Online publication ahead of print, AJMHS Vol 69, 2025

Spontaneous Urinary Bladder Rupture Due to Late Postoperative Urinary Retention After a Total Abdominal Hysterectomy – Case Report

Ardjan Nelaj[1], Elda Papa[2]*, Irena Boja[2], Alban Allaraj[2], Kejsara Tahiri[2], Desara Isaku[2], Rilind Bajraliu[2], Arba Sheja[2]

[1] General Surgery Division, "Mother Teresa" University Hospital, Tirana, Albania
[2] General Surgery Residency," Mother Teresa" University Hospital, Tirana, Albania

Abstract

Introduction: Spontaneous urinary bladder rupture due to late postoperative neurogenic bladder is a rare but serious condition that can lead to significant complications such as sepsis and renal impairment. This case underscores the necessity for timely recognition and intervention in post-surgical patients.

Case Presentation: A 42-year-old female, with a history of total abdominal hysterectomy performed seven weeks before, presented to the emergency department with generalized abdominal pain, nausea, vomiting, and absence of urination for two days. Initial imaging revealed free fluid in the abdomen and abnormal renal function. Despite conservative measures, her condition necessitated surgical exploration, during which a 2.5 cm rupture of the urinary bladder was discovered.

Surgical Procedure: The bladder rupture was repaired successfully with a two-layer closure and drainage was established. The patient's postoperative course was uneventful, with significant urine output and recovery of bowel function.

Discussion: Spontaneous bladder rupture is exceedingly uncommon, particularly following hysterectomy, and is often misdiagnosed. The role of anesthesia and postoperative medication in bladder function impairment is critical, as well as the need for vigilant monitoring of voiding function after pelvic surgeries.

Conclusions: Intraperitoneal bladder rupture

Address for correspondence: Elda Papa *, General Surgery Residency, " Mother Teresa" University Hospital, Tirana, Albania. E-mail: eldapapa.55@gmail.com

presents a grave risk following pelvic surgeries. This case emphasizes the importance of considering bladder integrity in differential diagnoses for postoperative patients exhibiting urinary retention and ascitic fluid, along with the essential role of voiding assessments in postoperative protocols. Early recognition of this complication is vital for preventing severe morbidity.

Keywords: urinary retention, neurogenic bladder, bladder rupture, urinary peritonitis.

INTRODUCTION

Spontaneous urinary bladder rupture due to late postoperative neurogenic bladder is a very rare condition reported rarely in the literature. Measures should be taken for early identification and treatment of the patient in order to prevent systemic and severe complications such as sepsis, peritonitis, electrolyte imbalance and kidney function impairment. The diagnosis might be challenging as the primary suspicion while a patient presents with ascitic liquid mostly goes toward portal hypertension, malignancies or GI tract perforations, but it should be kept in mind that surgery itself, anesthesia and opioid used for post-operative analgesia are risk factors for developing post-operative inhibition of micturition reflex and urinary bladder lower sensitivity, and this can lead to even more serious complications such as acute abdomen due to urinary bladder rupture as presented in this case report (1).

CASE PRESENTATION

A 42-year-old female patient was transferred to the emergency department of QSUT from Lezha hospital. She presented with complaints of generalized abdominal pain, nausea, vomiting, and an absence of urination and defecation for two days. Her medical history is significant for a total abdominal hysterectomy performed 7 weeks prior, due to uterine fibromyomas. She has no additional medical conditions and is not currently taking any medications or supplements. The patient reports no known drug allergies.

On objective examination, the patient was conscious and oriented to time and space. Her skin, sclerae, and mucosae exhibited normal coloration. Lung and heart sounds were normal. Abdominal examination revealed sensitivity in all quadrants with muscular guarding in the lower quadrants; limbs were free from edema.

