Echo Free Space in Morrison's Pouch in a Patient with Traumatic Bladder Rupture : A Case Report

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Ultrasonography is a useful emergency room technique for detection of abdominal hemorrhage in trauma patients. In the JATEC course (Japan Advanced Trauma Evaluation and Care course), FAST (Focused Assessment of Sonography for Trauma) is advocated to determine the presence of a fluid pool, especially hemorrhage, in the pericardial, thoracic, and abdominal cavities. Most clinicians are initially likely to regard fluid as hemorrhage from the abdominal organs, but the fluid may also be derived from blood, ascites, urine, or other fluids. We report a 39-year-old man who suffered a bruise to his lower abdomen in a traffic accident. He underwent ultrasonography, and an echo free space was found in his Morrison's pouch. Intraabdominal hemorrhage was suspected, but a CT scan did not show any multiple organ injury, but the bladder was ruptured. The fluid in the abdominal cavity was urine derived from this bladder rupture. The cause of FAST positivity, except for hemorrhage, is thought to be a blind spot for clinicians ; however, causes other than hemorrhage need to be considered, especially in patients with trauma to the lower abdominal region. (Kitakanto Med J 2008 ; 58 : 217~219)

Key Words : trauma, FAST, bladder rupture

Introduction

Recently, a focused assessment with sonography for trauma (FAST) has become a significant part of evaluations of trauma patients in many emergency rooms. FAST is performed to detect traumatically caused free peritoneal fluid in the abdomen, however, the origin of the fluid cannot be determined. The fluid may be derived from blood, ascites, urine, or other fluids, but most clinicians initially tend to think of hemorrhage from the abdominal organs. We presented the case of a 39-year-old man in whom sonography detected free peritoneal fluid in Morrison's pouch. Further examinations revealed that the fluid was not blood but urine caused by an intraperitoneal rupture of the bladder. Hence, it is necessary to understand that sonographic intraperitoneal fluid is not only hemoperitoneum but also uroperitoneum when there has been trauma to the lower abdomen.

Case Report

A 39-year-old man crashed his car into a tree at the side of the road, at the time of the accident he felt like he wanted to urinate. He was wearing a seat belt and the vehicle's air bag was functional. After the accident, he was transferred to the emergency room of our university hospital.

On admission, he was alert and arterial blood pressure was 117/82mmHg, heart rate 88bpm, and SpO2 98% (Room Air). He complained of lower abdominal pain without muscle defense or Blumberg's sign. Abdominal ultrasonography was performed to investigate the abdominal cavity, especially for abdominal hemorrhage. An echo free space was found in Morrison's pouch (Fig.1). Intra-abdominal hemorrhage was suspected. A urethral catheter was inserted and hematuria found. Urethral injury was thus highly suspected. A CT scan showed an iso-density area

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Received : December 12, 2007

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because the echo free space in Morrison's space was not derived from a hemorrhage of any abdominal organ but from urine. Laboratory data of the gross hematuria from the urethral catheter showed no inflammatory reaction (WBC 7400/mm³ and CRP<0.1, and Hb was 13.8g/dL); however, one and a half hours later, WBC increased to 13,600/mm³.

An emergency operation was performed because the patient complained increased abdominal pain, and muscle defense and Blumberg's sign appeared. Intraoperatively, just a little urine was recognized in the abdominal cavity. A small foramen (5cm in a diameter) was found on the peritoneal reflection 3cm from the anterior wall of the bladder. A small perforation was also found on the anterior wall of the bladder (Fig. 5). Both intraperitoneal and extraperitoneal bladder ruptures were clearly seen. As well, the urethral catheter penetrated the bladder wall and reached into the abdominal cavity (Fig. 6). No other injury of the abdominal organs was found and the two perforations were sutured. The postoperative condition of the patient was good and he was discharged in good condition from hospital on the 11th postoperative day.

Discussion

We present a case of traumatic bladder rupture. Blunt abdominal trauma is a common cause of bladder injury, mostly occurring in motor vehicle accidents. According to Corriere JN. et al., in their review of 111 bladder injuries, 86% were due to blunt trauma, and 90% of these were due to motor vehicle accidents.¹ A total of 89% were associated with pelvic fractures, and 9% of patients with pelvic fractures had bladder injury.² Another survey in patients with pelvic fractures determined the incidence of bladder rupture as 6~10%.³ Our patient had a bladder rupture but without pelvic fracture. Thus, this may be a relatively rare case.

As there was an echo free space in Morrison's space, we initially thought that an intra-abdominal hemorrhage was indicated. But, in patients with lower abdominal blunt trauma, especially with pelvic injury, uroperitoneum due to bladder rupture should be suspected. According to a survey on the accuracy of trauma ultrasound in major pelvic injury, among 21 patients with free peritoneal fluid, in 16 (76%) case the fluid was blood, and in 4 (19%) the fluid was urine.⁴

Hematuria can provide important information about the injury to kidney, urethra, and the urinary bladder, and a urethral catheter should be inserted for patients with the lower abdominal blunt trauma. Care is needed because of the possibility of intraperitoneal bladder rupture. Furthermore, CT cystography has been recommended in many reports for more accurate evaluations. In 316 patients, CT cystography detected bladder rupture with overall sensitivity and specificity of 95% and 100%, respectively; for intraperitoneal rupture, sensitivity was 78% and specificity 99%.⁵ Quagliano PV and coauthors reported that conventional retrograde cystography was found to be equivalent to CT cystography for detecting the presence or absence of blunt bladder injury.⁶

The case presented here demonstrated that ultrasonography for abdominal blunt trauma was useful for the detection hemoperitoneum as well as uroperitoneum in lower abdominal trauma. Uroperitoneum can be a blind point for clinicians. In any patient with lower abdominal blunt trauma, ultrasonography needs to be performed and the insertion of a biologically clean urethral catheter needs to be undertaken as part of the examination.

Conclusion

In cases of trauma patient receiving a blow to the lower abdominal region, even if FAST is positive, not only intraabdominal hemorrhage but also the bladder rupture should be considered.

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