

# Rare Case of Right Paraduodenal Hernia Leading to Intestinal Obstruction: A Clinical and Surgical Insight

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**Abstract:** "A right paraduodenal hernia, a rare type of internal hernia, can lead to serious complications such as intestinal obstruction and bowel gangrene if left untreated. This case report discusses a 25-year-old male patient who presented with acute abdominal pain, bilious vomiting, and constipation. Diagnostic imaging revealed small bowel obstruction, and surgery confirmed the presence of a herniated small bowel loop behind the ascending colon, with extensive gangrene up to the ileocecal junction. The patient underwent surgical resection of the gangrenous bowel and anastomosis. Postoperative recovery was uneventful, with followup showing no further complications. This case highlights the importance of early diagnosis and surgical intervention in managing paraduodenal hernias to prevent lifethreatening outcomes."

**Keywords:** right paraduodenal hernia, intestinal obstruction, bowel gangrene, small bowel resection, abdominal surgery

## 1. Introduction

The retroperitoneal protrusion of an abdominal organ through a peritoneal fold was described by Treitz in 1857 as an internal hernia. The herniation of abdominal contents due to congenital or acquired abnormalities in the peritoneal cavity is known as an internal hernia, and it accounts for less than one percent of all abdominal hernias worldwide. Anatomical features like recesses, foramina, or fossae may be involved if they occur at birth. The majority of internal abdominal hernias are paraduodenal hernias, which are inherited and account for around half of all occurrences. Paraduodenal hernias on the right side, on the other hand, encase the small bowel behind the ascending mesocolon and the right half of the transverse mesocolon, with the right colic vein and superior mesenteric artery running along the hernia's free edge, are more common on the left side (75% of cases).

## 2. Case Presentation

A male patient, aged 25, arrived at the emergency room at IGGMC Nagpur complaining of persistent abdominal pain, frequent episodes of bilious vomiting, and constipation that had persisted for the previous three days. He had never experienced chronic stomach ache before. Furthermore, the patient has been dealing with a high-grade fever, chills, and rigours for the last two days. Presenting symptoms were a pallor on examination, a systolic blood pressure of 90 mmHg, a diastolic pressure that could not be recorded, a pulse rate of 130 bpm, a temperature of 101°F, and tachycardia. During the physical examination, the doctor found guarding, an enlarged and painful belly, and the absence of bowel sounds. The results of the digital rectal examination showed a deflated and empty rectum. Figure 1 shows a right-sided pleural effusion as seen on the chest X-ray, and Figure 2 shows several air-fluid levels in the central abdomen, which is compatible with an acute small intestinal obstruction, as shown on the erect abdomen X-ray.



Figure 1: X-ray Chest: Rt sided pleural effusion



Figure 2: X-ray Abdomen erect :-evidence of multiple air fluid levels in the central abdomen s/o Acute Small Bowel Obstruction.

**Ultrasonography of Abdomen-** Mild perihepatic collection Small bowel loops dilated upto 3.1cm no e/o peristalsis mild interbowel collection. His routine blood investigation are

Volume 13 Issue 9, September 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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Hemoglobin 11gm/dl, Total Leucocyte Count – 17,500 / cumm, Platelet Count – 1,75,000 / cumm Serum Creatinine – 4.3 mg/dl, Serum Sodium – 140 meq/l, Serum Potassium – 5.6 meq/l

### 3. Procedure

The peritoneal cavity was reached by means of a midline laparotomy incision. Just behind the ascending colon, on the right side, there was evidence of herniated small bowel loops. Gangrene had spread from the small intestine all the way to

the ileocecal junction when the sac's neck strangled the bowel (Fig-3). Opening the sac was the sole way to determine the proximal extent of the gangrenous section. Laterally opening the sac allowed mobilisation of the ascending colon and hepatic flexure. There was a partial spare of about 70 cm of small bowel from the duodenojejunal junction, but the rest, up to the ileocecal junction, was determined to be gangrenous and unsalvageable. An end-to-end jejuno-ascending anastomosis was performed after resecting the gangrenous bowel. Layers of abdominal sutures were used to seal the incision after inserting a 32-mm drain.



