



# Richter supraumbilical hernia managed with invagination: a case report

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**Introduction and importance:** Richter's hernia is an incarceration of the anti-mesenteric border of a segment of bowel through an abdominal wall defect. It primarily affects elderly individuals but can occur at any age, with a slightly increased incidence in females. The increase in laparoscopic and robotic-assisted procedures has led to a rise in Richter's hernias.

**Case presentation:** A 40-year-old male with a history of laparoscopic cholecystectomy and kidney transplantation presented with a 4-day history of supraumbilical swelling and abdominal pain. The swelling was irreducible and accompanied by mild tenderness, and local signs of inflammation were exhibited. Intraoperatively, a 1.5 cm hernia defect was found, with the sac containing omentum and a portion of bowel segment for which invagination with serosal closure with the Mayo double-breasting technique was done.

**Clinical discussion:** Richter's hernia presents with abdominal discomfort, bloating, nausea, and vomiting, with a notable feature being the delayed onset of symptoms due to its partial involvement of the bowel wall. Diagnosis can be achieved through a computed tomography (CT) scan or intraoperative exploration. Management of Richter hernia is contingent upon the patient's clinical condition, physical examination, and suspicion of strangulation.

**Conclusion:** Diagnosis of Richter's hernia demands higher suspicion, particularly in patients with predisposing factors like a history of minimally invasive surgery. Prompt surgical intervention is crucial for reducing mortality and enhancing prognosis, with invagination alone being adequate if ischaemia is confined and mesh placement is unnecessary.

**Keywords:** invagination, Richter's hernia, supraumbilical hernia

## Introduction

Richter's hernia is herniation of a part of the bowel circumference, usually the anti-mesenteric part, through a fascial defect<sup>[1]</sup>. It accounts for ~10% of all hernia cases, with a higher occurrence observed in the tropical regions<sup>[2,3]</sup>. It commonly occurs in elderly individuals aged 60–80; nevertheless, it can occur at any age, including documented cases in the paediatric population<sup>[4]</sup>. There is a slightly elevated incidence among females, possibly attributed to the higher prevalence of femoral hernias in women, with the femoral ring being the primary site for Richter's hernia<sup>[5]</sup>. The increase in laparoscopic and robotic-

## HIGHLIGHTS

- Diagnosis of Richter's hernia demands higher suspicion, particularly in patients with predisposing factors like a history of minimally invasive surgery.
- Symptoms of bowel obstruction typically manifest only when around two-thirds of the intestinal wall's circumference is affected.
- If ischaemia is limited, invagination without mesh placement alone suffices.

assisted procedures has led to a rise in Richter's hernias because of unclosed port sites allowing for herniation of a portion of the bowel wall through the small fascial defect<sup>[6,7]</sup>.

The absence of a complete obstruction often leads to sub-clinical symptoms initially until the process advances, causing strangulation of the affected bowel<sup>[7]</sup>. It is noted that Richter's hernias tend to advance more swiftly to gangrene compared to regular strangulated hernias. Diagnosing Richter's hernia can pose challenges due to the nonspecific symptoms with confirmation during surgery. Over two-thirds of cases necessitate urgent and aggressive medical intervention due to complications such as bowel wall necrosis, with occurrences being more common in developing nations compared to developed countries<sup>[8,9]</sup>.

Operative treatment of Richter's hernias upon the viability of the affected bowel may often necessitate bowel resection alongside repairing the fascial defect<sup>[10]</sup>. Here we report a case

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adhering to SCARE 2023 of Richter's supraumbilical hernia in a 40-year-old male managed with invagination<sup>[11]</sup>.

