

Inflammation and infection

## Refractory urinary tract infection complicated rectus sheath abscess: A case report



Ting-Ying Lee <sup>a, c</sup>, Chia-Wen Wang <sup>b</sup>, Teng-Wei Chen <sup>a</sup>, Guo-Shiou Liao <sup>a</sup>, Hsiu-Lung Fan <sup>a</sup>, De-Chuan Chan <sup>a, \*</sup>

<sup>a</sup> Division of General Surgery, Department of Surgery, Tri-Service General Hospital, National Defence Medical Center, Taipei, Taiwan, ROC

<sup>b</sup> Division of Plastic Surgery, Department of Surgery, Tri-Service General Hospital, National Defence Medical Center, Taipei, Taiwan, ROC

<sup>c</sup> Department of General Surgery, Hsinchu Branch, Veterans General Hospital, Hsinchu, Taiwan, ROC

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### 1. Introduction

Urinary tract infection (UTI) is the third most common infection in humans, after respiratory and gastro-intestinal infections.<sup>1</sup> UTIs are the most common cause of both community-acquired and nosocomial infections in patients admitted to hospitals or nursing homes. It is distressing and occasionally life threatening without appropriate treatment. Refractory urinary tract infection (UTI) refers to  $\geq 2$  infections in six months or  $\geq 3$  infections in one year.<sup>2</sup> Most recurrences are thought to represent reinfection or relapse and are associated with stones, obstruction or long time urinary catheter placement. The refractory infection can lead to fatal sequelae such as sepsis, metastatic abscess and rarely, acute renal failure. It can also result in unusual complications, such as muscle

abscess. In several present cases, bacterial infection spread to the nearby tissues by the lymphatic or haematogenous systems and led to psoas abscess.<sup>3,4</sup> Here we present a rare case that had *Providencia stuartii*-infected UTI and complicated with rectus sheath abscess.

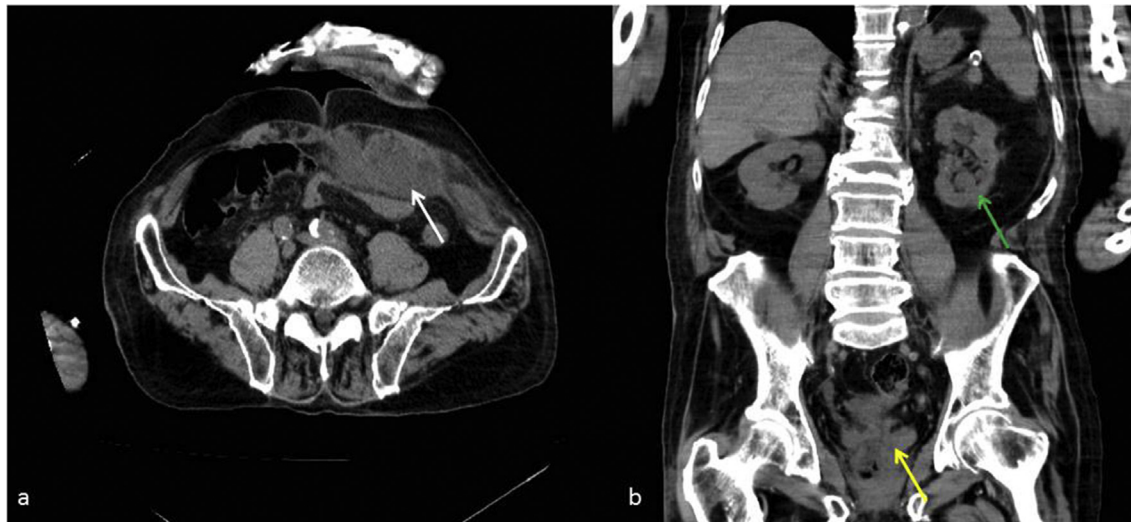
### 2. Case presentation

The 94-year-old man had Alzheimer's disease and a history of stroke, and was being cared for in a nursing home. He also had a problem of both ureteral and urethral stones, left complicated with recurrent episodes of acute pyelonephritis, acute cystitis and admitted to our hospital for several times within five years. Unfortunately, he also had problem of depressive disorder with hopeless and poor family support. He refused to undergo uroendoscopy to treat urolithiasis. This time he visited our emergency department due to fever and chills for one day. There was a 5\*10 cm tender, palpable mass found over the lower midline of the abdomen. Serum test showed leucocytosis (white blood cell count, WBC count: 14,960/ $\mu$ L). Turbid pyuria was found after Foley catheter placement and urinalysis showed WBCs exceeding 100/HPF. The abdominal ultrasonography showed a hypoechoic lesion impacted in the left rectus abdominis muscle sheath. The abdominal CT also confirmed fluid accumulated over the left rectus sheath about 5\*10\*15 cm and a 0.2 cm ureteral stone impaction over the lower third of the left ureter, with hydronephrosis (Fig. 1: 1a and b). A 0.1 cm urethral stone impacted over upper third of urethra. Open surgical drainage was performed under local anaesthetic. About 200 ml of white purulent fluid was removed by suction. Culture of urine and muscle abscess confirmed presence of *Providencia stuartii*.

