



SUCCESSFUL MANAGEMENT OF URINARY BLADDER CALCULUS FORMED OVER NEGLECTED FOLEY'S CATHETER WITH LASER LITHOTRIPSY: A CASE REPORT

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ABSTRACT

Urinary catheterisation is one of the most commonly performed urological emergency procedures worldwide. A long dwelling urinary catheter could be complicated by catheter obstruction due to encrustation and stone formation. Traditionally open cystolithotomy was the treatment standard but minimally invasive procedures like cystolitholapaxy , ESWL, pneumatic or Laser lithotripsy are frequently being used with greater ease and expertise worldwide. We present the case of a 70 year old male who had urosepsis due to stone formation over the neglected Foley's catheter balloon. The patient was managed successfully with Holmium laser lithotripsy.

KEYWORDS : Laser lithotripsy , Holmium laser , urinary bladder calculus, Foley's catheter

INTRODUCTION

Acute urinary retention is one of the most common urological emergencies seen in old age patients. It requires an urgent drainage of urine with the help of a catheter passed through the urethra.^[1] Sometimes when there is urethral stricture or urethral trauma, the catheter may be put in through Supra Pubic Cystostomy (SPC). Per urethral catheterisation is done under all aseptic conditions but an indwelling catheter for a long time can induce Urinary Tract Infection (UTI). The infecting organisms can induce biofilm formation which protects them from the antibiotic reach. An indwelling catheter in presence of UTI can lead to encrustation of the balloons of the catheter and stone formation. This can result in pain, hemorrhage , UTI and can make the change of urinary catheter difficult or sometimes impossible.^[2] We present the case of a 70 year old patient in accordance with the CARE checklist, who presented to the emergency department with uro-sepsis and Urinary Bladder (UB) calculus formed over the bulb of a neglected Foley's catheter balloon.

CASE REPORT

We present the case of a 70 year old male who presented to Emergency Room (ER) with pain lower abdomen, dysuria, fever, and intermittent haematuria. He was a known patient of Benign Enlargement of Prostate (BEP) and was on medical management with Tamsulosin and Dutasteride. He suffered an episode of acute retention of urine 2 years back for which he was catheterised at a local hospital. After a few days he accidentally pulled off the Foley's catheter. He never had any complaints after that and continued on medications. At the time of presentation to the ER, Blood investigations were; Hb :12.5 gm/dl, TLC: 11,300/mm³, Serum urea: 38 mg/dl, and Serum creatinine: 1.5 mg/dl. Ultrasound abdomen showed bilateral mild hydronephrosis, distended, thick-walled urinary bladder and echogenic shadow suggestive of urinary bladder stone with an enlarged prostate weighing 32 gm, approximately. He was catheterised with a Foley's catheter and started on intravenous Ceftriaxone 1 gm 12 hourly, Tablet Paracetamol 650 mg SOS, and Tablet Tamsulosin 0.4 mg at bed time. X-ray KUB showed a radio-opaque shadow in the UB.(Fig.1) Non Contrast Enhanced Computerised Tomographic Scan (NCCT) of abdomen showed encrusted Foley's catheter mimicking urinary bladder stone. (Fig.2) Urine culture yielded *Escherichia coli* sensitive to Amikacin

and Fluroquinolones. Patient was switched to Ciprofloxacin 500 mg 12 hourly per oral and continued for two weeks. After treating with antibiotics, he was planned for Cystolithotripsy. On Cystoscopy, 5.0 x4.5 cm yellowish-brown calculus was seen in the urinary bladder. (Fig.3) Calculus was fragmented with holmium laser. On fragmenting encrustations, remnant of balloon and Foley's catheter was seen. Foley's catheter was fragmented with laser and removed with Allik's evacuator. Postoperatively patient recovered well and voided easily after removal of the catheter on 1st post operative day. The patient is still in follow-up and is doing well on medical management.