A urinary catheter was inserted, yielding only 400 mL of urine, which was normal in appearance. Imaging and laboratory examinations conducted at Lezha Hospital at 08:50 AM revealed the following:

- White Blood Cell (WBC) count: 7.5 k/uL
- Neutrophils: 3 k/uL (within normal range)
- Blood Urea Nitrogen (BUN): 60.2 mg/dL (reference range: 15-40 mg/dL)
- Creatinine: 1.91 mg/dL (reference range: 0.57-1.11 mg/dL)

Urinalysis findings included:

- Urine strip test: slightly turbid with normal color,
  protein: 25 mg/dL (reference range: <10 mg/dL),
  WBC: 22-25 uL (reference range: <10),
  erythrocytes and hemoglobin: 50 uL (reference range: <5 uL).
- Microscopic examination: erythrocytes: 18-20 HPF (reference range: <3 HPF),
  WBC: 22-25 HPF (reference range: <2 HPF),
  alongside some squamous epithelial cells, crystals, and bacteria.

A plain abdominal CT revealing a moderate amount of free abdominal fluid without any other abnormalities.

Due to the elevated BUN and creatinine levels, a nephrology consultation was required prior to conducting a contrast-enhanced abdominal CT scan for further diagnostic clarification.

The nephrology team recommended premedication with intravenous normal saline (0.9% NaCl) at a dosage of 3 mL/kg body weight and 50 mL of Sodium Bicarbonate (8.4%), administered one hour before and six hours after the contrast CT examination. Close monitoring of diuresis, along with serial assessments of BUN, creatinine, electrolytes, and blood gas analysis, was advised.

Despite administration of the perfusions, urine output remained at 400 mL.

Repeated laboratory tests, 6 hours after the previous results, indicated:

- an elevated WBC count of 13.3 k/uL, with neutrophils increasing to 11.6 k/uL.
- D-Dimer levels 2.11 μg/dL (reference range: <0.5 μg/dL),
- BUN decreased to 49.9 mg/dL and creatinine to 1.69 mg/dL.

After obtaining consent from the patient and her family, the contrast-enhanced abdominal CT was performed, which revealed normal liver, biliary tract, pancreas, stomach, kidneys, and spleen. Both small and large intestines appeared normal but exhibited slightly edematous walls. The appendix demonstrated signs of inflammation, measuring 9 mm at the base and 6 mm at the apex. Both ovaries appeared normal with no suspicious lesions, while the urinary bladder exhibited slightly thickened walls, with the urinary catheter in place. Additionally, the amount of free fluid observed was increased when compared to the previous plain CT, described as clear and suggestive of ascites, although no source was identified during this examination.

Details of the surgical procedure

Due to the escalating WBC count and persistent abdominal pain unresponsive to analgesics, a surgical exploration was proposed to the patient and her family members. The risks and potential benefits of the procedure were thoroughly explained. Following informed consent and consultation with the anesthesiology team, the patient was prepared for surgery.

Upon entering the operating room, the patient was placed under general anesthesia (Midazolam 2,5mg, Fentanyl 150mcg, Propofol 200mg, Pancuronium 8mg, Sevoflurane, ventilated through a 7.5 mm diameter endotracheal tube) and prepared in a standard sterile manner. A midline infraumbilical incision was made. Accessing the abdominal cavity proved challenging due to adhesions between the small intestine and the abdominal wall, necessitating careful and gradual lysis of these adhesions. During this process, approximately 2 liters of clear fluid were aspirated.

The ovaries were found to be normal, while the appendix was inflamed, consistent with the preoperative CT findings, prompting the performance of a standard appendectomy.

As the procedure progressed and adhesions were finally cleared from the pelvic region, a 2.5 cm

