

Neglected Retained Suprapubic Catheter with Varied Management Options: A Case Series

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Abstract

Supra-pubic catheterization of bladder is used as a short or long term alternative to per-urethral catheterization.

Some catheter materials are more resistant to encrustation than others. If kept indwelling for longer duration, sooner or later all catheters cause complications like urinary tract infection (UTI), trauma, peri-catheter leakage, non-deflation of balloon, encrustations and stone formations resulting into retained catheter.

Stone formation over neglected indwelling catheter is not an unusual clinical scenario and its management depends on etiology of catheter retention and complication.

This article discusses etiopathogenesis, clinical presentations, diagnosis and varied management options used for the neglected retained supra-pubic catheter in three cases.

Keywords- Cystolithotomy; Indwelling catheter; Neglected Supra pubic catheter; Percutaneous cysto-lithotripsy; Retained Supra pubic catheter; Urinary bladder stone.

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Case series

Three patients presented with retained suprapubic catheter (SPC) to us with varied presentations. All cases were assessed by clinical history along with laboratory and radiology examination. Cases were managed on a case to case basis as per the need for treatment based on cause and complication of retained SPC, after starting culture-specific antibiotics. The clinical presentations and management details of the patients are depicted in **Table 1**.

Discussion

Suprapubic catheterisation is the first choice used to drain the urinary bladder where urethral catheterisation cannot be done because of obstruction or in patients needing long term catheterisation for stricture urethra or neurogenic bladder to avoid complications like epididymo-orchitis,

prostatitis, peri-urethral abscess, bladder neck erosion and penile skin necrosis.^{1,2}

Stone formation, encrustations over the indwelling catheter, urinary tract infection (UTI), blockage, peri-catheter leak, retained catheter and bladder spasm are not unusual clinical scenarios associated with long term urinary catheterisation.^{1,3,4}

Duration of the catheter is an important risk factor for the development of bacteriuria, which occurs at an incidence of 10% per day of catheterisation, which forms bio-film over the catheter and secretes extracellular polysaccharide matrix. Along with it, host urinary proteins and salts forms encrustations inside catheter lumen and around the tip of the catheter. The reported incidence of bladder lithiasis due to long term bladder drainage is 0.07-2.2%.^{1,5}

Table 1. Demographic profile, etio-pathogenesis, clinical presentation and management outcome of patients with retained SPC.

	Case 1	Case 2	Case 3
Age/Sex	65yr /male	35 year/male	30 year/male
Indication for SPC placement	BEP with AUR	Pan urethral stricture with AUR	Bulbar urethral stricture with AUR
Duration of SPC	1 year	1 year	3 years
Clinical presentation	Supra pubic pain, peri-catheter leak, severe LUTS and partially draining SPC	Supra pubic pain and total peri-catheter leak	Supra pubic pain, total pericatheter leak with occasional fever
Duration of symptoms	1 week	1 month	6 months
Cause for retained SPC	Not attended hospital due to fear of Covid-19 infection	Not remembering advice to change and felt it doesn't need to be changed	Told to change every monthly but could not follow up due to economic constraints, uneducated status and living in rural area.
Urine routine microscopy	4-5 pus cells	Plenty of pus cells	Plenty of pus cells
Blood Leucocytes count	11400	13000	15000
Serum Creatinine (mg/dl)	1.2	1.7	1.9
Urine culture (sensitivity)	Escherichia.coli (Nitrofurantoin)	Escherichia.coli (Ceftriaxone)	Klebsiella (Meropenam)
USG / NCCT KUB-	USG-Thick walled bladder with 70 cc prostate without hydronephrosis with foley's bulb with encrustations	USG-Partially distended bladder with 4.5x4.2x4 cm calculus around foley's bulb with 35 cc prostate	NCCT- Partially distended bladder with 5x5.2x5.1 cm calculus around SPC bulb with 42 cc prostate with moderate hydronephrosis and hydroureter. (Figure 3a)
Old RGU+ MCU	--	Pan urethral stricture	<1 cm Bulbar urethral stricture
Type of SPC catheter	Latex	Latex	Latex
Trial of SPC change prior to presentation(outside hospital)	Yes (SPC cut and presented with only 2 cm catheter above the skin in suprapubic area)	Yes (SPC cut and presented with cut end of catheter above the skin in suprapubic area)	Not tried
Treatment given	Cystoscopic guided suprapubic puncture of balloon after failed USG guided puncture (Figure 1a, b)	Cystolithotomy (Figure 2)	Cystoscopy+ Visual internal urethrotomy with scopy guided PCCL (Figure 3b)
Post-operative course	Uneventful	Uneventful. Normalization of creatinine	Uneventful. Normalization of creatinine and hydronephrosis.
Adjuvant procedure done	TURP	BMG Urethroplasty	--
Follow-up (USG kub/ Uroflowmetry)	Normal	Normal	Normal

