CASE REPORT

Tragedy of Inappropriately Managed Foley Catheter

Sujnanendra Mishra¹

Received: 18 September 2015 / Accepted: 19 March 2016 / Published online: 22 April 2016
© Federation of Obstetric & Gynecological Societies of India 2016

About the Author

Dr. Sujnanendra Mishra Worked in different remote places in Odisha as consultant in OBGYN. Presently working as ADMO (FW), Balangir, Odisha.

Introduction

One of the most commonly performed invasive procedures in hospitalized patients is urethral catheterization with a Foley catheter [1]. It has been estimated that 10–15 % of hospitalized patients will undergo Foley catheter drainage at some time during their admission [2]. Foley catheters are used routinely for both short- and long-term drainage of the urinary bladder and have been associated with many complications including infections, catheter encrustation, catheter blockage, bladder spasms, balloon rupture, leakage and retained catheter [3]. These complications occur more commonly with chronic indwelling catheters, but can also

happen with short term use as well. The retained Foley catheter is a vexing problem that many physicians are likely to encounter during their careers. The article also reviews the methods available for the removal of retained Foley catheters caused by balloons that will not deflate and provides the surgeon with strategies for managing this problem.

A case report of a patient with a non-deflating Foley urethral catheter balloon is described. The medical literature on complications of urethral catheterization was reviewed. Urinary bladder stones are common in males, rarely found in females (2 %), and their occurrence should be evaluated in detail. In females, urinary bladder stones are usually formed as a consequence of outlet obstruction or neurogenic bladder causing stasis and rarely from foreign body intrusion. The patients undergoing obstetric and gynecological surgery with implantation of foreign bodies in the urinary bladder do give rise to stone formation. Most of the foreign bodies include birth control devices, vaginal slings, and a few cases have non-absorbable suture [2, 4].

Dr. Sujnanendra Mishra is a Senior consultant in OBGYN and working as ADMO (FW) Balangir, Odisha.

✉ Sujnanendra Mishra
drsujnanendra@gmail.com

¹ OBGYN, Balangir, Odisha, India

We report an uncommon case of a 54-year-old female presenting with LUTS found to have calculi in the urinary bladder following prior abdominal hysterectomy.

Case Report

A 54-year-old female presented with severe lower urinary tract symptoms with frequency and dysuria (LUTS) and occasional passage of debris in urine, watery vaginal discharge and incontinence for last 1 year. She had undergone abdominal hysterectomy for fibroid uterus 4 years back. She also had history of difficult removal of non-deflectable balloon of a transurethral inserted bladder catheter postoperatively. Two weeks earlier, urine examination showed pyuria and microscopic hematuria and urine culture showed *E coli*. She was treated with antibiotics for two weeks, and when the condition did not improve, she was reevaluated. Vaginal examination revealed healthy vault and vagina. Pap smear was taken from the vault which was negative. A hard mass was felt on anterior vaginal wall. On “sounding” the bladder, stone was suspected by feeling it “clink” (on a urethral sound, an age-old technique for detecting bladder stones arising from the base of bladder). Two huge brownish-white stones with fine spicules on its surface were removed through suprapubic cystolithotomy. The urinary bladder was repaired in two layers using vicryl 3-0 and per urethral Foley catheter kept for 2 weeks. Weight of the stones was 228 and 263 g (Fig. 1). The stones were crushed and revealed to have been formed over pieces of materials of shattered Foley catheter balloon (Fig. 2).

The patient was in satisfactory condition during follow-up examination at 10 weeks. There was no urinary infection, dysuria, retention or incontinence and she was free from LUTS.

Discussion

Females account for only 2 % of all patients with bladder stones caused by bladder outlet obstruction [1]. The overall incidence of bladder calculi has increased slightly for females over the last four decades [3]. This might be due to an increase expectancy of life consequently in the elderly population as well as an overall increase in the number of female genitourinary procedures performed annually [3]. The presentation can comprise of severe LUTS, recurrent urinary tract infections (UTI), suprapubic pain and hematuria. Animal experiments have revealed that non-absorbable sutures, such as silk and Mersilene, cause substantial tissue reactions. Stones are formed when these

Fig. 1 Two huge brown white calculi removed from bladder

Fig. 2 Crushed calculi showing pieces of shattered balloon

sutures are exposed in the bladder cavity [3, 5]. Evidence in the literature classifies the foreign bodies causing bladder stone formation among females into extra cystic objects such as intrauterine devices which move ectopically into the bladder [6, 7], intra-cystic objects like parts of catheters or sutures left in the bladder [8, 9] and sutures left embedded in the bladder wall used to repair bladder damage during surgery [10, 11]. The majority of bladder calculi in females are secondary to pelvic surgery or after surgical procedures for incontinence. It results from either obstruction or foreign bodies [3, 12]. In our patient, the stone was a result of pieces of materials of shattered Foley catheter balloon left inside the bladder during its removal following abdominal hysterectomy done previously. The main principle for managing a bladder stone is to remove the underlying cause of stone formation, such as obstruction or bladder infection [4]. A bladder stone resulting from a foreign body that has become fixed on the bladder wall may occasionally require a laparotomy for its removal [5]. It is imperative that women who present with significant lower urinary tract symptoms for longer duration with prior history of urogynecologic procedures undergo a thorough evaluation to rule out inadvertent intra-vesical retention of foreign body [3].

