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**Case Report**

# Laparoscopic repair of left paraduodenal hernia in an adult: case report and literature review

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## ABSTRACT

An internal hernia is a protrusion of bowel through a normal or abnormal orifice in the peritoneum or mesentery and the resulting hernia remains intraperitoneal. The para-duodenal type is the most common type of congenital internal hernias. We reported a case of left paraduodenal hernia, who presented with recurrent attacks of severe abdominal pain and occasional vomiting. The case was diagnosed as a left huge paraduodenal hernia, and prepared for a laparoscopic repair after which he made uneventful recovery and remained free of symptoms when he was seen for follow up in surgery outpatient clinic.

**Keywords:** Congenital, Laparoscopy, Para-duodenal hernia, Peritoneal fossae

## INTRODUCTION

Paraduodenal hernias (PDH) are the most common type of congenital hernias associated with malrotation of the midgut, in which duodenal recesses, such as paraduodenal recesses are involved. PDH accounts for 53% of internal hernias, which constitute only 0.2 to 0.9% of intestinal obstructions, occurring in both adults and children.

The lifetime risk of small bowel obstruction (SBO) and strangulation is around 50% with a mortality of 20% and higher.[1] Patients with PDH present with various symptoms, ranging from intermittent abdominal pain associated with nausea and vomiting to acute obstruction. Also, 75 % of PDH are left-sided.[2,3] Surgical repair of PDH is mandatory to avoid complications and laparoscopy is a safe feasible option.[4]

## CASE REPORT

A 41-year-old Saudi male patient presented to the emergency department with a 12-hour history of recurrent colicky central abdominal pain and occasional vomiting, with no distension od change of bowel habit. He had similar presentation, but he didn't seek medical advice and symptoms relieved spontaneously. He had poorly controlled type 2 diabetes with no previous surgery. Clinically, he was a fair general condition with stable vital signs and was in pain. The abdomen was soft, not distended, with no guarding, rigidity, or masses, and bowel sounds**,** and rectal examination were normal. Hematological and biochemical investigations were within normal limits, except for a high random sugar of 16 mmol/l. Plain x-ray and ultrasonography were unremarkable. Contrast enhanced computerized tomography (CECT) of abdomen revealed a cluster of small bowel loops in the left upper quadrant consistent with the diagnosis of left para-duodenal hernia (Figure 1). Preparation for elective laparoscopic repair after endocrinology service consultation was done.

Laparoscopy started with 11 mm 30 degree camera inserted through the sub-umbilical port,together with other three 5 mm ports.The right hypochondrial and right lower quadrant are the working ports,while the left lower

quadrant for assistant (Figure 2A). Wash with saline was done and a drain inserted. He made uneventful recovery, started oral fluids gradually on the following day and proceeded to DM normal diet. An abdominal CT with oral contrast was done on the 2nd day showing successful repair (Figure 3). He was discharged of the 5th day, free of complaints and returned twice to OPD visits and was doing fine.

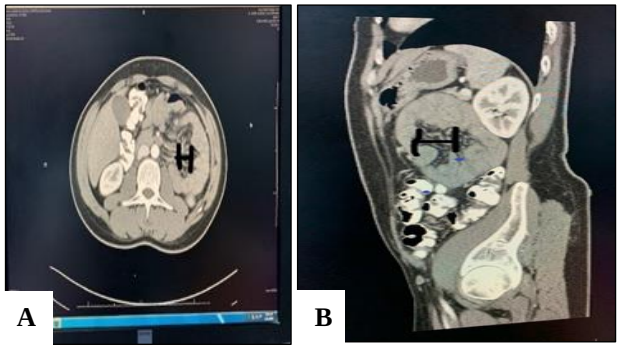


**Figure 1 (A and B): Transverse and coronal cuts of CECT of the abdomen showing a cluster of small bowel in left upper quadrant diagnostic of left paraduodenal hernia.**

