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# Recurrence of an inguinal hernia containing the dome of the bladder following laparoscopic repair with mesh: A case report

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## ABSTRACT

**INTRODUCTION:** A sliding hernia is a rare type of inguinal hernia in which the hernia sac is partially formed by the wall of a viscus, such as the sigmoid colon, bladder, cecum, or appendix. Sliding hernias involving the bladder often present with obstructive urinary symptoms that could potential lead to serious complications.

**CASE PRESENTATION:** In this case, we present a 37-year-old male with a recurrent sliding hernia containing the dome of the bladder after prior laparoscopic repair of a direct inguinal hernia with mesh.

**DISCUSSION:** A TAPP approach is preferred over a TEP approach in the laparoscopic repair of a sliding hernia; however, an open Lichtenstein repair should be used in cases of recurrent hernias with severe complications, such as extensive adhesions or incarceration.

**CONCLUSION:** The surgical approach for repair of a sliding hernia must be individualized based on the patient's clinical presentation and diagnostic findings.

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## 1. Introduction

A sliding hernia is a rare type of hernia in which the hernia sac is partially formed by the wall of a viscus, such as the sigmoid colon, urinary bladder, appendix, cecum or ureter [1,2]. The partial involvement of a viscus as part of the hernia sac is also referred to as a Type I sliding hernia. Type II sliding hernia sac contains the mesentery of retroperitoneal and a type III sliding hernia sac involves the entire viscus; however, these types are rare [1]. The frequency of sliding hernias is approximately 3–5% with the most common sliding component being the sigmoid colon (62.5–72.2%), follow by cecum (12.5–16.7%), appendix (12.5%), urinary bladder (5.6–12.5%), and ascending colon (5.6%) [1,3]. Sliding hernias also tend to occur in older age groups (63.5 years old) and have longer symptomatic periods (5.3 years) [1,3]. Complications involving sliding hernia include obstruction, incarceration, and strangulation. As for sliding hernias containing the bladder, patient's often present with obstructive urinary symptoms, scrotal swelling, urgency, dribbling, nocturia, frequency and incomplete voiding [4,5]. In severe cases, patients may present with hydronephrosis, hematuria and acute renal failure [2,4,5]. In general, sliding hernias are more difficult to repair secondary to the involvement of the viscus as part of the hernia sac. The repair requires careful dissection, which contributes to increased operating time. Laparoscopic methods for inguinal

hernia repair included transabdominal preperitoneal repair (TAPP) and total extraperitoneal repair (TEP). On occasion, a laparoscopic approach must be converted to an open repair due to a difficult dissection or other intraoperative complications. We present a case of a recurrent inguinal hernia that involved the dome of the bladder following laparoscopic repair and discuss the multiple techniques used to repair sliding hernias.

## 2. Presentation of case

A healthy 37-year-old male presented to the surgical clinic with a reducible right inguinal hernia and accompanying symptoms. Patient was taken to the operating room for a laparoscopic total extraperitoneal (TEP) repair after adequate preoperative preparation. Once the preperitoneal space was entered, a right direct hernia with a small indirect component was identified. A large 3DMax patch was laid over the myopectineal orifice and secured with SorbaFix to the iliopubic tract and rectus muscle. Patient tolerated the procedure and was discharged that day.

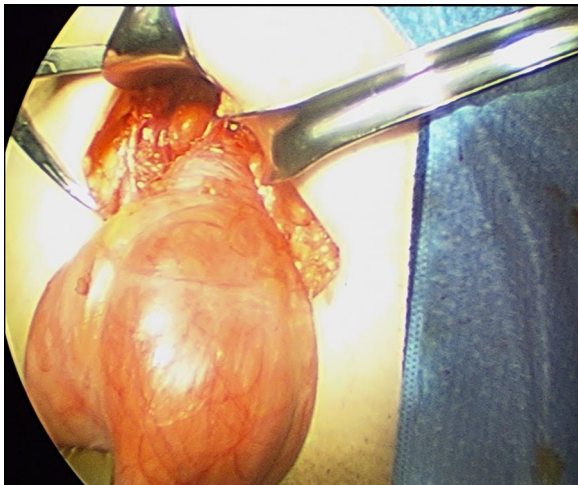
The patient returned to the surgery clinic one month later with a recurring right inguinal hernia. His occupation involved heavy physical labor. While at work, he noticed a popping sensation with an associated right groin mass. The patient denied urinary retention but reported discomfort and pressure with voiding. An inguinal hernia was identified on physical exam. There were no other significant symptoms. Due to the recurring nature, a CT abdomen and pelvis with oral and intravenous contrast were obtained. Imaging demonstrated a right inguinal hernia that contained portion