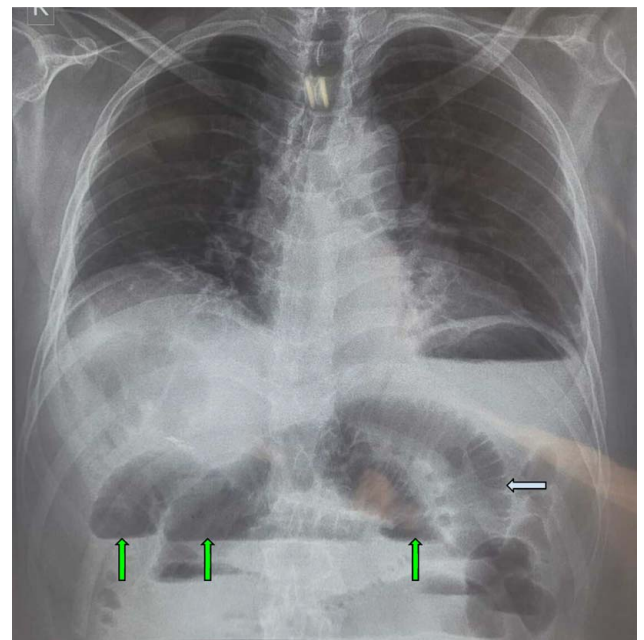
### Case presentation

A 40-year-old male presented with a 4-day history of supraumbilical swelling accompanied by abdominal pain. The swelling gradually increased in size on the first day and then remained constant. It was associated with acute-onset, progressive, severe pain without radiation and specific aggravating and relieving factors. He was passing stool and flatus normally and had no history of fever, abdominal distension, yellowish discoloration of the body, melena, urinary symptoms. The patient had a history of laparoscopic cholecystectomy 7.5 years ago and kidney transplantation 7 years ago.

On examination, the patient was hemodynamically stable. The swelling measured 4\*4 cm, and was irreducible, with mild tenderness. Local rise in temperature, erythema was noted in overlying skin (Fig. 1). Tympanic note was present over the abdomen with a dull note over swelling. The abdomen was not distended, and audible bowel sounds on auscultation were absent over swelling.

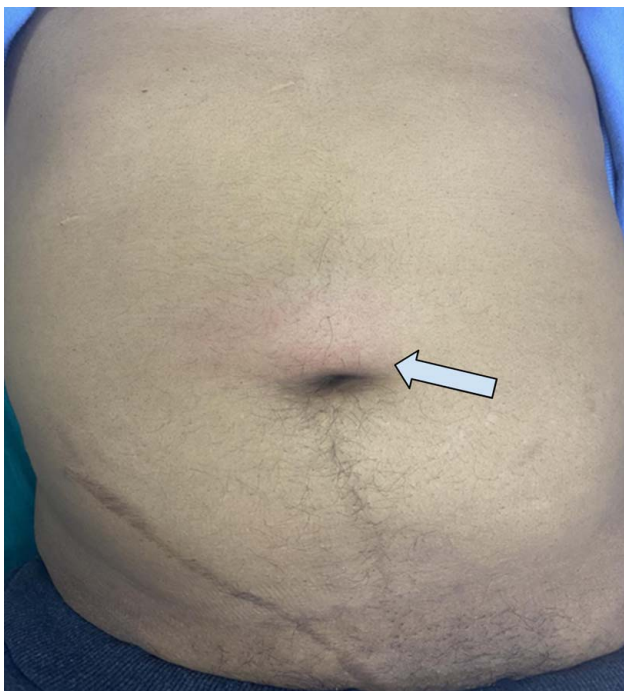
Abdominal ultrasound revealed an 8.5 mm defect in the deep fascia through which herniation occurred. The hernial sac, measured 5 cm in diameter, contained echogenic content with intact vascularity, likely omentocele. Erect X-ray abdomen revealed dilated fluid-filled small bowel loops suggestive of small bowel obstruction (Fig. 2). A provisional diagnosis of a strangulated supraumbilical hernia was made.

Intraoperative findings revealed a hernia defect measuring ~1.5 cm, with the hernia sac exhibiting dimensions of ~5 cm, encompassing the omentum and a segment of the bowel circumference located 150 cm from the duodenojejunal junction

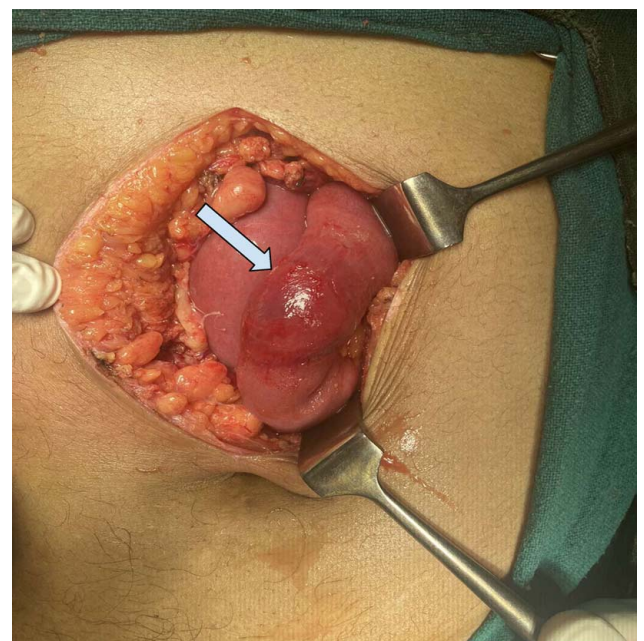


**Figure 2.** Erect abdominal X-ray showing multiple small bowel air-fluid levels (green arrows) and valvulae conniventes (grey arrow).

