

## Abdominal catastrophe secondary to paraduodenal hernia

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### ABSTRACT

An Internal hernia is a protrusion of abdominal viscera through the opening in the peritoneum or mesentery. We report the case of a left paraduodenal hernia (LPDH) combined with a small bowel obstruction in a 50-years-old male with pain abdomen and vomiting and no previous abdominal surgeries. An anteroposterior abdominal radiograph showed a clustered small bowel loops towards the left side of the abdomen and few air-fluid levels suggestive of obstruction. CECT abdomen showed a focal crowding of small bowel loops noted in the left anterior pararenal space with crowding of mesenteric vasculature and displacement of ascending left colic artery and inferior mesenteric vein anteriorly. The surgical intervention provided definitive diagnosis and treatment for LPDH. A paraduodenal hernia is a relatively rare cause of acute abdomen, and its diagnosis is often incorrect or delayed owing to its variable clinical manifestations. Therefore, it is important for the clinicians to recognize this condition, diagnose it early, and avoid making a wrong diagnosis owing to its high overall mortality rate.

**Keywords:** *Abdominal Catastrophe, Internal hernia, Paraduodenal.*

An internal hernia (IH) either congenital or acquired, is a protrusion of viscera through an opening in the peritoneum or mesentery [1]. These are further categorized by location, which includes paraduodenal, transmesenteric, and supra- or perivesical internal hernia and those located at the Foramen of Winslow [2,3]. Paraduodenal hernias result from the failure of mesenteric fusion with parietal peritoneum and malrotation of midgut and subsequent development of potential space in the left paraduodenal fossa [4]. Seventy-five percent of paraduodenal hernias occur on the left, while 25% occur on the right [5]. IH may cause acute intestinal obstruction, chronic digestive disorders, and nonspecific or mild symptoms such as nausea and vomiting. Because of this high variability in signs and symptoms, preoperative diagnosis is not always possible. IH is a rare condition with an incidence of <1% of all cases of bowel obstruction and upto 5.8% of all cases of small bowel obstruction [6,7,8]. Hereby, we present the clinical features and management of small bowel obstruction secondary to a left paraduodenal hernia (LPDH).

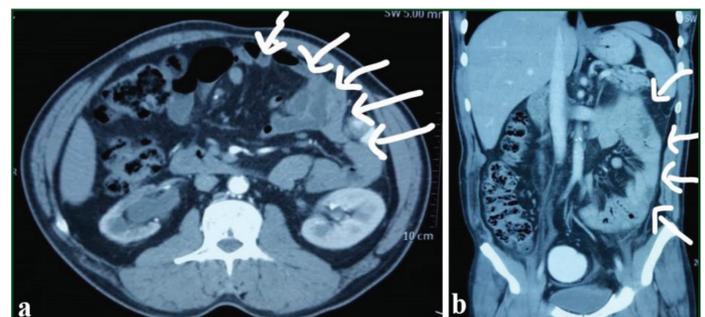
### CASE REPORT

A 50-years-old male patient presented to the emergency department with complaints of sudden onset of pain abdomen initially in the paraumbilical region that gradually progressed to the left side of the abdomen, accompanied by bilious emesis.

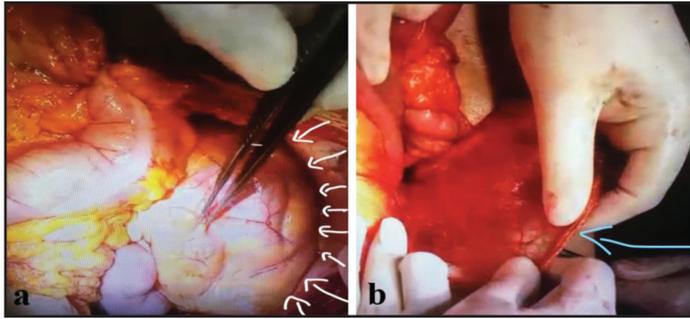
The patient denies any history of chronic abdominal pain, weight loss, loss of appetite or any other gastrointestinal symptoms. He was previously asymptomatic with no history of any abdominal surgery. His medical history included diabetes mellitus, hypertension and dyslipidemia controlled with medication.

On examination, his vital signs were as follows: pulse rate – 64 /min, blood pressure – 130/80 mm Hg and temperature – 98.6 F. An abdominal examination revealed a tender abdomen over epigastrium, left hypochondrium, left iliac and left lumbar region and distended abdomen with no overt peritoneal signs initially.

Laboratory studies were significant for an elevated white cell count of 12,000 cells/c.mm with a left shift on differential



**Figure 1:** (a) Axial contrast-enhanced computed tomography image shows a sac like small bowel through (arrows) the left Paraduodenal fossa; (b) Coronal Computed Tomography image demonstrates “sac-like” small bowel loops (arrows) within the left upper quadrant with engorged mesenteric vessels.



