Laparoscopic repair of intra-peritoneal bladder rupture secondary to blunt abdominal trauma

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Abstract:
The common condition associated with pelvic fractures is intraperitoneal rupture of urinary bladder. This is a true surgical emergency managed conventionally by open laparotomy with single or double layer repair. We present one case of successful laparoscopic repair of intraperitoneal bladder rupture secondary to blunt abdominal trauma.

Introduction:
The most common cause of urinary bladder rupture is blunt trauma to the lower abdomen associated with pelvic fractures. Traumatic intraperitoneal bladder rupture is a true surgical emergency & always requires surgical suture and bladder drainage. (1). Prior to the advent of laparoscopy, laparotomy and open repair of intraperitoneal bladder injuries using single or double layer repair was thought to be necessary in all cases. The advent of laparoscopic surgery offered new possibilities in treating intraperitoneal bladder ruptures, whether it is traumatic or iatrogenic. Laparoscopy as a diagnostic modality in trauma has been reported, however therapeutic laparoscopy for trauma remains a controversial subject.

Case report:
A 37 year old omni man brought by EMS to the Emergency Department of Sultan Qaboos University hospital as a case of motor –vehicle collision. He was driving with his seatbelt on & under the influence of alcohol with history of car-car collision. No history of LOC or vomiting. He complained of sever left hip pain.

On physical examination, he was confused with GCS 14 but no neurological deficit. He maintained his saturation in room air & was hemodynamically stable, blood pressure was 105/53 mmHg & pulse rate was 53 beats per min. He had left periorbital hematoma, multiple abrasions in his face & small lacerated wounds at left forehead & left cheek. In addition, he had 2cm deep lacerated wound left upper chest. His abdomen was distended, tense but no tenderness with multiple small abrasions. In lower limbs, there were multiple bruising & abrasions & his left hip was flexed & medially rotated. His x ray pelvis showed left hip dislocation with fracture acetabulum.
Once the Foley's catheter inserted, there was gross haematuria. In emergency department, he received 2gm ceftriaxone, TT injection & 5mg iv morphine. Than patient was shifted to CT room where CT head, c-spine & abdomen were done. Contrast Abdominal CT revealed Moderate amount of free fluid in the abdomen & pelvis with laceration at anterior pole of spleen & laceration of liver (segment Iva) 3cm. The kidneys & ureters were normal, so CT cystogram done & Evidence of intraperitoneal extravasation of contrast seen from the bladder. The Posterior dislocation left hip with fracture of posterior margin of acetabulum & linear fracture of anterior column were also identified.
CT head showed fracture left mandible, pteregoid, zygoma & lateral wall of left maxillary sinus. The patient was seen by surgeon on duty & planed for emergency laparoscopic repair of bladder rupture. During the operation, three port-technique were used & the findings were: minimal blood collection in the pelvis about 15ml with 4 cm bladder rupture in the dome. The laceration was sutured with continuous single layer of absorbable suture 2/0 vicryl. Than leaking test done to check the integrity of the closure & drain was placed in the perivesical space to monitor for possible urine extravasation post operation.
The surgery was combined with orthopedic procedure where closed reduction of left hip dislocation & skeletal traction using pin to proximal tibia were performed. Postoperatively patient was sent to the Department of surgery high dependency area. He had three ways Foley catheter & he was on continuous irrigation till his urine became clear. Daily monitoring his CBC, LFT, Urea & electrolytes which were remained normal. In the postoperative period a broad-spectrum antibiotic & LMWH were used. He was seen by ophthalmologist, ENT, maxillofacial & orthopedic Surgeons for the associated injury & treated accordingly. On the 7th day, Cystogram was done showed no leak so drainage of the peritoneal cavity was removed. Patient’s general condition was good, on regular physiotherapy, taken normal diet & passing good stream of urine. On 12th day of admission, patient was shifted to Khoula Hospital per his request for further management of his left acetabulum fracture.
Discussion:

Treatment recommendations for bladder rupture are well established as bladder catheter for retroperitoneal perforations and cystorrhaphy for the intraperitoneal ones (2). Traumatic intraperitoneal bladder rupture always requires surgical exploration and suturing. This type of damage in most cases is repaired by laparotomy, often because of the accompanying damage to other organs and pelvic bone fractures. In addition, this type of injury does not heal with prolonged catheterization alone (3).

Laparoscopic repair of intraperitoneal bladder perforation was first described in 1990 and since then, a number of cases of such approach have been reported to treat traumatic, spontaneous and iatrogenic bladder rupture, avoiding laparotomy (4). The first case reported on 1990 & It was iatrogenic intraperitoneal rupture which was successfully managed laparoscopically (4). The first case of laparoscopic repair of traumatic intraperitoneal bladder rupture was reported on in 1996 (5). While on 1997, first case of laparoscopic repair of idiopathic Intraperitoneal bladder rupture was reported (6).

From review the literature, instead of open laparotomy, laparoscopy can be used safely and effectively for the diagnosis and treatment of traumatic abdominal injuries. It can avoid laparotomy in 63% of the cases, decreasing its associated morbidity (7). In hemodynamically stable patients without diffuse peritonitis, the diagnostic laparoscopy can be used in stab wounds, gunshot wounds with questionable peritoneal penetration and in blunt trauma with free peritoneal fluid or equivocal physical examination (8). In the presence of simple and accessible injuries such as bladder rupture the therapeutic laparoscopy is performed (7). The Perforation of the bladder wall may be repaired by various means but in most reported cases one layer of bladder sutures were used, which was a fast and efficient way to close the damage . The size and length of perforation does not affect the course of the procedure and even a large long perforation can be treated using the laparoscopic technique (9).

Conclusion:

Laparoscopy is a safe, feasible, effective procedure for the evaluation and treatment of hemodynamically stable patients with abdominal trauma. It can reduce the number of nontherapeutic laparotomies performed. Laparoscopic repair of traumatic intraperitoneal rupture of urinary bladder is an effective and timely way to treat this type of injury. In stable patients this approach is the best short recovery, less traumatic treatment allowing visualization of the entire peritoneal cavity to exclude others lesions, giving favorable cosmetic effect, shortening the time of hospitalization & reducing the risk of wound infection after operations.

Reference:


