



Endourology

Cystolithotripsy through appendicovesicostomy in a patient of exstrophy of bladder-episadias complex with augmented urinary bladder: A simple technique

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ABSTRACT

Bladder stone formation is common in patients with augmented urinary bladder. In this case, we have applied minimally invasive technique through the existing appendicovesicostomy. After dilating the Mitrofanoff channel with dilators, we used 6.4/7.9 semirigid ureteroscope with pneumatic lithotripsy to fragment the stone. 20 Fr chest drain was introduced into the augmented bladder over the ureteroscope and all fragments were sucked out, rendering the patient stone free. Operating through the existing Mitrofanoff urinary diversion with ureteroscope along with judicious use of suction can be an excellent cost effective and minimally traumatic method of rendering the patient stone free.

1. Introduction

Augmentation cystoplasty is usually deployed to tackle situations like low compliant or congenitally malformed bladder. Colon, stomach and ileum are being regularly used for augmentation. Sometimes, the above procedure is performed along with or on a later date with bladder neck division for urinary incontinence and cutaneous continent diversion procedure. These lead to urinary stasis and along with bacteriuria, mucus production can lead to recurrent stone formation. An increased risk of stone formation in augmented bladder with outlet resistance procedure and continent urinary diversion has also been demonstrated by Kronner et al.¹ The incidence of calculi after augmentation cystoplasty ranges from 10 to 50%.²

There are numerous methods of removal of these stones ranging from open cystolithotomy to complex endoscopic maneuver where stone is fragmented using different energy sources.

This video demonstrates a cost effective and minimally traumatic method of rendering the patient stone free, in a case of augmentation cystoplasty with appendicovesicostomy and bladder neck division.

2. Procedure

A 24 year old male presented with recurrent episodes of fever with chills and rigors and difficulty in cannulating the

appendicovesicostomy. He is a known case of exstrophy of bladder-episadias complex for which he underwent intestincystoplasty with appendicovesicostomy (Mitrofanoff principle) with episadias repair in neonatal period. He had urinary incontinence thereafter but bowel was continent. On MCU, he had bilateral grade III vesicoureteral reflux. In 2009, he underwent bladder neck division with left rectus muscle interposition and repair of urethrocutaneous fistula. The urethrocutaneous repair failed but no urinary incontinence was reported. He was advised clean intermittent catheterization (CIC) every 2 hours and to leave the feeding tube in-situ overnight.

Now with the following complaints, he was advised ultrasonography of the whole abdomen which revealed multiple stones in the augmented bladder. NCCT KUB was done which confirmed the presence of two calculi 12.4mm and 13.6 mm respectively.

After preoperative anesthetic workup, we planned for minimally invasive approach through the appendicovesicostomy. We were also considering the option of open cystolithotomy.

[Video] We began by inserting a 0.035 guidewire through the stoma into the bladder. We then sequentially dilated the tract upto 14 Fr under fluoroscopic guidance. An 8Fr feeding tube was placed for outflow of normal saline. 6.4/7.9 Fr semirigid ureteroscope (URS) was introduced over the guidewire into the augmented bladder and the stones were identified. Pneumatic lithotripsy was used. Extraction of fragments with URS forceps was not possible due to acute curvatures of the Mitrofanoff

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channel. We planned on dilating the tract to 22 Fr with amplatz dilator and nephroscope insertion for quicker stone retrieval and suction but we found it difficult to dilate the tract beyond the proximal 2 cm of appendicovesicostomy. So, we introduced the URS again and fragmented the stones to the smallest possible fragments.

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Cystolithotripsy through appendicovesicostomy.

A 20 Fr chest drain was taken and the proximal fenestrated part was cut. We shortened the tube by 5–7 cm and introduced it over the URS to the bladder and did the suction. Complete stone clearance was achieved without any complications. Ureteroscope was re-introduced to check for any injury or residual stone. A 3 way 20 Fr Foley catheter was placed at the end of the procedure with bladder irrigation with normal saline @100 drops/min for 4 hours in the post-operative period.

The patient had an uneventful post operative period and was discharged the following day with 20 Fr foley catheter through the appendicovesicostomy.

The plan is catheter removal after 10 days and CIC every 4 hours thereafter.

3. Discussion

It is not uncommon for stones to develop in a case of augmented urinary bladder, mostly when it has a non-dependent drainage through Mitrofanoff channel. In this case, appendicovesicostomy was not in the midline. It was at the right iliac fossa, making clean intermittent catheterization more difficult for the patient.

Earlier open cystolithotomy was the main treatment option for such conditions but with advent of minimally invasive technologies, endoscopic management has emerged as a worthy alternative.

Although there is always a concern of endoscopic management leaving behind stone fragments in the bladder after lithotripsy which can act as nidus for stone formation again, Robert et al., in his comparison between intact and fragmented stone extraction concluded that there is no difference in the time to stone recurrence.³

In our case, we did not rule out the option to shift to percutaneous access or open technique. We knew that the most challenging part of the surgery is to prevent any injury or damage to the appendicovesicostomy. The patient has undergone several surgeries in his childhood and may require surgery again in the future for recurrent stone formation for which he might need percutaneous and open management. That is the reason we thought of going through the appendicovesicostomy and to keep a low threshold to shift to other options if and when needed. We do realise that open and percutaneous management would have decreased the operative duration. Stone analysis was done. It was a struvite stone.

Similar situation is reported by Lanzac de Lorca et al., where for a 6 cm augmented vesical calculus, they used two percutaneous access and an endobag for stone retrieval.⁴

Another case was reported by Lewis S et al., where stone in the neobladder was approached with transpsoas percutaneous technique.⁵

4. Conclusion

Though open cystolithotomy has been a traditional choice to treat stones in augmented cystoplasty cases, with the advent of endourology and proper planning, stone clearance may be achieved with minimally invasive methods. Depending on the stone burden, the whole procedure can be performed through the appendicovesicostomy. This procedure can also be repeated in the future if needed.

Presentations and awards at meeting

None.

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None.

Consent

The patient has provided informed consent for the surgery and treatment as well usage of his data for publishing and other research purposes.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.eucr.2023.102452>.

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