

# World Journal of *Clinical Cases*

*World J Clin Cases* 2023 February 16; 11(5): 979-1223



## Contents

Thrice Monthly Volume 11 Number 5 February 16, 2023

## MINIREVIEWS

- 979 Non-clostridium difficile induced pseudomembranous colitis  
*Jagirdhar GSK, Surani S*
- 989 Pleural effusion in critically ill patients and intensive care setting  
*Bediwy AS, Al-Biltagi M, Saeed NK, Bediwy HA, Elbeltagi R*

## ORIGINAL ARTICLE

## Retrospective Study

- 1000 Investigation of litigation in trauma orthopaedic surgery  
*Salimi M, Heidari MB, Ravandi Z, Mosalamiaghili S, Mirghaderi P, Jafari Kafiabadi M, Biglari F, Salimi A, Sabaghzadeh Irani A, Khabiri SS*
- 1009 Type 2 diabetes mellitus characteristics affect hepatocellular carcinoma development in chronic hepatitis B patients with cirrhosis  
*Li MY, Li TT, Li KJ, Zhou C*
- 1019 Relationship between glycemic variability and cognitive function in lacune patients with type 2 diabetes  
*Meng QZ, Wang Y, Li B, Xi Z, Wang M, Xiu JQ, Yang XP*
- 1031 COVID-19-related cardiomyopathy: Can dual-energy computed tomography be a diagnostic tool?  
*Aydin F, Kantarci M, Aydın S, Karavaş E, Ceyhan G, Ogul H, Şahin ÇE, Eren S*

## Observational Study

- 1040 Multiple regression analysis of risk factors related to radiation pneumonitis  
*Shi LL, Yang JH, Yao HF*
- 1049 Right hemicolectomy combined with duodenum-jejunum Roux-en-Y anastomosis for hepatic colon carcinoma invading the duodenum: A single-center case series  
*Liu PG, Feng PF, Chen XF*
- 1058 Analysis of the value and safety of thyroid-stimulating hormone in the clinical efficacy of patients with thyroid cancer  
*Liang JJ, Feng WJ, Li R, Xu RT, Liang YL*

## CASE REPORT

- 1068 Effect of liver transplantation with primary hyperoxaluria type 1: Five case reports and review of literature  
*Wang XY, Zeng ZG, Zhu ZJ, Wei L, Qu W, Liu Y, Tan YL, Wang J, Zhang HM, Shi W, Sun LY*
- 1077 Diagnosis of an intermediate case of maple syrup urine disease: A case report  
*Lin YT, Cai YN, Ting TH, Liu L, Zeng CH, Su L, Peng MZ, Li XZ*

- 1086** Angioimmunoblastic T-cell lymphoma induced hemophagocytic lymphohistiocytosis and disseminated intravascular coagulopathy: A case report  
*Jiang M, Wan JH, Tu Y, Shen Y, Kong FC, Zhang ZL*
- 1094** Giant myxofibrosarcoma of the esophagus treated by endoscopic submucosal dissection: A case report  
*Wang XS, Zhao CG, Wang HM, Wang XY*
- 1099** Novel gene mutation in maturity-onset diabetes of the young: A case report  
*Zhang N, Zhao H, Li C, Zhang FZ*
- 1106** Orthodontic-surgical treatment for severe skeletal class II malocclusion with vertical maxillary excess and four premolars extraction: A case report  
*Zhou YW, Wang YY, He ZF, Lu MX, Li GF, Li H*
- 1115** Envafolelimab combined with chemotherapy in the treatment of combined small cell lung cancer: A case report  
*Liu MH, Li YX, Liu Z*
- 1122** Thyrotoxicosis in patients with a history of Graves' disease after SARS-CoV-2 vaccination (adenovirus vector vaccine): Two case reports  
*Yan BC, Luo RR*
- 1129** Administration of modified Gegen Qinlian decoction for hemorrhagic chronic radiation proctitis: A case report and review of literature  
*Liu SY, Hu LL, Wang SJ, Liao ZL*
- 1137** Surgical resection of a giant thymolipoma causing respiratory failure: A case report  
*Gong LH, Wang WX, Zhou Y, Yang DS, Zhang BH, Wu J*
- 1144** Successful treatment of granulomatosis with polyangiitis using tocilizumab combined with glucocorticoids: A case report  
*Tang PF, Xu LC, Hong WT, Shi HY*
- 1152** Langerhans cell histiocytosis misdiagnosed as thyroid malignancy: A case report  
*Shi JJ, Peng Y, Zhang Y, Zhou L, Pan G*
- 1158** Combined treatment of refractory benign stricture after esophageal endoscopic mucosal dissection: A case report  
*Pu WF, Zhang T, Du ZH*
- 1165** Bladder preservation in complicated invasive urothelial carcinoma following treatment with cisplatin/gemcitabine plus tislelizumab: A case report  
*Yang R, Chen JX, Luo SH, Chen TT, Chen LW, Huang B*
- 1175** *Nocardia cyriacigeorgica* infection in a patient with repeated fever and CD4<sup>+</sup> T cell deficiency: A case report  
*Hong X, Ji YQ, Chen MY, Gou XY, Ge YM*

