

World Journal of *Clinical Cases*

World J Clin Cases 2023 January 16; 11(2): 255-486



Contents

Thrice Monthly Volume 11 Number 2 January 16, 2023

REVIEW

- 255 Application of the cortical bone trajectory technique in posterior lumbar fixation
Peng SB, Yuan XC, Lu WZ, Yu KX
- 268 Allogeneic stem cell transplantation in the treatment of acute myeloid leukemia: An overview of obstacles and opportunities
Chen YF, Li J, Xu LL, Găman MA, Zou ZY
- 292 Idiopathic hirsutism: Is it really idiopathic or is it misnomer?
Unluhizarci K, Hacioglu A, Taheri S, Karaca Z, Kelestimur F

MINIREVIEWS

- 299 Liver function in transgender persons: Challenges in the COVID-19 era
Milionis C, Ilias I, Koukkou E
- 308 Telenutrition for the management of inflammatory bowel disease: Benefits, limits, and future perspectives
Güney Coşkun M, Kolay E, Basaranoglu M
- 316 Liver transplantation amidst the COVID-19 era: Our center's experience
Khazaaleh S, Suarez ZK, Alomari M, Rashid MU, Handa A, Gonzalez AJ, Zervos XB, Kapila N
- 322 Prospects for the use of olfactory mucosa cells in bioprinting for the treatment of spinal cord injuries
Stepanova OV, Fursa GA, Andretsova SS, Shishkina VS, Voronova AD, Chadin AV, Karsuntseva EK, Reshetov IV, Chekhonin VP
- 332 Use of metaphors when treating unexplained medical symptoms
Seeman MV

ORIGINAL ARTICLE

Case Control Study

- 342 Microvesicles with mitochondrial content are increased in patients with sepsis and associated with inflammatory responses
Zhang HJ, Li JY, Wang C, Zhong GQ

Retrospective Study

- 357 Is fascial closure required for a 12-mm trocar? A comparative study on trocar site hernia with long-term follow up
Krittiyanitsakun S, Nampoolsuksan C, Tawantanakorn T, Suwatthanarak T, Srisuworanan N, Taweerutchana V, Parakonthon T, Phalanusitthepha C, Swangsri J, Akaraviputh T, Methasate A, Chinswangwatanakul V, Trakarnsanga A

- 366 Ten-year multicentric retrospective analysis regarding postoperative complications and impact of comorbidities in hemorrhoidal surgery with literature review

Moldovan C, Rusu E, Cochior D, Toba ME, Mocanu H, Adam R, Rimbu M, Ghenea A, Savulescu F, Godoroja D, Botea F

Observational Study

- 385 Tear inflammation related indexes after cataract surgery in elderly patients with type 2 diabetes mellitus

Lv J, Cao CJ, Li W, Li SL, Zheng J, Yang XL

CASE REPORT

- 394 Management of a rare giant cell tumor of the distal fibula: A case report

Fan QH, Long S, Wu XK, Fang Q

- 401 Repair of a giant inguinoscrotal hernia with herniation of the ileum and sigmoid colon: A case report

Liu SH, Yen CH, Tseng HP, Hu JM, Chang CH, Pu TW

- 408 Anti-leucine-rich glioma inactivated protein 1 encephalitis with sleep disturbance as the first symptom: A case report and review of literature

Kong DL

- 417 Fat-poor renal angiomyolipoma with prominent cystic degeneration: A case report and review of the literature

Lu SQ, Lv W, Liu YJ, Deng H

- 426 Perivascular epithelioid cell tumors of the liver misdiagnosed as hepatocellular carcinoma: Three case reports

Kou YQ, Yang YP, Ye WX, Yuan WN, Du SS, Nie B

- 434 H7N9 avian influenza with first manifestation of occipital neuralgia: A case report

Zhang J

- 441 Gefitinib improves severe bronchorrhea and prolongs the survival of a patient with lung invasive mucinous adenocarcinoma: A case report

Ou GC, Luo W, Zhang WS, Wang SH, Zhao J, Zhao HM, Qiu R

- 449 Habitual khat chewing and oral melanoacanthoma: A case report

Albagieh H, Aloyouny A, Alshagroud R, Alwakeel A, Alkait S, Almufarji F, Almutairi G, Alkhalaf R