DISCUSSION

Urinary retention is a common urological emergency worldwide, especially in old age males. This requires urgent urinary drainage which is often accomplished by introduction of a Per Urethral Catheter (PUC). Foley's catheter is the most commonly used self retaining catheter for this purpose.^[3] Foley's catheterisation may also be required for diagnostic procedures like intake and output charting, imaging of the urinary tract to find out the etiologies of various genitourinary illnesses, collection of clean urine samples and measurement of intra abdominal pressures as in case of abdominal compartment syndrome. It can be used for irrigation as after Trans Urethral Resection of Prostate (TURP), instillation of medications like BCG for Carcinoma of Urinary Bladder (UB) and Betadine or antibiotic irrigation of the UB.^[4] These catheters can be instilled and removed immediately after the successful drainage of the urine or they may be left in place with the help of self retaining balloons for a longer duration of time. This is required in case of old age males who usually develop bladder outlet obstruction secondary to Benign Enlargement of Prostate (BEP). A catheter is a foreign body which is likely to induce foreign body reaction and lead to UTI. Infectious complications of a PUC could be urethritis, cystitis, epididymitis, pyelonephritis and bacteremia. Apart from this catheterisation can lead to iatrogenic urethral injuries, urine leakage, catheter blockage, accidental removal of catheter, haemorrhage , urethral stricture, urethral perforation and formation of false passages in the urethral tract.^[5] Sometimes the long dwelling catheters are difficult to change . This could be due to the formation of sediments and concretions over or inside the lumen of the Foley's catheter or formation of stones over the Foley's bulb. The crystal formation over the catheters

leading to obstruction is seen in nearly 50% of the patients.^[6] The urease producing bacteria are most commonly responsible for the sediment formation which could be of Struvite or Apetite types. *Proteus mirabilis* is the most common organism widely associated with the crystalline bio film formation in long dwelling urinary catheters. It can quickly and most efficiently turn the urine alkaline, thus leading to the crystal formation. It has been proven in studies that by increasing the fluid and citrate intake the pH of the urine could be raised above 8.3, which inhibited the bio-film formation.^[7] X ray KUB region can pick up these bladder stones. USG of abdomen can detect the urinary bladder stones and show the kidney and prostate status. CT urography can further be helpful to assess the structural and functional image of the genitourinary system.^[8] Cystoscopy can not only visualise the stones or concretions but it could be therapeutic at the same time. Obstruction of the deflation channel is the most common cause of non deflating urethral catheter. In such situation push the catheter gently inside the urinary bladder to ensure it is not inside the urethra. The balloon port may be cut. If still the fluid does not drain pass, a lubricated guide wire over the inflation channel. If the balloon does not deflate then mineral oils could be instilled to dissolve the balloon material. If still not deflated then the USG guided balloon puncture could be tried. But sometimes all these measures may fail. This is due to concretion or stone formation over the inflated balloon.^[9] Then the patients usually require surgical intervention. Traditionally the approach was open surgery in the form of cystolithotomy. It has got high morbidity. But now a days, the minimally invasive techniques are gaining popularity and are being used with ease even in the developing world. Use of cystolitholapaxy, lithoclasts and cystolithotripsy like Extracorporeal Shock Wave Lithotripsy (ESWL), pneumatic and laser lithotripsy are being reported.^[10] In an unusual case report by Christopher CK et al, SPC was done first, and encrustations broken through the mature SPC tract using cystoscope and pneumatic lithotripter.^[11] Holmium laser can achieve the smallest stone fragments irrespective of the type of stone forming material. The depth of thermal injury ranges between 0.5-1.0 mm which makes it safe to be used near the mucosal surfaces. Karami H et al described the use of Holmium laser for transurethral cystolithotripsy of bladder stones larger than 2 cm in patients above 18 years of age. They achieved 98.5% stone clearance rate in a single sitting.^[12] Kara et al described the successful use of holmium lasers in the removal of bladder stones larger than 3 cm.^[13] Teichman et al described the holmium laser use to be successful in patients with UB stones larger than 4 cm.^[14] An added advantage of Holmium laser is that it can be used for the treatment of BEP at the same time through laser ablation of prostate.^[12] Although the use of flexible cystoscopes makes it difficult to focus on the UB stones with lasers due to mobility of the stones within the bladder but it is safe and effective way of dealing with the UB stones.^[13] The complications of Holmium laser lithotripsy could be transient hematuria, post operative fever, bladder perforations and mucosal injuries. In rare cases there could be formation of a urethral stricture.^[12] A variety of materials like latex, silicone, silver alloy and antibiotic impregnated catheters have been used but none can prevent the development of bacteriurea and possible encrustation.^[15] Thus, the patients need to be informed about the possible complications of an indwelling urinary catheter. An intermittent deflation and inflation of the catheter balloons should be done to break the encrustations forming over the catheter balloons. They should be asked to wash it with soap and water frequently.^[16] Patient should be told to get the PUC changed at frequent intervals or whenever they develop any urinary complications.