- 1182** Closed loop ileus caused by a defect in the broad ligament: A case report  
*Zucal I, Nebiker CA*
- 1188** Early postsurgical lethal outcome due to splenic littoral cell angioma: A case report  
*Jia F, Lin H, Li YL, Zhang JL, Tang L, Lu PT, Wang YQ, Cui YF, Yang XH, Lu ZY*
- 1198** Combinations of nerve blocks in surgery for post COVID-19 pulmonary sequelae patient: A case report and review of literature  
*Jin Y, Lee S, Kim D, Hur J, Eom W*
- 1206** Incidental right atrial mass in a patient with secondary pancreatic cancer: A case report and review of literature  
*Fioretti AM, Leopizzi T, La Forgia D, Scicchitano P, Oreste D, Fanizzi A, Massafra R, Oliva S*
- 1217** Difficult airway due to cervical haemorrhage caused by spontaneous rupture of a parathyroid adenoma: A case report  
*Han YZ, Zhou Y, Peng Y, Zeng J, Zhao YQ, Gao XR, Zeng H, Guo XY, Li ZQ*

**ABOUT COVER**

Editorial Board Member of *World Journal of Clinical Cases*, Tian-Biao Zhou, MD, PhD, Chief Doctor, Professor, Department of Nephrology, Second Affiliated Hospital, Shantou University Medical College, Shantou 515041, Guangdong Province, China. zhoutb@aliyun.com

**AIMS AND SCOPE**

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

**INDEXING/ABSTRACTING**

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: Xiang Li; 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**

February 16, 2023

**COPYRIGHT**

© 2023 Baishideng Publishing Group Inc

**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>



## Closed loop ileus caused by a defect in the broad ligament: A case report

Isabel Zucal, Christian A Nebiker

**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): 0  
Grade E (Poor): 0

**P-Reviewer:** Carannante F, Italy;  
Wang Y, China

**Received:** November 8, 2022

**Peer-review started:** November 8, 2022

**First decision:** November 22, 2022

**Revised:** December 23, 2022

**Accepted:** January 16, 2023

**Article in press:** January 16, 2023

**Published online:** February 16, 2023



**Isabel Zucal, Christian A Nebiker**, Department of General Surgery, Cantonal Hospital of Aarau, Aarau 5001, Switzerland

**Corresponding author:** Isabel Zucal, MD, Postdoc, Department of General Surgery, Cantonal Hospital of Aarau, Tellstrasse 25, Aarau 5001, Switzerland. [isabel.zucal@ksa.ch](mailto:isabel.zucal@ksa.ch)

### Abstract

#### BACKGROUND

Closed loop ileus caused by entrapment of bowel in a defect of the broad ligament is a rarity. Only a few cases have been reported in the literature.

#### CASE SUMMARY

We present the case of a 44-year-old, healthy patient with no prior history of abdominal surgery who developed a closed loop ileus due to an internal hernia secondary to a defect in the right broad ligament. She first presented to the emergency department with diarrhea and vomiting. As she had had no previous abdominal surgery, she was diagnosed with probable gastroenteritis and discharged. The patient subsequently returned to the emergency department due to a lack of improvement in her symptoms. Blood tests showed an elevated white blood cell count and a closed loop ileus was diagnosed on an abdominal computer tomography scan. Diagnostic laparoscopy revealed an internal hernia entrapped in a 2 cm large defect in the right broad ligament. The hernia was reduced and the ligament defect was closed using a running, barbed suture.