- 456 Systemic lupus erythematosus with multicentric reticulohistiocytosis: A case report

Liu PP, Shuai ZW, Lian L, Wang K

- 464 X-linked Charcot-Marie-Tooth disease after SARS-CoV-2 vaccination mimicked stroke-like episodes: A case report

Zhang Q, Wang Y, Bai RT, Lian BR, Zhang Y, Cao LM

- 472 Acute liver injury in a COVID-19 infected woman with mild symptoms: A case report

Lai PH, Ding DC

LETTER TO THE EDITOR

- 479** Incidence and clinical treatment of hypertriglyceridemic acute pancreatitis: A few issues

Yang QY, Zhao Q, Hu JW

- 482** Management of infected acute necrotizing pancreatitis

Pavlidis ET, Pavlidis TE

ABOUT COVER

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The WJCC is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Journal Citation Reports/Science Edition, Current Contents®/Clinical Medicine, PubMed, PubMed Central, Scopus, Reference Citation Analysis, China National Knowledge Infrastructure, China Science and Technology Journal Database, and Superstar Journals Database. The 2022 Edition of Journal Citation Reports® cites the 2021 impact factor (IF) for WJCC as 1.534; IF without journal self cites: 1.491; 5-year IF: 1.599; Journal Citation Indicator: 0.28; Ranking: 135 among 172 journals in medicine, general and internal; and Quartile category: Q4. The WJCC's CiteScore for 2021 is 1.2 and Scopus CiteScore rank 2021: General Medicine is 443/826.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: *Hua-Ge Yin*; Production Department Director: *Xu Guo*; Editorial Office Director: *Jin-Lei Wang*.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

January 16, 2023

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INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Repair of a giant inguinoscrotal hernia with herniation of the ileum and sigmoid colon: A case report

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Specialty type: Medicine, research and experimental

Provenance and peer review: Unsolicited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): C, C
Grade D (Fair): D
Grade E (Poor): 0

P-Reviewer: Sintusek P, Thailand;
Sultan AAEA, Egypt;
Tangsuwanaruk T, Thailand

Received: September 25, 2022

Peer-review started: September 25, 2022

First decision: October 18, 2022

Revised: November 11, 2022

Accepted: December 19, 2022

Article in press: December 19, 2022

Published online: January 16, 2023



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Abstract

BACKGROUND

Giant inguinoscrotal hernias are huge inguinal hernias that extend below the midpoint of the inner thigh in the standing posture. Giant inguinoscrotal hernias are rare in developed countries because of their better medical resources and early treatment. However, they can develop in patients who refuse surgery or ignore their condition. Intervention is inevitable because strangulation and organ perforation can occur, leading to peritonitis and sepsis. Common surgical approaches include open abdominal and inguinal approaches or a combination of both.

CASE SUMMARY

We present the case of a 73-year-old man who visited our emergency department with a huge mass in his left scrotum and septic complications. Abdominal computed tomography revealed a large left inguinoscrotal hernia that contained small bowel loops and the colon. Emergency surgical intervention was performed immediately because intestinal strangulation was highly suspected. The operative repair was performed using a combination of mini-exploratory laparotomy and the inguinal approach. The incarcerated organs, which included the ileum and sigmoid colon, had relatively good intestinal perfusion without perforation or

ischemic changes. They were successfully reduced into the abdomen, and bowel resection was not necessary. A tension-free prosthetic mesh was used for the hernia repair. Two weeks after the initial surgery, and with adequate antimicrobial therapy, the patient recovered and was discharged from our hospital. No evidence of hernia relapse was noted during the outpatient follow-up examination 3 mo after surgery.

CONCLUSION

Emergency surgery involving combined mini-exploratory laparotomy and the inguinal approach should be performed for serious incarcerated giant inguinoscrotal hernias.

