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A rare encounter of obstructed direct inguinal hernia of sliding variety

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ABSTRACT

INTRODUCTION: Direct Obstructed inguinal hernias of sliding variety with bladder as its content is extremely rare.

CASE REPORT: We report the case of an 83-year-old male known case of DM, presented with irreducible and painful swelling over the right inguinal region and cough impulse on right inguinal region. On exploration of the right side, the obstructed hernia was found to be a direct type sliding hernia with sac wall forming anterior covering layer and containing congested small bowel loops (ileum) and bladder forming the medial wall of the hernia sac. After gaining viability the content was reduced, posterior wall defect was closed and Lichtenstein tension free repair was done.

CONCLUSION: Direct inguinal hernia of sliding variety getting obstructed is rare. Direct Sliding hernia on right side with ileum as content and bladder forming the wall is extremely rare.

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1. Introduction

Hernias are among the oldest recorded afflictions of mankind and they are most commonly seen in the groin [1,2]. A hernia is defined as a protrusion, bulge or projection of an organ or a part of an organ through the body wall that normally contains it. In an inguinal hernia the protrusion occurs through the inguinal canal. Groin hernias are the most common conditions for which primary care physicians refer patients for surgical management [3].

Seventy-five percent of all abdominal wall hernias are found in the groin, making it the most common location for an abdominal wall hernia [4]. Of all groin hernias, 95% are hernias of the inguinal canal with the remainder being femoral hernia defects [5]. Two-thirds of the inguinal hernias are indirect and the remainders are direct inguinal hernia. An indirect inguinal is the most common hernia, regardless of gender. In men, indirect hernias predominate over direct hernias at a ratio of 2:1. Direct hernias are uncommon in women [4]. The lifetime risk of inguinal hernia is 27% in men and 3% in women [6]. There is clearly an association between age and hernia diagnosis. After an initial peak in the infant, groin hernias become more prevalent with advancing age. In the same way, the complications of hernias (incarceration, strangulation, and bowel obstruction) are found more commonly at the extremes of age [7].

Inguinal hernias can either be congenital or acquired. The proposed and well known risk factors and causes for inguinal

hernias were increased abdominal pressure, pre-existing weakness of abdominal muscles, straining during defecation, heavy lifting of weights, obesity, pregnancy etc. Predominantly in male populations, the risk factors that have been found to be associated with inguinal hernia were muscle weakness (previous appendectomy or other abdominal operations), physical stress, increased intra-abdominal pressure (chronic constipation and prostate enlargement), smoking, aging, connective tissue disease, and systemic illnesses. In females, obesity, pregnancy, and operative procedures have been shown to be risk factors that commonly contribute to the formation of inguinal hernia [8].

2. Sliding hernias

A sliding hernia is a protrusion through an abdominal wall of a retroperitoneal organ. Frequency of sliding hernias is estimated at 6–8% of all elective inguinal hernia repairs. Sliding hernias are considered to be more challenging to operate on than uncomplicated inguinal hernias [9]. The proportion of sliding hernias is even higher in the aged. Hernias of this kind are found almost exclusively in males and usually on the left side. Preoperative diagnosis is not essential if the surgeon can recognize the lesion at operation and knows how to repair it properly [10].

The work has been reported in line with the SCARE criteria [21].

3. Case report

3.1. History

An 83-year-old male presented in emergency with a pain in abdomen since 2 days and hematuria and 2–3 episodes of vomit-

