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Urinary bladder herniation in the differential diagnosis of inguinal hernia

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Abstract

Urinary bladder hernia is a clinical condition that mimics symptoms of inguinal hernia. It is vital to predict and prevent the iatrogenic bladder injury that may develop secondary to inguinal bladder herniation during inguinal hernia surgery, which is frequently performed, and to be able to determine our preoperative and perioperative surgical approaches. Patients with a diagnosis of inguinal hernia who underwent elective and emergency surgery between 2018 and 2020 were reviewed retrospectively. Age, gender, body mass indexes, imaging modalities, operation techniques, duration of hospital stay, perioperative and postoperative morbidity and mortality of the patients were recorded. Bladder herniation was found in seven patients, five of whom underwent elective surgery and two of whom underwent emergency surgery. The median age of the patients was 84 (min.52-max 89). Perioperative bladder injury was observed in two of the 6 patients who underwent computed tomography in the past year. Two patients, who had a bladder injury, underwent primary repair and were followed up with a foley catheter. Postoperative duration of hospitalization was 3.28 (2-7) days on average and the duration of hospitalization was prolonged up to an average of 6 (5-7) days in two patients with bladder injury. No postoperative mortality and morbidity were observed. It should be taken into consideration that there may be urinary bladder herniation in the differential diagnosis of inguinal swelling in patients presenting with symptoms of inguinal hernia at an advanced age. There is a need for methods that may reduce the morbidity and mortality secondary to bladder herniation.

Keywords: Inguinal hernia, bladder herniation, urinary leakage, bladder catheterization, surgery

Introduction

Inguinal hernia is one of the common diseases in general surgery practice and more than 20 million patients undergo inguinal hernia repair each year [1]. Almost any pelvic organ such as appendix, Meckel's diverticulum, omentum small intestine, colon, ovary, stomach and gallbladder can be located in the hernia sac [2]. Urinary bladder hernia (UBH) is a clinical condition involving less than 5% of all inguinal hernias [3]. The incidence of UBH, which is a rare condition, may be as high as 10% among obese men aged over 50 years [4,5]. UBH, which is often asymptomatic and where multiple factors are considered to be responsible for its etiology, is discovered incidentally during surgery or imaging studies performed [3,4].

The perioperative surprising encounter of the surgeons with this condition during inguinal hernia surgery performed very commonly may often lead to an increased rate of complications [3-5].

In this study, we planned to present the clinical demographic characteristics, perioperative and postoperative complications, and treatment modalities of the patients, who had surgery for an elective and emergency inguinal hernia and in whom bladder herniation was found, with the literature.

Materials and Methods

Patients with a diagnosis of inguinal hernia who underwent elective and emergency surgery at the tertiary Department of General Surgery between January 2018 and January 2020 were reviewed retrospectively via the Probel system. Bladder herniation was observed in seven patients among 978 patients. Seven patients were included in the study. Age, gender, body mass indexes, preoperative imaging modalities, operation techniques, mesh usage status, duration of hospital stay, perioperative and postoperative morbidity and mortality rates of the patients were recorded. A retrospective observational study was performed. Approval from University of Health Sciences Tepecik Training and Research Hospital institutional research ethics board was obtained (decision number 2020/12-1).

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Results

In this retrospective study of 978 inguinal hernia patients who underwent elective or emergency surgery, bladder herniation was observed in seven operated patients (0.71%). All patients were male with a median age of 84 (min 52- max89) years. Five patients (71.43%) had unilateral and two patients had bilateral (28.57%) inguinal hernias. Left inguinal bladder hernia was found in two patients (28.57%), right inguinal bladder hernia in five patients (71.43%) by imaging and perioperative surgery findings. No perioperative bladder necrosis was observed in any patient and no bladder resection was performed. It was observed that patients, who had elective surgery, had previous urology outpatient clinic admissions and therefore, non-contrast abdominal computed tomography (CT) performed in the last year revealed bladder herniation (Figure 1, Figure 2). Perioperative bladder herniation into the inguinal canal was seen in 6 patients and bladder herniation into the femoral canal in one patient. All patients were using medication due to benign prostatic hyperplasia (BPH). Perioperative bladder injury was observed in two elective patients who underwent non-contrast CT during the admission for their urinary complaints, primary repair of the bladder was performed in these patients and they were followed-up with Foley catheter along with the antibiotherapy support during service follow-up.

The mean body mass index (BMI) of the patients was found to be 21.74 kg/m² (19.6-28.8kg/m²). The mean body mass index of the patients included in our study was observed to be lower compared to the literature. Except for one patient with high BMI, other patients had a normal BMI. We think that this is due to the small patient group and especially when the age distribution is analyzed, due to non-homogeneous distribution secondary to having a patient group, most of which are aged 80 years or older. Although BH is most commonly observed in the 5th-7th decades, all patients in our study were over 80 years old, except for two patients. The American Society of Anesthesiologists (ASA) score of one patient who had elective surgery was 2 and the ASA score of the other four patients was 3. The ASA score of two patients who had emergency surgery due to incarcerated hernia was 3E.

