

Double Whammy: Severe Necrotizing Soft Tissue Infection in the Setting of Extraperitoneal Bladder Injury from Prolonged Urinary Bladder Catheterization

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Case Report

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Abstract

Urinary bladder injury due to prolonged indwelling Foley catheter placement is reportedly rare but potentially lethal complication. Review of literature showed most of the urinary bladder injuries reported was intraperitoneal. This is the first reported case of extraperitoneal bladder injury from foley catheterization causing severe necrotizing soft tissue infections of the lower abdomen and groin area. The patient was initially managed by surgical debridement of infected soft tissue, IV antibiotics and indwelling Foley catheter. The extraperitoneal bladder injury eventually required surgical repair of the perforated site and the open wound managed with negative pressure dressing. The patient was discharged from the unit after a course of antibiotics which helped clear the infection.

Keywords: Extraperitoneal Bladder Injury; Urinary Bladder; Necrotizing Soft tissue Infection; Injury from bladder Catheterization

Introduction

Perforation of the urinary bladder due to long term indwelling catheter is a rarely reported but potentially lethal complication with mortality rate as high as 50% [1]. The Centers for Disease Control estimates that roughly 12-25% of long-term hospitalized patients will have a Foley catheter. Growing geriatric population can lead to increase in chronic urinary catheterization making them at risk for possible urinary bladder perforation [2]. Majority of urinary bladder perforation from this etiology is intraperitoneal and managed operatively. Extraperitoneal bladder injury is typically managed conservatively with indwelling foley catheter, empiric

antibiotics, and analgesics and follow-up cystogram in 7 to 10 days prior to Foley removal.

This is the first case report on an extraperitoneal bladder injury complicated by severe necrotizing soft tissue infection.

Case Report

This is a case of an 83-year-old lady with past medical history of CVA, diabetes mellitus, hypertension and hypothyroidism who developed cystitis with longstanding indwelling catheter. Foley catheter was replaced at a nursing home and she eventually developed severe

abdominal pain. She was transferred and admitted to the Internal Medicine Service and subsequently referred to the Urology Service. She was treated with indwelling foley catheter and broad spectrum antibiotics. After 4 days, the patient developed cellulitis and was referred to the Acute Care Surgery service. A CT cystogram was requested which showed extraperitoneal bladder injury with extensive soft tissue edema concerning for necrotizing soft tissue infection (Figure 1). Decision was made to go to the OR for wound exploration. She was noted to have severe necrotizing soft tissue infection of the lower abdominal wall extending to the mons pubis (Figure 2). The Patient was admitted to the Surgical Intensive Care Unit post-operatively. Re-exploration of the wound three

days after the first operation revealed infection of the fascia requiring excisional debridement which exposed the 7 cm extraperitoneal bladder perforation. This was repaired in layered fashion using Vicryl sutures (Figure 3). Five days after, the patient underwent re-debridement and eventual VAC dressing. Wound culture grew *Bacteroides*, *Pseudomonas* and *Enterococcus faecium*. The patient was kept on broad spectrum antibiotics per sensitivity for 10 days. She was discharged to a rehabilitation facility 13 days after the original operation. The wound was successfully managed using negative pressure dressing and completely healed after 8 weeks (Figure 4). The foley catheter was removed after a negative cystogram.

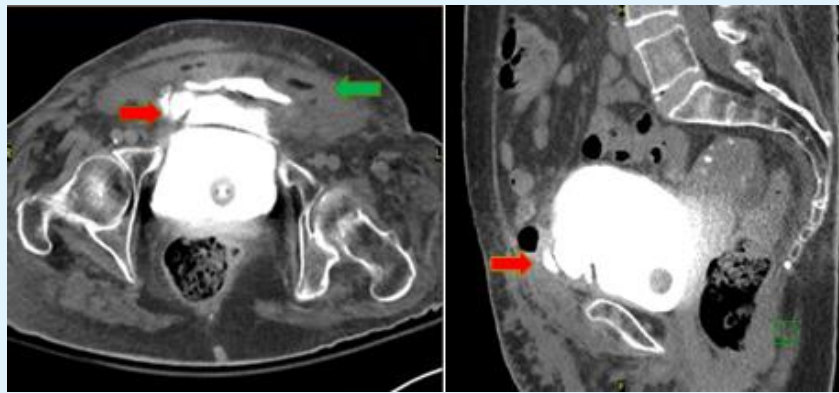


Figure 1: CT Cystogram Axial and Lateral view showing the bladder extravasation (red arrow) and surrounding soft tissue edema (green arrow).



