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Diagnostic challenges and surgical management of inguinal bladder hernia: A case report and literature review

Mingliang Li, Xuezhou Gu

Abstract

Inguinal bladder hernias (IBHs) are relatively rare, and patients often present with urinary discomfort. Early recognition of bladder involvement in inguinal hernias is critical to prevent iatrogenic bladder injury and associated complications. Here, we report a case of urinary tract infection secondary to an IBH, which was successfully repaired surgically, with an uneventful postoperative recovery. This report highlights the diagnostic and therapeutic strategies for managing IBH. Clinicians should maintain a high index of suspicion for bladder involvement in patients presenting with both lower urinary tract symptoms and an inguinal mass.

Keywords:

Bladder hernia, incarcerated inguinal hernia, inguinal bladder hernia, inguinal hernia repair

Introduction

Inguinal hernia is a common condition, with an estimated lifetime risk of approximately 27% in men and 3% in women.[1] It typically presents as a palpable mass in the groin region, often accompanied by varying degrees of discomfort or pain. In most cases, the diagnosis can be established based on a detailed medical history and thorough physical examination. However, several uncommon variants of inguinal hernia warrant particular attention. Among these, bladder inguinal hernia represents a rare entity, accounting for approximately 0.5%–3% of all inguinal hernias.[2] In addition to groin pain or swelling, affected patients may present with lower urinary tract symptoms or urinary retention.[3] In such cases, heightened vigilance is required during both diagnostic evaluation and surgical management. We report a case of urinary tract infection secondary to bladder herniation in an elderly male patient with an inguinal hernia.

Case Report

A 73-year-old male patient, with a body mass index of 31.14 and a medical history of hypertension, diabetes mellitus, and coronary heart disease, presented with persistent right flank discomfort for 2 weeks, along with a long-standing history of urinary difficulty. The patient had been diagnosed with a right inguinal hernia more than 10 years earlier and had previously undergone a conventional open repair without mesh implantation. One week after the initial surgery, he noticed a recurrent bulge at the operative site. The hernia was initially reducible; however, as the mass progressively enlarged, it gradually descended into the scrotum and became irreducible. This was accompanied by worsening urinary difficulty, and at times, the patient needed to manually compress the scrotum to facilitate urination.

Department of General Surgery, Sheyang County People's Hospital, Yancheng, China

Address for correspondence:
Dr. Xuezhou Gu, Department of General Surgery, Sheyang County People's Hospital, Yancheng 224300, China.
E-mail: xuezhougu@163.com

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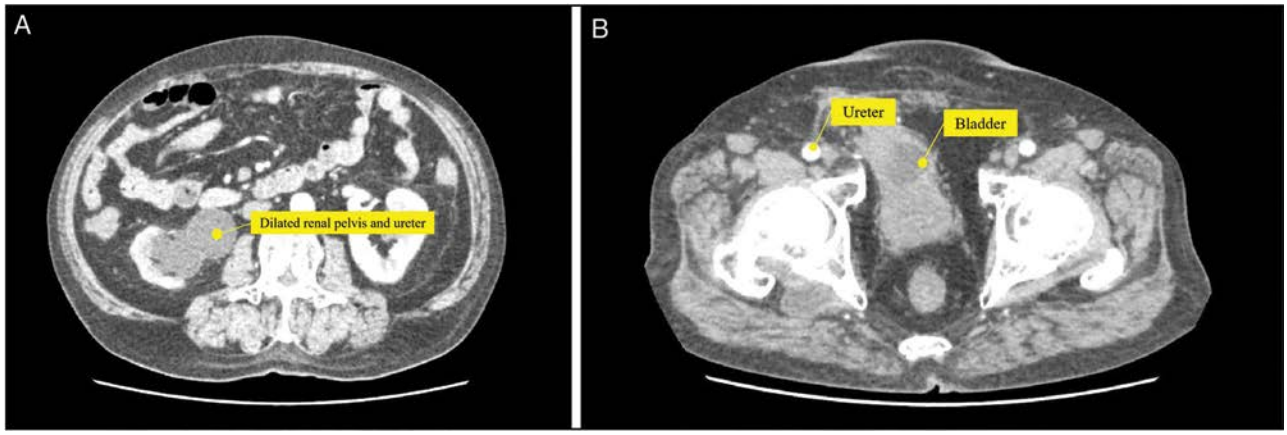