Many sources are available describing methods and techniques used to remove Foley catheters when the balloon will not deflate. Although many methods are often effective, they are not uniformly reliable. The initial step in the management of the non-deflating Foley catheter balloon is to advance the catheter to be sure the balloon is within the bladder. If this maneuver fails to deflate the balloon, the balloon port should be cut proximal to the inflation valve [13]. This step eliminates the valve mechanism and should allow the fluid to drain freely from the balloon. If this method is unsuccessful, the obstruction is most likely along the length of the catheter or at the entrance to the balloon. Although this technique might not be successful at deflating the balloon, removal of the valve facilitates additional deflation techniques.

The next step is to pass a lubricated fine-gauge guidewire, such as a stylet, through the inflation channel after the valve mechanism has been severed [14]. The guidewire might relieve any obstruction or allow the fluid to egress along the wire, thereby draining the balloon. If the stylet technique is not adequate at draining the balloon, a well-lubricated 22-gauge central venous catheter can be inserted over the preplaced guidewire using the Seldinger technique [15]. When the catheter tip is advanced enough to be in the balloon, the guidewire is removed, and the balloon should drain. If the balloon does not drain, the wire may be reinserted and used to advance further, as necessary.

If all these attempts at balloon deflation fail, techniques to rupture the balloon are available to facilitate catheter removal. Hyperinflation with air or saline should be avoided because of the painful nature of the procedure, risk of bladder rupture and need for further treatment as a result of retained balloon fragments.

Several chemicals have been used to dissolve the balloon wall and therefore allow its deflation. Ether, chloroform, acetone and mineral oil are among the agents most commonly used [10, 11]. Unfortunately, exposure of the bladder epithelium to these chemicals can result in chemical cystitis, bladder contractures, hematuria, bladder rupture and death. In addition, balloon fragments might be retained within the bladder, predisposing the patient to a variety of complications, including calculus formation [12], recurrent urinary tract infections [7] and irritation when voiding [16].

If chemicals are to be used to dissolve the balloon, the bladder should be filled through the irrigation-drainage port with 200 mL of sterile water or normal saline to dilute the chemical when it enters the bladder as the balloon ruptures.

When available, an urologist should be consulted to perform endoscopic balloon puncture. This method is the most reliable because it is performed under direct visualization. The physician has the added benefit of being able

to evaluate bladder injury and inspect for retained fragments at the time of catheter removal. Numerous techniques using rigid and flexible cystoscopy have been described for endoscopic balloon puncture. The catheter can be cut at the meatus and pushed into the bladder using the cystoscope. The balloon can then be punctured and deflated by injection needles passed through the working channel of the cystoscope [17].

Conclusion

The incidence of vesical calculi is on the rise in women due to an increase in pelvic procedures and incontinence surgery. Any female presenting with LUTS and recurrent UTI and vesical calculi should be thoroughly evaluated. Vesical calculi can rarely be caused after abdominal hysterectomy. Non-deflated balloon of a transurethral inserted bladder catheter is a problem that could be difficult to manage. Improper management would leave pieces of materials of shattered Foley catheter balloon inside the bladder.

Compliance with Ethical Standards

Conflict of interest None.

Ethical statement Author certifies that he has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.

References

1. Chawla A, Mishra DK, Kumar SP. Secondary vesical calculus in female. *Austin J Urol* 2014;1(3):2.
2. Wein AJ, Kavoussi LR, Partin AW et al. (eds). *Campbell-Walsh urology*. 10 ed. Philadelphia: Saunders-Elsevier Inc; 2012. p. 2523.
3. Schwartz BFL, Stoller ML. The vesical calculus. *Urol Clin N Am*. 2000;27:333–46.
4. Huang WCL, Yang JM. Sonographic appearance of a bladder calculus secondary to a suture from a bladder neck suspension. *J Ultrasound Med*. 2002;21:1303–5.
5. Su S-T, Huang H-F, Chang S-F. Encrusted bladder stone on non-absorbable sutures after a cesarean section: a case report. *JTUA*. 2009;20:143–5.
6. Chamary VL. An unusual cause of iatrogenic bladder stone. *Br J Urol*. 1995;76:138.
7. Kato K, Anup K. Vesical stone on migrated lippies loop. *Ind J Surg*. 1998;60:79.
8. Williams DJ. Uric acid bladder stone associated with a foreign body. *Postgrad Med J*. 1986;62:495.
9. Lipke ML, Schulsinger D, Sheynkin Y, et al. Endoscopic treatment of bladder calculi in post-renal transplant patients: a 10-year experience. *J Endourol*. 2004;18:787–90.
10. Kouriefs CL, Jones CR. Bladder stone following Stamey's colposuspension. *Aust N Z J Obstet Gynaecol*. 2002;42:305–6.
11. Zderic SAL, Burros HM, Hanno PM, et al. Bladder calculi in women after urethrovesical suspension. *J Urol*. 1988;139:1047–8.

12. Eckford SD, Persad RA, Brewster SF, et al. Intravesical foreign bodies: five-year review. *Br J Urol*. 1992;69:41–5.
13. Carr LK. An alternative to manage a nondeflating Foley catheter in women. *J Urol*. 1995;153(3 Pt 1):716–7.
14. Vandendris M. How to deflate refractory balloon of a bladder catheter. *Urology*. 1985;26:300.
15. Lutin CD, Mullins SD. Deflation of a Foley catheter balloon. *N Engl J Med*. 1982;307:1270.
16. Ndirangu K, Ngugi M. Problems of indwelling Foley catheters. *East Afr Med J*. 1994;71:132–4.
17. Goel MC, Bhadauria RP, Banerjee GK, et al. A new endoscopic technique for non-deflating Foley balloon. *Arch Esp Urol*. 1995;48:973–5.