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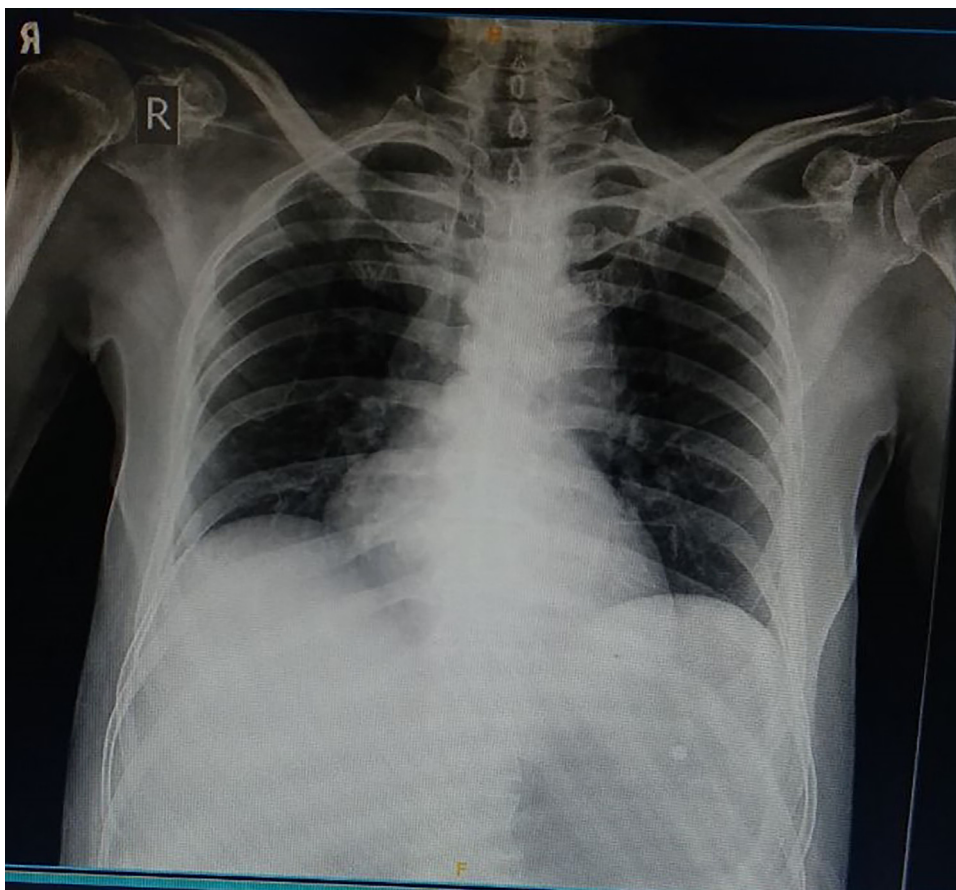


Fig. 1. Chest X ray.

ing since 1 day. Patient was a k/c/o ischemic heart disease and had undergone angioplasty 7 yrs back and was on antiplatelet agents for the same. Pain was acute, non-radiating, severe, and continuous and was associated with 2–3 episodes vomiting, which was non-projectile, non-bilious and contents were food particles. Patient was a known case of diabetes mellitus and ischemic heart disease, was on treatment for same.

3.2. Clinical examination

General physical examination and vitals of the patient was within normal limits except for mild pallor.

On local examination of the right inguinal region there was a globular swelling of size 6 × 7 cm present above and medial to right pubic tubercle. The swelling was globular in shape, had smooth surface, well defined margin, firm in consistency, irreducible, tender with local raise of temperature, with a negative cough impulse and a dull note on percussion. The examination of the right testes, epididymis, spermatic cord and contralateral inguinal-scrotal region was within normal limits. There was mild distension of the abdomen with diffuse tenderness, no guarding, and rigidity. Peristalsis present. Per rectal and other systemic examination was normal.

3.3. Investigations

X-ray of the abdomen in erect posture showed dilated small bowel loops (Fig. 2) and chest X-ray PA view was within normal limits (Fig. 1). Ultrasonography revealed the presence of right sided inguinal hernia containing loops of small intestine with no peri-

staltic activity and with fluid collection. So a diagnosis of right sided obstructed inguinal hernia was made on the basis of clinical and radiological finding. The patient was planned for surgery on an emergency basis with all necessary pre-operative work-up.