Figure 1: Computed tomography imaging: A. revealed dilation of the renal pelvis and ureter; B. and herniation of the distal segments of both ureters and the bladder into the right scrotum



Figure 2: A mass in the groin area before the operation

Over the preceding 2 weeks, the patient experienced progressively worsening right flank pain and discomfort, accompanied by fever, which prompted hospital admission. Physical examination and laboratory investigations suggested urinary tract obstruction with associated infection. Computed tomography (CT) imaging demonstrated herniation of the distal segments of both ureters and the urinary bladder into the right scrotum [Figure 1]. After informed consent was obtained, the patient was admitted to the Department of General Surgery, and elective surgical repair of the inguinal hernia was scheduled [Figure 2].

A laparoscopic approach was initially attempted. Intraoperatively, the internal inguinal ring defect



Figure 3: Laparoscopic exploration revealed a bladder hernia

measured approximately 5 cm in diameter. The peritoneum was incised in an arc-shaped fashion above the defect, extending from the lateral border of the medial umbilical ligament to the anterior superior iliac spine. The medial umbilical ligament was carefully preserved to avoid bleeding from the obliterated umbilical artery. Blunt dissection was then carried out along the avascular plane between the peritoneum and the transversalis fascia. Intraoperative exploration revealed that the entire urinary bladder [Figure 3], along with portions of both ureters, had herniated into the scrotum and could not be reduced laparoscopically [Figure 4]. Therefore, conversion to open surgery was undertaken. An anterior abdominal wall incision was made and deepened layer by layer to expose and open the hernia sac [Figure 5]. The bladder was carefully reduced from the scrotum, and the spermatic cord was meticulously dissected free from the hernia sac [Figure 6]. The hernia sac was subsequently closed with interrupted sutures. The bladder appeared viable and was successfully reduced to its normal anatomical position without the need for resection, with both ureters restored to their natural course. Intraoperative findings included a weakened posterior wall of the inguinal canal and atrophic musculature superior to the internal ring. The internal ring was narrowed using 2–0 absorbable sutures, and a

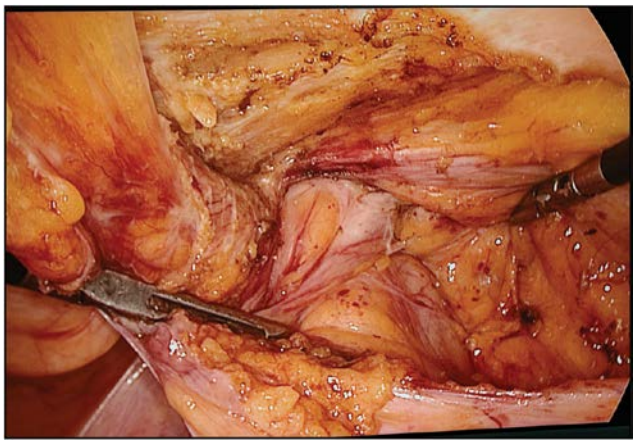


Figure 4: The bladder and ureters cannot be repositioned via laparoscopy

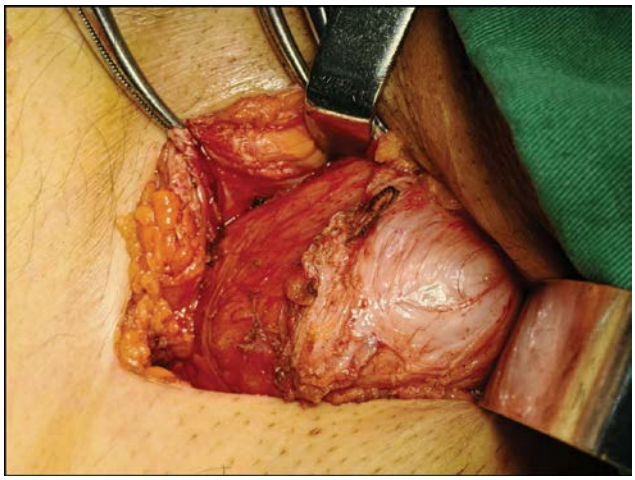


Figure 5: Performing the Lichtenstein procedure

lightweight polypropylene mesh was placed to reinforce the posterior wall of the inguinal canal [Figure 7]. After appropriate measurement, the mesh was tailored to a size of 10 cm × 15 cm to ensure adequate coverage of the defect without compromising the spermatic cord. The mesh was secured with continuous sutures to the inguinal ligament inferior to the pubic tubercle, and its superior margin was intermittently fixed to the conjoint tendon. A drainage tube was placed anterior to the mesh, brought out through a separate lateral stab incision, and secured in place. The external oblique aponeurosis was then closed, followed by layered closure of the remaining tissues.

