

Case Report

Laparoscopic repair of traumatic intraperitoneal bladder rupture: a rare case report

Udit Jain*, Dinesh Kumar, Sreedhar, Ifrah Ahmed Qazi, Mustaq Rasool

Department of Urology, Narayana Medical College, Nellore, Andhra Pradesh, India

Received: 10 April 2023

Accepted: 16 May 2023

***Correspondence:**

Dr. Udit Jain,

E-mail: Udit.jain24@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Laparoscopic repair of traumatic intraperitoneal bladder rupture is safe and effective technique. We here report case of 49 year male with traumatic intraperitoneal bladder rupture proven by CT urogram after sustaining blunt trauma abdomen injury, repaired by laparoscopy technique. Patient recovered without any complications and was discharged on postoperative day 6 under stable condition. we here by conclude that if bladder injury identified early and conditions if feasible, laparoscopic repair is one of the good options for further management without involving open laparotomy.

Keywords: Bladder trauma, No other visceral injury, Laparoscopic repair

INTRODUCTION

Most of the bladder injuries occur due to rapid-deceleration caused by motor vehicle collisions, falls, assaults and blows to the lower abdomen. Isolated urinary bladder injury is a rare entity comprising less than 2% of all cases.¹ Normally urinary bladder injuries in trauma setting managed by emergency laparotomy. While laparoscopic bladder repair is not a new technique, its use in the trauma setting has been infrequent. Therefore, here we describe use of laparoscopy for the repair of an Intra-peritoneal bladder rupture following blunt abdominal trauma.

CASE REPORT

We report the case of a 49-year-old male, who presented to us in Narayana medical college emergency department with alleged history of assault by his relative using wooden stick over his abdomen. He had been drinking alcohol prior to the assault. Upon presentation to the emergency service, he was complaining of lower abdominal pain since 6 hour, decreased urine output and

hematuria. After an initial evaluation, all blood investigations were done, and plain CT KUB was done. There was a gross amount of fluid in his pelvis, with ill-defined hyperdense area, likely to be hematoma. A retrograde cystogram confirmed our suspicion of an intraperitoneal bladder injury, and the patient was taken to the operating room (Figure 1).



Figure 1: Cystogram showing bladder rupture.

Because this patient remained hemodynamically stable and only bladder injury was there, we decided to perform a laparoscopic repair of this injury. First, a cystoscopy was performed to ensure the site of the injury (bladder dome perforation noted). 18-French Foley catheter placed. Next, we performed laparoscopic repair of the intraperitoneal bladder injury. We placed 10 mm supraumbilical camera port and another 10 and 5-mm ports at RIF and LIF respectively. Upon entering the abdomen, the entire abdominal contents were examined and noted to be without other injuries. There was a mild amount of bloody urine in the pelvis along with the blood clots. A 4-cm defect was noted at the dome of the bladder (Figure 2). The Foley catheter was visualized within the bladder defect. Bladder was released from anterior wall and dropped down. Perforated edges were freshened and sutured with 3-0 V lock suture in single layer. After repair was completed, the Foley catheter was irrigated with 100mL of sterile saline. A watertight seal had been created (Figure 3). The 20 French abdominal drain was placed. Camera port closed with 1-0 vicryl. Skin closed with ethilon 2-0.



Figure 2: Laparoscopic repair of bladder.



Figure 3: Postop cystogram showing no leak wall.

Post-operatively patient recovered well and abdominal drain was removed on POD 6 and discharged under stable condition with PUC in situ. At a follow-up visit after 15 days, patient had no complaints and catheter was removed.

DISCUSSION

Around 1.5% cases of blunt trauma patient present with bladder injury. The 80% of the time associated with pelvic fractures. Road traffic accidents are the most common causes (90%), followed by falls, industrial trauma/pelvic crush injuries, and other blows to the abdomen. Bladder rupture occurs from a blow/injury to the abdomen when bladder is distended. The dome of the bladder is the most common site affected because it is the weakest and mobile part.¹⁻⁴

Bladder rupture most frequently present with gross hematuria.^{1,5} Other signs associated with bladder injuries are perineal hematoma, associated with abdominal distension. Patient complain of the inability to urinate, abdominal pain, or suprapubic discomfort. Laboratory studies may show abnormal electrolytes and an increase in blood urea nitrogen and creatinine.^{1,4}

After suspecting the bladder injury, it is mandatory to confirm it. Insert foleys catheter, if blood present at meatus avoid it, because of doubt of urethral injury with it.¹ For diagnosis computed tomography is used. The sensitivity of the CT scan is 80% for the diagnosis of bladder trauma. Its advantage is the ability to recognize other intra- abdominal trauma and identify all areas of pelvic fracture.⁶

Retrograde cystogram is the gold standard for diagnosing intraperitoneal bladder rupture, it is done after a Foley catheter has been inserted, 300 to 400 mL of contrast (6:1 dilution with normal saline) is instilled into the bladder under gravity filling while antero-posterior and oblique plain films are taken while the bladder is full.^{1,5} Post void films are also performed for completion of the examination. Contrast will outline the intra-abdominal organs, including the small bowel, paracolic gutters, and around the liver.