3.4. Surgical intervention findings

A right sided inguinal-scrotal skin incision was given. Sac opened and neck of sac defined. The sac was opened and content being the congested small bowel loop with omentum and bladder forming the medial wall of the hernia (Figs. 3 and 4). Diagnosis of sliding hernia Type1 with bladder forming medial wall of the sac was confirmed on operating table. 100% oxygen was given and warm saline mop placed over bowel loops for 5 min. Bowel shows signs of viability and hence pushed back into the peritoneum. Sac was partially excised and ligated. Posterior wall defect was closed with continuous 1-0 polypropylene sutures and Lichtenstein tension free mesh repair was done with (1-0) polypropylene interrupted suture.

Post-operative recovery was uneventful. Hematuria was suspected to be due to bladder herniation and patient being on anti-platelet agent in view of ischemic heart disease. Hence was managed conservatively and sonography of bladder was not done. Hematuria got subsided over next two post-operative days and urine was clear. Patient was kept nil per oral for three days, passed flatus on fourth post-operative day and passed stools on fifth post-operative day. Hematuria got resolved by fourth post-operative day. He was discharged on seventh day after he regained normal appetite and bowel and bladder function with proper advice and follow up after 5 days for suture removal.

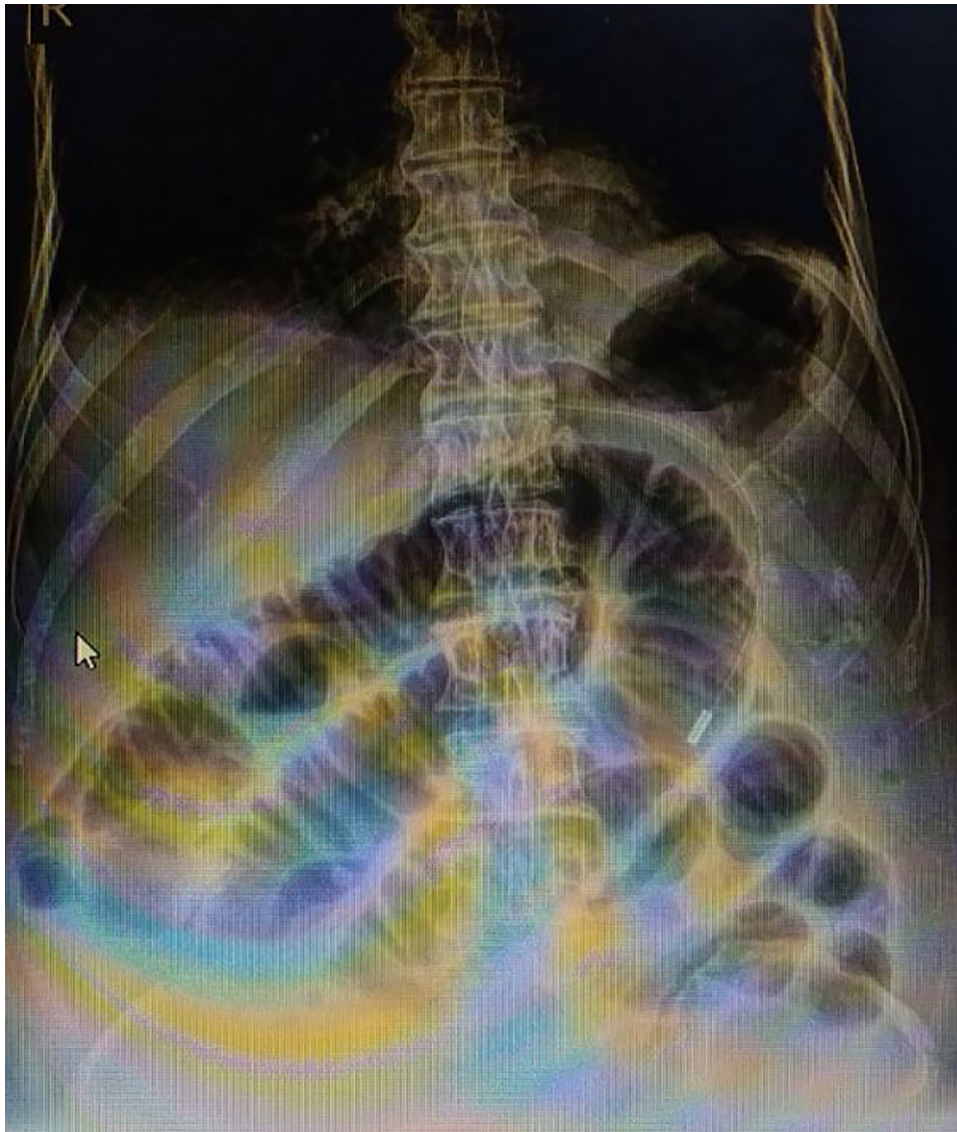


Fig. 2. X ray abdomen erect showing dilated bowel loops proximal to obstruction.

3.5. Follow up

During the follow-up visit after 7 days, the operation scar was found to have healed well and the patient was absolutely asymptomatic.

6 months follow up visit, patient is doing well with completely healed scar. No evidence of any recurrence.

4. Discussion

