Oncology

Spontaneous bladder rupture due to bladder carcinoma: A case report required emergency radical cystectomy

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ABSTRACT

We report a case of spontaneous bladder rupture due to bladder carcinoma. A 52-year-old female presented in septic shock, and computed tomography revealed free air in the subphrenic space and a mass in the middle of the pelvis. The exploratory laparotomy helped to confirm a definitive diagnosis: bladder rupture due to bladder carcinoma. She underwent a radical cystectomy and survived. Surgical intervention is recommended to manage carcinomatous bladder rupture. Timely and accurate diagnosis is essential to optimize the patient’s outcomes. The possibility of spontaneous bladder rupture should not be overlooked as a differential diagnosis in cases of the acute abdomen.

Introduction

Bladder rupture has severe complications that are associated with a high rate of mortality. Blunt trauma accounts for most cases of bladder rupture. Rare cases of spontaneous bladder rupture have been reported in association with pelvic irradiation, retention, chronic cystitis, malignancy, and diverticulitis. Today, bladder rupture is no longer fatal as it once was, because more awareness and better imaging have led to timely diagnosis. However, as its clinical findings are similar to those of intestinal perforation, bladder rupture can sometimes be misdiagnosed, even with the aid of computed tomography (CT) imaging.

Here, we report a case of spontaneous bladder rupture due to invasive bladder cancer. Although the initial assessment was confusing, an exploratory laparotomy helped to confirm a definitive diagnosis of bladder rupture. Fortunately, the subsequent radical cystectomy rescued the patient from fatal pan-peritonitis.

Case presentation

A 52-year-old female was brought in by ambulance to the emergency department with impaired consciousness. We could not obtain a full medical history, but her relatives said that she had complained of fatigue and loss of appetite for 1 month. Physical examination revealed a Glasgow Coma Scale of 11 (E2V4M5), temperature of 38.9 °C, pulse rate of 180 beats/minute, respiratory rate of 30 cycles/minute, and systolic hypotension (<60 mmHg). A solid mass was palpable in the lower abdomen, and there was tenderness throughout the abdomen. Her laboratory data showed a white blood cell count of 13.3 × 10³/μL, C-reactive protein of 56.4 mg/dL, serum creatinine of 1.4 mg/dL, and blood urea nitrogen (BUN) of 63.6 mg/dL. CT showed free air in the subphrenic space (Fig. 1A), and a mass of 11 cm in the middle of the pelvis (Fig. 1B). A urinary catheter drained 20 ml of cloudy urine, and urine analysis revealed 100 red blood cells/high power field (HPF) and 100 white blood cells/HPF. Rapid urine cytology was class V.

During the examination, her respiratory state worsened. She was immediately intubated, and an exploratory laparotomy was performed. This revealed that the ascites was cloudy and thick pus was scattered in the entire peritoneal cavity. There was a solid tumor occupying the bladder. The wall of the bladder dome was necrosed. A part of the necrotic area was thinned out, and a 3 mm hole from which pus and urine leaked out of the bladder was identified (Fig. 2A).

We made a diagnosis of intraperitoneal bladder rupture due to bladder cancer, with peritonitis, and sepsis. The surgery was converted to a radical cystectomy with bilateral cutaneous ureterostomy. Histopathological examination revealed that the bladder rupture was due to a urothelial carcinoma with squamous cell differentiation, pT3b (Fig. 2B). She recovered from the septic shock with no distinctive complications and was discharged. She declined to receive adjuvant therapy and died of cancer cachexia 10 weeks after the surgery.

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Discussion

Spontaneous bladder rupture is rare and is associated with high morbidity and mortality.\(^2\) Common causes of spontaneous bladder rupture are pelvic irradiation, retention, chronic cystitis, invasive tumor, and diverticulitis.\(^1\) Typical CT images of bladder rupture into the peritoneal cavity show accumulation of ascites and free air.\(^2\) Leaked urine causes ileus, peritonitis, and elevation of BUN and creatinine due to reabsorption.\(^1\) However, these findings are also observed in case of intestinal perforation. These similarities make immediate and accurate diagnosis difficult.

In this case, although we suspected bladder ruptured due to bladder cancer, we could not rule out the possibility of an intestinal perforation, as signs such as free air in the subphrenic space, abdominal tenderness, and septic shock usually indicate an intestinal perforation. The exploratory laparotomy helped to confirm the definitive diagnosis and the subsequent intervention saved her life.

The mortality rate of spontaneous bladder rupture due to bladder carcinoma is about 47%.\(^3\) Once the diagnosis of this condition is established, surgical interventions such as partial cystectomy or radical cystectomy are recommended in cases of intraperitoneal rupture.\(^3\) However, relatively many cases are managed by bilateral cutaneous ureterostomy alone\(^4\) or conservatively using an indwelling urethral catheter,\(^5\) as the patient’s condition does not allow the patient to undergo surgery. In cases that receive surgical intervention, partial cystectomy is preferred to radical cystectomy, as radical cystectomy is deemed too invasive.\(^6\) However, in this case, we had no choice but to carry out radical cystectomy as the patient was in septic shock, and without the removal of the source of infection, the peritonitis would have persisted. Partial cystectomy was also impossible as most of the bladder was occupied by a solid tumor, and there was no normal mucosa left.

Conclusion

To manage bladder rupture due to invasive bladder cancer, a surgical intervention is recommended. However, a delayed diagnosis increases complications which in turn reduces the opportunity for surgical intervention. Therefore, we must be aware of the possibility of spontaneous bladder rupture as a differential diagnosis in cases of acute abdomen.

Informed consent

Written informed consent was obtained from the patient for her anonymized information to be published.

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CRediT authorship contribution statement

Touko Asano: Conceptualization, Writing - original draft, Writing - review & editing, Supervision. Yukihiro Ohtsuka: Data curation,
Visualization, Resources.

Declaration of competing interest

None.

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