BEP- Benign Enlargement of Prostate, AUR- Acute Urinary Retention, SPC- Supra Pubic Cystostomy, USG- Ultrasonography, NCCT- Non Contrast Computerized Tomography, RGU- Retrograde Urethrogram, MCU- Micturating Cystourethrogram, TURP- Trans-Urethral Resection of Prostate, BMG- Buccal Mucosa Graft, PCCL- Percutaneous Cystolithotripsy.

Suprapubic foley catheters are retained due to stone formation, encrustations around the tip of catheter, non-deflation of balloon, cupping effect of dilated balloon or spontaneous true knotting, if kept indwelling for long term without change.⁴

Encrustations may be extra or intra-luminal which impedes deflation of balloon leading to retained catheter.³ In our series also, the formation of the stone at the tip of the catheter was the cause for retention in two cases, and in one it was intra-luminal encrustation.

Reported causes for not changing the catheter are- improper counselling by treating physician, economic constraints, resident of rural India, inaccessible for periodic change and negligent behaviour of the patient.^{1,4} In our series, one patient did not change catheter due to fear of getting COVID-19 infection while attending hospital. The second patient did not remember the advice regarding catheter change and had negligent behaviour while the third patient could not do so due to economic constraints because he lived in an inaccessible area.

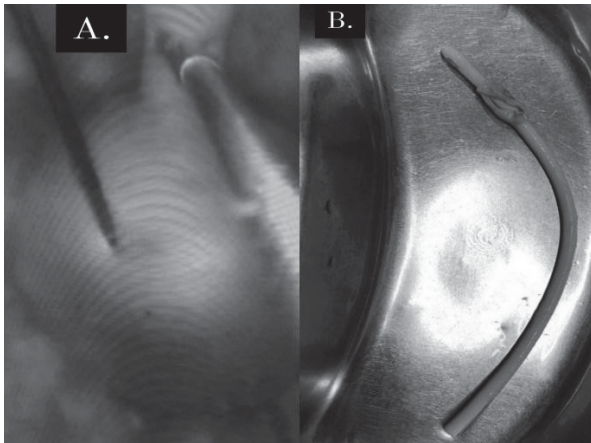


Figure 1. Cystoscopic guided suprapubic puncture of balloon (A); Foley's catheter with punctured balloon (B).

Long term indwelling retained catheter becomes gradually obstructed resulting into offensive urine leakage around the catheter, local tenderness, palpable mass due to formation of stone, pyuria, supra-pubic discomfort, fever and chills.^{3,4,6} In our series, all the patients presented with supra pubic pain and peri-catheter leakage with blocked catheter in two patients and associated fever in one case.

In patients presenting with unchanged long term indwelling catheter, one should be highly suspicious of encrustations or stone formation around catheter and a step ladder approach must be used to treat it because often times the exact cause of retention is not known. Diagnosis of retained SPC is made by the inability to change or remove the catheter and using sonography or Non-Contrast Computed Tomography (NCCT) scan for formation of encrustations / stone around the tip like in our cases.^{1,3}

The aim in managing patients of retained catheter is to remove the catheter with the simplest procedure without leaving fragments of balloon or catheter behind with minimum discomfort to the patient.⁴

