Laparoscopic treatment of traumatic bladder rupture

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KEY WORDS

bladder rupture ◗ laparoscopic treatment

ABSTRACT

The most common cause of urinary bladder rupture is blunt trauma to the lower abdomen. Intraperitoneal bladder rupture always requires surgical exploration. According to the recommendations of the European Association of Urology it is necessary to issue dual-layer walls of the bladder with suprapubic urine drainage or discharge from leaving the catheter in the bladder from the urethra. Since 1994, intervention in bladder rupture was successfully applied with the laparoscopic method. We present the case of a patient with bladder rupture who was successfully treated by laparoscopic access. In case of damage of the bladder in stable patients laparoscopic access seems to be a possible method of choice. Such access allows surgeons to assess the visual organs throughout the abdomen and shortens the recovery time. The size and length of rupture does not affect the course of the procedure and even large, long perforations can be treated using the laparoscopic technique. Laparoscopy is an effective and timely way to treat this type of injury, giving favorable cosmetic effect, shortening the time of hospitalization, and reducing the risk of wound infection after operations.

INTRODUCTION

Genitourinary tract involvement is found in approximately 10% of patients with injuries. The urinary bladder, thanks to its location in the pelvis rarely requires surgical intervention and among abdominal injuries that require surgical repair, 2% involve the bladder [1]. The most common cause of urinary bladder rupture is blunt trauma injury to the lower abdomen (67-86%) [2, 3]. More than 90% of cases of bladder damage are caused by motor vehicle accidents, most often associated with pelvis fractures. The main clinical sign is massive hematuria (80%) and abdominal tenderness resulting from urinary irritation of the peritoneum and the inability to urinate spontaneously. The presence of blood in the urethral meatus suggests damage to the urethra. The primary diagnostic test is retrograde urethrocystography using about 350 ml of 0.9% NaCl with contrast solution. Optionally, it is a possibility to perform cystography during an abdominal CT. There are 2 types of bladder rupture – intra and extraperitoneal. The second one always requires surgical exploration. According to the recommendations of the European Association of Urology it is necessary to issue dual-layer walls of the bladder with suprapubic urine drainage or discharge from leaving the catheter in the bladder from the urethra. In literature since 1994, when Parra introduced the method of laparoscopic management of bladder injury there have been some reports, in which the laparoscopic method was applied successfully [4]. In Poland this method was successfully applied in 2001 [5]. We present a case of bladder rupture treated successfully with laparoscopic access.

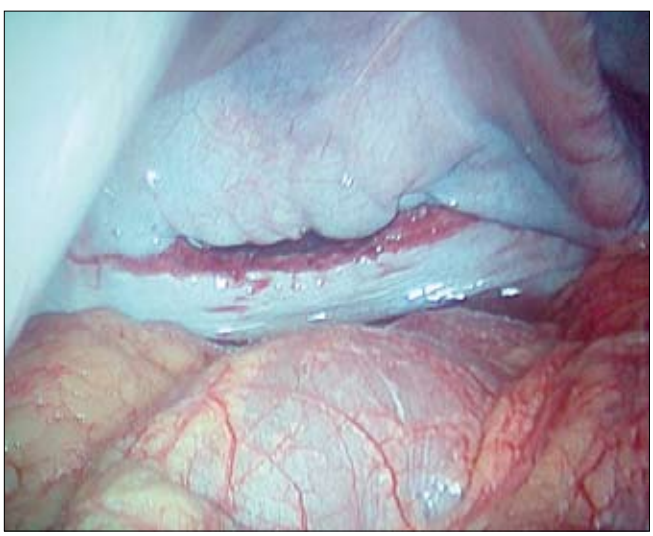

Fig. 1. Transverse bladder rupture length of about 8-10 cm penetrating the peritoneal cavity.

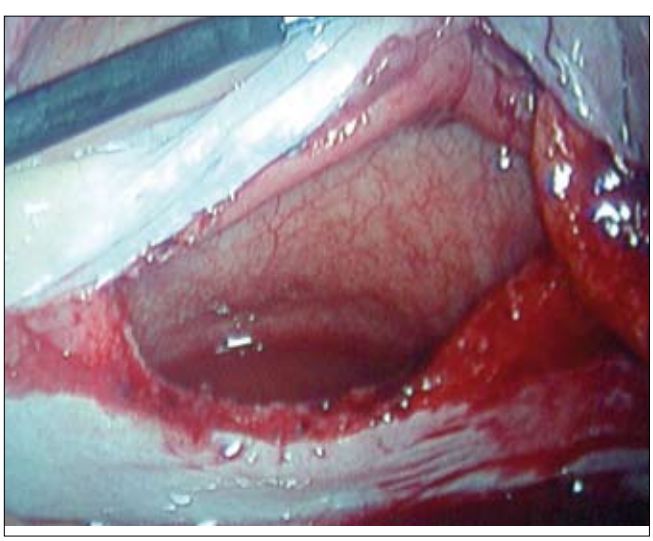

Fig. 2. Transverse bladder perforation. Visible layers of the bladder wall.

