

## Encrusted Suprapubic Catheter in Urethral Injury with Pulmonary Embolism: What To Do?

AH Hamzah<sup>1</sup>, AS Adnan<sup>2,3</sup>, TH Mallhi<sup>4</sup>, M Nor Gohar Rahman<sup>5</sup>, YH Khan<sup>6,7</sup>, AH Khan<sup>8</sup>

### ABSTRACT

*Suprapubic catheters (SPCs) have advantages over urethral catheters with respect to decreased bacteriuria and greater patient acceptability. Catheter encrustation is one of the most common intricacies of SPC and is treated with extracorporeal shock wave lithotripsy and endoscopy lithotripsy. We reported a case of blocked, encrusted SPC, along with urethral injury, that was further complicated by pulmonary embolism. All conventional techniques to treat encrustation were not suitable due to worsening of urethral injury and risk of bleeding as the patient was taking anti-coagulants. Therefore, we adopted a safe and quick procedure by which a 5 mm 0° cystoscope was inserted and the encrusted part of the catheter was fragmented, using artery forceps, leading to removal of the catheter without jeopardy to the catheter track and patient's safety.*

**Keywords:** Catheter, pulmonary embolism, suprapubic catheter, urethral injury, urology.

### INTRODUCTION

Urinary bladder catheters are used for urinary drainage or as a means to collect urine for measurement. Suprapubic catheters (SPC) are the most invasive catheter and require a surgical procedure for placement and insertion through the abdominal wall into the bladder, either intraoperatively in association with another surgical procedure or percutaneously (1). Suprapubic catheterisation has advantages over urethral catheterisation with respect to decreased bacteriuria and greater patient acceptability (2). Avoidance of urethral strictures, decreased level of nursing care, preserved sexual function, prevention of penile pressure necrosis, early post-surgical ambulation, lower infection rates, ease of bladder training, shorter hospitalisation stays and decreased postoperative infections are some other additional benefits of SPC (3). However, SPC is also accompanied by several minor and

rare, major complications like bladder perforation, catheter migration, bleeding and blockage. Encrustation is one of the most common causes of catheter blockage that is usually treated with extracorporeal shock wave lithotripsy (ESWL) and endoscopy lithotripsy (EL). Here, we reported a case of SPC encrustation with urethral injury, complicated with pulmonary embolism, for which the patient was taking anticoagulants. We described a new technique for the removal of SPC as the patient was not suitable for conventional methods of SPC removal due to anticoagulant therapy and underlying urethral injury.

### CASE REPORT

A 45-year-old Malay male met with a motor vehicle accident and had sustained open book pelvic fracture. Micturating cystourethrogram showed bulbous urethral injury (Fig. 1) for which SPC was placed (Fig. 2).

From: <sup>1</sup>Urology Centre, Dinar Urology & Ambulatory Specialist Center, 81800 Johor Bahru, Johor, Malaysia, <sup>2</sup>Ara DAMANSARA Medical Centre, Jalan Lapangan Terbang Subang, Seksyen, 40150 Shah Alam, Selangor, Malaysia, <sup>3</sup>Faculty of Allied Health Science and Nursing, Universiti Islam MELAKA, Batu 28, Kuala Sungai Baru, 78200 Alor Gajah, Melaka, Malaysia, <sup>4</sup>Discipline of Pharmacy, School of Dentistry & Medical Sciences, Charles Sturt University, Orange 2800, Australia, <sup>5</sup>Urology Unit, Department of Surgery, School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerain 16150, Kelantan, Malaysia, <sup>6</sup>Medicines R Us

Chemist, Gregory Hills 2557, New South Wales, Australia, <sup>7</sup>School of Pharmacy, Faculty of Health and Medical Sciences, Taylors University, Selangor, Malaysia and <sup>8</sup>Department of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800, Penang, Malaysia.

Correspondence: Dr TH Mallhi, Department of Clinical Pharmacy, College of Pharmacy, Jouf University, Al-Jouf Saudi Arabia. Emails: tauqeer.hussain.mallhi@hotmail.com

The patient also had T10-L1 fracture with neurological deficit up to L1 level. The patient underwent open reduction and internal plate fixation for pelvic fracture, and delayed repair was planned for urethral injury. Unfortunately, the patient developed deep vein thrombosis (DVT) after surgery, due to immobility, for which low-molecular-weight heparin was initiated. Later, the patient developed massive pulmonary embolism as a result of DVT, and warfarin was started to maintain international normalised ratio values within the range of 2–3. The patient was then discharged from hospital with SPC and was directed to change the catheter after every 2 weeks.