Key Words: Inguinal hernia; Ileum; Sigmoid colon; Sepsis; Hernia repair; Case report

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Core Tip: Giant inguinoscrotal hernias are defined as hernias extending below the midpoint of the inner thigh of the patient in the standing position. Symptoms may vary, and serious complications, including intestinal obstruction and strangulation, may cause peritonitis and sepsis. Emergency surgery should be performed because of the risks of strangulation, perforation, and progressive necrosis. In this case, it was surprising to find the simultaneous existence of the ileum and sigmoid colon in the large inguinal hernia sac. The use of the inguinal approach combined with mini-exploratory laparotomy for giant hernial repair is beneficial and should be considered.

Citation: Liu SH, Yen CH, Tseng HP, Hu JM, Chang CH, Pu TW. Repair of a giant inguinoscrotal hernia with herniation of the ileum and sigmoid colon: A case report. *World J Clin Cases* 2023; 11(2): 401-407

URL: <https://www.wjgnet.com/2307-8960/full/v11/i2/401.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v11.i2.401>

INTRODUCTION

Giant inguinoscrotal hernias are defined as huge inguinal hernias that extend below the midpoint of the inner thigh in the standing posture[1]. Although rare, giant inguinoscrotal hernias still exist in developed countries. The main problem with inguinal hernias is their increasing size, which necessitates early surgical intervention. Giant inguinoscrotal hernias may develop in patients who refuse surgery or ignore their disease for a long time. Treatment of inguinoscrotal hernias is inevitable because strangulation and organ perforation can occur, resulting in further peritonitis and sepsis[2]. The World Society of Emergency Surgery (WSES) guidelines for emergency repair of complicated abdominal wall hernias suggest that patients should undergo emergency hernial repair immediately if intestinal strangulation is suspected[3]. Additionally, it has been proven that emergency surgical interventions are associated with higher rates of postoperative complications and adverse outcomes compared to early elective procedures[3,4]. We report the case of a patient with a giant inguinoscrotal hernia and herniation of the ileum and sigmoid colon without early surgical intervention who presented with sepsis and suspected bowel strangulation. The emergency repair was performed using a combination of mini-exploratory laparotomy and the inguinal approach.

CASE PRESENTATION

Chief complaints

A 73-year-old man visited the emergency department of our hospital because of a huge mass in his left scrotum and intolerable lower abdominal and groin pain for a duration of approximately 2 wk.

History of present illness

Approximately 20 mo prior, the patient was diagnosed with a huge left inguinoscrotal hernia at our outpatient department; however, he refused early surgical intervention. Several days before the patient presented to the emergency department, he also experienced general weakness and decreased urine output.

History of past illness

Other than the previous diagnosis of left inguinal hernia, the patient had no history of chronic diseases or surgeries.

Personal and family history

The patient had been working as a security guard at an apartment for more than 10 years. Part of his job involved lifting and carrying packages received by the residents. No relevant family history was noted.

Physical examination

His vital signs were as follows: Body temperature, 36°C; blood pressure, 106/73 mmHg; heart rate, 95 beats/min, and respiratory rate, 22 breaths/min. The results of the physical examination revealed pitting edema of the bilateral lower limbs, tenderness in the left lower abdomen and inguinal region, a large irreducible inguinoscrotal hernia on the left side that measured approximately 14 cm x 16 cm in the supine position, and bilateral inguinal ecchymosis (Figure 1).

Laboratory examinations

Laboratory serum examinations revealed a white blood cell count of $21.57 \times 10^3/\mu\text{L}$, 92.3% neutrophils, and thrombocytopenia with a platelet count of $90 \times 10^3/\mu\text{L}$. C-reactive protein and procalcitonin levels were 35.32 mg/dL and 24.96 ng/mL, respectively. The serum creatinine level was 2.3 mg/dL.

Imaging examinations

Abdominal computed tomography (CT) scanning was performed without contrast because of decreased renal function, suggesting a huge left inguinal hernia with herniation of the small intestine and colon as well as a small number of ascites (Figure 2).

FINAL DIAGNOSIS

Physical and laboratory serum test results and radiographic findings indicated the presence of a large incarcerated inguinal hernia with sepsis.

TREATMENT

After diagnosing, we intravenously administered antibiotics comprising Flomoxef 1g every 12 h. Flomoxef was chosen because of its efficacy for intra-abdominal infections. The dosage was adjusted according to the patient's creatinine clearance rate. Because of the risks of strangulation, perforation, and further profound septic shock, emergency surgery was performed.

