

A forgotten complication of a defunctionalized urinary bladder: pyocystis

Zaw Min

Received: 4 February 2014 / Accepted: 13 February 2014 / Published online: 20 February 2014
© SIMI 2014

A 74-year-old woman presented to the hospital with fever, nausea, lethargy, and abdominal pain. Her past medical history was significant for end-stage renal disease, resulting from bilateral nephro-ureterectomy for chronic pyelonephritis secondary to chronic reflux nephropathy. She was febrile with temperature of 38.3 °C, and physical examination showed tense suprapubic tenderness without involuntary guarding. The laboratory work-up demonstrated a leukocytosis (WBC 16,000/mm³, normal 4,000–11,000/mm³). Blood cultures were negative. Computed tomography (CT scan) of the abdomen and pelvis was performed because of the persistent suprapubic pain, and it showed a thickened bladder wall with a small-sized urinary bladder (Fig. 1a, b). A straight urinary catheter was cautiously inserted, and purulent fluid was drained out. A presumptive diagnosis of pyocystis was entertained. A flexible cystoscopy was subsequently performed. Purulent fluid and tissue debris were noted within the bladder, and were aggressively irrigated out. Suprapubic and Foley urinary catheters were placed. Fluid culture grew *Escherichia coli*, *Citrobacter freundii* and *Enterococcus faecalis*. Continuous neomycin bladder irrigation was applied via the suprapubic catheter, and then drained through the Foley catheter. Systemic intravenous piperacillin-tazobactam 2.25 g every 12 h was administered simultaneously. She received 4 weeks of antimicrobial therapy, via both intravenous and intravesical routes, to control the infection. The patient was eventually discharged without additional antibiotics.

Pyocystis, also known as *vesical empyema*, is the accumulation of pus in the urinary bladder, especially a defunctionalized bladder in patients with end-stage kidney disease, supravescical urinary diversion without radical cystectomy or bladder irradiation [1]. Pyocystis syndrome gained attention in the 1960s after urinary diversion procedures became the standard treatment for a variety of lower urinary tract pathologies. The reported incidence of this complication ranged from 10 % to as high as 67 % in patients with supravescical urinary diversion procedures [2, 3]. It is reported to be rare in dialysis patients, but its actual incidence in that patient population is not known [3, 4]. There are many postulated mechanisms of pathogenesis of pyocystis. The widely accepted one is the collection, liquefaction and decomposition of shed bladder epithelium. As part of wear and tear, the lining bladder epithelium is shed continuously, and then expelled out by urine flow. In anuric patients, the shed epithelial cells accumulate, and, when infected, pyocystis is typically ensued [1–4].

The presenting symptoms are usually similar to those in patients presenting with a lower urinary tract infection, including fever, suprapubic pain, purulent urethral discharge or sepsis. Microbiologically, the causal microorganisms are routine urinary pathogens, such as *E. coli*, *Proteus* spp., *Serratia* spp. and *Enterococcus* spp. [2, 3]. Diagnosis is based on symptoms of lower urinary tract infection, purulent discharge via the urethra or during catheterization, supported by CT scan imaging studies showing a characteristic thickened, hypertrophied, and cystic appearance of the bladder wall (Fig. 1a, b) [3, 4]. Despite the familiar clinical presentation of urinary tract infection, the diagnosis is usually delayed or missed, as it is mistakenly assumed that urinary bladder infection does not develop in anuric patients. Its treatment is unique, and routinely requires combined systemic and intravesical

Z. Min (✉)

Department of Medicine, Division of Infectious Diseases,
Allegheny General Hospital, Allegheny Health Network,
420 East North Avenue, East Wing, Suite 407, Pittsburgh,
PA 15212, USA
e-mail: zmin@wpahs.org

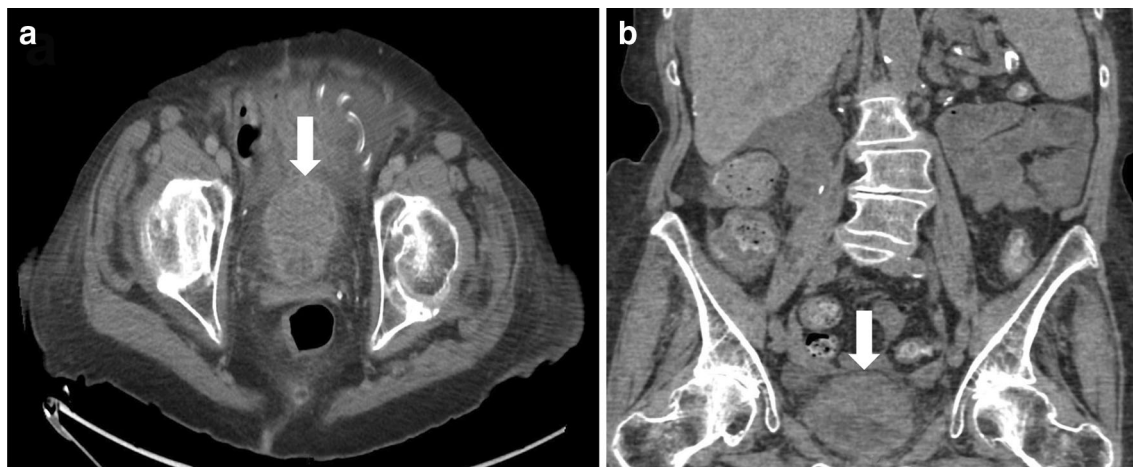


Fig. 1 Computed tomography abdomen and pelvis with intravenous contrast demonstrates a small urinary bladder with thickened cystic wall in both axial (a) and coronal (b) views (white arrows)

antibiotic administration in order to eradicate the infection. The duration of therapy is usually 2–4 weeks, and it is determined by the clinical response. Cystectomy is often performed in recalcitrant cases with multiple recurrences in spite of optimal antimicrobial therapy [3, 4].

In conclusion, pyocystitis is a forgotten complication of a non-functioning bladder in anuric patients or patients with supravescical urinary diversion without primary cystectomy. It is important for practicing physicians to recognize pyocystitis disease because its treatment differs from that of the usual cystitis. Urinary catheterization, and combined systemic and intravesical antibiotic therapy are required to treat this locally infected bladder. Cystectomy is the last option for resistant cases of pyocystitis.

Conflict of interest None.

References

1. Ray P, Taguchi Y, MacKinnon KJ (1971) The pyocystitis syndrome. *Br J Urol* 43(5):583–585
2. Adeyoju AB, Lynch TH, Thornhill JA (1998) The defunctionalized bladder. *Int Urogynecol J Pelvic Floor Dysfunct* 9(1):48–51
3. Remer EE, Peacock WFIV (2000) Pyocystitis: two case reports of patients in renal failure. *J Emerg Med* 19(2):131–133
4. Bibb JL, Servilla KS, Gibel LJ, Kinne JE, White RE, Hartshorne MF, Tzamaloukas AH (2002) Pyocystitis in patients on chronic dialysis. a potentially misdiagnosed syndrome. *Int Urol Nephrol* 34(3):415–418