CONCLUSION

Foley's catheters if left inside the urinary bladder for a long duration can lead to formation of encrustations or frank stones over the catheters which can make their change or removal very difficult. Wherever available Holmium Laser lithotripsy

can be applied to break these concretions and stones in an easy and effective way. Patients should be explained about the complications of urinary catheterisation, advised about catheter hygiene and for frequent change of urinary catheters.

FOOT NOTE

Reporting Checklist: The authors have completed the CARE reporting checklist.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form . The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this case involving human participants were in accordance with the ethical standards of the institutional and national research committees and with the Helsinki Declaration.

CONSENT

Written informed consent was obtained from the patient. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

FINANCIAL DISCLOSURES

None

ACKNOWLEDGEMENTS

Nil

Author's Contributions

Rajesh Chaudhary: Contributed substantially to the Conception, design, Acquisition of data, Analysis and interpretation of data, drafting the article, Critical revision of the article and final approval of the version to be published.

Manjeet Kumar: Contributed substantially to the Conception and design, Acquisition of data, Critical revision of the article and final approval of the version to be published

Ankit Shukla: Contributed substantially to the Conception and design, Acquisition of data, Critical revision of the article and final approval of the version to be published.

Tenzin Tsomo: Contributed substantially to the Conception and design, Acquisition of data, Critical revision of the article and final approval of the version to be published.



Figure 1: Showing The Urinary Bladder Calculus

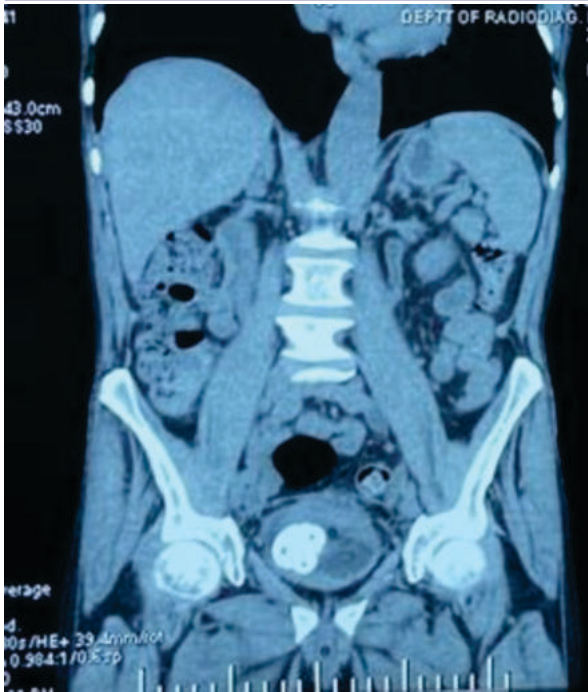


Figure 2: NCCT Abdomen Showing The Urinary Bladder Calculus.



Figure 3: Cystoscopic Image Showing Stone Formed Over The Foley's Catheter.

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