



Original Case Report

Internal Herniation of an Ileojejunum Loop Through the Ovarian Ligament Leading to Acute Small Bowel Obstruction and Gangrene in a Young Female: A Rare Case Report

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Abstract: Background: Internal hernias are an uncommon cause of acute small bowel obstruction and are associated with a high risk of bowel strangulation and ischemia due to delayed diagnosis. Pelvic internal hernias are particularly rare, and herniation of the small bowel through the ovarian ligament is an exceptionally uncommon entity with very few cases reported in the literature. **Case Presentation:** A 24-year-old female with no prior history of abdominal or pelvic surgery who presented with acute abdominal pain, vomiting, and obstipation of two days' duration. Clinical examination revealed tachycardia and signs of intestinal obstruction. Laboratory investigations showed leukocytosis and elevated inflammatory markers. Contrast-enhanced computed tomography of the abdomen and pelvis demonstrated features of distal small bowel obstruction with twisting of ileal loops, mesenteric congestion, reduced bowel wall enhancement, and mild ascites, raising suspicion of strangulation. Emergency diagnostic laparoscopy was performed and subsequently converted to exploratory laparotomy. Intraoperatively, a gangrenous ileojejunum segment measuring approximately 70 cm was found herniating through a defect in the right ovarian ligament. Resection of the gangrenous bowel with primary side-to-side ileojejunum anastomosis was performed, and the ovarian ligament defect was repaired. The postoperative course was uneventful, with gradual return of bowel function and satisfactory recovery. The patient was discharged in stable condition and remained asymptomatic on follow-up. Herniation of the small bowel through the ovarian ligament is an extremely rare cause of acute intestinal obstruction. A high index of suspicion is required, particularly in young females without previous surgical history. Early radiological evaluation and prompt surgical intervention are essential to prevent bowel ischemia and improve clinical outcomes.

Keywords: Internal hernia, Ovarian ligament, Small bowel obstruction, Ileojejunum herniation, Bowel gangrene, Mesenteric ischemia, Pelvic hernia, Acute abdomen, Strangulated bowel, Computed tomography, Exploratory laparotomy

INTRODUCTION

Acute small bowel obstruction (SBO) is a common surgical emergency and a significant cause of morbidity and mortality worldwide. The majority of

cases are attributed to postoperative adhesions, external hernias, neoplasms, or inflammatory strictures [1]. In contrast, internal hernias represent a rare etiology, accounting for less than 1% of all cases

of intestinal obstruction. Despite their low incidence, internal hernias are clinically important because they carry a disproportionately high risk of strangulation, bowel ischemia, and gangrene due to delayed diagnosis and rapid disease progression 2.

Internal hernias are defined as protrusion of a viscus through a normal or abnormal peritoneal or mesenteric aperture within the peritoneal cavity. They may be congenital or acquired and are broadly classified based on their anatomical location, including paraduodenal, pericecal, foramen of Winslow, transmesenteric, transmesocolic, intersigmoid, and pelvic hernias 3. Among these, pelvic internal hernias are exceptionally rare, and herniation through gynecological structures such as the broad ligament or ovarian ligament constitutes an extremely uncommon subset. Herniation through the ovarian ligament is particularly rare, with only isolated cases reported in the literature 4.

The ovarian ligament is a fibromuscular structure extending from the ovary to the uterus and is not typically associated with defects large enough to permit bowel herniation. Defects in the ovarian ligament may be congenital or acquired secondary to inflammation, trauma, pregnancy, or pelvic surgery 5. When present, such defects can allow small bowel loops to herniate into the pelvic cavity, leading to obstruction and potential vascular compromise. Due to the rarity of this condition, clinical awareness remains limited, and preoperative diagnosis is often challenging 6.

The clinical presentation of internal hernias is nonspecific and frequently mimics more common causes of SBO. Patients typically present with acute or intermittent abdominal pain, vomiting, abdominal distension, and obstipation. Physical examination findings may be subtle in early stages, while laboratory investigations often reveal nonspecific inflammatory markers 2,7. As a result, diagnosis is frequently delayed until ischemia or gangrene develops. In young patients without previous abdominal surgery, the diagnostic dilemma is further compounded, as adhesive obstruction is less likely and alternative causes must be considered 8.

