-invasive to most-invasive approach. Given the relative ease and success of retrograde ureteroscopy, it is a reasonable first step in management.[2] Percutaneous access may be necessary, as it provides an advantage in accommo-

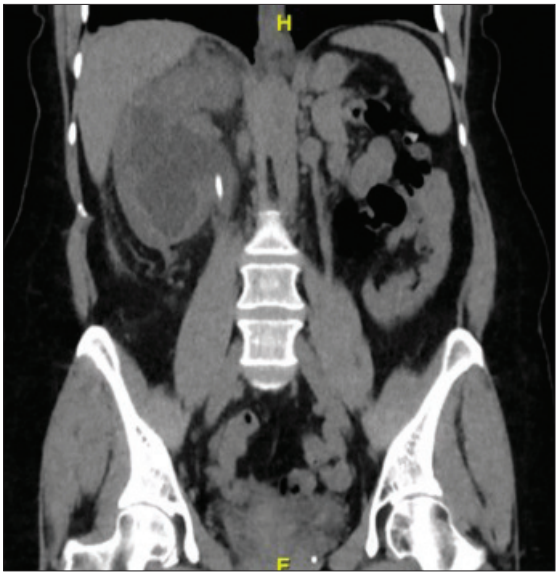

Figure 1. Coronal view of retained foreign body with associated significant hydronephrosis.

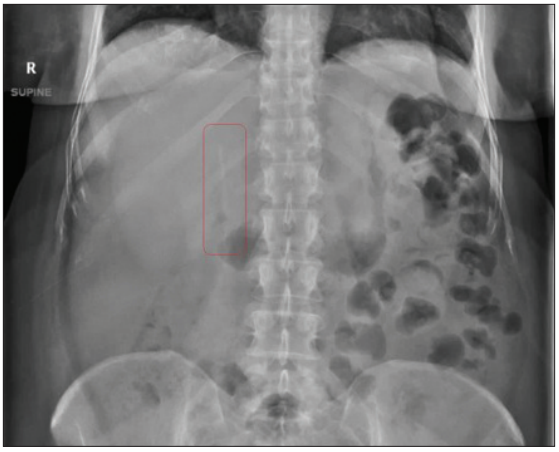

Figure 2. Kidney-ureter-bladder X-ray demonstrating evidence of a retained foreign body in the proximal ureter.

Figure 3. A retained balloon dilator packaging cover immediately following percutaneous removal (bottom), compared to one from a new package (top).

dating both larger instruments and objects, with the caveat of increased morbidity. More invasive surgical exploration has been described but is rarely necessary.[11] In the setting of a known foreign body from prior surgery, patient preparation for the potential of both antegrade and retrograde access can achieve the goal of foreign body removal in a single surgery.

Surgical safety counts are performed in the operating room setting to track every stitch and instrument, with the goal of preventing retained hardware in patient incisions; however, when it comes to devices in the endourologic suite, they are opened without a count. The surgeon must be careful to be aware of any additional packaging or device pieces that could possibly be left behind inside the patient — and ensure that any learners involved in the procedure are aware of disposable aspects of packaging. This is particularly true for equipment that is used infrequently. In these instances, it may be a prudent to institute a back table surgical count for all individual pieces opened. Alternatively, a surgeon may dispose of all unnecessary packaging components when opening an instrument, confirming with a nurse at the back table.

CONCLUSIONS

Retained foreign bodies after endourologic procedures are rare but can result in complications and morbidity to patients. Retrograde and antegrade endoscopic techniques are highly successful in management of iatrogenic foreign bodies. This case draws particular attention to the packaging of instruments in the operating room. Surgeons must ensure all components are appropriately removed, discarded, and accounted for at the end of a procedure to limit the risk of retained foreign body.

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This paper has been peer-reviewed.

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