Groin hernias are generally classified as inguinal (indirect and direct) and femoral based on the site of herniation relative to surrounding structures. Indirect hernias protrude lateral to the inferior epigastric vessels, through the deep inguinal ring. Direct hernias protrude medial to the inferior epigastric vessels, within Hesselbach's triangle. The borders of the triangle are the inguinal ligament inferiorly, the lateral edge of rectus sheath medially, and the inferior epigastric vessels superolaterally [11].

A hernia can be classified as reducible or irreducible. A reducible hernia is one in which the contents can be pushed back into the abdomen by putting manual pressure on it. An irre-

ducible/incarcerated hernia is one in which the contents cannot be pushed back

into the abdomen by applying manual pressure. Irreducible hernias are further classified into obstructed and strangulated hernias. An obstructed hernia is one in which the lumen of the herniated part of intestine is obstructed whereas a strangulated hernia is one in which the blood supply of the hernia contents is compromised, thus, leading to ischemia. The lumen of the intestine may or may not be patent [12].

5. Risks of strangulation

Indirect inguinal hernias have a higher risk of strangulation. The risk of strangulation and obstruction is lowest for direct inguinal hernias as they have a wide neck, which can often be monitored and managed conservatively. Strangulated external hernias account for 18–20% of all intestinal obstructions in adults [13,14]. Indirect inguinal hernias carry more risk of strangulation and incarceration than direct hernias. When they become incarcerated the incidence is about 34.1% versus 16.7% and 32.6% versus 10.3% in two different studies [14,15].

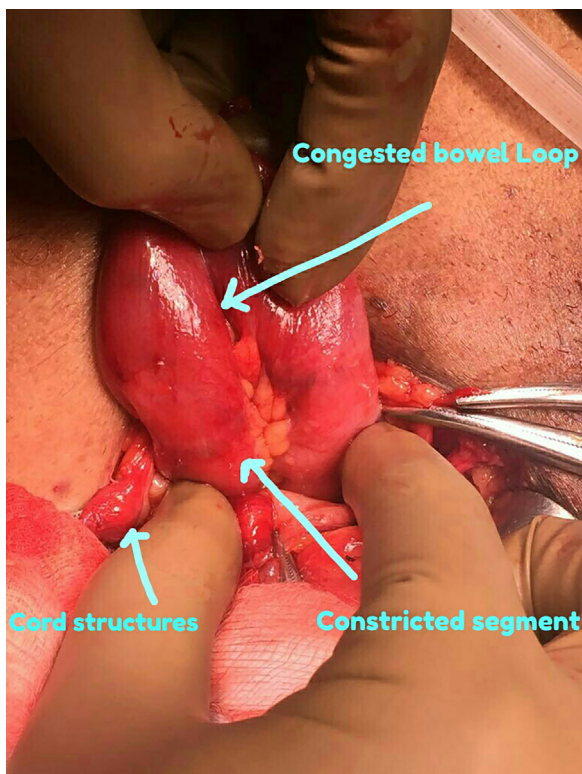


Fig. 3. Intraoperative picture of bowel loop as content.