Contrast-enhanced computed tomography (CECT) has emerged as the imaging modality of choice for evaluating suspected internal hernias. Characteristic CT features include clustered or abnormally positioned bowel loops, mesenteric vessel crowding or twisting, focal transition points, bowel wall thickening, mesenteric congestion, ascites, and reduced bowel wall enhancement suggestive of ischemia 9. However, even with advanced imaging, definitive preoperative identification of rare pelvic internal hernias remains difficult, and the diagnosis is often established intraoperatively 10.

Prompt surgical intervention is essential once strangulation is suspected, as delayed management significantly increases the risk of bowel necrosis, sepsis, and mortality. Surgical management involves reduction of the herniated bowel, assessment of viability, resection of gangrenous segments if present, and closure of the hernia defect to prevent recurrence 11. Reporting such rare cases is crucial to enhance clinical awareness, improve diagnostic accuracy, and emphasize the importance of early operative management 11.

In this report, we describe a rare case of internal herniation of an ileojejunal loop through a defect in the ovarian ligament in a young female, leading to acute small bowel obstruction and bowel gangrene, and discuss its clinical, radiological, and surgical implications.

CASE PRESENTATION

Patient Information

A 24-year-old female presented to the emergency department with acute abdominal symptoms. She had no known medical comorbidities, no prior history of abdominal or pelvic surgery, and no history of trauma. There was no significant gynecological history, including pelvic inflammatory disease, endometriosis, or prior obstetric interventions. She was not on any long-term medications and had no known drug allergies. There was no family history of gastrointestinal or gynecological disorders.

History of Present Illness

The patient reported a 2-day history of abdominal pain that was insidious in onset and colicky in nature. The pain was initially mild but progressively increased in intensity and frequency over time. It was predominantly localized to the lower abdomen and was aggravated following food intake. The pain was associated with multiple episodes of vomiting, which were initially non-bilious and later became more frequent. She also complained of non-passage of stools and flatus for two days, suggestive of intestinal obstruction. There was no history of fever, jaundice, hematemesis, melena, altered bowel habits, or weight loss. She denied any urinary symptoms or menstrual irregularities.

Physical Examination

On admission, the patient appeared anxious and distressed due to abdominal pain. She was tachycardic with a pulse rate of 148 beats per minute, while her blood pressure was recorded at 110/80 mmHg. She was afebrile, and oxygen saturation was maintained on room air. Abdominal examination revealed mild distension with diffuse tenderness, more pronounced in the lower abdomen, along with guarding. There was no rigidity or palpable mass. Bowel sounds were sluggish on auscultation. Examination did not reveal

any visible or palpable external hernias. Digital rectal examination showed an empty rectum. Systemic examination of the cardiovascular, respiratory, and central nervous systems was unremarkable.

Laboratory Investigations

Baseline hematological investigations demonstrated leukocytosis, with total leukocyte counts ranging from 10,700 to 12,500/ μ L during the hospital course. Differential counts showed neutrophilic predominance. Inflammatory markers were elevated, including C-reactive protein and procalcitonin, indicating an ongoing inflammatory or ischemic process. Renal function tests and liver function tests were within normal limits. Serum electrolyte analysis revealed mild hypokalemia, which was corrected with intravenous potassium supplementation. Arterial blood gas analysis did not reveal metabolic acidosis. Urinalysis was normal. Ascitic fluid analysis, performed intraoperatively, revealed lymphocyte-predominant cells without evidence of bacterial infection or malignant cells.

Radiological Evaluation

Contrast-enhanced computed tomography of the abdomen and pelvis revealed mild edematous wall

thickening of a few ileal loops located in the midline pelvis, associated with surrounding mesenteric fat stranding. Mild dilatation of distal jejunal and ileal loops was noted, measuring up to 3.2 cm in diameter. A focal area of narrowing and twisting of a distal ileal loop was identified in the right hemipelvis, with associated mesenteric congestion and crowding of vessels. Reduced bowel wall enhancement of one ileal loop raised concern for compromised vascularity and evolving mesenteric ischemia. Mild free fluid was noted in the peritoneal cavity. Based on these findings, a diagnosis of distal small bowel obstruction with suspected strangulation was considered.