Figure 2: Operative picture Day 3 after debridement showing necrosis of the fascia (arrow)

Discussion

Foley catheter insertion is a common medical procedure and can cause some complications including

urinary tract infection, bladder stones, bleeding, iatrogenic hypospadias, faulty placement, dislodgement and traumatic placement. Bladder perforation is rare but a well described complication of chronic foley catheter placement [3]. Based on the case reports reviewed, most of the urinary bladder perforations are intraperitoneal and usually located at the dome of the bladder. It usually manifests with severe abdominal pain and hematuria. Diagnosis can be difficult since the symptoms are often vague and nonspecific. Extraperitoneal bladder perforation can also occur in patients with chronic foley catheter. Thus, a patient who presents with abdominal pain should be evaluated for possible bladder perforation. Diagnosis is obtained using CT cystogram. Classification of bladder injury as to intraperitoneal and extraperitoneal will guide management. Intraperitoneal injury is managed operatively typically through exploratory laparotomy and in some instances thru a laparoscopic approach [4]. Laparoscopy should be relegated to patients who are hemodynamically stable with isolated bladder injury and

no other associated injury requiring surgical intervention. Extraperitoneal injury is treated with foley catheter and follow up cystogram. Review of literature showed that presence of other medical conditions such as diabetes mellitus, advanced age, immunocompromised state, uterine fibroids, infection, appendicitis, urinary bladder neoplasm, and pelvic radiation predisposed patients with chronic indwelling foley catheter to urinary bladder perforation [5-7]. Spontaneous rupture of the urinary bladder had been reported but other risk factors can contribute to the rupture including blunt trauma to the lower abdomen, cancer of the pelvic organ, irradiation, bladder tumor, large uretero-vesical stone, urethral or suprapubic catheterization, postpartum, atonic bladder, previous laparotomy, iatrogenic from saline irrigation, and binge alcohol intake[4]. The exact mechanism on why perforation occurs in chronic foley catheter placement is uncertain. In vivo experiment by G. Miles showed that negative pressure exerted on untrained column of urine in the drainage tubing sucks the bladder mucosa in the proximal orifices of the catheter causing formation of hemorrhagic pseudo-polyp within 10 minutes of catheter insertion [8,9]. We believe that our patient, having been predisposed to necrotizing soft tissue infection by her diabetic state, may have developed necrosis of the bladder that leads to the perforation. Delay in appropriate management of necrotizing soft tissue infection and bladder perforation carries a high rate of morbidity and mortality. For this reason, patients with bladder

perforation even those managed non-operatively, should be admitted to the surgical team to prevent delay in surgical management should it be deemed necessary. Bladder perforation can be prevented by avoidance of catheterization and timely discontinuation of foley catheter if possible. Alternative methods like intermittent catheterization and supra-pubic catheterization should also be considered [10]. However, in patients with coexisting diabetes supra-pubic catheterization may not be appropriate since there is a risk for developing severe soft tissue infection.

Conclusion

High index of suspicion for perforated bladder injury should be considered on elderly patients with chronic catheterization presenting with abdominal pain. Necrotizing soft tissue infection can occur concomitantly with bladder injury and aggressive and early debridement should be done. More recent cases have shown that intraperitoneal bladder injuries can be repaired using the laparoscopic method. However, both of these cases were performed in stable patients without any bladder neck injury [11,12]. Therefore, we would not recommend using laparoscopic repair in complicated bladder rupture cases. In general, patients who are suspected to have a bladder rupture should be admitted to the surgery service to ensure complications are identified and handled in a timely fashion.