**Figure 2: Intraoperative picture showing (a) small bowel loops enclosed in the hernia sac (arrows) in the left paraduodenal space; (b) the intact sac (arrow) after reduction of the small bowel as its contents.**

smear and the international normalized ratio (INR) was 1.5. Other laboratory tests revealed normal hemoglobin level, hematocrit reading, platelet count, urea level, creatinine level, electrolytes level, amylase level, lipase level and liver function tests. An anteroposterior abdominal radiograph showed a clustered small bowel loops towards the left side of the abdomen and few air-fluid levels suggestive of obstruction.

A contrast-enhanced computed tomography (CECT) abdomen showed a focal crowding of small bowel loops noted in the left anterior pararenal space with crowding of mesenteric vasculature and displacement of ascending left colic artery and inferior mesenteric vein anteriorly (Fig 1). The small bowel loop shows no obvious bowel wall thickening at present. Feces sign noted within the small bowel and multiple enlarged mesenteric lymphnodes were present within the small bowel mesentery of average size 9mm. The redundant sigmoid colon and the right-sided moderate hydronephrosis with obstructive proximal ureteric calculi of 9.2mm were noted.

The symptoms were gradually exacerbated after admission and second physical examination of the abdomen revealed apparent rebound tenderness with increased abdominal distention. The patient was thus taken to the operating room for explorative laparotomy. While running the bowel, a hernia sac was discovered arising from a defect to the left of the fourth part of the duodenum, consistent with an LPDH. An aggregation of small bowel loops was herniated through the defect into the space of Landzert. The bowel was easily reduced from the hernia sac and the hernia sac was excised and LPDH orifice was closed primarily by fixing the root of the mesentery.

Intraoperative findings are shown in figure 2. Postoperative period was uneventful with complete resolution of abdominal pain. The patient was started on oral feeds on a postoperative day3, shifted to the ward and discharged on the postoperative day6 with instruction for the resumption of normal daily activities. The sutures were removed on the postoperative day10. Follow-up at 1 month and 2 months revealed no recurrence of abdominal symptoms. The patient was asymptomatic for ureteric calculi, therefore was referred to the urologist for further management.

## DISCUSSION

Internal hernias (IH) are an uncommon cause of intestinal obstruction and occur when abdominal contents are trapped

within a compartment of the abdominal cavity. Theories regarding the exact origin of paraduodenal hernias are controversial. Error in intestinal rotation and fixation that leads to entrapment of the small bowel between the mesocolon and the posterior abdominal wall is the most accepted theory. Right and left paraduodenal hernias are separate entities, differing in anatomic position and also in embryological origin, as well.

Paraduodenal hernia (PDH) involves the protrusion of a viscus through a peritoneal or mesenteric opening [7]. A left PDH occurs when the bowel prolapses through the Landzert fossa [9]. Landmarks of the fossa of Landzert being left of the fourth part of the duodenum, anterior to the posterior peritoneum and posterior to the inferior mesenteric vein and left branches of the middle colic artery [10,11,12].

Incongruity with the presented case, the median age range at diagnosis is fourth and sixth decades and overall male/female sex ratio for internal hernias is approximately 3 [13]. In this case, the patient typically presented with signs and symptoms compatible with bowel obstruction. The overall mortality rate is 20%, and the mortality rate is upto 50% in the case of treated strangulated bowel or ischaemic bowel and 100% in the case of untreated strangulated bowel or ischaemic bowel [14].

Computed Tomography (CT) is the most effective diagnostic tool, with typical appearance being an encapsulated sac containing dilated small bowel loops at the duodenojejunal junction with mass effect compression of the posterior stomach and distal duodenum. Additionally, distention and engorgement of the mesenteric vessels will commonly shift the mesenteric trunk to the right and displace the transverse colon downward [15].

In the case of IH, plain radiography is the first-line diagnostic imaging tool that can reveal the presence of a dilated intestinal loop over a herniated bowel segment with or without mass effects of other abdominal organs. CT has become the diagnostic modality of choice in diagnosing any internal hernia. In typical CT images, left PDH shows a cluster of dilated bowel segments with engorged and displaced mesenteric vessels at the hernia orifice [16]. If small bowel obstruction is not present, the collapsed bowel loops may be mistaken for a soft tissue mass. A high index of suspicion for this condition can help avoid unnecessary and unsuitable invasive procedures such as CT-guided biopsy [17].

The patients with the left PDH have a 50% lifetime risk of hernia incarceration with 20-50% mortality for acute presentations. Therefore, after the diagnosis of a left PDH, operative management is recommended regardless of symptoms. In this case report, laparotomy repair is documented to be appropriate, using basic principles of hernia repair- reduction of contents, restoration of anatomy and repair of the defect primarily [18]. Open surgery is the usual approach to this condition, though successful laparoscopic repair of right and left PDH have been reported in the literature. The first laparoscopic repair of PDH was reported in 1998 by Uematsu et al [19]. All PDH should be repaired, including those that are asymptomatic [20].

## CONCLUSION

The paraduodenal hernia has various non-specific symptoms and a high mortality rate. Therefore, in accordance with the above-noted literature and the surgical and clinical success of this case, it is important to include a PDH in the differential diagnosis of a patient presenting with small bowel obstruction and no history of abdominal surgery. Although this condition is extremely rare, it is important for a medical practitioner to recognize it in order to prevent a delay in the administration of appropriate treatment.

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