Urinary Bladder Rupture Associated With Squamous Cell Carcinoma Of The Bladder; A Cause Of Acute Peritonitis
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Abstract
Spontaneous rupture of the urinary bladder associated with bladder cancer is very rare. Its signs and symptoms are those of peritonitis, and thus non-specific, possibly causing diagnostic confusion. A 69-year-old man with a history of macrohematuria and possible neurogenic bladder presented with signs of peritonitis. Laparotomy revealed bladder rupture associated with squamous cell carcinoma of the bladder. This condition should be added as a differential diagnosis of peritonitis, especially with a history of urinary symptoms.

INTRODUCTION
Clinical presentations of bladder rupture in an acute phase are usually those of peritonitis and thus non-specific, possibly leading to diagnostic confusion. Spontaneous rupture of the urinary bladder associated with bladder cancer is very rare. This report presents the case of a 69-year-old man with rupture of the urinary bladder associated with squamous cell carcinoma of the bladder.

CASE REPORT
A 69-year-old man was admitted with acute severe lower abdominal pain after urination. He had noticed macrohematuria and had had intermittent lower abdominal pain since 3 months before. He had gait disturbance due to spinal cord injury as a result of attempted suicide by jumping.

On admission, he had blood pressure 152/95 mmHg, pulse rate 111 bpm, and body temperature 37.2 °C, with tenderness with guarding in the left lower quadrant. Macrohematuria was observed, with urinalysis revealing protein and white blood cells. Laboratory data were: white blood cells, 18.8×10^9/L; C-reactive protein, 11.4 mg/dL; serum creatinine, 1.2 mg/dL. Abdominal computed tomography (CT) revealed bladder tumors in the entire bladder, which was distended with urine (Fig. 1a). The perivesical area and sigmoid colon wall showed thickening, compatible with tumor invasion to the sigmoid colon. No free air or ascites were observed. We diagnosed this condition as localized peritonitis due to bladder cancer invading the sigmoid colon. Antibiotics improved his symptoms and laboratory data.

Figure 1
Figure 1. Imaging findings of contrast-enhanced computed tomography on admission (a) and on day 3 (b).

a. Markedly enhanced tumor of the bladder is noted.
b. Massive ascites is noted. Compared with (a), urine volume and bladder tension appear to be decreased. This may suggest perforation of the bladder, which was not noticed before laparotomy.

On day 3 the abdominal pain suddenly increased and a CT revealed massive ascites (Fig. 1b), necessitating an emergent laparotomy. The bladder wall was markedly thickened and infiltrated by a tumor that had invaded the sigmoid colon through the adjacent mesentery. The dome of the bladder had a 1cm diameter perforation, through which urine was leaking. A partial cystectomy followed by primary closure and a partial sigmoid colectomy were performed. Histological examination of the excised bladder revealed poorly differentiated squamous cell carcinoma (SCC). His general condition deteriorated and he died 2 months later.
DISCUSSION
This case brought up three important clinical issues. First, bladder cancer, although rare, could cause bladder rupture, leading to acute onset of peritonitis. A PubMed and manual search yielded 18 cases of bladder rupture associated with bladder cancer (Table 1). The present case is, to our knowledge, the 19th such case. While transitional cell carcinoma accounted for 7 (37%: 7/19), SCC accounted for 9 (47%: 9/19), showing a stark contrast to <5%, the reported incidence of SCC among bladder cancer. SCC may be vulnerable to perforation, the reason for which is unclear.

Second, the preceding urinary symptoms should be assessed. Symptoms and signs of bladder rupture in the acute phase are those of peritonitis caused by any other disease and are non-specific. Preoperative diagnosis is difficult: preoperative diagnoses were made in only 19% (4/19); however, previous urinary symptoms were present in 74% (14/19). The present patient had had macrohematuria for 3 months. Abdominal pain occurred after urination. A small rupture and thus a small amount of urine leakage may have occurred at this time.

Third, neurogenic bladder may have played an additional role in spontaneous rupture, which no previous reports have addressed. Neurogenic bladder was suspected from the previous history of spinal cord injury and distended bladder shown by CT, although no detailed neurological and/or urological examinations had been performed. Neurogenic bladder may cause bladder over-distension and also chronic inflammation, which may have accelerated the bladder rupture. Sensory disturbance, if it was present, may have masked the pain possibly caused by bladder cancer, discouraging an earlier medical checkup, and thus its detection. If these histories and/or symptoms, i.e., hematuria, pain after urination, and signs compatible with neurogenic bladder, had been more carefully assessed, a precise preoperative diagnosis may have been made. Cystography or CT cystography may have provided a preoperative diagnosis.

Repair of the bladder and drainage are standard procedures for bladder rupture. The prognoses of bladder cancer patients with bladder rupture may be poor since the disease is highly advanced to the extent that it has induced bladder rupture. Taking this into account, minimally invasive treatment based on the correct preoperative diagnosis may be employed. Bladder rupture should be included in the differential diagnosis of a patient with peritonitis, especially with a previous history of urological problems.

CONCLUSION
Physicians must be aware that bladder cancer can lead to bladder rupture, which can cause peritonitis. Previous history of urological problems should be paid attention to.

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References
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