Bladder injuries are mainly of two types intraperitoneal and extraperitoneal injuries. Extraperitoneal injuries are generally treated conservatively with Foleys catheter. Intraperitoneal injury often associated with other intra-abdominal injuries, therefore the bladder injury is repaired during laparotomy. It is repaired in a 2-layer fashion with absorbable suture. The bladder is then drained via a transurethral catheter or suprapubic catheter.⁶ If the patient is stable, and other bladder injury is the only suspected injury, laparoscopy can be a modality used to repair the bladder.

After the proper workup, laparoscopic repair of the bladder is safe and practical. There are many advantages

of laparoscopic repair in the stable trauma patient, like shorter length of hospital stay, decreased use of postoperative analgesia, faster return to activities of daily living, and possible decreased cost in the long run, among other things.³ Surgeon has the ability to see the bladder mucosa and any intra-vesicular blood clots that may be present, and also has the opportunity to remove clots and achieve hemostasis with the help of laparoscopy.^{3,4}

Laparoscopic repair can be done with 2-layer closure as in open repair. The other options for closure of intraperitoneal cystostomy include single-layer closure, Endo-loop suture for closure, and automatic stapler. Overall, the key to closure is a watertight seal without lithogenic properties of the material used for closure, which was problematic with the stapling devices.⁸⁻¹¹

After the repair water seal can be checked by instillation of normal saline, indigo carmine, or methylene blue via Foley catheter.^{3,10,12} Once the repair is confirmed, the laparoscope can be used to confirm there are no other injuries within the abdomen. A urinary catheter is left in place at the conclusion of the procedure as well as a pelvic drain.¹⁰

It must be stressed that laparoscopic repair of an intraperitoneal bladder injury should only be performed in a stable patient with an isolated bladder injury or minimal other injuries. Recommendation of laparoscopy repair in patients with multiple other injuries, especially other intra-abdominal injuries, hemodynamic instability, unstable pelvic fractures, or patients with pelvic hematomas is not recommended.^{11,12}

CONCLUSION

As we are progressing towards an era of minimally invasive approach for all surgeries, Laparoscopic repair of the bladder rupture is a good alternative to the conventional open repair. Through this case report we hereby prove that laparoscopic repair can be used in trauma settings. There-fore it is concluded that prompt diagnosis and appropriate management of bladder injuries promote excellent results and minimal morbidity.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Gomez RG, Ceballos L, Coburn M. Consensus statement on bladder injuries. BJU Int. 2004;94:27-32.
2. Corriere JN, Sandler CM. Diagnosis and management of bladder injuries. Urol Clin North Am. 2006;33:61-71.
3. Yee DS, Kalisvaart JF, Borin JF. Preoperative cystoscopy is beneficial in selection of patients for laparoscopic repair of intra peritoneal bladder rupture. J Endourol. 2007;10:1145-8.
4. Gunnarsson U, Heuman R. Intraperitoneal rupture of the urinary bladder the value of diagnostic laparoscopy and repair. Surg Laparosc Endosc. 1997;7:53-5.
5. Wirth GJ, Peter R, Poletti PA, Iselin CE. Advances in the management of blunt traumatic bladder rupture: Experience with 36 Cases. BJU Int. 2010;106(9):1344-9.
6. Kim FJ, Chammas MF, Varella Gewehr E, Campagna A, Moore EE. Laparoscopic management of intraperitoneal bladder rupture secondary to blunt abdominal trauma using intra-corporeal single layer suturing technique. J Trauma. 2008;65:234-6.
7. Matsui Y, Ohara H, Ichioka K, Terada N, Yoshimura K, Terai A. Traumatic bladder rupture managed successfully by laparoscopic surgery. Int J Urol. 2003;10:278-80.
8. Appeltans BMG, Schapmans S, Willemsen PJA, Vergruggen PJEM, Denis LJ. Urinary bladder rupture: Laparoscopic repair. BJU. 1998;81:764-5.
9. Iselin CE, Rohner S, Tuchschnid Y, Schmidlin F, Graber P. Laparoscopic repair of traumatic intraperitoneal bladder rupture. Urol Int. 1996;57:119-21.
10. Poffenberger R. Laparoscopic repair of intraperitoneal bladder injury: A simple new technique. Urology. 1996;47:248-9.
11. Bhanot A, Bhanot A. Laparoscopic repair in intraperitoneal rupture of urinary bladder in blunt trauma abdomen. Surg Lapa-rosc Endosc Percutan Tech. 2007;17:58-9.
12. Parra RO. Laparoscopic repair of intraperitoneal bladder perforation. J Urol. 1997;151:1003-5.

Cite this article as: Jain U, Kumar D, Sreedhar, Qazi IA, Rasool M. Laparoscopic repair of traumatic intraperitoneal bladder rupture: a rare case report. Int J Res Med Sci 2023;11:2307-9.