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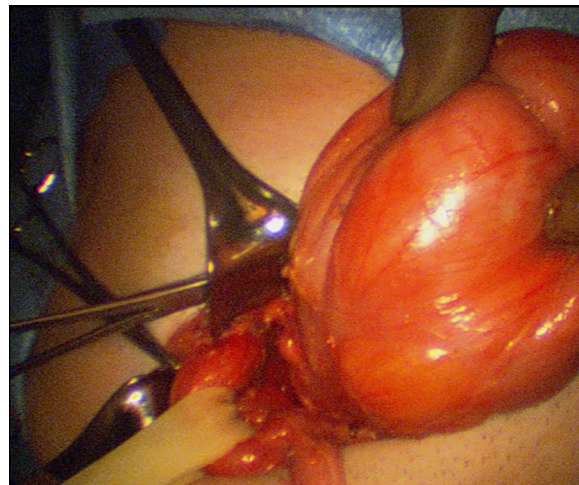
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**Fig. 1.** Right-sided inguinal hernia containing the dome of the bladder extending into the scrotum.



**Fig. 2.** Dissected hernia sac including bladder and viscera.



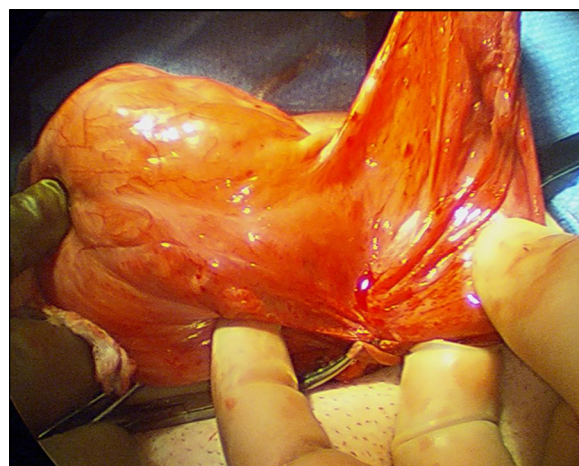
**Fig. 3.** Dissected hernia sac including bladder and viscera.

of the dome of the bladder extending into the scrotum (Fig. 1). The dome of the bladder seems to go underneath the laparoscopically placed mesh. With these new findings, the patient was admitted and urgent repair of the incarcerated sliding hernia was planned.

The patient was brought back to the operating room a few days prior to admission for an open repair of an incarcerated perivesicular sliding hernia. A large direct defect was identified, and the preperitoneal mesh could be palpated down in the defect (Fig. 2). A large portion of the bladder could also be felt within the direct hernia sac (Fig. 3). The bladder was dissected from the mesh and reduced back through the direct defect (Fig. 4). The floor of the defect was repaired with a Bio-A tissue patch, as there was inadequate tissue to close the defect. An Ultrapro macroporous prolene mesh was trimmed to size and placed above the floor to patch the direct space. Patient was discharged from recovery the same day.

### 3. Discussion

The incidence of urinary bladder within a sliding hernia is 5.6–12.5% and less than 1% in all hernias. Sliding hernias are often complicated at the time of presentation. A study conducted by Patle et al. demonstrated that 64.8% of cases were complicated, with 50% irreducible, 12.9% obstructed and 1.9% strangulated. Only 35.2% of cases were found to be reducible [3]. Patient's with sliding hernias containing the bladder often present with obstructive urinary symptoms, scrotal swelling, urgency, frequency, incomplete voiding, hydronephrosis and acute renal failure [4,5]. Average age of patients with sliding hernias is 10 years greater than that of patients without a sliding component (63.5 vs. 53.4) [1]. Our patient's age was 37 years old, which is younger than the mean age seen in mul-