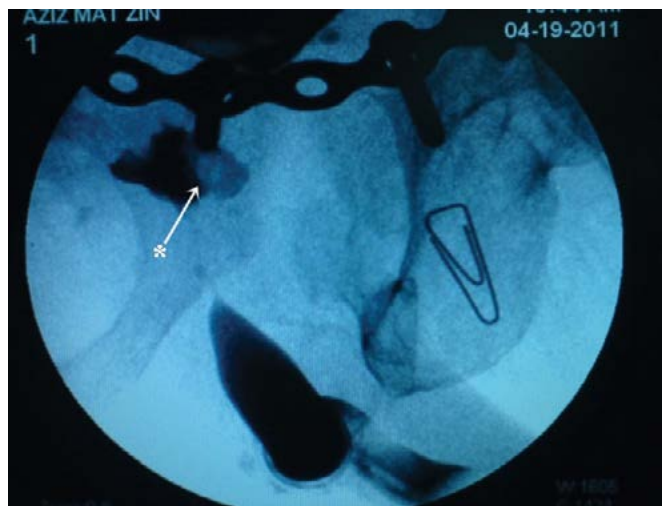


Fig. 1: Micturating cystourethrogram (MCUG) indicating bulbous urethral injury (\*).



Fig. 2: Placement of a suprapubic catheter due to delay repair for urethral injury.

One month later, the patient was referred to urology outpatient clinic due to failure of catheter removal. An X-ray demonstrated catheter encrustation (Fig. 3), while

computed tomography scan of the pelvic region showed the presence of calcification ring on the catheter, suggesting encrustation.

All the conventional methods to treat encrustation were associated with high morbidity in this case, due to the use of anticoagulant therapy for pulmonary embolism. Repeated insertion of a lithotripter through the urethra was not suitable in our patient because of underlying urethral injury. So, we adopted a quick and safe technique of removing encrusted SPC in this high-risk patient. We admitted the patient and planned the procedure on the fifth day of admission. Warfarin was stopped and heparin was infused 3 days prior to the procedure with monitoring of activated partial thromboplastin time until its values were two times higher than normal. On procedure day, suprapubic tract was dilated by using artery forceps under spinal anaesthesia. Under the direct vision, a 5 mm 0° cystoscope was inserted and encrusted part of the catheter was fragmented using artery forceps, leading to removal of the catheter (Fig. 4). The catheter track was thoroughly washed and a new SPC was placed. Oral warfarin was started immediately, and the patient was discharged on the second day of procedure without any complication or bleeding episode.

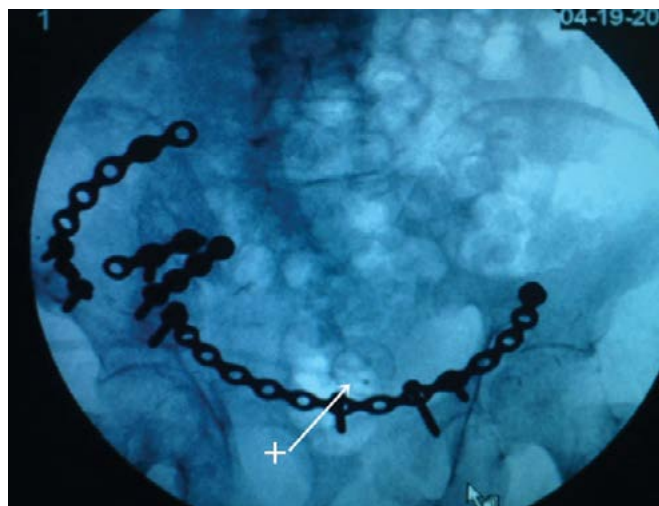


Fig. 3: MX-ray showing calcified ring suggesting encrusted catheter (+).



Fig. 4: Removed suprapubic catheter with calcified tip.

## DISCUSSION

Urethral injury can be realigned by rigid cystoscopy in the early phase of injury or by delayed urethral repair after 6 weeks of injury, but in later case, placement of SPC is needed to bypass the urethral (4). In our case, delayed repair was planned because the patient had open book pelvic fracture with neurological deficit where prognosis is guarded. A long-term catheterisation was also planned, due to high risk of neurogenic bladder. Catheter entrapment is a potential complication and occurs due to balloon malfunction, faulty valve mechanism, malfunction of the inflation channel or crystallisation of fluid within the balloon (5).

Besides the advantages of SPC over urethral catheterisation, it also carries several complications like infection, bladder spasm, balloon malfunction and intraluminal or extraluminal catheter encrustation (2). The encrustation mechanism can be explained by the reason that the insertion of a catheter in body causes immune response, leading to formation of bacterial biofilm on the catheter. This biofilm secretes an extracellular matrix of bacterial glycocalyxes and host proteins. Urinary crystals, such as struvite and calcium phosphate, are also incorporated into biofilm (6). Alkalisiation of urine by urease enzyme, released by *Proteus mirabilis*, promotes crystallisation of struvite and calcium phosphate (7).

