Postpartum Emphysematous Cystitis after Casarean Section

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Emphysematous cystitis is a rare infectious condition of the urinary bladder. Underlying diabetes mellitus is present in over half of reported cases with women being affected twice as often as men. It also occurs in alcoholism, undernutrition, radiating and immunosuppressive treatments. We present a case of postpartum emphysematous cystitis after Casarean section (C-sec) in a young female without underlying disease. (J Korean Continence Soc 2009;13:159-62)

Key Words: Emphysematous cystitis, Postpartum, Casarean section

Case Report

A 28-year-old woman visited to emergency room. She had no history of medical treatment and trauma except having gone through C-sec a week ago. After C-sec, she had experienced fatigue, poor oral intake and constipation. She had also presented with gross hematuria, dysuria and diffuse abdominal pain for 2 days.

On physical examination, she was afebrile with a temperature of 37.1°C and was hemodynamically stable with suprapubic tenderness. And then urethral catheter was inserted and urine color was slightly pinkish.

The initial laboratory results included the following: hemoglobin 12.8g/dL, leukocytes 9.49×10^9/ L with 76% segmented neutrophils, BUN 51.2mg/dL, creatinine 2.4mg/dL, random blood glucose 103mg/dL. A urinalysis revealed occult blood 3+, pH 8.0, numerous erythrocytes after Casarean section (C-sec) in a young female without underlying disease.
Fig. 1. CT scan shows inflammatory change (thick arrow) around pelvic cavity, including the bladder wall and perivesical space, and air (thin arrow) in the intramural space.

Fig. 2. CT scan after therapy shows the improvement of bladder wall edema and intramural gas.

and 3-5 leukocytes per high power field.

Plain abdominal radiography showed no remarkable findings. Computed tomography (CT) revealed a thickened, trabeculated bladder wall containing pockets of gas (Fig. 1) and multifocal poor corticomedullary differentiation of both kidneys.

We diagnosed her case as emphysematous cystitis and acute pyelonephritis (APN). Following urine and blood culture study, fluid and antibiotics therapy (quinolone 200mg per 12 hours, IV) started. After beginning to treat, she responded with improvement of her abdominal pain and hematuria. On the 4th day in the hospital, cystoscopy revealed multiple submucosal bullous erythematous lesions (Fig. 3). Urine culture test revealed the growth of E. coli, sensitive to almost commonly used antibiotics. After 9-day course of antibiotics treatment, repeat cystoscopy showed submucosal bullous erythematous lesion
disappeared (Fig. 4). A repeat CT which was performed one week after the patients was discharged showed complete disappearance of intramural gas and bladder wall thickness (Fig. 2).

Discussion

Although gas-producing infections account for a very small percentage of all bacterial infections of the urinary tract, they are extremely important because of their life-threatening potential. The spectrum of gas-producing infections includes emphysematous pyelitis, emphysematous pyelonephritis, and emphysematous cystitis. These are distinct clinical entities including clinical course, management, and ultimate prognosis differ appreciably.

Emphysematous cystitis was first discussed in 1926 by Hueper [2] and is defined by the presence of gas in the urinary bladder walls and often in the bladder lumen due to infection by gas-fermenting organisms. The most common causative organism is E. coli, but other organisms were reported including Enterobacter aerogenes, Klebsiella pneumoniae, Proteus mirabilis, Staphylococcus aureus and Candida albicans [3]. In our case, E. coli was the causative organism.

The hypotheses to explain these unusual infectious conditions compromise four factors: 1) glucose or albumin in urine is the source for fermentation to hydrogen and carbon dioxide, as suggested in previous publications; 2) obstruction of the bladder outlet or neuropathic replication; 3) relative hypoperfusion due to diabetic microvasculopathy reduces the rate of gas dispersion; 4) necrotizing tissue is a weak barrier and gas dissects the intraluminal space [4].

The major risk factors for the disease include old age, female sex, diabetes mellitus, neurogenic bladder, and bladder outlet obstruction, although it has also been reported with other pre-existing conditions such as alcoholism, undernutrition or disabled general medical condition [5].

No specific symptoms are associated with emphysematous cystitis. The usual signs and symptoms, such as dysuria, frequency, urgency, nocturia, and gross hematuria, are similar to those for uncomplicated cystitis. Crampy abdominal pain and pneumaturia may be noted but are not common [6]. Like these, the clinical features are inconclusive or actually unhelpful. However, the radiologic findings provide the most reliable diagnostic clues. Demonstration of intramural gas in the walls of the urinary bladder is the basis for the radiologic diagnosis of emphysematous cystitis. Plain radiography can reveal air and the soft-tissue doughnut sign in the pelvis. Also evident can be a radiolucent line of gas around the bladder wall, "cobblestone" in appearance, and gas within the lumen. This finding of plain radiography should be differentiated from findings that lead to a diagnosis of rectal gas, emphysematous vaginitis, pneumatosis cystoides intestinalis, and gas gangrene of the uterus. Ultrasound commonly demonstrate diffuse bladder wall thickening. Focal regions of high-amplitude echoes with posterior dirty acoustic shadowing into the lumen may be seen, and misinterpreted as bladder calculi with ultrasound. CT is highly sensitive examination that allows early detection as well as differentiation of intraluminal or intramural gas [7]. Free intraluminal air usually seen in nondependent areas, forming an air fluid level with urine in the bladder lumen while intramural air is seen as multiple small pockets of air along all the walls regardless of gravity as was seen in our patient. It is also useful in evaluating other causes of intraluminal gas such as enteric fistula formation from adjacent bowel carcinoma or inflammatory disease. An abdominal-pelvic CT scan can further delineate the extent of disease, whether the infection has spread to pelvicalyceal systems and renal parenchyma. It is important to differentiate emphysematous cystitis from emphysematous pyelonephritis, in which gas involves the renal parenchyma.

Management of emphysematous cystitis includes the following: a) control of underlying disease; b) administration of appropriate antibiotics; c) establishment of urinary drainage; d) provision of required general medical supportive care; e) exclusion of a bladder fistula; f) sur-
gical debridement only when unavoidable [8]. Surgical intervention is necessary only for obstructions, stones, or other anatomic abnormalities, but it is rarely needed. The differentiation of this complicated condition from other urinary tract infections is the first step in the diagnosis of emphysematous cystitis. It is easy to confuse this condition with pelvis or retroperitoneal infections such as emphysematous pyelonephritis, which have a much higher mortality rate compared with emphysematous cystitis and require aggressive surgical intervention [9].

The prognosis for this condition is generally favorable, but there have been reports of severe necrotizing cystitis requiring cystectomy, and a mortality rate of 20% [10]. Delayed diagnosis may lead to unfavorable outcomes including overwhelming infection, extension in ureter and renal parenchyma, bladder rupture and death. Improved outcomes may be achieved by early recognition of the infection, by clinical and radiological assessment, and by appropriate antibiotic therapy. Prognosis for emphysematous cystitis is favorable as in our case if it is diagnosed promptly and treated properly.

In conclusion, postpartum emphysematous cystitis after C-sec in a young female without underlying disease has not been previously reported. We present a case of postpartum emphysematous cystitis after C-sec in a young female without underlying disease.

References

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