The patient was placed in the supine position under general anesthesia. An inguinal incision on the left side revealed that the hernial sac was filled with ileum and sigmoid colon. Because of the failure to reduce the contents into the abdominal cavity, even with enlargement of the internal ring, a mini-midline incision was made. The incarcerated organs were carefully pulled out, and the adhesion between the hernial contents was separated. The hernial contents were grossly inflamed, with mild swelling and an erythematous appearance (Figure 3A). The incarcerated organs, with relatively good intestinal perfusion and no perforation or ischemic changes following a thorough examination, were successfully reduced into the abdomen (Figure 3B). The hernial repair was performed using tension-free techniques with unabsorbable polypropylene mesh sutured on the posterior wall of the inguinal canal. Finally, a Jackson-Pratt drain was placed in the left inguinal canal. The patient was transferred to the intensive care unit after surgery to closely monitor the end-organ function.

OUTCOME AND FOLLOW-UP

The patient experienced no complications during the early postoperative period. Two weeks after the initial surgery, with adequate infection control, the patient recovered and was discharged. The patient was able to remain in the standing position without evidence of relapse of the hernia at the time of the outpatient follow-up examination 3 mo after surgery.

DISCUSSION

Giant inguinoscrotal hernias are rare in developed countries. However, they can occur as a complication



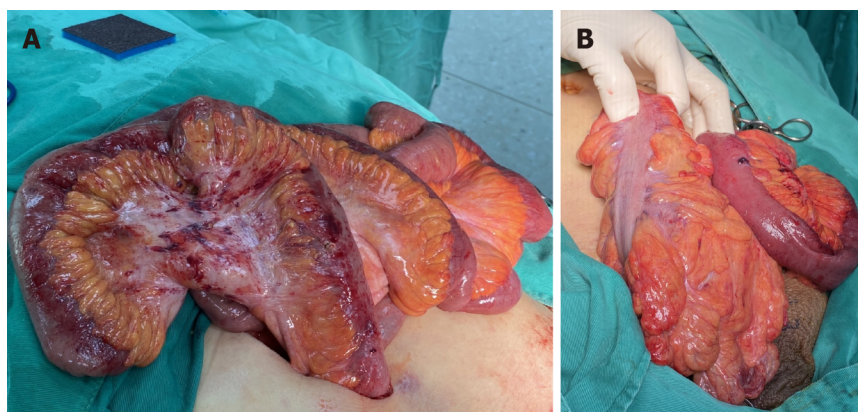
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Figure 1 Left-side giant inguinoscrotal hernia. A: Huge irreducible inguinoscrotal hernia with the penis buried within the enlarged scrotum; B: Ecchymosis formation in the bilateral inguinal region.



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Figure 2 Abdominal computed tomography scan. A: Computed tomography (CT) of the abdomen (axial section); B: CT scan of the abdomen (coronal section) revealing a large left-side inguinal hernia containing small bowel loops as well as the colon.



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Figure 3 Intraoperative findings. A: Hernial contents are grossly inflamed, with mild swelling and an erythematous appearance; B: The ileum and sigmoid colon from the hernial sac with relatively good perfusion.

of an inguinal hernia. Other complications of an inguinal hernia include hernial enlargement, increasing pain, and incarceration or strangulation. They often result from patient neglect and the rejection of the suggested surgery for a hernia. For our patient, the risk factors for inguinal hernia were identified as his age, sex, and occupation[5]. Giant inguinoscrotal hernias are more common in less developed countries that lack medical resources. The size of the hernia often negatively affects daily activities. The penis buried in the enlarged scrotum can result in urine dribbling over the scrotal skin, potentially leading to

skin damage, ulceration, and further infections[6]. Giant inguinoscrotal hernias accompanied by acute kidney injury resulting from urinary tract obstruction have been reported[7,8]. In the present case, the CT scan did not reveal obstructive uropathy such as hydronephrosis. Hence, we suspected that renal impairment with the clinical presentation of decreased urine output in our case occurred as a result of sepsis. Hernial contents that cannot be reduced into the abdominal cavity are referred to as incarcerated hernias. Bowel obstruction and strangulation of the bowel contents with a compromised blood supply are serious results of incarceration. The common contents of the hernial sac are the small intestine and omentum. In some cases, the stomach, appendix, cecum, kidney, urinary bladder, ovaries, and sigmoid colon have been found in the hernial sac[9,10]. In the present case, the simultaneous existence of the ileum and sigmoid colon in a large inguinal hernia sac was observed.

