Laparoscopic intraperitoneal bladder injury repair of a trauma patient: A case report

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A B S T R A C T

The standard intraperitoneal bladder injury repair approach is an open technique; however, in some cases of isolated bladder injury, it can be alternatively repaired by laparoscopy. A 28-years-old male who sustained a motor vehicle accident found to have isolated intraperitoneal bladder injury which was repaired laparoscopically. Cystogram after 2 weeks confirmed the successful outcome. Although laparoscopic repair technique found to be safe and efficient, careful patient selection is mandatory.

1. Introduction

Among trauma cases, the incidence of traumatic bladder injuries is approximately 1.6%. Bladder injuries are described as either blunt, penetrating, or iatrogenic and can be classified as intraperitoneal or extraperitoneal injuries. An intraperitoneal bladder injury indicates the need for immediate surgical repair, as it may lead to chemical peritonitis caused by urine leakage and has shown poor response with conservative management with Foley’s catheter drainage alone. The standard repair approach is an open technique; however, in some cases of isolated bladder injury, laparoscopic repair is an alternative option.

2. Case report

We report on a 28-year-old male, brought to the emergency department after a motor vehicle accident. He was the passenger but was found restrained and not ejected from the car after being hit by a truck. Upon arrival, he was fully awake and conscious, did not require artificial oxygenation, and was relatively stable. He was complaining of pain in the right lower limb and abdomen. Primary and secondary surveys were done with a negative extended focused assessment with sonography in trauma (E-FAST), and a Foley catheter was inserted without difficulty draining hematuric urine. Laboratory studies were unremarkable. The patient was stable and went to the radiology department, where a contrast-enhanced abdomen and pelvic computed tomography (CT) with delayed image was performed without a cystogram phase. The injuries observed by X-ray and CT scan were: a right femur fracture, with the balloon of a Foley’s catheter inflated outside the bladder: this suggested bladder injury at the dome, with free fluid in the abdomen, but no other intra-abdominal organ injuries were detected. In addition, the delayed images showed the contrast was confined within the entire course of the ureters with no extravasation or no filling defects.

A decision was made to take the patient for diagnostic laparoscopy, given that the patient had abdominal free fluid. An infraumbilical incision was made, and a balloon port was inserted, followed by the laparoscopic camera. The abdomen was inspected, and no trocar site injury was detected. Next, a 5-mm port was inserted in the supraumbilical level at the right midclavicular line, and an 11-mm port was inserted in the supraumbilical level at the left midclavicular line. Upon entering the abdomen, systematic inspection of the abdominal viscera was unremarkable, except a 4-cm bladder dome injury, as seen with a visible Foley catheter in the abdomen (Fig. 1).

The repair was accomplished with 2-0 Vicryl suture material, with two layers running continuously (Fig. 2). A saline test was performed intraoperatively with 180 ml, which was negative for any leak. A new catheter was inserted after the repair under vision, while the saline test was repeated and was again negative.

The patient had an uneventful hospital stay, as the abdominal drain did not suggest any urine leakage. A cystogram was done after 2 weeks and revealed no extravasation, with a capacity of 300 ml (Fig. 3); the Foley catheter was removed smoothly, and the patient voided freely before being discharged.

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Bladder injury can be the only presenting injury following blunt trauma; in fact, it is frequently attributed to an overdistended bladder during the accident, with the most common site of injury in the dome since it is the weakest wall, which we can assume for our patient.

Ureteral injuries due to trauma are rare accounting for 1% of all urotrauma cases. Diagnosis is confirmed by delayed image of the CT scan. However, missed injury is common and can end up with major morbidity. When there is a high suspicion of ureteral injury in a trauma patient, a retrograde pyelography must be done.¹

Standard traumatic intraperitoneal bladder injury repair is always performed by open laparotomy. However, advances in laparoscopy have made it a safe option, especially for isolated intraperitoneal bladder injury or associated minimal injuries, in hemodynamically stable patients.¹–³

There are few cases of laparoscopic bladder injury repair described in the literature. A review of ten trauma cases showed different defect sizes (with a maximum of 8 cm) and bladder wall sites, including single- and double-layer repairs. Nevertheless, all reported cases, except one, had a short hospital stay and no perioperative complications. In one case, surgery was converted to an open procedure because concomitant bowel injury was detected.¹ In the present case, the patient had a 4-cm bladder dome injury, and he tolerated the procedure well without any perioperative complications. He had a very successful outcome.

Tiffany D. had described having a patient with an intraperitoneal 3 cm bladder dome defect with successful repair and outcome, showing similar findings as in our case.² May et al. reported a case of intraperitoneal bladder injury following transurethral resection of a bladder tumor (TURBT). Diagnostic laparoscopy was performed, and a 2-cm posterior wall bladder injury was detected and successfully repaired with a single layer.⁴,⁵

No large case series were available in the literature regarding this subject, and there is no available data for long-term outcomes for those patients who have undergone laparoscopic repair. To our knowledge, this is the first case to be reported in Saudi Arabia.

4. Conclusion

Patient selection is important for laparoscopic bladder injury repair, and there are benefits associated with laparoscopy over the open approach. Laparoscopic bladder injury repair is recognized as a safe and efficient approach and encourage surgeons to use minimally invasive interventions.

Declaration of competing interest

None.

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Fig. 1. A Foley catheter balloon was seen floating in the abdomen.

Fig. 2. After the procedure.

Fig. 3. Normal opacification of the urinary bladder with no extravasation noted during cystogram on postoperative day 14.

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