CASE REPORT

Acute abdomen due to strangulated intravesical hernia with incidental finding of kidney tumor: A case report and literature review

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ABSTRACT

Internal supravesical hernia is a rare type of internal abdominal hernia with overall incidence <4% of all internal abdominal hernias. The clinical diagnosis is a major preoperative diagnostic challenge for both the surgeon and the radiologist. It is a rare cause of small bowel obstruction, but in case of strangulation it can be fatal and it necessitates urgent surgical intervention. In this case study, we report a case of intravesical type of supravesical hernia in a 63-year-old man with acute intestinal obstruction and an accidental finding of a kidney tumor. In the article, we discuss the clinical picture, diagnosis, risk factors, treatment strategy and complications of this rare entity.

Keywords: Acute abdomen; intestinal obstruction; supravesical internal hernia.

INTRODUCTION

Internal abdominal hernia is protrusion of the bowel through the peritoneum, mesentery, or omentum into a compartment in the abdominal cavity, whereas the hernia orifice is usually a preexisting foramen, recess, fossa, or congenital defect of the mesentery. Hernia orifice can also be caused by peritoneal defect due to surgery, inflammation, ischemia, and trauma.[1] They can be paraduodenal with the overall incidence 50–55% of internal abdominal hernias, pericecal 10–15%, hernias through the foramen of Winslow 6–10%, transmesenteric, omental and transmesocolic 8–10%, intersigmoid 4–8%, retroanastomotic 5%, and pelvic and supravesical hernias <4%.[2] It constitute 0.5–4.1% of acute obstruction cases caused by hernias.[2] Supravesical hernia may be asymptomatic for many years and clinical diagnosis is difficult. The clinical presentation of supravesical abdominal hernia is nonspecific, intermittent and includes symptoms of recurrent intestinal obstruction. It may cause significant discomfort, from constant pain, nausea, vomitus (especially after a heavy meal), intermittent colicly pain, to chronic digestive problems and recurrent, and intermittent intestinal obstruction. Symptoms may be altered or relieved by changes in patient's position, because of the propensity of these hernias to reduce spontaneously. It may occur with an acute intestinal obstruction of small bowel loops and depending on the size of the foramina and the size of the herniated bowel; loops can be returned to its normal site or be incarcerated. Computed tomography (CT) scan is the gold standard test for diagnosing supravesical abdominal hernia with specific signs on CT such as abnormal localization of the small bowel in abdominal cavity.[3]

CASE REPORT

In this report, we present a case of 63-year-old man who was admitted as an emergency to the center for abdominal surgery because of severe generalized abdominal pain, followed by nausea, vomiting, absence of flatus, abdominal distention, and difficulty in urination. Abdominal pain began 12 h before admission, from full health. Patient had

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same complaints 5–6 days before, but they lasted less. On admission he was hemodynamically stable. Plain abdominal X-ray showed multiple air fluid levels and obstructed small bowel with bowel loops distension up to 45 mm. MSCT of the abdomen and pelvis with IV contrast showed edematous intestinal convolutions, probably ileum with signs of obstruction on the right site in the pelvis and supravesically. It also showed dilatation of the proximal jejunum up to 5 cm with suspected signs of intestinal pneumatosis and small content of free liquid in between intestinal convolutions and in the pelvis. It also showed multiple stones inside gallbladder and neoplastic change in the upper pole of right kidney measuring 55 mm in diameter and smaller simplex cysts localized in the lower pole - Figure 1a and b.

After adequate fluid resuscitation, catheterization and placement of nasogastric tube, explorative laparotomy was made with midline infraumbilical incision. Intraoperative findings