The total operative time was 215 min, and the procedure was completed without intraoperative complications. The postoperative course was uneventful. Incisional pain was mild, and the scrotal swelling gradually resolved. The urinary catheter was removed after 1 week of indwelling. Follow-up ultrasonography demonstrated a post-void residual urine volume of < 10 mL, indicating satisfactory recovery of urinary function. The patient was discharged on postoperative day 9 [Figure 8]. He was

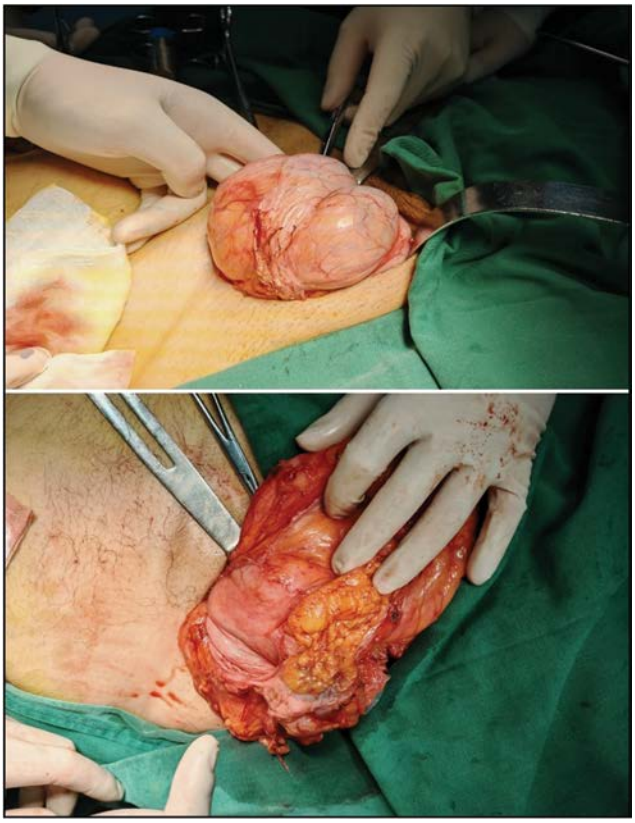


Figure 6: Separating and resetting the bladder

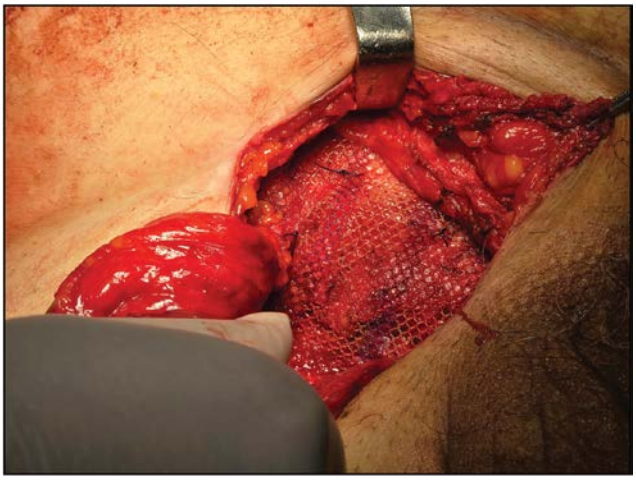


Figure 7: A lightweight polypropylene mesh was placed to reinforce the posterior wall of the inguinal canal

advised to avoid strenuous activity and heavy-lifting and to seek prompt medical attention if any concerning symptoms developed. At the 3-month follow-up visit [Figure 9], the patient remained clinically stable, with no evidence of hernia recurrence.

Discussion

This report describes a rare case of a 73-year-old male with a recurrent inguinal hernia involving the urinary



Figure 8: Nine days after surgery



Figure 9: Three-month follow-up

bladder. The patient had undergone open inguinal hernia repair 10 years earlier, but the hernia recurred shortly thereafter. His primary presenting symptoms included lower back pain, urinary tract infection, and difficulty with urination.