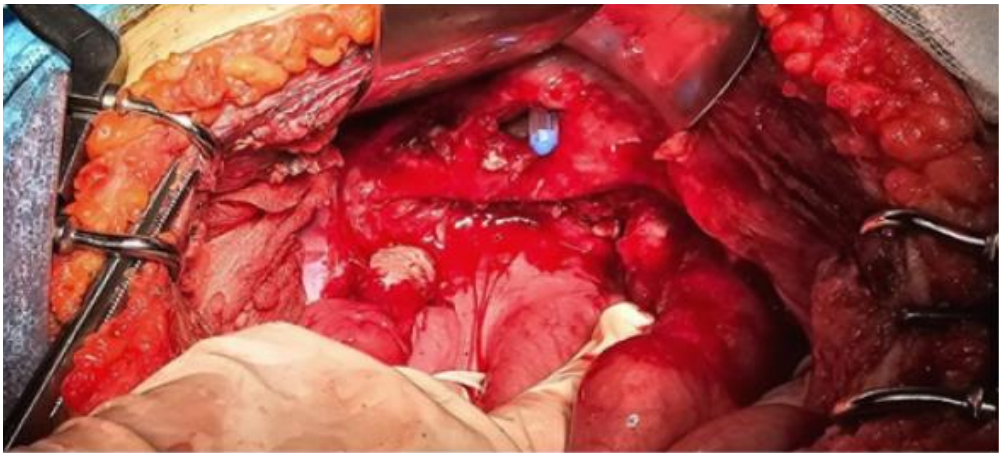

Figure 1. The tip of the urinary catheter pointing out towards the peritoneal cavity, through a 2.5cm defect at the dome of the urinary bladder

rupture in the dome of the urinary bladder was discovered. (Figure 1).

The bladder rupture was repaired in two layers, ensuring no additional lesions were present within the bladder and confirming that the ureters appeared normal. A thorough exploration of all other abdominal organs revealed them to be intact. The abdominal cavity was irrigated extensively with normal saline solution to minimize the risk of infection and ensure a clean environment for healing.

After irrigation, a drain was placed in the Douglas pouch to facilitate postoperative drainage. The abdominal cavity was subsequently closed layer by layer, and the urinary catheter was retained in place for a duration of 14 days to promote adequate urinary drainage during the recovery period.

The surgical procedure concluded without complications, and the patient was monitored closely in the postoperative period for any signs of infection or other complications.

Post-operative period

The postoperative course was uneventful; the patient had a daily urine output of 2.5 to 3 liters, passed flatus on the second day, and had a bowel movement on the third day. She was started oral feeding on the second postoperative day. She was mobilized normally, and her postoperative blood work was within normal limits. The patient received intravenous antibiotics (Cefazolin 1g x 3 IV, Ciprofloxacin 200 mg X 2 IV), thromboprophylaxis with LMWH (Dalteparine 5000 uI X 1 SC), PPI for gastric protection (Omeprazole 40 mg X 1 IV) and AIJS for pain management (Ibuprofen 400 mg x1 IV, Indometacine 100 mg X 2 per rectum), for 5 days. The abdominal drain was removed on the fourth postoperative day after less than 20 mL of fluid was discharged.

A normal contrast cystogram was performed prior to removing the urinary catheter, 14 days post-surgery. Throughout her recovery, the patient felt well, reported no abdominal pain, and

exhibited normal urinary function. Follow-up was scheduled to monitor her progress.

DISCUSSION

Bladder rupture is a situation that occurs rarely and, in most cases, is the result of pelvic or abdominal trauma. A smaller percentage can be iatrogenic, arising from surgical or endoscopic procedures, with spontaneous rupture being extremely uncommon (1).

Spontaneous bladder rupture has been reported very rarely in the literature, with most cases occurring in female patients following radiation therapy for cervical cancer. In PubMed, only one case of spontaneous bladder rupture post-hysterectomy has been published about a patient who did not undergo radiation therapy (2).

The case we present here is another rare instance of late spontaneous bladder rupture in a 42-year-old female patient who underwent total abdominal hysterectomy for benign pathology seven weeks prior. The cause of this occurrence may have been postoperative urinary retention, a known complication following surgical procedures in the pelvic region and beyond. Any type of surgery carries a risk of developing urinary retention, but gynecological and anorectal procedures have a higher risk due to factors such as regional pain and damage to peripheral pelvic nerve branches, which can lower bladder sensitivity (3).

Other predisposing factors include anesthesia (especially spinal), age over 50, female gender, pelvic organ prolapse, preoperative incontinence, postoperative urinary tract infections, administration of more than 750 ml of intraoperative fluid, and use of opioids for postoperative analgesia. Studies have shown that the use of postoperative opioids increases the risk of postoperative urinary retention by 1.5 times, while the use of indomethacin as analgesic prophylaxis significantly reduces this risk (3).