#### CONCLUSION

Bowel incarceration through an internal hernia may present with misleading symptoms and laparoscopy may reveal unexpected findings.

**Key Words:** Broad ligament; Ileus; Internal hernia; Laparoscopy; Case report

©The Author(s) 2023. Published by Baishideng Publishing Group Inc. All rights reserved.

**Core Tip:** In young patients with negative history of abdominal surgery presenting at the emergency department with nausea and vomiting, the initial differential diagnosis should include ileus. If an ileus is suspected, computer tomography and laparoscopy are the diagnostic tools of choice. Internal hernias are rare, especially those through the broad ligament, but they should be considered to avoid complications such as bowel necrosis. Because of the rarity of the conditions, there are no studies or long-term data on the best treatment option, but most authors describe a direct defect closure.

**Citation:** Zucal I, Nebiker CA. Closed loop ileus caused by a defect in the broad ligament: A case report. *World J Clin Cases* 2023; 11(5): 1182-1187

**URL:** <https://www.wjgnet.com/2307-8960/full/v11/i5/1182.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v11.i5.1182>

## INTRODUCTION

Internal hernias are responsible for up to 4% of bowel obstruction in the emergency setting[1,2]. Herniation of the bowel through the broad ligament has been reported to underlie 4%–7% of these cases [2-5]. A computer tomography (CT) scan is the diagnostic tool of choice, however, the cause of bowel obstruction is usually not identified. In this regard, diagnostic laparoscopy plays a crucial role. Not only the area of bowel entrapment can be identified, but the hernia can be reduced, and the defect surgically closed.

The initial clinical presentation may be misleading and non-specific, as affected women have typically not had previous abdominal surgery[5]. Here we present a case of a 44-year-old woman with closed loop ileus caused by a defect in the right broad ligament. The case was reported in accordance with the SCARE 2020 guidelines[6].

## CASE PRESENTATION

### Chief complaints

A 44-year-old female patient with sudden onset of abdominal pain was assigned to the surgical emergency department by the gynecological ward after exclusion of a gynecological pathology.

### History of present illness

The pain was mainly localized in both lower abdominal quadrants and accompanied by nausea without vomiting.

### History of past illness

History of past illness was negative.

### Personal and family history

She was otherwise healthy, had two children *via* vaginal delivery, and had no history of abdominal operations.

### Physical examination

On clinical examination, pain was found on palpation of the right lower abdominal quadrant without signs of peritonism.

### Laboratory examinations

The blood tests showed an elevated white blood cell count (26 g/L) and normal C-reactive protein (CRP).

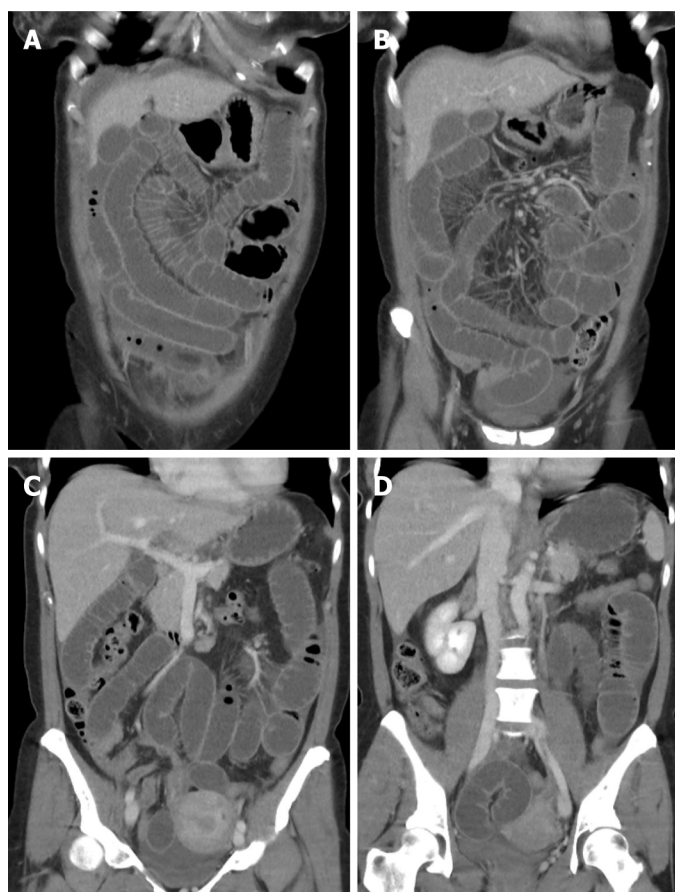
### Imaging examinations

An ultrasound scan could not identify the appendix. However, distended bowel without peristalsis was seen in the right lower quadrant, possibly indicating a segmental obstruction. Because of a lack of previous abdominal operations, an ileus seemed unlikely and the patient was diagnosed with enteritis. She was scheduled for a control the next morning.