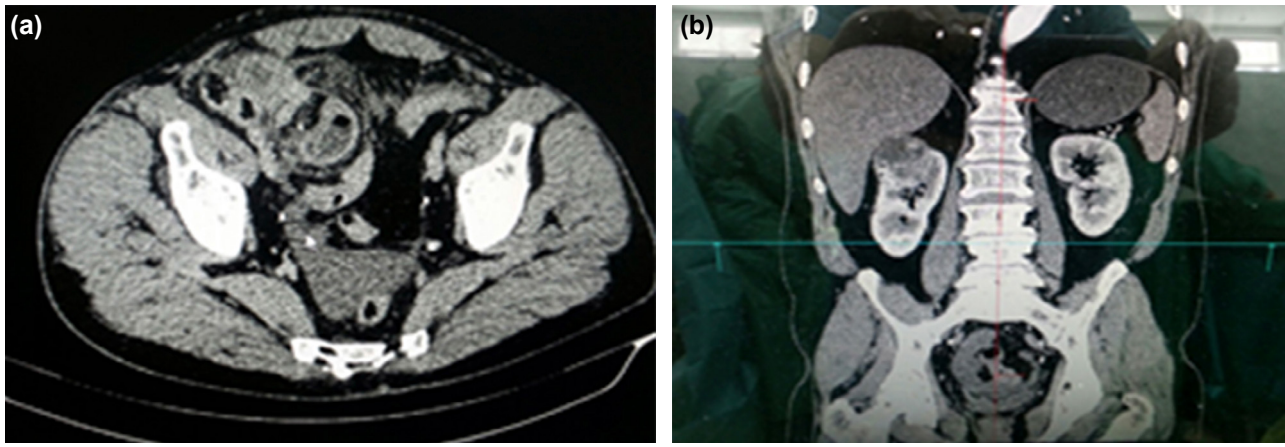

Figure 1. (a) MSCT of abdomen and pelvis: Ileum with signs of obstruction. **(b)** MSCT urography: Incidental finding of tumor in the right kidney.

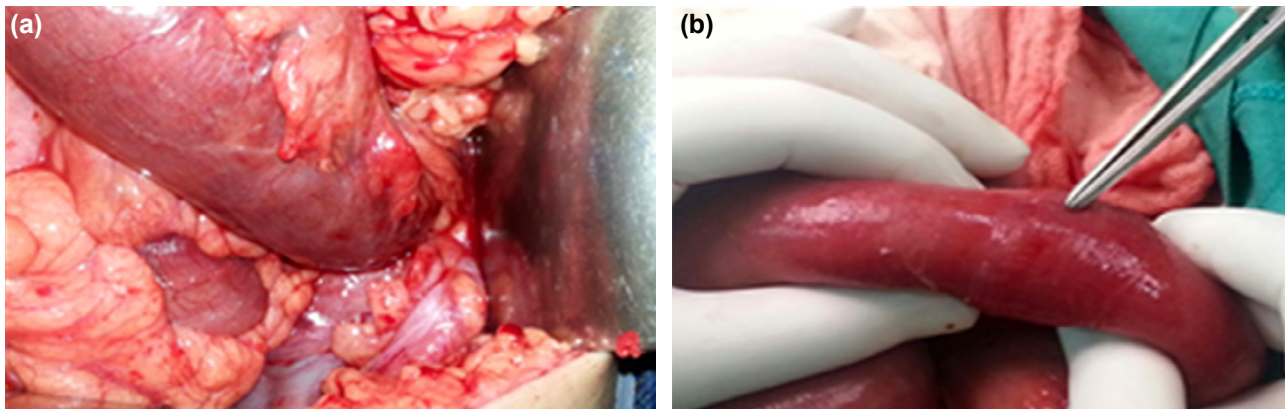

Figure 2. (a) The incarceration of terminal loops of ileum in the supravesical hernia defect. **(b)** Viable terminal ileum loops.

