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Managing A Complex Reoperative Abdomen: Small Bowel Perforation With Right Spigelian And Incisional Hernias In A Patient With Indiana Pouch Diversion.

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ABSTRACT

A 58-year-old female from Dharmapuri, India, belonging to a low socioeconomic background, presented with a four-day history of abdominal distension, colicky abdominal pain, obstipation, and multiple episodes of non-bilious vomiting. She had a significant surgical history including cesarean section complicated by vesicovaginal fistula, multiple fistula repairs, cystectomy with continent urinary diversion using an Indiana pouch, and subsequent procedures for pouch and ureteric calculi. Computed tomography of the abdomen revealed a large incisional hernia containing bowel and omentum, severe rectus muscle atrophy with divarication of recti, and herniation of ileal loops through the right linea semilunaris suggestive of a Spigelian hernia. Emergency exploratory laparotomy revealed dense adhesions between bowel loops and the anterior abdominal wall, extensive interloop adhesions, a right Spigelian hernia with a 5 × 6 cm defect containing viable ileum, and a 1 × 1 cm perforation in the ileum approximately 2 cm proximal to the previous ileocolic anastomotic site with minimal peritoneal contamination. The patient underwent resection of the perforated ileal segment along with the previous ileocolic anastomosis, proximal end ileostomy, distal transverse colon stump closure, and anatomical repair of the Spigelian hernia. The coexistence of Spigelian hernia and ileal perforation is extremely rare. Previous abdominal surgeries may result in dense adhesions, altered anatomy, and increased risk of bowel complications. This case highlights the complexity of managing acute abdominal emergencies in patients with multiple prior operations and urinary diversion procedures. Thorough preoperative evaluation and meticulous surgical technique are essential to achieve favorable outcomes. This case represents a rare association of ileal perforation with a right Spigelian hernia in a patient with extensive previous abdominal surgery. Early recognition, careful intraoperative assessment, and timely surgical intervention are crucial in preventing morbidity in complex reoperative abdominal emergencies.

Keywords: Spigelian hernia; ileal perforation; Hollow viscus perforation; Incisional hernia; Intestinal obstruction; Indiana pouch; Reoperative abdomen; Emergency laparotomy.

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CASE DETAILS

A 58-year-old female, a resident of Dharmapuri, India, belonging to a low socioeconomic background, presented to the emergency surgical department with complaints of abdominal distension, abdominal pain, and inability to pass stools and flatus for four days.

The patient was apparently well four days prior to admission, following which she developed abdominal distension that was insidious in onset and gradually progressive. She also developed abdominal pain that was colicky in nature, insidious in onset, non-radiating, and not associated with any specific aggravating or relieving factors. The patient had complete obstipation with no passage of stools or flatus for four days. She also had a history of three to four episodes of vomiting, which were non-projectile and non-bilious in nature.

There was no history of fever, hematemesis, melena, or significant weight loss. She had no known history of diabetes mellitus, hypertension, bronchial asthma, epilepsy, tuberculosis, or other chronic systemic illnesses.

Relevant Surgical History

The patient had a complex surgical history involving multiple abdominal and pelvic procedures over the preceding three decades.

- **1996:** The patient underwent cesarean section for obstructed labour through a classical lower midline abdominal incision. The postoperative period was complicated by the development of a vesicovaginal fistula involving the trigonal and supratrigonal region.
- **1998:** She underwent transvesical bladder bivalving repair with omental interposition, along with total abdominal hysterectomy and left salpingo-oophorectomy.
- **2006:** She underwent vaginal repair of vesicovaginal fistula with Martius flap interposition.
- **2011:** Due to persistent urinary tract complications, she underwent cystectomy with continent urinary diversion using an Indiana pouch, with the appendix utilized as a catheterizable stoma.
- **2020:** She underwent stomal dilatation and open lithotomy for multiple pouch and ureteric calculi.

The extensive surgical history resulted in multiple previous abdominal interventions, altered bowel anatomy, and a complex reoperative abdomen.

Clinical Findings On admission, the patient was evaluated systematically.

General Examination

The patient was conscious, oriented, and hemodynamically stable. There were no clinical features suggestive of sepsis or shock. There was no history or clinical evidence of fever.