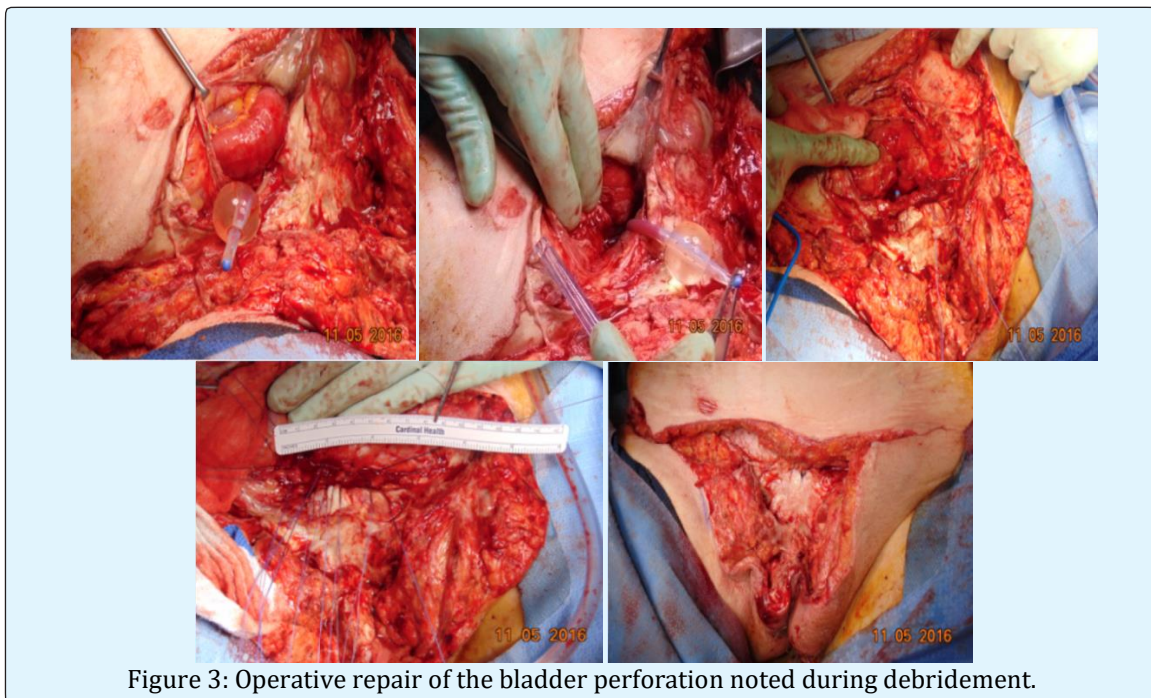


Figure 3: Operative repair of the bladder perforation noted during debridement.



Figure 4: Wound- 8 weeks post operatively

References

1. Paul AB, Simms L, Paul AE, Mahesan AA, Ramzanali A (2016) A Rare Cause of Death in a Woman: Iatrogenic Bladder Rupture in a Patient with an indwelling Foley Catheter. *Urol Case Rep* 6: 30-32.
2. Ogawa S, Date T, Muraki O (2013) Intraperitoneal urinary bladder perforation observed in a patient with an indwelling urethral catheter. *Case Rep Urol* 765704.
3. Magee GD, Marshall SG, Wilson BG, Spence RA (1991) Perforation of the urinary bladder due to prolonged use of an indwelling catheter. *Ulster Med J* 60(2): 237-239.
4. Saleem MA, Mahmoud AM, Gopinath BR (2009) Spontaneous urinary bladder rupture: a rare differential for lower abdominal pain in a female patient. *Singapore Med J* 50(12): 410-411.
5. Huffman JL, Schraut W, Bagley DH (1983) Atraumatic perforation of bladder. Necessary differential in evaluation of acute condition of abdomen. *Urology* 22(1): 30-35.
6. Fujikawa K, Yamamichi F, Nonomura M, Soeda A, Takeuchi H (1999) Spontaneous rupture of the urinary bladder is not a rare complication of radiotherapy for cervical cancer: report of six cases. *Gynecol Oncol* 73(3): 439-442.
7. Stojadinovic MM, Mitrovic S, Milovanovic DR (2012) Micropapillary carcinoma of the bladder presented with spontaneous intraperitoneal bladder rupture. *Can Urol Assoc J* 6(2): 42-45.
8. Milles G (1965) Catheter-Induced Hemorrhagic Pseudo polyps of the Urinary Bladder. *JAMA* 193(11): 968-969.
9. Feneley RC, Hopley IB, Wells PN (2015) Urinary catheters: history, current status, adverse events and research agenda. *J Med Eng Technol* 39(8): 459-470.
10. Margolin DJ, Gonzalez RP (2004) Retrospective analysis of traumatic bladder injury: does suprapubic catheterization alter outcome of healing? *Am Surg* 70(12): 1057-1060.
11. Karadag CA, Tander B, Erginel B, Dilek Demirel, Unal Bicakci, et al. (2016) Laparoscopic repair in children with traumatic bladder perforation. *J Minim Access Surg* 12(3): 292-294.
12. Marchand TD, Cuadra RH, Ricchiuti DJ (2012) Laparoscopic repair of a traumatic bladder rupture. *JSLs* 16(1): 155-158.

