Case Report

Obturator Hernia of the Bladder Treated by Midline Preperitoneal Approach: A Case Report

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Abstract

A 77-year-old female with a 3-year history of left thigh pain and a diagnosis of hip osteoarthritis presented with worsening left thigh pain and the onset of lower abdominal pain and cold sweat. Computed tomography showed a left obturator hernia. The small bowel was not obstructed, and the obturator hernia was thought to contain the urinary bladder. Cystoscopy showed a recess in the left wall of the bladder, and cystography revealed protrusion of the bladder into the left obturator foramen. The patient was preoperatively diagnosed with obturator hernia of the bladder. Repair was performed using the midline preperitoneal approach. Within the obturator foramen, there was a hernia sac composed of thick peritoneum with the bladder lying along the medial wall of the sac. Intraoperative diagnosis was paraperitoneal bladder hernia through the obturator foramen. The obturator foramen was repaired with a polypropylene mesh, which was placed in the preperitoneal space and fixed to Cooper's ligament. We report a rare case of obturator hernia of the bladder treated by midline preperitoneal approach.

Key words: obturator hernia, bladder hernia, midline preperitoneal approach

Introduction

Obturator hernias (OHs) account for only 0.07 % of all hernias and occur most commonly in thin elderly women¹⁾. Most OHs are diagnosed following small

bowel obstruction. Bladder hernias account for 1-4 % of groin hernias in adults²⁾, but few cases of bladder hernias through the obturator foramen have been reported. We present a rare case of OH of the bladder in an elderly female with chronic thigh pain diagnosed by computed tomography, cystoscopy, and cystography, and repaired by a midline preperitoneal approach.

Case Report

A 77-year-old female presented to Kumiai Kosei Hospital with a 3-year history of left thigh pain. She was diagnosed with osteoarthritis of the hip by an orthopedist. Her left thigh pain had worsened over the previous year, and new symptoms of lower abdominal pain and cold sweat had appeared. Over the previous 6 months, these symptoms occurred several times a week, with symptoms improving within a few hours of rest or massage of the groin. The patient denied nausea, problems with micturition, and abnormal gait.

Computed tomography was performed by an orthopedist to examine her thigh pain, which revealed no fractures, and identified the OH. Because ileus was not present, the orthopedist chose observation; however, 3 months after the CT examination, her thigh pain and abdominal pain worsened, and she consulted our department. At presentation, she was 146 cm tall and weighed 39 kg, resulting in a BMI of 17.6 kg/m². No apparent mass was palpable at her obturator foramen, and we considered that her thigh pain was a Howship-Romberg sign. Computed tomography performed by the initial orthopedist 3 months earlier revealed a fluid-filled spherical mass 2 cm in diameter in the left obturator foramen (**Fig. 1**). The small bowel was not obstructed. Her bladder was filled with urine and continuous with

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Fig. 1 a) Horizontal view: CT image showing a fluid-filled spherical mass 2 cm in diameter (arrow) in the left obturator foramen. b) Sagittal view: The bladder is filled with urine (arrowheads) and continuous with the spherical mass in the obturator foramen (arrow).

Fig. 2 CT performed when the bladder was empty, showing a soft tissue density (arrow) 1 cm in diameter without fluid in the left obturator foramen.

the spherical mass in the obturator foramen. We then performed enhanced computed tomography, which revealed an empty bladder, and showed that the spherical mass observed previously in the obturator foramen was no longer present. Instead, a soft tissue mass, 1 cm in diameter, without fluid, was visualized in the left obturator foramen (**Fig. 2**). OH of the bladder was suspected. Her condition was not emergent; therefore, we chose elective surgery. Because OH of the bladder is rare, cystoscopy was performed for further examination before surgery. Cystoscopy showed a recess in the left wall of the

bladder, and cystography revealed a round-shaped protrusion into the left obturator foramen (**Fig. 3**). This finding led to a preoperative diagnosis of OH of the bladder.