Abdominal Examination

Abdomen was distended with generalized fullness involving all quadrants. Umbilicus was not visualized due to abdominal distension. Abdomen did not move synchronously and equally in all quadrants with respiration. A previous midline laparotomy scar was present. No visible gastric or intestinal peristaltic movements were noted. An appendicular stoma was present in the right iliac fossa, which appeared healthy and was functioning. No local warmth was noted. Diffuse abdominal tenderness was present. There was no guarding or rigidity. Liver dullness was preserved, with no evidence of obliteration. Tympanic to resonant note was elicited over the abdomen. Bowel sounds were sluggish. (FIGURE:1)



Figure 1: Clinical picture of the abdomen showing gross fullness over the all quadrants of the abdomen with previous midline laparotomy scar and appendicular conduit.

Radiological Evaluation

Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis revealed:

1. **Large hypogastric incisional hernia**
 - Containing bowel loops and omentum.
 - Defect size approximately **9 × 9.7 cm**.
 - Tanaka index calculated as approximately **0.11**.
2. **Severe divarication of recti**
 - Associated with significant bilateral rectus muscle atrophy and trophic changes.
3. **Right lateral abdominal wall defect**
 - Herniation of ileal loops through the right linea semilunaris.
 - Defect size approximately **3 cm**, suggestive of a right Spigelian hernia.
4. Evidence of small bowel obstruction and pneumoperitoneum.(FIGURE:2) .(FIGURE:3)

