Emphysematous Cystitis: Report of Two Cases

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There has been little documentation of emphysematous cystitis. The typical presentation includes lower abdominal pain and hematuria, but some patients may present with septic shock. Because of the severe manifestation of infection around the pelvic cavity, we often confuse this disease with intraabdominal or retroperitoneal abscess. Here in we present two cases from the emergency department. Treatment included aggressive antibiotic therapy and bladder drainage. One patient, a 91 year-old woman, recovered in stable condition. The other, an 80 year-old woman, had an exploratory laparotomy but no pus formation was noted. She was discharged with stabilized vital sign.

Key words: antibiotic therapy, emphysematous cystitis, retroperitoneal abscess

Introduction

Emphysematous cystitis is a rare condition. It is usually found in diabetic patients and is characterized by gas bubbles within the bladder cavity or wall. Symptoms and signs are nonspecific and include lower abdominal pain, hematuria and frequency. The clinical severity can range from no symptoms to septic shock. Difficulty in diagnosis usually results in delayed diagnosis and incorrect management. In this report we review other reports on the clinical conditions, predisposing factors and management of this condition to aid in its early diagnosis in the emergency department.

Case Reports

Case 1

An 80-year-old woman with lower abdominal pain, syncope and disturbed consciousness was referred from another hospital under the impression of meningitis. The Glasgow coma scale evaluation was E3VaM4 in our emergency department. At first, a central nervous system infection was suspected, but this was disproved. Abdominal computed tomography showed urinary bladder wall thickening with increased density of the surrounding mesentery fat plane. An inflammatory process was first considered. (Fig. 1) She had about 1800 ml of turbid urine and leukocytosis a white blood cell WBC count of 13700/ul. The urinalysis study showed a WBC count of 60-65 per high power field and a microscopic examination showed bacteria, but there was no definitive result from urine culture until discharge. She had emergency surgery because of her septic status and suspected intraabdominal infection. Severe adhesions with inflammatory changes over the lower abdomen and an oozing bladder wall were noted. No pus was found around the perivesical area. The only contributory factor in this woman was diabetes mellitus. After surgery,
antibiotic therapy with metronidazole 500 mg by intravenous drip per eight hours and gentamycin 80 mg by intravenous drip per twelve hours was used for eight days and then the regimen was changed to sulfamethoxazole-trimethoprim (Co-Trimoxazole) 2 tablets oral route twice daily for the next nine days. The patient’s vital signs gradually stabilized and she was discharged about 2 weeks later.

Case 2

A 91-year-old woman complained of gross hematuria. Lower abdominal discomfort with tenderness and frequency for 2 days. Her consciousness was confused at admission. Abdominal radiography in the emergency department showed one thin line of air around the pelvic cavity (Fig. 2) and an abdominal CT scan revealed air accumulated around the bladder wall (Fig. 3). The urinalysis showed many leukocytes in each high power field. She had sepsis with a WBC count of 12300 /ul and mild renal impairment with a creatine level of 2.6 mg/dl. Three-way Foley irrigation and parenteral antibiotics in clunding, cefazolin 1000 mg by intravenous drip per eight hours and clindamycin 300 mg by intravenous drip per eight hours were used for 9 days. Her general condition improved after bladder irrigation and antibiotic therapy on the third day of hospitalization. The renal function improved to the normal range after therapy and a follow-up abdominal radiograph showed no specific air accumulated within the pelvic cavity (Fig. 4). The patient had no history of contributing diseases except left frontal meningioma about 6 years ago. She was discharged in stable condition. *Escherichia coli* was cultured from the urine.

Discussion

Emphysematous cystitis is one complication of urinary tract infection. According to Biyani et al, this condition was first discussed in 1926 by Hueper(1). No specific symptoms are associated with emphysematous cystitis. The usual signs and
Fig. 2 Radiography shows that air has accumulated along the bladder wall. (arrowhead)

Fig. 3 A thin rim of intramural air surrounds the bladder mucosa and is seen within the bladder cavity on CT. (arrow)

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\(^{2-4}\). Therefore, the physician must be alert to this condition and diagnosis with a simple examination is mandatory. The diagnostic findings are associated with gas accumulated around the genitourinary tract. On abdominal radiographs, gas can be seen around the bladder and intramural
gas bubbles may be noted outlining the bladder wall. Intravenous urography and pelvic computed tomography can further clarify the extent and location of the air collection in the bladder wall. A cystoscopy usually presents a picture of small vesicles within the bladder mucosa. They rupture easily and release air which accumulates in the dome of the bladder. Findings of contributing factors or a concealed disease entity are very important. Risk factors for this condition include a history of diabetes mellitus and chronic or recurrent urinary tract infection, structural abnormalities in the bladder (e.g. bladder diverticulum) and urinary stasis (such as in benign prostate hyperplasia or neurogenic bladder). Therefore, the differential diagnosis includes vesico-enteric fistula secondary to diverticulitis, Crohn’s disease, carcinoma of the rectosigmoid colon and recent instrumentation. Intraluminal gas should be distinguished from bowel gas. An erect radiograph shows an air-fluid level in the bladder. This helps ensure a correct diagnosis. Granel et al reported that another rare condition which can cause emphysematous cystitis is lupus cystitis under steroid therapy. The prognosis for emphysematous cystitis is good since it is usually a benign condition if the correct diagnosis and treatment can be given as soon as possible. However, septic shock, necrosis of the bladder wall, rupture of the bladder and vesico-colonic fistula may occur in some cases.

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) surgical debridement only when unavoidable. Surgical intervention is necessary only for associated 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 pelvic or retroperitoneal infections such as emphysematous pyelonephritis, which have a much higher mortality rate compared to...
with emphysematous cystitis and require aggressive surgical intervention\(^{(11)}\).

**Conclusion**

Emphysematous cystitis is rare but relatively easy to treat with aggressive management. The diagnosis can be difficult owing to lack of specific urologic symptoms and signs at the time of presentation. The treatment of this disease includes aggressive management with antibiotics and drainage of the bladder. Supportive medical care is usually sufficient to control this disease\(^{(10)}\). It is possible that there are more cases of emphysematous cystitis which are not diagnosed correctly. The most common reason is that doctors are unfamiliar with this disease. Intravesical gas accumulation may disappear after Foley insertion and radiological findings are usually the first clue to this disease.

**References**

產氣性膀胱炎：病例報告及文獻回顧

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產氣性膀胱炎於之前的文獻中少有提及，其對外的臨床症狀不具專一性，常出現血尿，下腹痛等症狀，但病人常常合併了嚴重的敗血症，故在急診的判斷上，往往讓人誤認為是腹內或後腹腔腫瘤，而進行手術清創及引流。在此吾人提出兩個病例，其中一個病例接受了剖腹探查手術但並無特殊發現；實際上只須使用抗生素治療合併膀胱引流等手法便足以治療此等病患。另外搜尋其他文獻記錄來合併討論有關產氣性膀胱炎之診斷及治療。

關鍵詞：抗生素治療，產氣性膀胱炎，後腹腔腫瘤