We elected to address the OH of the bladder operatively, and the obturator foramen was exposed bilaterally by midline laparotomy. The right side was unremarkable. On the left side, a peritoneal recess was observed at the obturator foramen. There was no abdominal organ incarceration or other type of hernia. The preperitoneal space was dissected from the midline incision, and the obturator foramen below Cooper's ligament was examined. Within the obturator foramen, there was a hernia sac of thick peritoneum with the bladder lying along the medial wall of the sac (**Fig. 4**). There was no diverticular change of the bladder wall or fibrous connection between the bladder and obturator foramen. The patient was intraoperatively diagnosed with paraperitoneal bladder hernia through the obturator foramen. The obturator foramen was covered by a polypropylene mesh (onlay patch, PerFix™ Light Plug, Bard Davol Inc., Warwick, RI), which was placed in the preperitoneal space and fixed to Cooper's ligament.

The patient's symptoms disappeared quickly after surgery; therefore, her previous thigh pain was confirmed as a Howship-Romberg sign. She was discharged from the hospital on postoperative day 5 without complications. Cystoscopy after surgery revealed the disappearance of the recess in the left

Fig. 3 a) Cystography showing a round-shaped protrusion (arrow) of the bladder into the left obturator foramen. b) Enlarged image.

Fig. 4 a) Operative findings showing a hernia sac in the obturator foramen composed of thick peritoneum with the bladder lying along the medial wall of the sac. b) Schema of the operation.

wall of the bladder, and the patient remained asymptomatic at the 6-month follow-up.

Discussion

OHs are rare and most commonly involve the small bowel; however, herniation of other organs including the large bowel, ovary, fallopian tube, omentum, appendix, and bladder has been reported³⁻⁵. There are three types of OH. Type I OH occurs when preperitoneal fat and connective tissue (pilot tag) enter the obturator orifice. Type II OH is characterized by dimpling of the peritoneum over the obturator canal. Type III OH occurs when an organ enters the obturator foramen and fails to resolve spontaneously. Type I OH can cause pelvic pain. Perry and Hantes⁶ performed laparoscopic repair of type I OH in women with chronic neuropathic pain and concluded that

the condition is more common than previously recognized, with pilot fat tags occurring in up to 64% of female cadaver dissections⁶. Koebke and Tillmann⁷ described the fat body of the obturator canal. They observed a strong fibrous cord running from the urinary bladder to the fat body of the obturator canal in 46 cases, and in five cases, the cord caused a small pouch to form in the wall of the bladder⁷. OH of the bladder may be more common than previously thought.

There are only four case reports of bladder hernias through the obturator foramen in English^{5,8-10}, two case reports in Japanese^{11,12}, and three case reports in other languages¹³⁻¹⁵. Details of the English and Japanese case reports are listed in **Table 1**. Most of these cases were diagnosed by chance during examination for anorexia, fever, urinary tract

Table 1 Cases of obturator hernia of bladder reported in English and Japanese

Case	Year	Author	Age/Sex	Reason for examination	Diagnostic method	Treatment
1	1901	Gladstone ⁵⁾	78/F	autopsy for morbus cordis	autopsy	none
2	1976	McCarthy ⁶⁾	60/M	back pain	cystography, cystoscopy	operation by extraperitoneal approach
3	2008	Velásquez-López et al. ⁹⁾	66/F	recurrent urinary tract infection	CT, cystography, cystoscopy	operation by laparoscopy
4	2009	Kaneta et al. ¹⁰⁾	73/F	follow-up examination after esophageal cancer	PET/CT	none
5	2009	Kikkawa et al. ¹¹⁾	96/F	fever	CT, cystography	watchful waiting
6	2012	Ogata et al. ¹²⁾	80/F	nausea and anorexia	CT, cystography	watchful waiting
7	2015	The Present Case	77/F	thigh pain, abdominal pain, and cold sweat	CT, cystography, cystoscopy	operation by midline preperitoneal approach

infection, back pain, or nausea. In the two Japanese cases, symptoms were not severe, so patients were treated with watchful waiting. Laparoscopic surgery has also been used to treat OH of the bladder⁹⁾. In that case, cystoscopy was performed intraoperatively, and light from the cystoscope guided the laparoscopic dissection of the bladder wall. In a German case, the entire bladder was herniated, with hemorrhagic infarction¹³⁾. The hernia was reduced through resection of the superior pubic ramus¹³⁾.