CASE REPORT

A 34-year-old man under the influence of alcohol was admitted to the Emergency Department of Medical University Hospital in Bydgoszcz with suspicion of perforation of the gastrointestinal tract. At the time of admission the patient's gen-

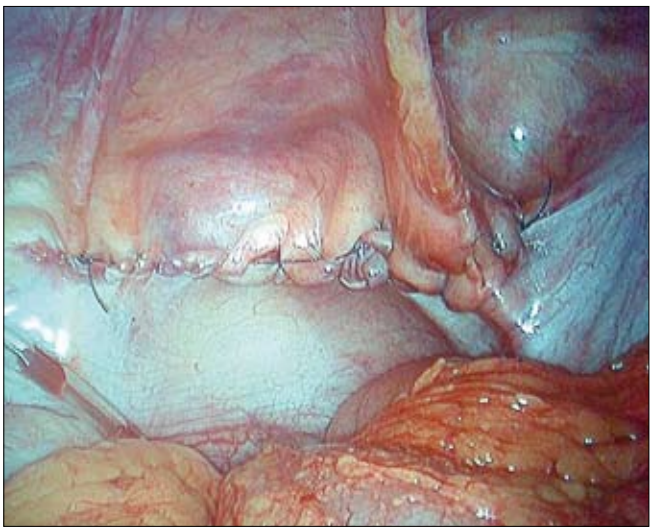

Fig. 3. Single layer of absorbable sutures.

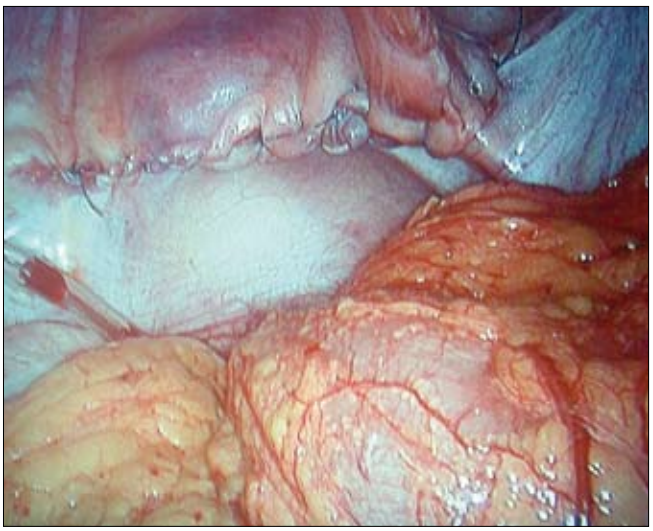

Fig. 4. Drainage of the peritoneum.

eral condition was good. He complained of a strong pain in the abdomen, which started suddenly after he collapsed during an alcohol party – he fell out of bed and suffered blunt lower abdomen injury. On physical examination he was stable, RR blood pressure was 120/80 mm Hg, pulse rate was 70 per min but signs of inflammation of the peritoneum were present. In laboratory tests the following abnormalities were found: leukocytosis (17.27 x 10^3/ul), increased level of creatinine in serum (3.6 mg/dl). Amylases in serum were not elevated. The man was unable to void urine spontaneously because of lack of urge. In the course of further diagnostics, abdominal ultrasound was performed, where the radiologist described the bladder unchanged and a large amount of free fluid in the peritoneal cavity around the liver, spleen and in the lower abdomen. The patient was qualified by the surgeon on duty to laparoscopic exploration. During the operation there was no pathology in the abdomen apart from a vast, approximately eight-centimeter long lateral tear across the walls of the bladder at the top and back walls (Fig. 1, 2).

Because of bladder perforation over a distance of about 8-10 cm, further part of the operation was performed by the urological team. The laceration was sutured with one layer of absorbable suture (Fig. 3).

Three-way Couvelaire 20 F catheter was placed in the bladder. Drainage of the peritoneum was also performed under visible control (Fig. 4).

Then the patient was sent to the Department of Urology. In the postoperative period a broad-spectrum antibiotic was used. On the second day the patient was able to get up, on the 3rd day the drainage of the peritoneal cavity was removed and on the 9th day the catheter from the bladder was removed. In the control tests, a normalization of kidney parameters was found. In the urine culture no evidence of urinary tract infections was found. After removing the catheter from the bladder the control ultrasound of the kidney and the bladder was performed which appeared to be normal. The patient's general condition was good, with good stream of urine. Patient was discharged in the 10th day of hospitalization.

DISCUSSION

Traumatic bladder damage in the peritoneum always requires surgical exploration and suturing. This type of damage in most cases is also repaired by laparotomy, often because of the accompanying damage to other organs and pelvic bone fractures. In case of damage of the bladder in stable patients laparoscopic access seems to be possibly used as a method of choice [6, 7]. Such access allows the surgeon to assess the visual organs throughout the abdomen and shortens the time of recovery. The procedure is performed under general anesthesia and the patient's position on the back with three ports. Perforation of the bladder wall may be repaired by various means. Part of authors in the case of minor damage (eg. after TUR-Tu) apply single sutures 1-3 [8]. In most reported cases one layer of bladder sutures were used, which was a fast and efficient way to close the damage [7 ,9]. Sutures are made through the muscle layer and peritoneum. The size and length of breaks does not affect the course of the procedure and even a large long perforation can be treated using the laparoscopic technique [10].

CONCLUSIONS

Laparoscopy is an effective and timely way to treat this type of injury, gives favorable cosmetic effect, shortens the time of hospitalization, and reduces the risk of wound infection after operations.

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