**Fig. 4.** Dissection of sac away from bladder.

tiples studies. His recurrence could be attributed to the nature of his work, since it required frequent straining forces to the abdominal and inguinal region. In a prospective study, Matthews et al. followed 1696 men after open and laparoscopic hernia repair and reported that a higher preoperative activity level during work or leisure time predicted a high risk of recurrence after laparoscopic repair [6,7]. The persistent elevation in intraabdominal pressure could be a potential factor in the development of this patient's recurrent hernia. Other risk factors of recurrence following laparo-

scopic repair included BMI less than 25, influence of a caregiver, ASA classification and recent enlargement of hernia [6].

Diagnosis of a sliding hernia is usually established during the dissection of the hernia sac [1]. Imaging techniques such as ultrasound, computerized tomography, and contrast-enhance retrograde cystography prove helpful in making a preoperative diagnosis. Preoperative identification of structures within the hernia sac allows better surgical planning and may help reduce the risk of injury to viscera. Inadvertent bladder injury during herniorrhaphy can be left unrecognized, leading to postoperative hematuria, sepsis, and fistula formation [5,8]. These imaging techniques are also useful in the recognition of preoperative complications such as bladder rupture and incarceration [9]. If ultrasound or CT is not available, a retrograde cystogram can be used to evaluate patients with obstructive urinary symptoms. In our patient, CT scan identified a direct inguinal hernia containing the urinary bladder without signs of rupture or incarceration.

Laparoscopic methods for inguinal hernia repair included trans-abdominal preperitoneal repair (TAPP) and total extraperitoneal repair (TEP). In a TAPP repair, an optical trocar is inserted at the umbilicus into the peritoneal cavity. This allows inspection of the peritoneal cavity and confirmation of a sliding hernia by examining the wall of the hernia sac [3]. In a TEP repair, the preperitoneal space is accessed with or without opening the hernia sac [3]. In our patient, the first herniorrhaphy was repaired using the TEP approach. This is the preferred approach because it does not enter the peritoneal cavity; therefore, reducing the incidence of bowel injury, adhesion formation, and postoperative bowel obstruction.

For the repair of a sliding hernia, the TAPP approach is the preferred laparoscopic method because the peritoneal cavity can be visualized to confirm the involvement of an abdominal organ in the hernia sac [3]. Sliding hernias are often irreducible and difficult to dissect due to adhesions. Therefore, a TAPP approach is better suited due to its advantages in visualization and mobility of instruments compared to a TEP repair.

Despite the popularity of the laparoscopic approaches, many sliding hernias are repaired using an open Lichtenstein herniorrhaphy. This method is the best option for patients with severe complications including extensive adhesions, incarceration, extreme visceroptosis, bladder rupture, or giant hernias resulting in abdominal compartment syndrome [9]. In a Lichtenstein repair, mesh is anchored to Cooper's ligament, inguinal ligament, conjoined tendon and transversalis fascia in a tension free manor [8]. In our patient, a Lichtenstein repair was chosen for the repair of the recurrent sliding hernia due to the presence of extensive adhesions and the size of the bladder involved in the hernia sac. Therefore, the method of repair should be individualized based on careful analysis of clinical presentation and diagnostic findings.

#### 4. Conclusion

A sliding hernia containing the urinary bladder is a rare occurrence, comprising less than 1% of all hernias undergoing elective repair. It commonly occurs in the older population and has a longer symptomatic period. Ultrasonography and computerized tomography are useful diagnostic tools for the examination of sliding hernias and for formulation of surgical plans. Complications accompanying sliding hernias include irreducibility, obstruction, and strangulation. TAPP approach is preferred over TEP when attempt-

ing laparoscopic repair of an irreducible sliding hernia. An open Lichtenstein repair should be used in case of multiple or severe complications.

#### Competing interests

The authors declare that they have no competing interest.

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#### Ethical approval

Case report required no IRB approval. Informed consent was obtained from patient.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

#### Author contribution

Dr. Ryan D. Konik and Dr. Patrick Narh-Martey—writing the paper.

Dr. Gregg Bogen—study concept, primary surgeon.

#### Guarantor

Ryan D. Konik, MD.

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