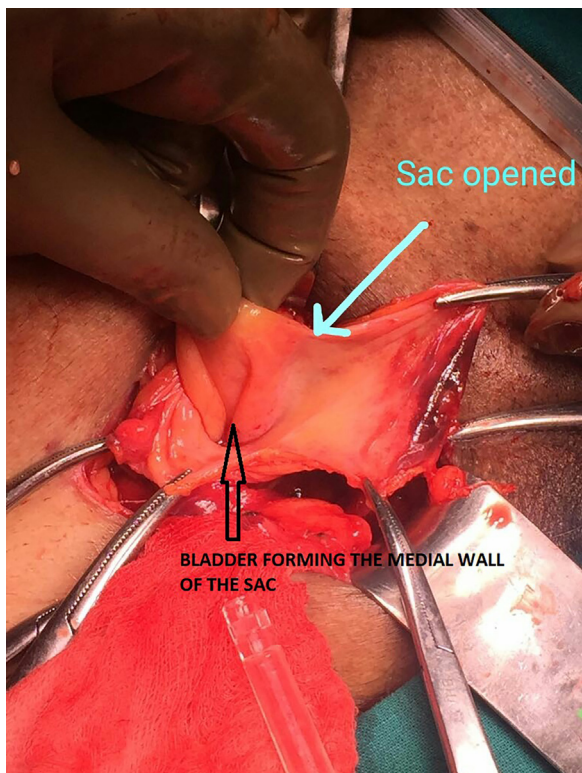


Fig. 4. Intraoperative picture showing bladder forming medial wall of sac.

Even though the neck of the direct hernia sac (fascia defect) is soft and wide enough to avoid strangulation in the early stage of the hernia, it may become fibrotic, solid and narrowed with time.

This process may create a risk for a direct hernia to be incarcerated [15].

Herniation of the urinary bladder accounts for 1%–3% of all inguinal hernias [15]. It is frequently unilateral, on the right side with a 70% male predominance [16]. Other risk factors include older age, obesity and history of herniorrhaphy [17]. Two main factors in development of bladder hernia are the presence of lower urinary tract obstruction which leads to bladder distension together with weakening of both the abdominal and the bladder wall which enables it to slide through the dilated inguinal ring, especially with constant increase in the pelvic pressure during straining

6. Sliding hernias

A sliding inguinal hernia is a protrusion of a retroperitoneal organ through an abdominal wall defect. Frequency of sliding hernias is estimated at 3–8% of all elective operations of inguinal hernias. Sliding hernias are supposed to be more anatomically challenging for a surgeon than an uncomplicated non-sliding inguinal hernias. The anatomical and physiological concept of sliding inguinal hernia is frequently misunderstood by surgeons of all levels of experience. Not infrequently, any inguinal hernia that is big enough or has any organ (e.g. small intestine) inside its sac is referred to as sliding hernia [20].

The main obstacle in surgical approach to this type of hernias was-and still is-the fact that part of the hernia sac is in reality a retroperitoneal organ thus, during opening of the sac an inadvertent damage to a vital organ can be made. The advance of anatomical knowledge and evolution of surgical technique allowed for a better understanding of this entity. With the better understanding of pathological anatomy of the sliding hernia various classification systems have been introduced [20].

7. Classification of sliding hernias

Bendavid divides the sliding inguinal hernia into three anatomical variants depending on the size of the sac and its relation to the retroperitoneal “sliding” organ [20].

TYPE I is defined as any hernia in which part of the peritoneal sac is made up by the wall of viscus.

TYPE II is defined as any hernia containing a retroperitoneal viscus and its mesentery, in which the mesentery forms part of the wall of the peritoneal sac.