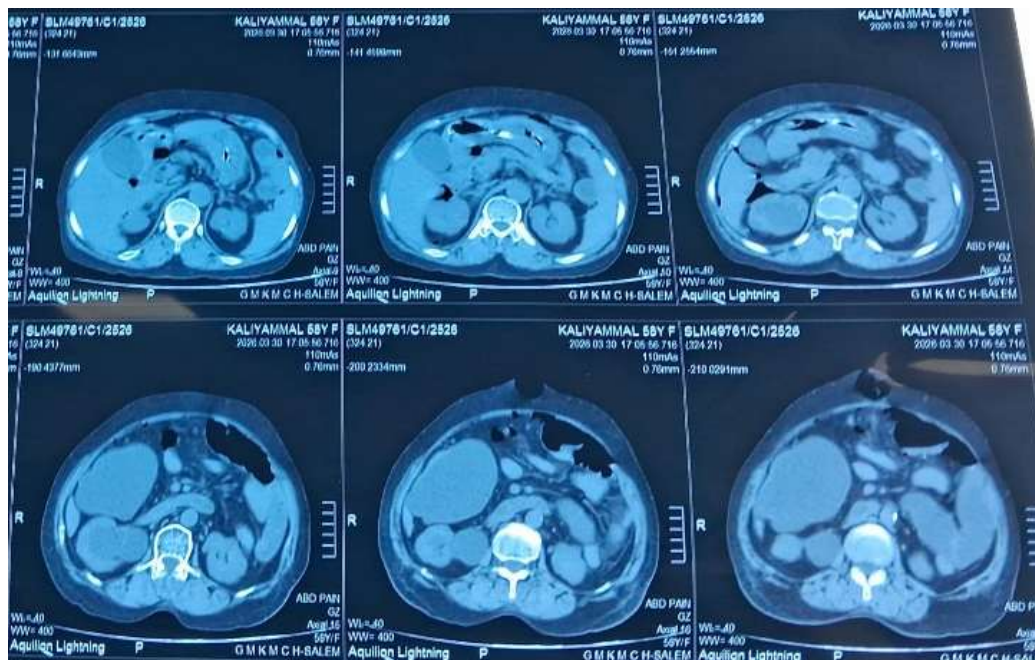


Figure 2: CT Abdomen showing pneumoperitoneum

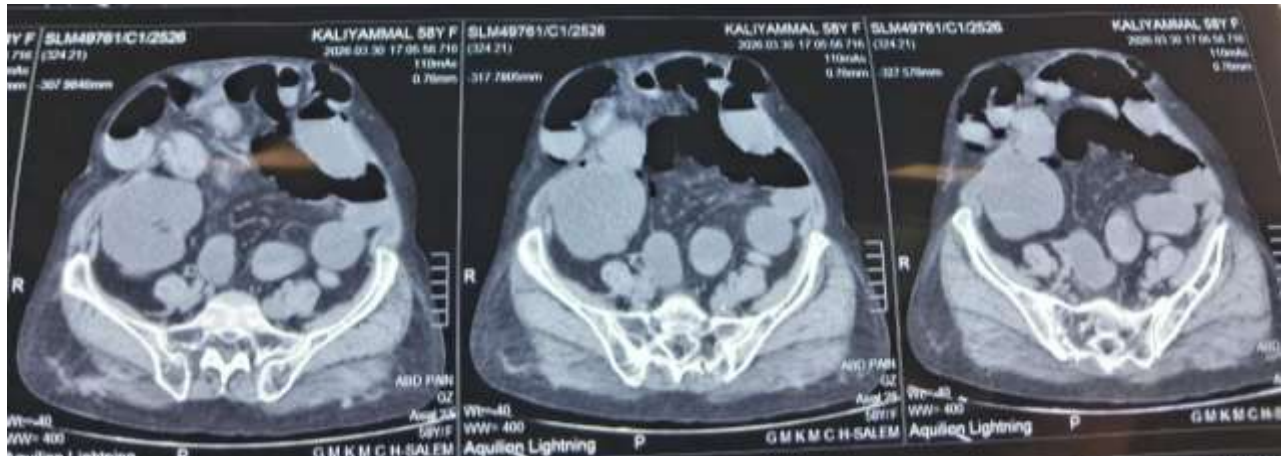


Figure 3: CT ABDOMEN showing incisional and right spigelian hernia with bowel and omentum as contents

Based on clinical presentation and imaging findings, a diagnosis of complicated abdominal wall hernia with bowel obstruction was considered, and the patient was planned for emergency exploratory laparotomy.

Operative Findings: Emergency exploratory laparotomy was performed. Intraoperative findings included:

- Dense adhesions between bowel loops and the anterior abdominal wall.
- Extensive interloop adhesions due to previous multiple abdominal surgeries.
- Large incisional hernia with bowel and omental contents.
- Right Spigelian hernia with a defect measuring approximately **5 × 6 cm** (FIGURE:4).



Figure 4: Intraoperative image showing defect of right spigelian hernia

- Ileum was identified as the content of the Spigelian hernia; however, the bowel was viable with no evidence of strangulation.
- A **1 × 1 cm perforation** was identified in the ileum approximately **2 cm proximal to the previous ileocolic anastomotic site**. (FIGURE :5)



Figure 5: Intraoperative image showing perforated site in dilated ileum proximal to ileotransverse anastomosis

- Minimal peritoneal contamination was noted.
- The appendicular conduit and Indiana pouch were visualized and carefully preserved. (FIGURE:6)



Figure 6: Intraoperative image showing caecum as Indiana pouch and appendix as catheterizable conduit

The final intraoperative diagnosis was:

Ileal perforation with uncomplicated right Spigelian hernia and a larger incisional hernia in a complex reoperative abdomen.

Surgical Intervention

The patient underwent:

1. Emergency exploratory laparotomy.
2. Extensive adhesiolysis.
3. Resection of the perforated ileal segment along with the previous ileocolic anastomotic site.
4. Creation of proximal end ileostomy.
5. Closure of distal transverse colon stump.
6. Anatomical repair of the right Spigelian hernia and incisional hernia (FIGURE:7)



Figure 7: Intraop image showing the anatomical repair of right spigelian hernia

Special attention was given to preservation of the Indiana pouch and appendicular conduit to prevent injury to the urinary diversion system.

Postoperative Course

The patient was monitored in the postoperative period with attention to Ileostomy function. Fluid and electrolyte balance. Wound care. Prevention of surgical site infection. Recovery of bowel function. The postoperative period was uneventful. The patient gradually resumed oral intake after return of bowel function. The ileostomy was functioning appropriately, and there were no immediate postoperative complications. She was discharged with advice regarding stoma care and follow-up.