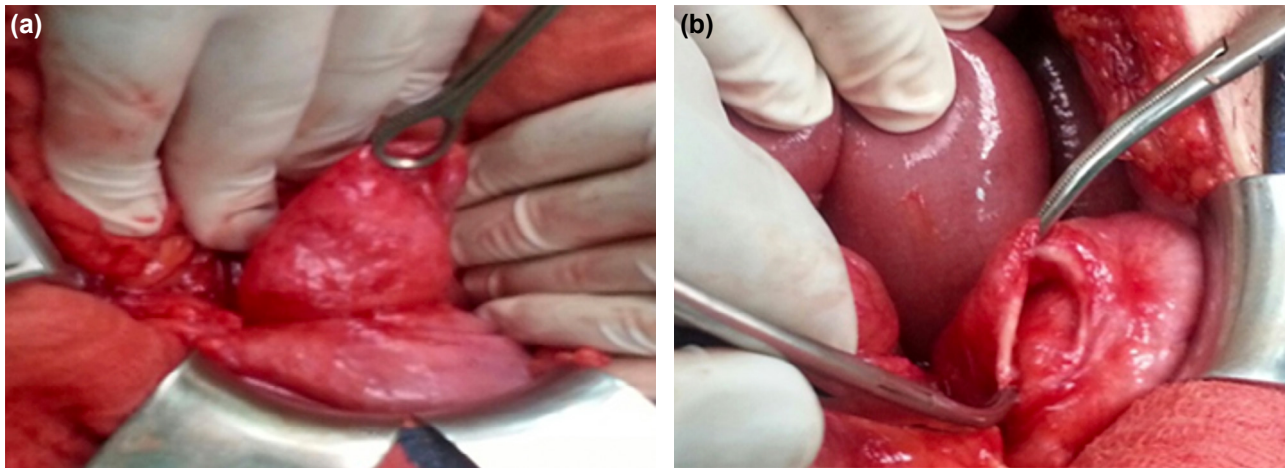

Figure 3. (a) The supravesical fossa in the form of deep diverticulum. **(b)** The supravesical hernia defect.

were dilated convolutions of the jejunum and proximal 2/3rd of the ileum with collapsed distal ileum and the incarceration of terminal loops of ileum in the supravesical hernia defect. Manual deliberation of the incarcerated terminal ileum loops was made, followed by manual decompression of the small intestine and cautious exploration of intestinal loops. The incarcerated terminal ileum loops were viable - Figure 2a and b.

By digital exploration of hernia defect after reduction of incarcerated bowel, we established that the hernia ring defect was approximately 3×3 cm localized in the supravesical fossa in the form of deep diverticulum which herniated directly into the bladder wall forming intravesical type of internal supravesical hernia - Figure 3a and b.

Urologist was consulted. Hernia sac was resected and hernia ring was closed with continuous stiches Prolene 2.0 suture. Post-operative recovery was without complications, intestinal passage was established after 36 h, thus patient was switched to oral feeding. Patient was discharged on the 7th postoperative day with advice to visit urologist at the scheduled time for surgical treatment of kidney tumor. A month later he underwent open radical nephrectomy and open cholecystectomy. Patient had uncomplicated recovery with no evidence of recurrence in the follow-up period of 3 years.

DISCUSSION

Internal hernias are cause of small bowel obstruction in only 0.6–5.8% cases, with high overall mortality rate that can exceed 50%.[4–6] Supravesical hernia is a rare type of internal abdominal hernia with overall incidence <4% of all internal abdominal hernias and it often presents with small bowel obstruction.[1] It represents a herniation of the abdominal contents through the supravesical fossa of the anterior abdominal wall. The supravesical fossa is a triangular area that lies in the paravesical space, bounded laterally and superiorly by the medial umbilical ligament (remnant of the left or right umbilical artery) and medially by median umbilical ligament (remnant of urachus). The inferior boundary is formed by the peritoneal reflection that passes from the anterior abdominal wall to the dome of the bladder. Fossa can have a form of a deep diverticulum. This supravesical diverticulum may herniate in several directions. A hernia that occurs in the upper part of the fossa usually protrudes through the abdominal wall as a direct inguinal hernia (external supravesical hernia). Rarely, it remains inside the abdomen, passing into the spaces around the bladder (internal supravesical hernia). Internal supravesical hernias are less common than external supravesical hernia. The first case of external supravesical hernia was reported by Sir Astley Cooper in 1804[7] and 10 years later Ring described the first internal supravesical hernia.[8] Many factors affect the development of this type of hernia. The formation of concave peritoneal depression of the paravesical space is significantly influenced by atrophy of the peritoneal fat due to various factors (aging, malnutrition, and disease), which predisposes to the formation of inflammatory areas, which creates scars on which hernias appear. The cause of supravesical hernia may be dysraphism between Cooper's ligament and the transversal fascia due to subperitoneal tissue-fibrillary contraction after inflammation.[9] A significant factor associated with this type of hernia is the increase in intra-abdominal pressure.[10] In addition, in predisposed individuals, bladder filling with difficulty urinating and urinary retention causes a weakness in the integrity of the transverse abdominal aponeurosis and trasversalis fascia, creating a supravesical peritoneal diverticulum.[11] Supravesical hernias occur mainly in adult men as a result of antero-superior enlargement of the bladder during its filling. In women, the enlargement of the bladder during its filling is lateral, which is why supravesical hernias are less common in them.[12] Other factors associated with this type of hernia are increased expression of umbilical folds that lead to the formation of a deeper peritoneal depression of the paravesical space into which the surrounding abdominal structures can protrude.[10,13] Inadequate collagen synthesis (congenital or acquired) leads to weakness and multiple damage to the fascial and aponeurotic structures of the anterior abdominal wall.[10,14] The intravesical type of internal supravesical hernia occurs when the apex of the bladder is weakened by defective closure of the urachus which results in formation of diverticulum that can herniate directly into the bladder.[15,16] Skandalakis et al.[9] proposed the terms "anterior supravesical," "right or left lateral supravesical," and "posterior supravesical" depending on whether the hernia passed in front of, beside, or behind the bladder, respectively. Preoperative diagnosis of this internal hernia is very difficult and challenging due to non-specific clinical findings and therefore in most cases the diagnosis is made intraoperatively. Early diagnosis is important to prevent complications and reduce morbidity rates.