Bladder hernias can be classified into three types. Paraperitoneal hernias are the most common and are characterized by a bladder that remains extraperitoneal and is medial to the peritoneal herniation. In intraperitoneal hernias, the bladder is completely covered with peritoneum within the hernia sac. In extraperitoneal hernias, the peritoneum remains in the abdomen and the bladder alone herniates. In the two case reports of OH of the bladder treated by operation, there is no mention of the type of peritoneal herniation^{8,9)}. In our case, computed tomography showed bladder and soft tissue in the obturator foramen. Surgical observation revealed a hernia sac of thick peritoneum in the obturator foramen with the bladder lying along the medial side of the sac. Therefore, the patient was diagnosed with a paraperitoneal bladder hernia through the obturator foramen. This fact suggests that herniation of small intestine and bladder into the obturator foramen can coexist; therefore, it is important to consider bladder herniation, even in cases of OH of the small intestine.

Multiple surgical techniques have been described for OH repair, including laparoscopic (preperitoneal and transperitoneal approaches) and inguinal techniques. In the present case, we performed a midline

laparotomy to visualize the obturator foramens bilaterally. From this incision, the preperitoneal space was dissected to the obturator foramen, which was then covered by a polypropylene mesh. We chose this strategy because 15% of OH are bilateral, and midline incision laparotomy allows for examination of both sides of the obturator foramen. Also, if the hernia is bilateral, both sides can be repaired through this single incision. This strategy also allowed for ample exposure of the preperitoneal space to provide adequate visualization and avoid bladder injury.

Another advantage of the midline preperitoneal approach is that it can be used in emergent cases. Midline laparotomy exposes any bowel herniation and, if necessary, readily allows for resection of the intestine. In this situation, the peritoneal incision is separated from the hernia orifice, which may prevent contamination of the preperitoneal space below the hernia orifice. Therefore, this approach may improve the safety of preperitoneal mesh repair with bowel resection^{16,17)}.

In Kumiai Kosei Hospital from July 2014 to August 2015 the midline preperitoneal approach was performed for one case of OH, one case of bilateral inguinal hernia and three cases of femoral hernia (**Table 2**). Good results were achieved following elective operations, but postoperative seroma and seroma infection occurred following emergent cases. Seroma was treated by needle aspiration, and seroma infection was treated by catheter drainage for 1 week and antibiotic therapy for 2 weeks. This therapy avoided having to remove the mesh. The midline preperitoneal approach requires wide dissection of the preperitoneal space, which is complicated by existing tissue inflammation and edema, in emer-

Table 2 Five cases of midline preperitoneal approach for bilateral inguinal hernia, obturator hernia and femoral hernia

Case	Age/ Sex	Type of hernia	Timing of surgery	Bowel resection	Repair of the defect	Operation time (min)	Complications
1	80/F	FH	elective surgery	(-)	polypropylene mesh	46	(-)
2	50/M	BIH	elective surgery	(-)	polypropylene mesh	92	(-)
3 (the present case)	77/F	OH	elective surgery	(-)	polypropylene mesh	62	(-)
4	68/F	FH	emergency surgery	(-)	polypropylene mesh	53	seroma infection
5	77/F	FH	emergency surgery	(-)	polypropylene mesh	50	seroma

FH: femoral hernia, BIH: bilateral inguinal hernia, OH: obturator hernia

gent cases. We believe this is the reason for seroma development in our two emergent cases; therefore, we conclude that a midline preperitoneal approach is a good choice for elective surgery for bilateral inguinal hernia, OH, and femoral hernia, but controversial for emergency surgery, because of the high risk of seroma and seroma infection.

OH of the bladder seldom accompanies ileus; therefore, laparoscopic surgery should be attempted as a minimally invasive surgery. However, in Japan, there are few case reports describing laparoscopic surgery for bladder hernia. There is one review of 11 cases¹⁸⁾ in which five cases were repaired by the transabdominal pre-peritoneal approach, and two cases were repaired by the totally extraperitoneal approach. In four cases, the laparoscope was used only for observation, and the hernia was repaired by the anterior approach¹⁸⁾. Laparoscopic surgery for OH of the bladder may be challenging, and for greatest safety, some authors report that the totally extraperitoneal approach with cystoscopy, and the transabdominal pre-peritoneal approach with tumescent local anesthesia into the preperitoneal space is useful^{9,18)}.

Conflict of interest: None.

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