DISCUSSION

Spigelian hernia is a rare ventral abdominal wall hernia occurring through a defect in the Spigelian fascia between the lateral border of the rectus abdominis muscle and the semilunar line. It accounts for approximately **0.1–2% of abdominal wall hernias** and is more commonly seen in females during the fifth to seventh decades of life. Risk factors include increased intra-abdominal pressure, previous abdominal surgery, obesity, and impaired abdominal wall integrity [1, 2].

Unlike other ventral hernias, Spigelian hernias are often located beneath the external oblique aponeurosis, making clinical diagnosis difficult. The narrow defect predisposes to incarceration and strangulation, with bowel obstruction being a common presentation [3, 4]. In the present case, the right Spigelian hernia contained viable ileal loops without strangulation. The unusual feature was the coexistence of ileal perforation near a previous ileocolic anastomotic site in a patient with multiple previous abdominal surgeries.

Complex Reoperative Abdomen and Adhesion-Related Challenges

Multiple previous abdominal and pelvic procedures, including vesicovaginal fistula repairs, cystectomy, and continent urinary diversion, resulted in significant anatomical alteration. Postoperative adhesions are common following abdominal surgery and contribute to bowel obstruction and increased complexity during repeat laparotomy.

In this case, dense adhesions between bowel loops, anterior abdominal wall, and interloop, adhesions increased operative difficulty and the risk of inadvertent bowel injury. Careful adhesiolysis and identification of altered anatomy were essential for safe surgical management.

Incisional Hernia and Abdominal Wall Integrity

Incisional hernia is a common long-term complication following abdominal surgery, influenced by surgical technique, wound healing, infection, and patient-related factors [5]. The patient had a large hypogastric incisional hernia containing bowel and omentum, associated with severe divarication of recti and rectus muscle atrophy.

The coexistence of incisional and Spigelian hernias indicates extensive abdominal wall weakness. The Tanaka index, based on hernia sac volume relative to abdominal cavity volume, assists in assessing large incisional hernias and planning management. In this case, the large defect size and muscle atrophy reflected significant abdominal wall compromise.

Indiana Pouch and Altered Abdominal Anatomy

Indiana pouch urinary diversion is a complex reconstructive procedure involving creation of a low-pressure reservoir using bowel segments with a catheterizable channel using the appendix or ileum.⁶ Subsequent abdominal emergencies in these patients require careful identification and preservation of altered anatomy. In the present case, the appendicular conduit and Indiana pouch were identified and preserved despite extensive adhesions, highlighting the importance of knowledge of previous surgical anatomy during reoperative abdominal surgery.

Small bowel Perforation After Previous Ileocolic Anastomosis

Hollow viscus perforation is a surgical emergency requiring prompt diagnosis and source control. perforations may result from malignancy, diverticular disease, ischemia, trauma, inflammatory conditions, or iatrogenic causes [6, 7].

The perforation in this patient was located in the ileum, approximately 2 cm proximal to the previous ileocolic anastomosis. Chronic adhesions, altered bowel mobility, and previous reconstruction may have contributed to local mechanical stress and perforation. Minimal contamination and early intervention helped prevent severe septic complications.

Surgical Management Considerations

Emergency surgery for bowel perforation requires control of contamination, resection of affected bowel, and restoration or diversion of intestinal continuity based on patient condition and operative findings.

In this case, resection of the perforated ileal segment with previous ileocolic anastomosis, proximal end ileostomy, and distal stump closure provided effective source control while avoiding the risks of emergency bowel anastomosis.

The right Spigelian hernia was repaired anatomically during the same procedure. Mesh use in contaminated emergency surgery remains controversial due to infection risk; therefore, repair technique should be individualized according to contamination, tissue quality, and patient factors [8].

CONCLUSION

This case represents a rare association of ileal perforation with right Spigelian and incisional hernias in a patient with extensive previous abdominal surgery and continent urinary diversion. Altered anatomy, dense adhesions, and abdominal wall defects created significant diagnostic and operative challenges.

Early diagnosis, careful surgical planning, preservation of previous reconstructions, and timely intervention are essential for successful outcomes in complex reoperative abdominal emergencies.

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