Table 1. Distribution of the preoperative test findings and surgical characteristics

Diagnostic and surgical procedures	Total number of patients (n=54)	
	Yes	No
	n (%)	n (%)
Preoperative abdominal X-ray	30 (55.5)	24 (45.5)
Preoperative CT of abdomen	21 (38.9)	33 (61.1)
Open approach(laparotomy)	46 (85.2)	8 (14.8)
Anterior approach	1 (1.8)	53 (98.2)
Laparoscopic approach	7 (12.9)	47 (87.1)
Intestinal resection	11 (20.4)	43 (79.6)
Sutura of hernial defect	54 (100)	0 (0)
Resection of the hernial sac	5 (9.2)	49 (90.8)

CT: Computed tomography.

Pre-operative diagnosis is possible with CT (CT scan) or abdominal magnetic resonance imaging (MRI).[17,18] CT is currently the best imaging technique for detecting these hernias. In addition, it provides information about surrounding structures and morphology of the anterior abdominal wall. Finding of bowel loops in the supravesical space or near the bladder, distortion of the bladder wall and small bowel dilatation on CT scan or MRI may suggest a diagnosis, but often findings are not specific. Laparoscopic exploration is of great help in the diagnosis of internal hernias and surgical treatment. Pelvic adhesions are common in women due to inflammatory diseases or surgeries present difficulties during laparoscopic exploration. Cystoscopy and herniography might also be helpful in preoperative diagnosis.[15,19] Cystoscopy may show a tunnel shaped deformity in the bladder wall.[15] Herniography can show supravesical hernia. Gullmo[19] described in his series of 1000 herniography cases 183 external and 1 internal supravesical hernia, but this method of investigation is not widely available. Clinical presentation of supravesical hernia consists of vague abdominal symptoms or frequent recurrent abdominal pain, nausea, and vomiting due to recurrent intestinal obstruction. The intensity of the symptoms depends on the reducibility of the hernia and the existence of incarceration or strangulation. Ischemic necrosis of the small intestine can occur as a result of strangulation. In the intravesical type of supravesical hernia, bladder irritation and dysuria is common due to compression of the bladder by dilated small bowel convolutions.[12,14] We searched through PUBMED published and indexed English language literature that included the expression (((supravesical internal hernia) OR (paravesical hernia)) OR (prevesical hernia)) OR (intravesical hernia))). By exploring the literature, we identified 50 publications (with 54 patients presented) on supravesical internal hernias that were the cause of intestinal obstruction, not including our case report. In our case, we report a patient with intravesical intestinal acute obstruction in the supravesical fossa. The first report of the cystoscopic presentation and diagnosis of intravesical supravesical hernia was published by Blum in 1904. By searching literature on PubMed, we found that first successful reparation of the intravesical type of internal supravesical hernia was published by Sawyers and Stephenson, in 1957.[15] In our case, CT scan showed an image at the right iliac fossa that suggested an intussusception but the diagnosis of internal supravesical hernia was eventually made during laparotomy. The exploration showed a right intravesical supravesical internal hernia with an incarcerated viable ileal loop. The hernia was reduced by cautious traction, its sac was excised and the defect was closed with 2/0 prolen interrupted stiches. The postoperative course was without complications. There is no gold standard surgical procedure for internal supravesical hernia. Since supravesical hernia is a common cause of intestinal obstruction, treatment requires urgent deliberation of the incarcerated intestinal convolute and closure of the hernia defect by open or laparoscopic approach. In ischemic necrosis of the intestinal convolute, resection should be performed. Most surgeons consider that excision of the hernial sac is unnecessary and that it is sufficient to refresh the edges of the defect and close it with continuous or interrupted stitches with non-resorptive sutures.[16,20] By reviewing the literature case reports on PubMed, only few cases have been repaired using a laparoscopic approach.[21,22] Laparoscopic approach and reparation require good knowledge of the anatomical structures of the pelvis and an experienced endoscopic surgeon. The first laparoscopic repair of an internal supravesical hernia was performed by Gorgun in 2003.[21] Morimoto et al.[23] recently reported the first successful reparation of an internal supravesical hernia by anterior approach.