Figure 3 (a)



Figure 3 (b)

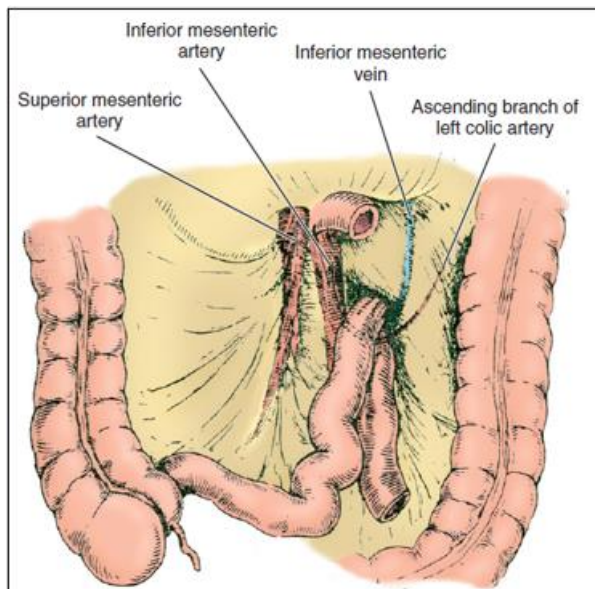
Fig 3a and 3b: Hernial sac with small bowel loop inside sac and gangrenous bowel loop

Postoperatively, the patient received broad-spectrum antibiotics for 10 days and was started on enteral feeding from the 5th day onwards. The drain was removed on the 7th day, sutures were removed on the 10th day, and the patient was discharged. A follow-up visit after 2 months revealed no fresh complaints and no weight loss.

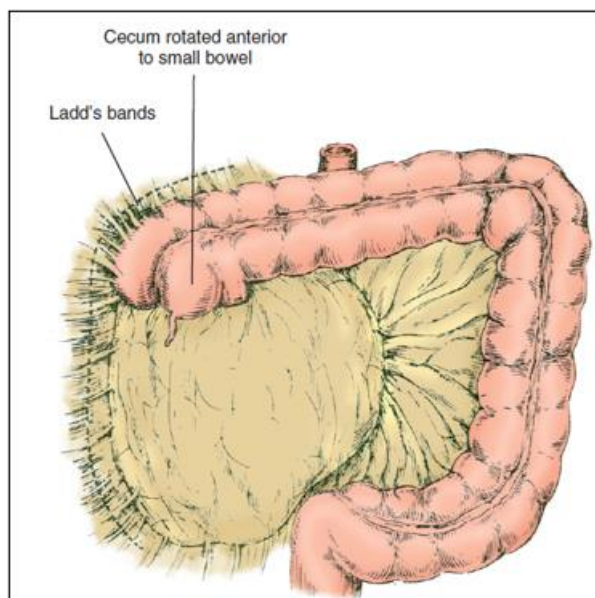
### 4. Discussion

An internal hernia was first defined by Treitz in 1857 as an abdominal organ protruding retroperitoneally through a peritoneal fold. This unusual hernia occurs when the abdominal contents leak out of the body due to a hole in the peritoneal cavity that can be either born with the defect or developed over time. These hernias might be present before birth and can involve cavities, openings, or bones that already exist in the body. Ghahremani categorises internal hernias into six different types, with less than 1% of all abdominal hernias falling into each of these groups: paraduodenal hernias, hernias through the foramen of Winslow, transmesenteric hernias, pericaecal hernias, intersigmoid hernias, pericaecal hernias (10–15%), paravesical hernias, and intersigmoid hernias, ranging from 4-8%, and <4%, are all internal hernias. Paraduodenal hernias (PDHs) are the most prevalent kind, and they tend to manifest between the ages of 40 and 60, with a 3:1 male-to-female ratio. More people have paraduodenal hernias on the left side of the body (75% vs. 25%). Paraduodenal hernias have a complex history

that has been the subject of much speculation. According to Andrews, PDH develops when a peritoneal developmental defect occurs during midgut rotation. The small bowel becomes invaginated into an unsupported portion of the left mesocolon due to a lack of blood flow in Left PDH. The hernia sac's anterior wall is the small bowel that becomes stuck between the mesocolon and the inferior mesenteric vein (IMV), which is located in the posterior abdominal wall. In a similar vein, a right PDH develops when something goes wrong with the second stage of embryonic intestinal rotation, which stops the right side of the gut from continuing to rotate before it reaches the arterial section. As the postarterial segment continues to rotate, the small bowel becomes trapped behind the right colonic mesentery. The hernia sac's anterior boundary is formed by the superior mesenteric artery. While barium studies can show an abnormal cluster of jejunal loops in the right quadrant, which can displace neighbouring organs like the colon and SMA, CT is still the gold standard for preoperative diagnosis when it comes to PHs. Radiographically, PDH presents with distinctive features first noted by Kummer as the "classical empty abdominal sign"—the "total absence of small intestine in the true pelvis in the upright position; the small bowel is confined in a smooth, sharply circumscribed mass".