TYPE III the sliding hernia consists on a protrusion of a viscus itself, and the peritoneal sac is very small or even absent. This last variant is an extremely rare finding and accounts for approximately only 0.01% of all inguinal hernias.

8. Clinical presentation and management of sliding hernias

It is very rare to establish preoperative diagnosis of a sliding inguinal hernia as there are no particular clinical signs indicating the possibility of sliding hernia. Older patients with big hernias, presenting with a long history of inguinal lump are the group most likely to have a retroperitoneal organ protruding into the hernia sac [18].

If a surgeon does not open a hernia sac, a small sliding hernia can be easily overlooked. If the sac is manipulated gently this should not have any influence on the outcome of surgery in terms of early and late complications. As in the current practice it is becoming increasingly rare for surgeons to routinely open an inguinal hernia sac, a number of sliding hernias can undergo surgery without being recognized as such.

Traditionally sliding hernias were considered difficult to operate on. For an inexperienced or non-prepared surgeon even today it

can pose quite a challenge. One of the main reason why sliding inguinal hernia used to be considered such a difficult operation, was that in previous decades it was customary to aim at the excision of a whole peritoneal hernia sac and high ligation of a remaining stump. Given that in a sliding hernia a part of the sac is formed by the retroperitoneal organ the risk of injury of that organ was indeed higher. Currently the excision of a sac is not considered mandatory. Gentle dissection of the sac allows to perform tension free repair as in any inguinal hernia operation.

The laparoscopic repair of a sliding inguinal hernia is possible, however it requires important technical skills. Even in the hands of the most experienced laparoscopic hernia surgeons the conversion to open procedure can be necessary in as much as 10% of all cases [19].

In our case, as the patient had presented with right obstructed inguinal hernia, exploration of inguinal hernia was done. Direct inguinal hernia sac of sliding variety was concluded on table and decision to open the sac was made to look for the viability of the content of sac despite it being of a sliding variety. It was found to be an obstructed direct inguinal hernia with small bowel loop (ileum) of sliding type 1 variety with bladder forming the medial wall of the sac.

9. Conclusion

- 1) Though incarceration and even strangulation are extremely uncommon in direct inguinal hernia as compared to indirect inguinal hernia. A long standing direct inguinal hernia may present as acute or sub-acute intestinal obstruction especially in elderly patients. Hence old age with obstructed inguinal hernia might be of direct variety and needs to be repaired immediately.
- 2) Sliding hernias are diagnosed intra-operatively and is very difficult to identify clinically. Sliding hernias are most common in old age male, of indirect variety on left side according to most literatures.
- 3) The fundamentals of sliding inguinal repair are meticulous, gentle dissection and identification of all anatomical structures.
- 4) Opening of the sac is not necessary in sliding hernias, except in case where obstructed or strangulated hernia is expected.
- 5) The good operating technique and the use of modern prosthetic materials should allow us to have the same risk of early and late complications after operating on a sliding and non-sliding inguinal hernia.

However, obstructed direct inguinal hernia of sliding type with bladder forming its one of contents is extremely rare and no such case has been reported yet.

Conflicts of interest

None declared.

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Ethical approval

This is a case report and does not require ethics committee approval.

Consents

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 on request.

Author contributions

Dr Manmohan Kamat

Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published.

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Dr Neerajpratap Singh

Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published.

Registration of research studies

This is a case report and not a research study.

Guarantor

Dr Manmohan Kamat.