Under normal circumstances, encrustation of a catheter can be treated either with ESWL or EL. Canby-Hagino *et al.* described the use of intraluminal pneumatic lithotripsy for removal of intraluminal encrustation of the catheter; a pneumatic lithotripsy probe is inserted into the lumen of the catheter and advanced in a jackhammer-like fashion. This technique results in disruption of intraluminal encrustations and straightening of the tubes so that they can be removed in an atraumatic manner (8). Kunzman *et al.* reported that use of ESWL delivered at 8 kV level causes fragmentation of encrusted balloon (9). Christopher Ho reported a case in which an encrusted urethral catheter was fragmented by using a lithotripter under direct vision through suprapubic catheter tract (10).

We faced management dilemma in the current case. The placement of the urethral catheter was contraindicated due to blocked, encrusted SPC and underlying urethral injury. The treatment of encrustation with ESWL was not suitable because of warfarin use and possible risk of bleeding during the procedure. The use of the lithotripter requires repeated insertion through urethral that can worsen the urethral injury. Therefore, we adopted a safe and quick procedure to remove

encrusted SPC that did not jeopardise the catheter track and patient's safety.

## CONCLUSION

Encrusted catheter is a common intricacy in urology practice that can be treated in several ways. To the best of our knowledge, we reported the first case of treatment of encrustation with artery forceps by using 5 mm 0° cystoscope in high-risk patient with pulmonary embolism and urethral injury, where conventional methods of treatment are contraindicated.

## LEARNING POINTS

The current report is a rare case of SPC encrustation complicated by urethral injury and pulmonary embolism.

ESWL and EL are conventional and gold standards to manage such patients in routine practice

Conventional treatments for encrustation were not suitable in our patient because of urethral injury and anticoagulants use.

We developed a safe and quick technique to break encrusted SPC without harming catheter track.

A new technique used to treat such high-risk patients will aid clinicians to manage such patients in a safe manner.

## AUTHORS' NOTES

AAH and MNGR performed the procedure in the current patient. ASA and AHK carried out radiological and laboratory investigations. THM and YHK wrote the manuscript and approved the final draft.

## REFERENCES

1. Jacob P, Rai BP, Todd AW. Suprapubic catheter insertion using an ultrasound-guided technique and literature review. *BJU Int* 2012; **110**: 779–84.
2. Perrin LC, Penfold C, McLeish A. A prospective randomized controlled trial comparing suprapubic with urethral catheterization in rectal surgery. *Aust N Z J Surg* 1997; **67**: 554–6.
3. Adeyemo B, Makovitch S, Foo D. A peculiar complication of suprapubic catheterization: recurrent ureteral obstruction and hydronephrosis. *J Spinal Cord Med* 2013; **36**: 166–9.
4. Olapade-Olaopa EO, Adebayo SA, Atalabi OM, Popoola AA, Ogunmodede IA, Enabulele UF. Rigid retrograde endoscopy under regional anaesthesia: a novel technique for the early realignment of traumatic posterior urethral disruption. *Afr J Med Med Sci* 2002; **31**: 227–80.
5. Gonzalgo ML, Patrick CW. Balloon cuffing and management of the entrapped Foley catheter. *Urology* 2003; **61**: 825–7.
6. Hedelin H, Eddeland A, Larsson L, Pettersson S, Ohman S. The composition of catheter encrustations, including the effects of allopurinol treatment. *Br J Urol* 1984; **56**: 250–4.
7. Mobley HL, Warren JW. Urease-positive bacteriuria and obstruction of long-term urinary catheters. *J Clin Microbiol* 1987; **25**: 2216–7.
8. Canby-Hagino ED, Caballero RD, Harmon WJ. Intraluminal pneumatic lithotripsy for the removal of encrusted urinary catheters. *J Urol* 1999; **162**: 2058–60.

9. Kunzman SA, Srinadh ES, Lala SM, Albusaidi Q. Management of retained encrusted urethral catheter with extracorporeal shockwave lithotripsy. *Indian J Urol* 2002; **19**: 83–4.
10. Christopher CK Ho, Yugasaravanan K, Praveen S, Eng Hong G, Zulkifli Z. Encrusted and incarcerated urinary bladder catheter: what are the options? *Libyan J Med* 2010; **5**: 1–3.

© West Indian Medical Journal 2026.

This is an article published in open access under a Creative Commons Attribution International licence (CC BY). For more information, please visit [https://creativecommons.org/licenses/by/4.0/deed.en\\_US](https://creativecommons.org/licenses/by/4.0/deed.en_US).