**Figure 4 (a):** Left paraduodenal hernia.



**Figure 4(b):** Right paraduodenal hernia

A cluster of abnormally enlarged small bowel loops to the left of the fourth portion of the duodenum that extends into the descending mesocolon is the hallmark CT image of left paraduodenal hernia. It may seem as though the affected loop's mesenteric arteries are swollen with fluid. Looking at the front side, you can observe the ascending left colic artery and the inferior mesenteric vein above the herniated loop. The hernial sac is located behind the transverse colon. Typically, the normal anatomical link between the Superior mesenteric artery and vein is preserved. An aberrant cluster of ascending mesocolon small bowel loops is the hallmark CT result. The anteromedial border of the encapsulated small bowel loops is where you can find the right colic vein and the Superior mesenteric artery. A CT scan that supports the diagnosis shows that the Superior mesenteric artery and vein's jejunal branches are bent to the right and back. It is possible to observe the colon's hepatic flexure in front of the hernial sac. There is no change to the typical anatomy of the Superior mesenteric artery and vein. Misalignment of the Superior

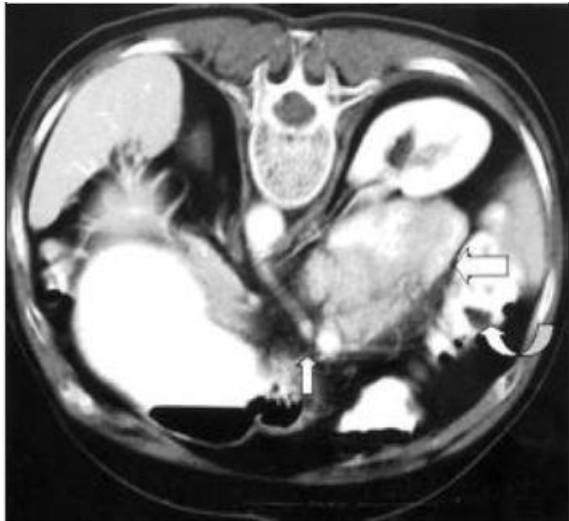
mesenteric artery and vein occurs when herniation and malrotation are present together.

Paraduodenal hernia treatment entails reducing hernia contents, resecting hernia sac, restoring normal gut anatomy, and fixing the hernia defect, all in accordance with hernia repair principles. The procedure can be performed either openly or through laparoscopy. Laparotomy should be considered when gangrene or probable bowel strangulation is present. It is critical to avoid opening the sac at the hernia orifice since doing so could accidentally injure vital arteries. To repair a left paraduodenal hernia, a surgeon may first suture the mesenteric defect after gently pulling on the small bowel to drain the sac. If the contents cannot be reduced, an incision can be performed on an avascular plane to the right of the IMV to expand the defect and remove them. After that, the retroperitoneum can be sutured to the mesentery on the right side of the IMV. To fix a right paraduodenal hernia, surgeons may move the right colon medially by releasing the hepatic flexure and ascending colon lateral attachments. With this move, the small bowel stays on its right side while the ascending colon moves to the left. The affected segment must be surgically removed and then anastomosed in the event of intestinal strangulation or gangrene.

To fix a right paraduodenal hernia, surgeons may move the right colon medially by releasing the hepatic flexure and ascending colon lateral attachments. With this move, the small bowel stays on its right side while the ascending colon moves to the left. Resection and anastomosis of the affected segment are required in cases of intestinal strangulation and gangrene.



**Figure 5 (a):** Left paraduodenal hernia: Axial CT section showing left Para duodenal hernia (horizontal arrow), Inferior mesenteric vein (vertical arrow) and engorged mesenteric vessels supplying affected loop (arrow head).



**Figure 5 (b):** Right of paraduodenal hernia: Axial CT sections showing right Para duodenal hernia (horizontal arrow), superior mesenteric artery (vertical arrow) and colon (curved arrow)

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## 5. Conclusion

Intestinal blockage due to a right paraduodenal hernia is extremely uncommon and is typically detected during surgery. Patients exhibiting recurrent stomach pain, with or without signs of small intestinal obstruction, necessitate a high index of suspicion for pre-operative diagnosis. Preoperative diagnosis allows for laparoscopic or open repair treatment of these patients, which may lessen the morbidity and mortality caused by strangling and bowel imprisonment if untreated. Potentially useful developments in pre-operative diagnosis and elective hernia repairs include improvements in imaging methods and an increase in the number of instances mentioned in medical literature.

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