confirming Richter supraumbilical hernia. The entrapped bowel segment was initially ischaemic (Fig. 3) and exhibited restored vascularity following a 20-min mopping with hot water. Consequently, invagination of the bowel with serosal closure was undertaken. Closure of the rectus sheath was accomplished using prolene, employing the Mayo double-breasting technique for fascial defect closure. Subsequent



**Figure 1.** Supraumbilical hernia with overlying erythematous skin (arrow).



**Figure 3.** Intraoperative image demonstrating mildly ischaemic small bowel (arrow) on the anti-mesenteric side.

closure procedures were conducted on the subcutaneous tissue and skin layers, respectively. The patient had no intraoperative or perioperative complications. His diet was advanced as tolerated beginning on postoperative day 2. He was discharged home on postoperative day 4 on oral pain medications and tolerating a regular diet. He has done well in the year since discharge without concerning episodes of abdominal pain or other abdominal symptoms.

## Discussion

Richter's hernia was first described in 1785 by August Gottlich Richter, a German surgeon<sup>[1]</sup> who proposed that the development of Richter's hernia depends on specific conditions related to the size and texture of the hernial opening<sup>[3]</sup>. It occurs mostly in the femoral ring (71%), and deep inguinal ring (23%), with the least incidence at ventral hernia (6%) also, port sites of laparoscopic surgery became a common site for such type of hernia<sup>[10,12]</sup>. The site of occurrence in our case was likely the laparoscopic port insertion sites for prior surgeries.

It presents with abdominal discomfort, distention, nausea, and vomiting, the distinctive aspect being the delayed onset of symptoms since it affects only a segment of the bowel wall<sup>[3]</sup>. Symptoms of bowel obstruction typically manifest only when around two-thirds of the intestinal wall's circumference is affected, and patients usually do not have intestinal obstruction, which was the case in our patient; however, some reports have reported obstructive symptoms in Richter's hernia<sup>[13]</sup>. In addition, the trapped portion of the bowel is often anti-mesenteric and can rapidly become gangrenous due to limited blood supply<sup>[14]</sup>.

Diagnosis relies on clinical and radiological examination; in around 10% of patients, clinical and radiologic signs of an ileus are evident. A consistent physical manifestation is tenderness, erythema or swelling around a possible hernia site, as observed in our case<sup>[3]</sup>. Ultrasound examination can identify the constricted wall segment, evaluate its blood perfusion, and detect potential swelling in contrast to the adjacent healthy area<sup>[15]</sup>. A computed tomography (CT) scan can reveal the contents of the hernia sac, assisting in preoperative planning and differentiating it from an abdominal mass or abscess. Nevertheless, due to the pressing nature of this condition, a precise diagnosis is often made during the surgical procedure<sup>[16,17]</sup>.

The approach to managing Richter's hernias is contingent upon the patient's clinical condition, examination findings, and suspicion of strangulation. If ischaemia exceeds 50% or involves the mesentery, resection of the affected segment is warranted. Conversely, if ischaemia is less than 50% or confined to the anti-mesenteric border, invagination of the affected part under serosal suture is deemed the optimal management approach, as exemplified in our case scenario(18). Repairing the hernial defect is imperative to prevent recurrence, but the use of mesh is a subject of controversy. Mesh repair is commonly undertaken in cases without ischaemia, while it is avoided in settings where infection is likely, such as in ischaemic or perforated bowel<sup>[10]</sup>. In our case, we opted against mesh repair due to the presence of an ischaemic bowel with some toxic fluid in the sac, which could elevate the risk of infection.

## Conclusion

The presentation of Richter's hernia is subtle, requiring a higher level of suspicion in patients with predisposing factors such as a history of minimally invasive surgery and comorbid conditions. Timely surgical intervention reduces mortality and improves prognosis. If ischaemia is limited, invagination without mesh placement alone suffices.

## Ethical approval

Since this is a case report, our Institutional Review Board has waived the requirement for ethical approval.

## Consent

Informed written consent was taken from the patient.

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## Authors contribution

Conceptualization: S.D., S.D. Patient management: S.D., S.D., B.D. Writing—original draft: S.D., S.D., S.P., P.L., B.D., N.N. Writing—review and editing: S.D., S.D., S.P., P.L., B.D., B.G., L.K., S.J., N.N. Visualization and supervision: S.D., S.D., B.D., L.K., S.J. All the authors reviewed and approved the final version of the manuscript.

## Conflicts of interest disclosure

All the authors declare that they have no conflicts of interest.

## Research registration unique identifying number (UIN)

Not applicable.

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## Data availability statement

Datasets are available upon reasonable request from corresponding author.

## Provenance and peer review

Not applicable.

## Declaration

All the authors declare that the information provided here is accurate to the best of their knowledge.

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