Selection of management should be based on the etiology of catheter retention and its complication. It is better to avoid formation of encrustations by aseptic catheter insertion, continuous closed drainage system, and three-weekly catheter change.⁵ It is necessary to change catheter before it gets blocked to reduce unnecessary catheter associated problems.²

Catheter can remain stuck if cuff is formed after deflation of balloon or non-deflation of balloon due to intra-luminal encrustations. In such situations, following methods are available to remove retained foley catheter:^{2,7}

- a) USG guided balloon puncture
- b) Blind supra-pubic puncture
- c) Insertion of ureteric catheter stellate or wire through inflating channel
- d) Per rectal palpation of balloon and puncture
- e) Catheter telescoping
- f) SPC

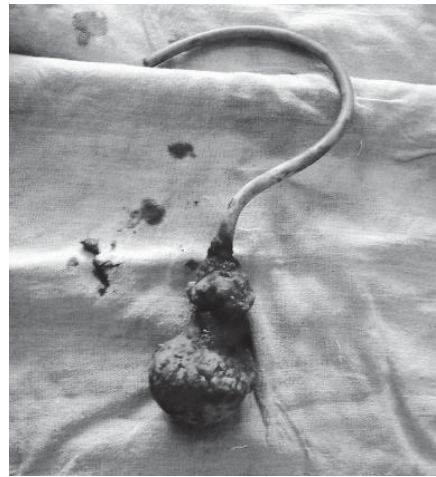


Figure 2. Intact removal of calculus formed over foley's balloon.

For deflation of balloon, the sonologist needs full bladder to see the bladder and intra-vesical structures but it is difficult or not possible when there is peri-catheter leakage.⁴ In case one, we used cystoscopy guided puncture of balloon after failed sonography trial as fixing of the catheter balloon was not possible. This may be due to previous trial of removal by flush cutting of catheter to the skin or intraluminal encrustations.

Sharma et al described management options for retained catheter with stone formation/ encrustations around the tip which are- Extracorporeal Shock Wave Lithotripsy (ESWL), cystoscopic pneumatic lithotripsy and cystolithotomy. Patients having large hard stone associated with pan urethral stricture should be tackled by cystolithotomy.³ Singh et al also described open cystolithotomy to remove retained supra pubic catheter due to stone formation at the tip.¹ In our series also, the second case had pan-urethral stricture with neglected retained catheter due to large stone who underwent cystolithotomy.

Wollin et al described the treatment options for bladder calculi as- open cystolithotomy, ESWL, Percutaneous Cysto-lithotripsy (PCCL). PCCL should be used for stones larger than 3cm, multiple, inability to perform trans-

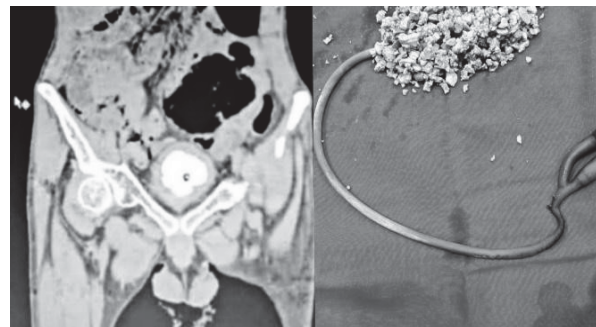


Figure 3. CT shows rounded stone around the tip and balloon of catheter (A); Foley's catheter with fragmented stones around the tip (B).

urethral lithotripsy because of anatomy.⁸ In our third case, cystoscopic guided PCCL was done considering very large stone and associated short segmental bulbar urethral stricture after doing visual internal urethrotomy.

Conclusion

To avoid complications and morbidity of retained suprapubic catheter we suggest few recommendations like:

1. Judicious use of SPC with proper instructions regarding regular change and follow up to patient and his relatives.

2. Proper education and counselling of patient who needs long term indwelling catheter and health care providers who changes it.
3. It is necessary to maintain SPC register having address, phone number of patient to access them quickly if they fail in changing the catheter and follow up to avoid further morbidity and complications.

We feel that every 3-4 weekly change of suprapubic cystostomy catheter is the responsibility of both the patient and the treating surgeon who placed it.

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