### Further diagnostic work-up

Within 12 h, the patient was brought back to the emergency department by ambulance and had





DOI: 10.12998/wjcc.v11.i5.1182 Copyright ©The Author(s) 2023.

**Figure 1** computer tomography scan of the abdomen. A: Small bowel distension is observed; B: The dilated small bowel indicates an obstruction; C: The site of change of intestinal caliber is located in the right lower quadrant; D: The cause of obstruction cannot be identified.

developed additional vomiting and diarrhea. A diffuse pain on palpation of the lower abdominal quadrants was elicited and stool samples were collected for microbiological analysis. The white blood cell count had fallen to 14 g/L, and the CRP had risen to 20 mg/L. Again, the patient was discharged with the diagnosis of enteritis. On the next day, the patient came to the emergency department again with constant vomiting and new bloody diarrhea. A CT of the abdomen was performed, and a closed loop obstruction was postulated. Moreover, ascites was observed. The CT findings are shown in [Figure 1](#). The patient was scheduled for an emergency laparoscopy which detected herniation of the ileum into a 2 cm defect in the right broad ligament.

## FINAL DIAGNOSIS

An internal hernia through the right broad ligament.

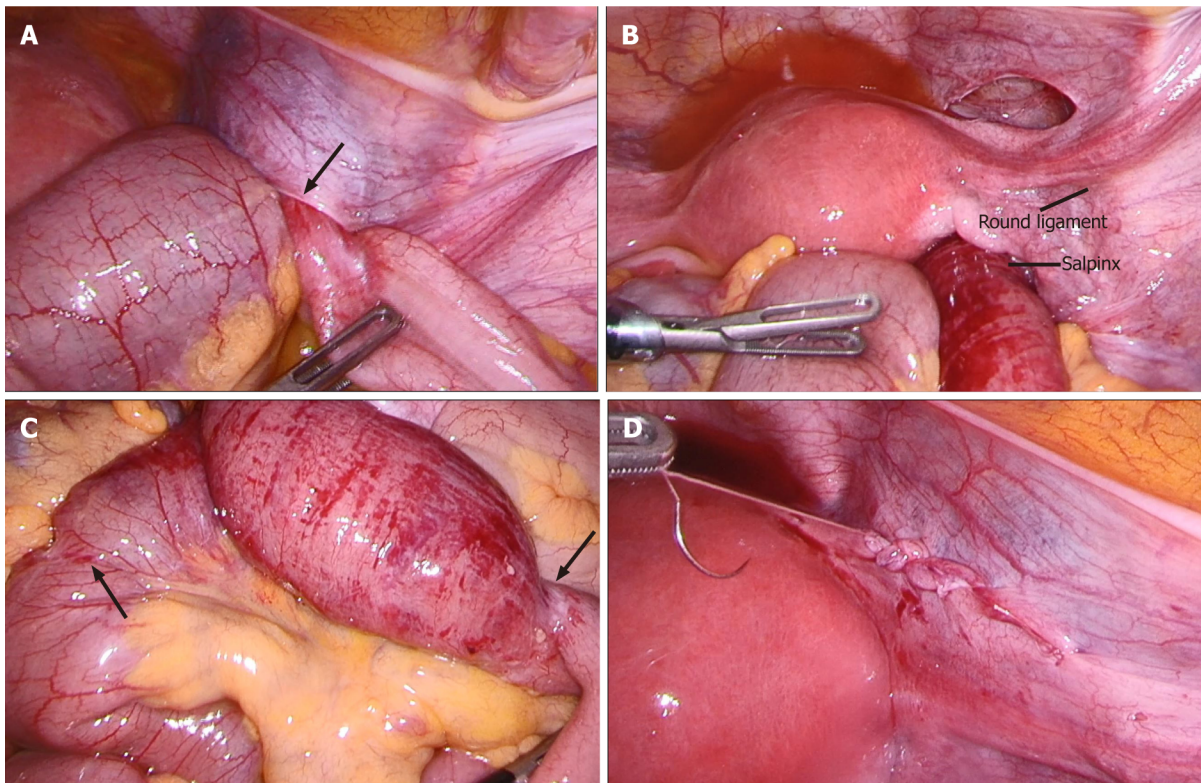
## TREATMENT

The bowel was successfully reduced and presented no signs of bowel ischemia. Two strangulation marks were identified but appeared to be without transmural necrosis. The defect in the right broad ligament was closed by using a barbed running suture. The intraoperative findings and defect closure are shown in [Figure 2](#). The nasogastric tube could be removed the day after surgery. Food was well tolerated, and the patient was discharged on the third postoperative day.

## OUTCOME AND FOLLOW-UP

After discharge, no further clinical follow-up was planned in the surgical outpatient clinic and the patient did not present again to the emergency department.





DOI: 10.12998/wjcc.v11.i5.1182 Copyright ©The Author(s) 2023.

**Figure 2 Intraoperative findings.** A: Internal hernia is identified: small bowel incarceration through a defect in the right broad ligament of the uterus (arrow); B: Overview on the anatomy: The defect is caudal to the salpinx and round ligament of the uterus. According to the classification by Cilley *et al*[13], this classifies as a type I hernia; C: Strangulation marks are indicated by arrows and between which hyperemic bowel can be observed; D: Defect closure with a running suture.

## DISCUSSION

Bowel obstruction caused by herniation through the broad ligament is very rare and may occur in healthy patients with no prior history of abdominal surgery. Symptoms including nausea, vomiting and paradoxical diarrhea may therefore be attributed to enteritis, as happened in our case. In a case reported by Agrawal *et al*[7], a ruptured ovarian cyst was suspected before the exploratory laparotomy was performed and an internal hernia through the broad ligament was detected[7]. Such hernias usually manifest as closed loop obstruction on a CT scan[8,9], but the etiology is hard to detect. Thus, reaching the correct diagnosis may be delayed.