Urinary retention is characterized by impaired bladder emptying, leading to an increase in the volume of retained urine. It can be immediate or delayed, complete or partial, symptomatic or asymptomatic, acute or chronic, obstructive or non-obstructive, transient or prolonged. In most cases, postoperative urinary retention resolves spontaneously within 4-6 weeks. It is crucial to identify clinical signs that may raise suspicion for late partial urinary retention, such as hesitancy to urinate, slow urine flow, the need to lean forward during urination, straining, incomplete emptying sensations, or increased urinary incontinence. A pelvic examination may reveal issues such as hematoma, abscess, pelvic floor muscle spasms, areas of hypersensitivity, and perianal pain.

Thus, urinary retention is a condition that can lead to serious consequences if not identified and treated in a timely manner, as in our case, where the outcome was bladder rupture.

The most vulnerable area of the bladder is the dome (1). Bladder injuries are classified into five grades.

Table 1. Bladder injuries

Grade	Description
1	contusion, intramural hematoma, or partial thickness lacerations
2	extraperitoneal bladder wall lacerations of < 2 cm
3	extraperitoneal > 2 cm or intraperitoneal < 2 cm bladder wall lacerations
4	intraperitoneal bladder wall lacerations > 2 cm
5	intra- or extra-peritoneal bladder wall lacerations involving the trigone or bladder neck

Grade 1 and grade 2 injuries are managed non-surgically, with drainage and indwelling catheter placement for 7-14 days. Injuries of grade 3 or higher require additional surgical management using polyglactin sutures (4).

The American Urological Association guidelines recommend that intraperitoneal bladder rupture should always be corrected surgically (1). Small defects can be closed with a single layer, while those over 2 cm should always be closed in two layers, preferably using absorbable sutures like Vicryl. In all cases of bladder rupture, it is recommended to maintain urinary catheterization for 14-21 days after surgical or conservative treatment, removing it only after confirming via retrograde cystography with contrast that the defects are closed and contrast does not leak beyond the bladder walls (1-5).

CONCLUSIONS

Intraperitoneal bladder rupture is a serious condition that can lead to severe consequences if untreated, such as urinary peritonitis, sepsis, renal failure, and electrolyte imbalances due to the reabsorption of urinary electrolytes, nitrogen and creatinine. It is important to consider bladder rupture as a differential diagnosis in patients who have undergone pelvic surgery and present with urinary retention and unexplained ascitic fluid. Also we would like to emphasize the crucial role of the voiding trial for assessment of the voiding function in the postoperative period and how important it is that it becomes part of the protocol for every surgical center. Early recognition of this complication is crucial for timely intervention and preventing further morbidity.

Acknowledgement: None declared

Conflict of Interest Statement: The authors declare that they have no conflict of interest.

REFERENCES

1. Simon LV, Sajjad H, Lopez RA, et al. Bladder Rupture. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470226/

2. Hayashida H, Mabuchi S, Kawamura N, Matsuzaki S, Hisa T, Kamiura S. Spontaneous

bladder rupture attributable to a radical hysterectomy-associated neurogenic bladder in patients with cervical cancer: A case report and literature review. Int J Surg Case Rep 2023;103:107879.
doi: 10.1016/j.ijscr.2023.107879. Epub 2023 Jan 6. PMID: 36630764; PMCID: PMC9841013.

3. Geller EJ. Prevention and management of postoperative urinary retention after urogynecologic surgery. Int J Womens Health 2014;6:829-38. doi: 10.2147/IJWH.S55383. PMID: 25210477; PMCID: PMC4156001.

4. Patibandla S, Amanuddin SM, Ansari AZ, Saeed A, Kratz K. Iatrogenic Bladder Injury During Laparoscopic Hysterectomy: A Case Report and Discussion of Anatomic Variations. Cureus 2024;16(3):e56556. doi: 10.7759/cureus.56556. PMID: 38646348; PMCID: PMC11028013.

5. Salleh H, Azli S, Khairul-Asri MG, Jagwani A. The deceiving encounter of a spontaneously ruptured urinary bladder. Ann R Coll Surg Engl 2022;104(3):e67-e69. doi: 10.1308/rcsann.2021.0129. Epub 2021 Nov 23. PMID: 34812665; PMCID: PMC10335045.

6. Snauwaert C, Geerts A, Colle I, Van Vlierberghe H. Ascites: not always the usual suspects. Acta Gastroenterol Belg 2012;75(1):45-8. PMID: 22567747.