In our patient with a giant inguinoscrotal hernia, sepsis occurred with impaired renal function and coagulation according to the Sequential Organ Failure Assessment score[11]. We performed surgery immediately because of the risk of strangulation and progressive necrosis, which could be fatal according to the WSES guidelines for emergency repair of complicated abdominal wall hernias[3].

A sudden increase in intra-abdominal pressure may occur after the majority of the hernial organs have been reduced into the abdominal cavity[12]. Abdominal compartment syndrome can develop, leading to respiratory compromise attributable to an increase in intrathoracic pressure[13]. To avoid compromising respiratory and cardiac functions and enable successful recovery, a complete preoperative evaluation and careful postoperative monitoring are important.

Several surgical interventions have been developed for this purpose, and they all share the common strategy of relocating the hernial organs into the abdominal cavity, adapting to a relative emptiness. Two approaches can be employed. First, the abdominal cavity can be increased by artificially inducing progressive pneumoperitoneum[14,15] or creating an anterior abdominal wall defect and performing mesh repair and flap techniques[16,17]. Second, reduction of abdominal or hernial contents can be performed to relocate the reduced abdominal organs[18].

In the present case, bowel resection was not necessary because the patient maintained an acceptable abdominal space without excessive tension and airway pressure perioperatively. Furthermore, his vital signs and urine output were closely monitored postoperatively because of the high risk of increased intra-abdominal pressure. Although measuring the intravesical pressure is a common method used to identify intra-abdominal pressure, we did not use this for our patient because of its relatively invasive nature despite the minimally invasive implementation requirements. Orchiectomy was not performed because dissection of the spermatic cord was not problematic. The scrotal skin was not resected because it was not infected. We successfully predicted that the skin would be able to recover after the removal of additional tension caused by the giant inguinoscrotal hernia.

We used an inguinal approach combined with a mini-midline incision. This method of management has several advantages. First, it results in an easier reduction of the ileum and sigmoid colon into the abdominal cavity through the defect. Second, it allowed us to carefully examine the bowel condition to determine the presence of perforation or ischemic changes. Finally, a Jackson-Pratt drain could be placed to ensure adequate drainage. Because hernial defects are large, the risk of recurrence of giant inguinoscrotal hernias is much higher than that of other inguinoscrotal hernias. The use of tension-free techniques whenever possible is recommended for hernial repairs[19]. Most importantly, in addition to the initial surgical intervention, appropriate antimicrobial therapy was fundamental for our patient with sepsis.

CONCLUSION

In modern surgical practice, giant inguinoscrotal hernias are uncommon. When they do occur, they present challenges for the attending surgeon because they can cause fatal complications. For patients presenting with sepsis, emergency surgery should be performed if there is significant incarceration or strangulation. Adequate preoperative planning as well as intraoperative and postoperative monitoring are essential for these patients. The use of a combination of mini-exploratory laparotomy and the inguinal approach is worthy of further investigation. Enlargement of the abdominal cavity or debulking of the abdominal organs should be avoided if the abdominal cavity is sufficient. Relocation of the incarcerated organs using proper and early antimicrobial therapy was the cornerstone of successful treatment for this case.

FOOTNOTES

Author contributions: Liu SH and Yen CH contributed to the drafting of the manuscript; Pu TW contributed to revising the final draft. Tseng HP contributed to the acquisition of data; Chang CH and Hu JM contributed to the investigation and interpretation of the data; All authors have read and approved the manuscript.

Informed consent statement: Informed written consent was obtained from the patient for the publication of this

report and any accompanying images.

Conflict-of-interest statement: The authors declare that they have no conflict of interest to disclose.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

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Country/Territory of origin: Taiwan

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S-Editor: Liu GL

L-Editor: A

P-Editor: Liu GL

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