During the hospitalization, he underwent wet-wound iodine gauze dressing. We also prescribed levofloxacin 500 mg intravenous q12h daily dose for bacterial infection. After one week of treatment, the pyuria improved and there was no fever noted. The purulent discharge persisted but improved significantly. The incision was wide open for one week then began to second healing. The patient's general condition improved significantly. He became afebrile and both his leucocyte counts returned to normal values.

\* Corresponding author. 325 Cheng-gong Rd Sec 2, Nei-hu, 114, Taipei, Taiwan, ROC. Tel.: +886 2 87927191; fax: +886 2 87927372.

E-mail addresses: [lty242@gmail.com](mailto:lty242@gmail.com) (T.-Y. Lee), [janet320@yahoo.com.tw](mailto:janet320@yahoo.com.tw) (C.-W. Wang), [tengweichen@yahoo.com.tw](mailto:tengweichen@yahoo.com.tw) (T.-W. Chen), [liaogs20371@gmail.com](mailto:liaogs20371@gmail.com) (G.-S. Liao), [doc20450@gmail.com](mailto:doc20450@gmail.com) (H.-L. Fan), [chrischan1168@yahoo.com.tw](mailto:chrischan1168@yahoo.com.tw) (D.-C. Chan).



**Fig. 1.** Abdominal CT. 1a: A 10\*5cm in size abscess impacted in the left rectus sheath. (White arrow). 1b: Severe inflammatory change over urinary tract system included prostate and bladder. (Yellow arrow) Hydronephrosis was also found in the left kidney. (Green arrow).

Intravenous levofloxacin was changed to the oral form for further management. He was then discharged on the tenth day post-admission, in a stable condition. The follow-up culture of discharge and urine showed no bacterial growth. The follow-up ultrasound showed hydronephrosis which persisted on the left, whereas the rectus sheath abscess was resolute.

### 3. Discussion

*Providencia stuartii* infection is rarely seen in UTI patient, having a prevalence of 0.3–1%.<sup>5</sup> It has long been associated with persistent infections of indwelling catheters in nursing home settings. It is also associated with gastroenteritis and bacteremia. *Providencia* infections are uncommon and are usually nosocomial. They represent an emerging problem because of the increasing prevalence of antibiotic resistance secondary to extended-spectrum beta-lactamases (ESBLs). This case lived in a nursing home without an indwelling urinary catheter. The opportunistic UTI may have been from untreated renal stones and obstructive uropathy, and controlled with oral antibiotics.

Rectus sheath abscess is rarely seen clinically. It is commonly caused by previous surgical interventions such as laparoscopy or exploratory laparotomy. This case had no history of prior abdominal surgery or even uroendoscopy. A few studies have reported that psoas muscle abscess spread from hematogenous system in chronic upper third of UTI patients.<sup>3,4</sup> Reviews of abdominal CT post-therapeutically revealed severe inflammation of the bladder and prostate. The rectus sheath abscess may have caused by spread from low genitourinary tract infection.

Treatment of bacterial rectus sheath abscess is usually by antibacterial medication coupled with surgical drainage of the abscess.<sup>4</sup> Fortunately, the *P. stuartii* infection had not presented antibiotic

resistance secondary to extended-spectrum beta-lactamases (ESBLs) and was sensitive to amikacin, ceftazidime, ceftriaxone, levofloxacin and meropenem. The patient received a complete course of levofloxacin and open surgical drainage. No abscess tunnel developed after treatment. The end result was a clean wound, with negative urine cultures for bacterial infection in follow-up studies. However, the chronic UTI may recur without treatment of the renal stones and obstructive uropathy. We advised him of the necessity for surgical intervention. He had not decided to receive renal stones management. The ethical controversy must be first resolved.

### 4. Conclusion

This is a rare case with an unusual microorganism-infected UTI complicated with rectus sheath abscess. Open surgical drainage or tube drainage combined with appropriated antibiotics therapy may treat this disease effectively. However, treating the source of the complicated UTI is also necessary.

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