Initial Management and Surgical Decision-Making

The patient was initially managed with nil per oral status, nasogastric tube decompression, intravenous fluid resuscitation, broad-spectrum intravenous antibiotics, analgesics, and correction of electrolyte imbalance. Despite adequate resuscitation, the patient continued to have persistent abdominal pain and tachycardia. In view of worsening clinical status and radiological features suggestive of bowel ischemia, an emergency surgical intervention was planned to prevent further progression to bowel necrosis and sepsis.

Intraoperative Findings and Surgical Procedure

The patient was taken up for emergency diagnostic laparoscopy. On laparoscopic evaluation, dilated and edematous small bowel loops were visualized, with a gangrenous segment of bowel seen occupying the pelvic cavity. Visualization and safe manipulation were limited due to marked bowel distension and the extent of ischemic involvement; therefore, the procedure was converted to an exploratory laparotomy.

Upon laparotomy, approximately 70 cm of ileojejunal bowel was found herniating through a defect in the right ovarian ligament. The herniated segment appeared dusky, congested, and nonviable, with loss of peristalsis, confirming strangulation and ischemic gangrene. The proximal jejunal loops were grossly dilated and edematous, while the distal ileum and large bowel were collapsed. The remaining bowel was carefully examined and found to be viable.

The gangrenous ileojejunal segment was gently reduced from the pelvic cavity and resected with adequate proximal and distal margins. A primary side-to-side ileojejunal anastomosis was performed using a single-layer interrupted suturing technique with 3-0 mersilk, ensuring good vascularity and tension-free approximation. The defect in the right ovarian ligament was clearly identified and meticulously closed using interrupted sutures to prevent recurrence of herniation. Thorough peritoneal lavage was performed, hemostasis was secured, and a pelvic drain was placed. The abdomen was closed in layers.



Fig 1: Intraoperative photograph showing gangrenous ileojejunal bowel segment herniated through a defect in the right ovarian ligament

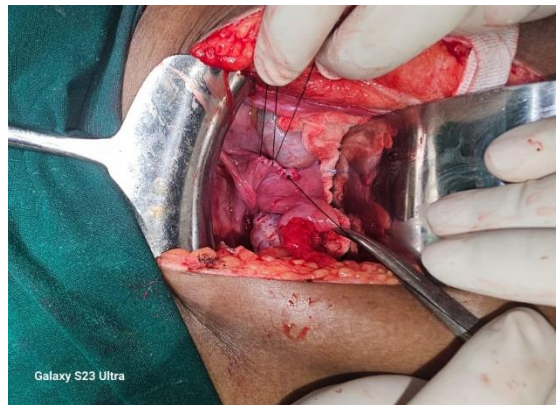


Fig 2: Intraoperative photograph showing the defect in the right ovarian ligament after reduction of the herniated bowel, being repaired with interrupted sutures

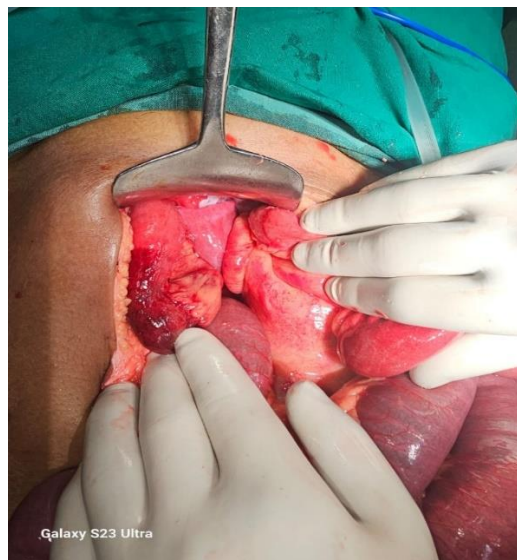


Fig 3: Intraoperative photograph demonstrating the herniated ileojejunal loop in the pelvic cavity prior to reduction, with proximal bowel dilatation

Postoperative Course

The patient was shifted to the postoperative ward and managed with intravenous antibiotics, analgesics, and

supportive care. Hemodynamic parameters remained stable throughout the postoperative period. Gradual return of bowel sounds was noted, followed by passage of flatus. Oral feeding was initiated and progressively advanced as tolerated. The pelvic drain output reduced steadily and was subsequently removed. The patient recovered well and was discharged in stable condition on postoperative day six.