In Table 1, we present diagnostic procedures and operative approaches in published case studies.

Conclusion

Intravesical type of supravesical hernia is extremely rare and can be cause of acute or chronic intestinal obstruction and urinary problems. Early pre-operative diagnosis of intravesical intestinal obstruction is important to prevent life-threatening ischemic bowel necrosis. In the diagnosis of recurrent intestinal obstruction, CT of the abdomen is of great help and the role of radiology is crucial in the diagnosis of supravesical hernia. In case of incarceration and strangulation of small bowel, emergency surgery by open or laparoscopic approach is necessary. Laparoscopic exploration and reparation require a good knowledge of the anatomical relations between pelvic structures, great skill, and experience in repairing acute intestinal obstruction caused by supravesical hernia and possible intraoperative complications. Incidental finding of supravesical defect during surgical exploration of the pelvis should be sutured to prevent small bowel obstruction.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Externally peer-reviewed.

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REFERENCES

1. Takeyama N, Gokan T, Ohgiya Y, Satoh S, Hashizume T, Hataya K, et al. CT of internal hernias. Radiographics 2005;25:997–1015. [CrossRef]
2. Ghahremani GG. Abdominal and pelvic hernias. In: Gore RM, Levine MS, editors. Textbook of Gastrointestinal Radiology. 2nd ed. Philadelphia, PA: Saunders; 2000. p. 1993–2009.
3. Blachar A, Federle MP, Brancatelli G, Peterson MS, Oliver JH 3rd, Li W. Radiologist performance in the diagnosis of internal hernia by using specific CT findings with emphasis on mesenteric hernia. Radiology