In the literature, only a few similar cases have been described. We were able to perform a laparoscopic hernia reduction and closure of the defect without complications. In other reported cases, the hernia had to be reduced *via* laparotomy[7-11]. Although the bowel was hyperemic, there were no signs of bowel ischemia, so no bowel resection had to be performed. In contrast, in other reported cases, strangulated bowel had to be resected[10]. In the case reported by Takahashi *et al*[9], the fallopian tube had to be removed due to necrosis[9]. Hashimoto *et al*[8] described recurrence of a broad ligament hernia in a 53-year-old woman 10 years after primary repair[8]. In a case reported by Rodrigues *et al*[12], asymptomatic, internal broad ligament hernia was an incidental finding in an exploratory laparoscopy to recover a lost intrauterine device[12].

According to Cilley *et al*'s classification[13], we report a type I hernia as the defect was located caudal to the round ligament in the broad ligament. A type II hernia would have been located in the mesovarium and mesosalpinx above the round ligament, and a type III hernia has been described as a defect through the meso-ligamentum teres uteri[13]. Broad ligament defects and consecutive hernias can be congenital or acquired[14]. Congenital defects arise from spontaneous rupture of congenital cysts in the broad ligament and are usually bilateral, whereas acquired defects may be secondary to delivery trauma, pregnancy, surgery, or inflammatory disease[9,14]. Inspection of the contralateral broad ligament is important to avoid re-operation, however, guidelines on the optimal defect closure and long-term outcomes are missing.

## CONCLUSION

A closed loop ileus due to an internal hernia in patients with a negative history of abdominal surgery may present with misleading symptoms. A CT scan is the diagnostic tool of choice to identify closed loop obstruction, but only laparoscopy can provide the correct diagnosis and treatment. Due to the rarity of broad ligament internal hernias, there is no consensus on the best surgical treatment. Observation of long-term outcomes of the reported cases with regards to hernia recurrence is needed.

## FOOTNOTES

**Author contributions:** Zucal I and Nebiker CA performed the research, analyzed the data and wrote the manuscript; All authors have read and approved the final manuscript.

**Informed consent statement:** Informed written consent was obtained from the patient for publication of this report and any accompanying images.