The hernia of one patient who had emergency surgery was repaired primarily and mesh reinforcement was used in the other 6 patients. Except for one patient, concomitant comorbidities and high ASA scores of the patients caused them to be followed up in the intensive care on the first postoperative day. We believe that this had an impact on the total duration of hospitalization and is an effective factor in prolonging the mean duration of hospitalization. In addition, the duration of hospitalization was observed to be prolonged up to 7 days due to perioperative bladder injury in 2 patients. After confirming that there was no urinary leakage following postoperative cystograms, two patients with bladder injury were discharged on appropriate antibiotherapy after their foley catheters were removed. No urinary tract infection or recurrence was seen during the postoperative follow-up of the patients. Perioperative bladder injury was observed in two patients and no postoperative mortality and morbidity were seen.

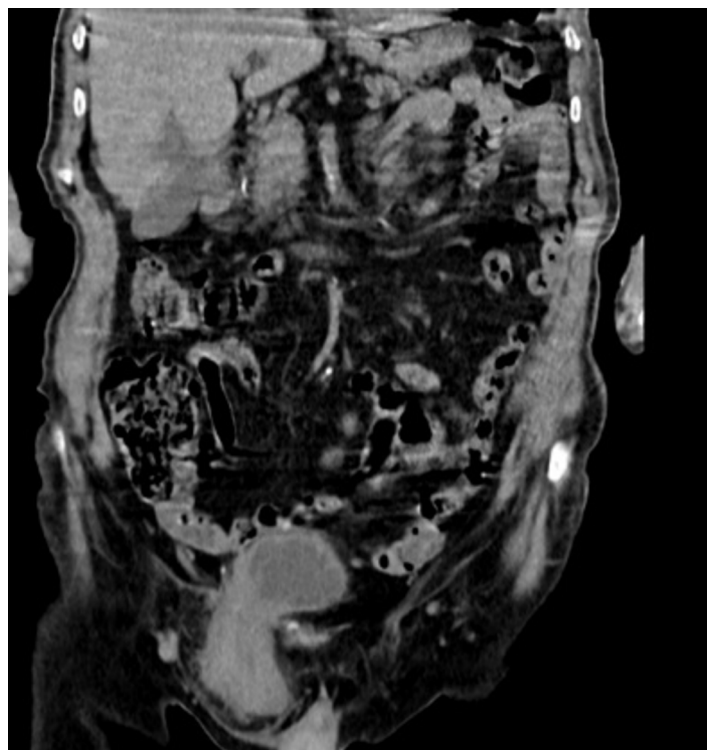


Figure 1. The coronal view of a bladder herniated into the right inguinal canal on CT scan



Figure 2. The axial view of a bladder herniated into the right inguinal canal on CT scan

Discussion

Inguinal UBH accounts for 1-4% of all inguinal hernias [3,4]. UBH is divided into three subgroups depending on its relation to the peritoneum: extraperitoneal, paraperitoneal, and intraperitoneal [5]. Paraperitoneal hernia is the most common type [5,6]. The herniation may involve a small area from any portion of the bladder or may include the whole bladder [3,5]. Although herniation is frequently observed in the inguinal (75%) and the femoral canal (23%), UBH can also happen across the obturator, ischiorectal and abdominal peritoneal openings by 2% [5-7].

The incidence of UBH in case series and review studies in the literature has a male dominance [6. Branchu et al [3] reported

an incidence of 95.3% in men, similar to our study. Although the inguinal hernia side was not reported in this study, Kraft et al and Lee et al have reported that the bladder herniation was predominantly in the right inguinal region in their case series, similar to our study [4,6].

Multiple factors such as male gender, advanced age, obesity, BPH, weakness of the pelvic floor muscles, adhesion of the bladder wall to perivesical adipose tissue, decreased bladder tone, bladder diverticulum, tumoral mass leading to urinary obstruction, bladder stone play a role in UBH etiopathogenesis [3-6]. All patients in our study had male sex and BPH as risk factors. No bladder diverticulum, stone, or tumoral mass was seen in the patients. In the study conducted by Lee et al [6], the mean age was reported to be 71 years and the advanced age was emphasized to be a risk factor. The mean age of the patients included in our study was 84 (min 52- max 89) years and the patients in our study had a higher mean age compared to the study conducted by Lee et al [6].