References

- [1] S. Chawla, Recent concepts in inguinal hernia repair, *Med. J. DY Patil Univ.* 6 (2013) 381–382.
- [2] K. Ballas, T. Kontoulis, Ch Skouras, A. Triantafyllou, N. Symeonidis, et al., Unusual findings in inguinal hernia surgery: report of 6 rare cases, *Hippokratia* 13 (2009) 169–171.
- [3] T. Bax, B.C. Sheppard, R.A. Crass, Surgical options in the management of groin hernias, *Am. Fam. Physician* 59 (1999) 143–156.
- [4] C.M. Beauchamp, B.M. Ever, K.L. Mattox, Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice, vol-2, 19 ed., Saunders, Philadelphia, 2012, p. 1114.
- [5] A. McIntosh, A. Hutchinson, A. Roberts, H. Withers, Evidence-based management of groin hernia in primary care—a systematic review, *Fam. Pract.* 17 (October (5)) (2000) 442.
- [6] J. Gould, Laparoscopic versus open inguinal hernia repair, *Surg. Clin. North. Am.* 88 (October (5)) (2008) 1073–1081, vii–viii.
- [7] M.J. Zinner, S.W. Ashley, Maingot's Abdominal Operations, 12 ed., McGraw Hill Education, New York, 2012, p. 124.
- [8] S. Vijayakumar, R. Alagar samy, A study on incidence and risk factors of inguinal hernia in ESI population, *OSR J. Dent. Med. Sci. (IOSR-JDMS)* 15 (May (7)) (2016) 32–34, e-ISSN: 2279-0853, p-ISSN: 2279-0861 Ver.VIII.
- [9] Andrzej L. Komorowski, Jorge Moran-Rodriguez, Rehan Kazi, Wojciech M. Wysocki, Sliding inguinal hernias, *Int. J. Surg.* 10 (2012) 206–208.
- [10] Max R. Gaspar, Morton M. Woolley, Eugene J. Joergenson, Sliding indirect inguinal hernia, *Calif. Med.* 85 (November (5)) (1956) 330–334.
- [11] F.C. Brunicaudi, D.K. Andersen, T.R. Billiar, et al., Schwartz's Principles of Surgery, 10 ed., McGraw Hill Education, New York, 2014, p. 1496.
- [12] W.I.B. Onuigbo, G.E. Njeze, Inguinal hernia. A review, *J. Surg. Operative Care* 1 (2) (2018).
- [13] G. McEntee, D. Pender, D. Mulvin, et al., Current spectrum of intestinal obstruction, *Br. J. Surg.* 74 (November (11)) (1987) 976–980.
- [14] Y. Kekec, A. Alparlan, S. Demirtas, et al., Effect of strangulation on morbidity and mortality in irreducible hernia, *Turk. J. Surg.* 9 (1993) 128–131.
- [15] H. Kulacoglu, B. Kulah, S. Hatipoglu, F. Coskun, Incarcerated direct inguinal hernias: a three-year series at a large volume teaching hospital, *Hernia* 4 (3) (2000) 145–147.
- [16] J.A. Alvarez, R.F. Baldonado, I.G. Bear, J.A. Solís, P. Alvarez, J.I. Jorge, Incarcerated groin hernias in adults: presentation and outcome, *Hernia* 8 (May (2)) (2004) 121–126.
- [17] N. Andac, N. Baltacioglu, D. Tuney, et al., Inguinoscrotal bladder herniation: is CTa useful tool in diagnosis? *Clin. Imaging* 26 (5) (2002) 347–348, [http://dx.doi.org/10.1016/S0899-7071\(02\)00447-3](http://dx.doi.org/10.1016/S0899-7071(02)00447-3).
- [18] A.L. Komorowski, J. Moran Rodriguez, R. Kazi, W.M. Wysocki, Sliding inguinal hernias, *Int. J. Surg.* 10 (4) (2012) 206–208.

- [19] N.M. Patle, O. Tantia, P. Prasad, S. Khanna, B. Sen, Sliding inguinal hernias: scope of laparoscopic repair, *J. Laparoendosc. Adv. Surg. Tech. A* 21 (April (3)) (2011) 227–231.
- [20] Andrzej L. Komorowski, David Domínguez Usero, José Ramón, Martín-Hidalgo Rodil, Jorge Morán-Rodríguez, in: Prof. Silvestro Canonico (Ed.), Sliding Inguinal Hernias, Inguinal Hernia, InTech, 2014, <http://dx.doi.org/10.5772/58223>.
- [21] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, for the SCARE Group, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (2016) 180–186.

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