2001;221:422–8. [CrossRef]
4. Akyildiz H, Artis T, Sozuer E, Akcan A, Kucuk C, Sensoy E, et al. Internal hernia: Complex diagnostic and therapeutic problem. Int J Surg 2009;7:334–7. [CrossRef]
5. Martin LC, Merkle EM, Thompson WM. Review of internal hernias: Radiographic and clinical findings. AJR Am J Roentgenol 2006;186:703–17. [CrossRef]
6. Fan HP, Yang AD, Chang YJ, Juan CW, Wu HP. Clinical spectrum of internal hernia: A surgical emergency. Surg Today 2008;38:899–904.
7. Keynes WM. Supravesical hernia. In: Nyhus LM, Harkins HN, editors. Hernia. Ch. 41. Philadelphia, (PA): JB Lippincott; 1964.
8. Ring J. A case of internal inguinal hernia. Lond Med Reposit 1814;2:204.
9. Skandalakis JE, Gray SW, Burns WB, Sangmalee U, Sorg JL. Internal and external supravesical hernia. Am Surg 1976;42:142–6.
10. Sozen I, Nobel J. Inguinal mass due to an external supravesical hernia and acute abdomen due to an internal supravesical hernia: A case report and review of the literature. Hernia 2004;8:389–92. [CrossRef]
11. Warvi WN, Orr TC. Internal supravesical hernias. Surgery 1940;8:312–25.
12. Lee SR. Clinical characteristics and laparoscopic treatment of supravesical hernia. J Laparoendosc Adv Surg Tech A 2017;27:1192–7. [CrossRef]
13. Ozturk NC, Kurtoglu Z. Internal Supravesical hernia accompanied with anomalous fold formations: A cadaveric case report. Surg Radiol Anat 2014;36:1089–92. [CrossRef]
14. Laiz-Diez B, Gonzaez-González J, Ruiz-Tovar J, Cea-Soriano M, Duran-Poveda M. Intestinal obstruction caused by strangulated hernia in the prevesical space: One case and revision of the literature. [Article in Spanish]. Rev Chil Cir 2017;148:1–4.
15. Sawyers JL, Stephenson SE Jr. Internal supravesical hernia: Report of the first successful operative repair of the intravesical type. Surgery 1957;42:368–74.
16. Barnes DR, Dreyer BJ. Internal supravesical hernia; Report of a case presenting with bladder symptoms. Br J Surg 1953;40:508–9. [CrossRef]
17. Sasaya T, Yamaguchi A, Isogai M, Harada T, Kaneoka Y, Suzuki M. Supravesical hernia: CT diagnosis. Abdom Imaging 2001;26:89–91.
18. Chou CK, Liu GC, Chen LT, Jaw TS. The use of MRI in bowel obstruction. Abdom Imaging 1993;18:131–5. [CrossRef]
19. Gullmo A. Herniography. The diagnosis of hernia in the groin and incompetence of the pouch of Douglas and pelvic floor. Acta Radiol Suppl 1980;361:1–76.
20. Saravanan B, Paramu MK, Ranganathan E. Supravesical hernia: A rare cause of intestinal obstruction. Int J Surg 2008;6:471–2. [CrossRef]
21. Gorgun E, Onur E, Baca B, Apaydin B, Yavuz N, Sirin F. Laparoscopic repair of an internal supravesical hernia: A rare hernia causing small bowel obstruction. Surg Endosc 2003;17:659. [CrossRef]
22. Clementi M, Bonanni L, Sista F, Vicentini V, Salvatorelli A, Di Furia M, et al. Laparoscopic treatment of obstructed internal supravesical hernia: A cases series and rewiev of the literature Ann Med Surg (Lond) 2018;36:58–62. [CrossRef]
23. Morimoto M, Honjo S, Sakamoto T, Tokuyasu N, Arai Y, Amisaki M, et al. Internal supravesical hernia repaired via the anterior approach alone: A case report. Int J Surg Case Rep 2017;39:297–300. [CrossRef]

OLGU SUNUMU - *ÖZ*

İnsidental renal tümör bulgusu olan strangüle intravezikal herniye bağlı akut abdomen: Olgu sunumu ve literatür taraması

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İnternal supravezikal herni, genel insidansı tüm internal abdominal hernilerin %4'ünden az olan, nadir görülen bir internal abdominal herni türüdür. Klinik tanısı, hem cerrah hem de radyolog için ameliyat öncesi önemli bir zorluktur. Nadir görülen bir intestinal obstrüksiyon nedenidir, ancak strangülasyon durumunda ölümcül olabilir ve acil cerrahi müdahale gerektirir. Bu olgu çalışmasında, akut intestinal obstrüksiyonu olan 63 yaşındaki erkek hastada internal supravezikal herni olgusu ve insidental renal tümör bulgusu sunulmuştur. Makalede, bu nadir antitenin klinik tablosu, tanısı, risk faktörleri, tedavi stratejisi ve komplikasyonları tartışılmaktadır.

Anahtar sözcükler: Akut abdomen; internal supravezikal herni; intestinal obstrüksiyon.

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