**Conflict-of-interest statement:** All the authors report no relevant conflicts of interest for this article.

**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).

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

**Country/Territory of origin:** Switzerland

**ORCID number:** Isabel Zucal 0000-0002-1537-8458.

**S-Editor:** Li L

**L-Editor:** A

**P-Editor:** Li L

## REFERENCES

- 1 **Zemour J**, Coueffe X, Fagot H. Herniation of the broad ligament... And the other side? *Int J Surg Case Rep* 2019; **65**: 354-357 [PMID: 31783233 DOI: 10.1016/j.ijscr.2019.11.024]
- 2 **Ghahremani GG**. Internal abdominal hernias. *Surg Clin North Am* 1984; **64**: 393-406 [PMID: 6729672 DOI: 10.1016/s0039-6109(16)43293-7]
- 3 **Martin LC**, Merkle EM, Thompson WM. Review of internal hernias: radiographic and clinical findings. *AJR Am J Roentgenol* 2006; **186**: 703-717 [PMID: 16498098 DOI: 10.2214/ajr.05.0644]
- 4 **Fukuoka M**, Tachibana S, Harada N, Saito H. Strangulated herniation through a defect in the broad ligament. *Surgery* 2002; **131**: 232-233 [PMID: 11854708 DOI: 10.1067/msy.2002.113886]
- 5 **Reyes N**, Smith LE, Bruce D. Strangulated internal hernia due to defect in broad ligament: a case report. *J Surg Case Rep* 2020; **2020**: rjaa487 [PMID: 33294168 DOI: 10.1093/jscr/rjaa487]
- 6 **Agha RA**, Franchi T, Sohrabi C, Mathew G, Kerwan A; SCARE Group. The SCARE 2020 Guideline: Updating Consensus Surgical Case Report (SCARE) Guidelines. *Int J Surg* 2020; **84**: 226-230 [PMID: 33181358 DOI: 10.1016/j.ijssu.2020.10.034]
- 7 **Agrawal P**, Grab JT IVs, Howe HR 3rd, Cross K. Ruptured Ovarian Cyst Masking Diagnosis of Hernia Through Broad Ligament of Uterus: A Case Report. *J Investig Med High Impact Case Rep* 2022; **10**: 23247096221100500 [PMID: 35610939 DOI: 10.1177/23247096221100500]
- 8 **Hashimoto Y**, Kanda T, Chida T, Suda K. Recurrence hernia in the broad ligament of the uterus: a case report. *Surg Case Rep* 2020; **6**: 288 [PMID: 33196861 DOI: 10.1186/s40792-020-01030-5]
- 9 **Takahashi M**, Yoshimitsu M, Yano T, Idani H, Shiozaki S, Okajima M. Rare Contents of an Internal Hernia through a Defect of the Broad Ligament of the Uterus. *Case Rep Surg* 2021; **2021**: 5535162 [PMID: 34194864 DOI: 10.1155/2021/5535162]
- 10 **Arif SH**, Mohammed AA. Strangulated small-bowel internal hernia through a defect in the broad ligament of the uterus presenting as acute intestinal obstruction: A case report. *Case Rep Womens Health* 2021; **30**: e00310 [PMID: 33868965 DOI: 10.1016/j.crwh.2021.e00310]
- 11 **Ohno S**, Chikaishi W, Sugimoto T, Komori S, Kawai M. An incarcerated internal hernia of the sigmoid colon through a defect in the broad ligament: A case report. *Int J Surg Case Rep* 2021; **85**: 106169 [PMID: 34274757 DOI: 10.1016/j.ijscr.2021.106169]

- 12 **Rodrigues F**, Sarmiento I, Tiago P. Asymptomatic internal hernia through a defect of broad ligament: a surprising finding in a laparoscopic surgery to recover a lost levonorgestrel-releasing intrauterine system. *BMJ Case Rep* 2015; **2015** [PMID: 25564646 DOI: 10.1136/bcr-2014-206804]
- 13 **Cilley R**, Poterack K, Lemmer J, Dafoe D. Defects of the broad ligament of the uterus. *Am J Gastroenterol* 1986; **81**: 389-391 [PMID: 3706255]
- 14 **Simstein NL**. Internal herniation through a defect in the broad ligament. *Am Surg* 1987; **53**: 258-259 [PMID: 3579036]



Published by **Baishideng Publishing Group Inc**  
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

**Telephone:** +1-925-3991568

**E-mail:** [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)

**Help Desk:** <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