Levine[4] first reported in 1951 that 1%–4% of inguinal hernia cases involve the urinary bladder. Risk factors for bladder herniation include advanced age, male sex, obesity, weakness of the abdominal and pelvic musculature, and chronic bladder outlet obstruction. These factors may contribute to weakening of the bladder wall, bladder enlargement, and subsequent herniation into the inguinal canal.[3,5] Small inguinal bladder hernias (IBHs) are often asymptomatic, whereas larger hernias frequently present with inguinal swelling and lower urinary tract symptoms, including urinary tract infections.[6] A characteristic clinical feature is the need for manual compression of the hernia sac to achieve complete bladder emptying after spontaneous voiding.[7] This phenomenon, known as Mery's sign, should prompt clinicians to consider the possibility of an IBH.[8] There are also reports of large IBH occurring without urinary symptoms. Therefore, in any elderly, obese patient presenting with a large inguinal hernia, the possibility of bladder involvement should be considered.[9-11] Timely diagnosis and intervention are crucial for the management of this rare but potentially life-threatening condition.[12,13]

The diagnosis of IBH primarily relies on imaging studies.[14,15] Ultrasound is often used as the first-line modality due to its convenience and noninvasiveness, typically demonstrating a hypoechoic mass extending from the inguinal canal into the scrotum. Cystography remains the gold standard for diagnosing IBH. Nevertheless, the literature indicates that IBHs are more often identified intraoperatively rather than preoperatively. Unexpected intraoperative discovery of the hernia significantly increases the risk of bladder injury.[16] Although CT imaging is not routinely indicated for conventional inguinal hernias, it can be particularly valuable in patients suspected of having a bladder inguinal hernia as it facilitates preoperative surgical planning and helps prevent inadvertent bladder injury.[3,17-19] Especially when the hernia contents contain stones, CT examination is especially useful for identifying them.[20] Additionally, in cases where the hernia contents are reducible, CT performed in the prone position may provide greater diagnostic value.[21] Clinicians should select the most appropriate examination method based on the individual patient's presentation and clinical circumstances.

Once a definitive diagnosis is established, surgical repair is indicated. Open hernia repair with mesh remains the primary treatment modality,[22] with recurrence rates comparable to those of laparoscopic approaches.[23,24] In our experience, hernias that are difficult to reduce can also present challenges for laparoscopic management. If necessary, the surgeon may enlarge the defect in the posterior wall of the inguinal canal intraoperatively to facilitate reduction of the hernia sac. Bladder resection is relatively uncommon and is reserved for cases in which the

bladder is incarcerated, necrotic, or associated with a diverticulum or tumor.[16] Among open surgical options, both Lichtenstein tension-free repair[25,26] and the improved Bassini technique[27,28] have been reported in previous cases. The choice of procedure may depend on the surgeon's experience and proficiency. Intraoperative use of methylene blue-dyed saline has been successfully employed to identify the bladder and prevent iatrogenic injury during hernia repair.[29]

In addition to open surgery, recent studies have also reported hybrid laparoscopic/open approaches[30] or purely laparoscopic techniques,[31,32] suggesting that, in the hands of an experienced surgical team, these methods can be safe and feasible alternatives. Laparoscopic repair is generally associated with shorter hospital stays, reduced analgesic requirements, earlier mobilization, and faster return to normal daily activities.[33] Given that procedures involving the urinary system require precise manipulation, some studies have recommended robot-assisted surgery, which has been reported as safe and effective and may offer additional benefits for patients with concurrent urinary conditions, such as an IBH.[34]

Conclusion

Inguinal hernia is a common surgical condition, whereas IBH is rare. Clinicians should be vigilant and enhance their understanding of its diagnosis. The treatment strategy involves repositioning the bladder to its normal anatomical location and repairing the inguinal hernia. Depending on the clinical scenario, either laparoscopic or open surgical approaches—or a combination of both—may be employed.

Author contributions
All authors contributed to the writing and resource provision of this article.

Ethical policy and Institutional Review Board statement
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Declaration of patient consent
Informed consent was obtained from all individual participants included in the study.

Data availability statement
The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Conflicts of interest
There are no conflicts of interest.

Human and animal rights
This article does not contain any study with animals performed by any of the authors.

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