Follow-Up

On outpatient follow-up, the patient remained asymptomatic with normal bowel habits. Surgical wounds had healed well, and no postoperative complications or recurrence of symptoms were observed.

DISCUSSION

Internal hernias are a rare but clinically significant cause of small bowel obstruction, accounting for less than 1% of all cases. Despite their low incidence, they are associated with a high risk of bowel strangulation and ischemia due to delayed diagnosis and rapid progression². Pelvic internal hernias are particularly uncommon, and herniation of the small bowel through the ovarian ligament represents an exceptionally rare entity, with only isolated cases reported in the literature¹². The present case highlights the diagnostic challenges and surgical importance of recognizing this rare cause of acute intestinal obstruction, especially in young females without prior abdominal surgery.

The ovarian ligament is a fibromuscular structure extending from the ovary to the uterus and is not typically considered a site prone to herniation. Defects in the ovarian ligament may be congenital or acquired and can occur due to inflammation, trauma, pregnancy-related changes, or previous pelvic procedures¹³. In the absence of prior surgery or pelvic pathology in our patient, a congenital defect is the most likely etiology. Such defects may remain asymptomatic for years until bowel herniation occurs, leading to acute obstruction and strangulation¹⁴.

Clinical presentation of internal hernias is often nonspecific and indistinguishable from more common causes of small bowel obstruction. Symptoms such as colicky abdominal pain, vomiting, abdominal distension, and obstipation are typical, as observed in the present case. Physical examination findings may be subtle in early stages, and laboratory investigations are generally nonspecific, although leukocytosis and elevated inflammatory markers may suggest ischemia or strangulation. These factors contribute to delayed diagnosis and increase the risk of bowel necrosis.

Contrast-enhanced computed tomography plays a pivotal role in the evaluation of suspected internal hernias. Characteristic imaging findings include clustered or abnormally positioned bowel loops, focal transition points, mesenteric vessel crowding or twisting, bowel wall thickening, mesenteric congestion, ascites, and reduced bowel wall enhancement suggestive of ischemia⁷. In the present case, CT findings of twisted ileal loops with mesenteric congestion and reduced wall enhancement

raised suspicion of strangulation, prompting timely surgical intervention. However, definitive preoperative diagnosis of ovarian ligament herniation remains challenging, and most cases are diagnosed intraoperatively.

Early surgical exploration is crucial once strangulation is suspected, as delay can result in bowel gangrene, perforation, sepsis, and increased mortality. Laparoscopy can serve as both a diagnostic and therapeutic tool in selected cases; however, conversion to laparotomy may be required in the presence of extensive bowel distension or gangrene, as encountered in our patient¹⁵. Surgical management involves reduction of the herniated bowel, resection of nonviable segments, primary anastomosis when feasible, and closure of the hernia defect to prevent recurrence¹⁶.

This case underscores the importance of maintaining a high index of suspicion for rare internal hernias in young patients presenting with acute small bowel obstruction without a history of prior surgery. Awareness of such unusual entities and careful interpretation of radiological findings can facilitate early diagnosis and prompt surgical management, thereby reducing morbidity and improving outcomes.

CONCLUSION

Internal herniation of the small bowel through the ovarian ligament is an exceptionally rare cause of acute small bowel obstruction and poses a significant diagnostic challenge due to its nonspecific clinical presentation and rarity. This case emphasizes the importance of maintaining a high index of suspicion for internal hernias in young female patients presenting with features of intestinal obstruction in the absence of previous abdominal surgery. Contrast-enhanced computed tomography plays a crucial role in early identification of strangulation and ischemic changes; however, definitive diagnosis is often established intraoperatively. Prompt surgical exploration is essential to prevent catastrophic complications such as bowel gangrene, perforation, and sepsis. Early intervention allows timely reduction of the herniated bowel, resection of nonviable segments, and definitive repair of the hernia defect, thereby improving clinical outcomes. Reporting such rare presentations is vital to enhance awareness among clinicians and radiologists, facilitate early

diagnosis, and guide appropriate surgical management in similar cases in the future.

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