12.7% of patients with UBH are asymptomatic [3-5]. Symptoms, including pain and swelling in the inguinal area, size reduction of inguinal mass after voiding (Mery's sign), dysuria, hematuria, increased urination by pressing on the swelling area, nocturia, urinary urgency, urinary retention, increased frequency of voiding are the most common presenting complaints [3,4]. In addition, UBH may also have severe clinical manifestations such as acute renal failure, and vesicocutaneous fistula. All patients in our study had complaints of swelling in the inguinal region (100%) and pain in the inguinal region (100%). In a systematic review study conducted by Branchu et al.3, it was observed that 60.3% of the patients had inguinal swelling and 39.7% of the patients had inguinal pain, these complaints were similar to common presenting complaints observed in patients with typical inguinal hernia [3].

Less than 7% of UBH can be diagnosed preoperatively, while 16% can be diagnosed postoperatively due to complications such as iatrogenic bladder injury and urinary leakage [6]. In our study, two patients who developed bladder injury were detected perioperatively and surgical primary repair was performed. If the bladder herniation is missed out, it may result in serious complications such as vesicoureteral reflux, vesicocutaneous fistula, bladder rupture, hydronephrosis, necrosis secondary to strangulation, and even death [3,6].

Among the preoperative imaging modalities, especially cystography and CT are outstanding imaging modalities. Although many studies advocate cystography as the gold standard, compared to CT, both imaging modalities have some advantages over each other [7-11]. Compared to cystography, CT has a higher rate of predicting structures within the hernia sac and excluding other non-hernia causes [8,9]. There are studies reporting that performing CT especially in the prone position in these patients may provide an advantage in diagnosis. These studies stated that diagnostic accuracy would be higher because it is easier for the contrast agent to pass to the herniated bladder region on images taken in prone position [10,11]. USG, on the other hand, has a lower sensitivity and specificity for the diagnosis compared to cystography and CT [8-11]. In our study, 7 patients who underwent surgery had preoperative superficial tissue USG, and bladder herniation was observed in none of them. On the contrary, superficial tissue ultrasonography stated that there was a herniated bowel loop view.

Although performing preoperative CT does not eliminate the risk of urinary injury, it is obvious that CT is superior in diagnosing and revealing the contents of the hernia sac compared to USG [8-10]. In our study, bladder injury was observed in two of six patients who had undergone CT in the past year for previous urological complaints. Although it is possible to have detailed information about the contents of hernia sac with computed tomography that can be performed routinely in all patients in the risk group, this is a costly condition and cannot be expected to be a highly feasible method in routine clinical practice. Also, routine CT may not reduce the risk of developing bladder injury, as in our study.

There is no standardization and there are different opinions for the treatment of bladder herniation due to cases reported frequently on a case-by-case basis and few studies in the literature. Although conventional surgery (80.7%) methods have been often used, it has been reported that laparoscopic (6.5%) and robotic surgery (2.2%) were also used [3,6]. The most commonly used technique in conventional surgery is Lichtenstein with a rate of 32.7%, followed by Bassini, Mac Way, Shouldice methods, respectively. The mesh was reported to be used in the hernia repair by 34.8%. In our study, Lichtenstein (85.7%) was preferred as the most common method and Mac Way (14.2%) method was used in one patient.

Foley catheters were not inserted in any patient who was included in our study, had UBH, and had elective surgery, and bladder injury was observed in 2 (40%) of 5 patients who had elective surgery compared to all operated patients (28.5%). As the preoperative foley catheterization was performed in both patients, who had emergency surgery, we believe that palpation of the balloon of the foley catheter in the area considered to be a hernia sac guides us and reduces the risk of bladder injury. Foley catheterization, which is a simple, inexpensive, and easily applicable method, can be considered as a factor that may reduce the rate of perioperative bladder injury. In our study, we think that prophylactic antibiotherapy given preoperatively and early foley catheter removal in patients without bladder injury may have a role in the absence of the urinary system infection secondary to bladder catheterization in any patient.

Although the number of patients included in our study is limited, performing lower abdominal CT, a preoperative non-invasive method, and bladder foley catheterization, an invasive method, are methods that reduce the risk of perioperative bladder injury and may decrease the mortality that may develop in patients with comorbidities in this advanced age group secondary to postoperative urinary leakage [8,9]. When evaluated on the cost basis, we believe that bladder foley catheterization may be an easily accessible and applicable method.

Conclusion

In conclusion, it should be kept in mind that inguinal bladder herniation may be found in the differential diagnosis of inguinal swelling, especially in patients with advanced age who had inguinal hernia symptoms as well as urinary symptoms. Although not compatible with the literature, BMI was lower in the patient group included in our study, and the mean age of occurrence was found to be higher compared to the literature. Having a bladder injury in two patients who underwent preoperative CT suggests that imaging may not eliminate the risk of perioperative complications

but may decrease it. Prospective studies with a large number of cases on this subject are warranted.

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Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

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Ethical approval

Approval from University of Health Sciences Tepecik Training and Research Hospital institutional research ethics board was obtained (decision number 2020/12-1).

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