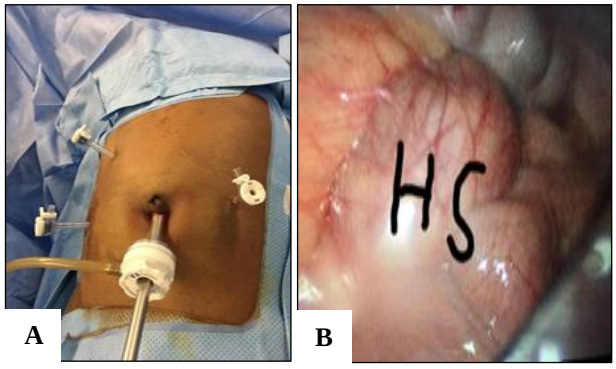


**Figure 2: (A) Laparoscopy access via 4 ports technique is shown, (B) intraoperative photo, obtained after ephalad diplacment of greater omentum, showing the hernial sac (HS);containing loops of upper jejunum.**

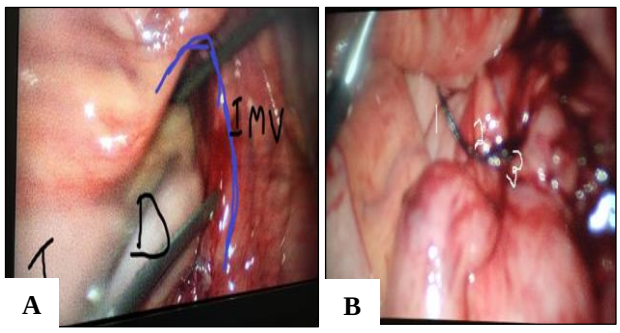


**Figure 3: (A) Laparoscopic reduction of jejunal loops (j) the defect (d) is shown with IMV (blue line) at its free edge. (B) 1, 2, 3 are silk sutures closing the defect completely.**

## DISCUSSION

In 1857 Treitz defined an internal hernia as a retroperitoneal protrusion of an abdominal organ through a peritoneal fold and the first classification in right and left was done in 1889 by Jonnesco.[1,15,16] Internal hernias can be either congenital or acquired,such as postoperative after bariateric surgery.[2] Internal hernias are rare with the 0.2-0.9% cases of intestinal obstruction and with 0.5-4.1% cases of intestinal obstruction caused by hernia. They are subdivided into subgroups based on the localization: the paraduodenal (congenital mesentericoparietal) hernia is a most common type with an overall incidence of 53%, followed by pericecal (13%), Foramen of Winslow and transmesenteric (8%), intersigmoid, supravescical and pelvic (6%), transomental (1-4%) ones.[1-4] PDH are most common, representing 50% of the cases with 75% of cases are left sided and male to female ratio of 3:1. PDH accounts for 53% of internal hernias, which constitute only 0.2 to 0.9% of intestinal obstruction, with a mortality of 20% and more. PDH occurr in both adults and children, with the mean age of diagnosis is the 4th-6th decade of life.[2,7,8] PDHs are caused by an abnormal rotation of the primitive midgut in embryonic life. In cases of left PDH, the small bowel invaginates into an avascular segment of the left mesocolon and is entrapped between the mesocolon and the posterior abdominal wall, forming the anterior wall of the hernia sac while in cases of right PDH, the counterclockwise rotation of the midgut is arrested on the right side. As a result, the small bowel becomes trapped in a hernial sac formed by the peritoneum behind the colonic mesentery, where the cecum and ascending colon rotate anteriorly.[6,14] The most frequently encountered fossae are: inferior of Treitz (60%), combinated superior and inferior (30%), superior (5%), fossa of Landzert (2%) and fossa of Waldeyer (1%).[4,6] The left paraduodenal fossa lateral to the fourth portion of the duodenum and posterior to the inferior mesenteric vein (IMV) and left colic artery is present (fossa of Landzert). In the case of right PDH (lateral and posterior to the third portion of the duodenum in Waldeyer's fossa) which is closely related to the superior mesenteric axis. The diagnosis of PDH is challenging and is almost never achieved clinically. Patients are often asymptomatic or present with recurrent vague and general abdominal symptoms, such as periumbilical pain,nausea and vomiting may be present. Pain is often intermittent due to herniation and spontaneous reduction and attempts at imaging the hernia during the asymptomatic interval may be un-successful.[2,12-14] The symptoms are often misinterpreted as functional gastrointestinal problems such as irritable bowel syndrome or non-ulcer dyspepsia.[15] SBO with strangulation occurs in up to 66% of all patients during their lifetime, with a mortality of 20% or more. PDH should be repaired once diagnosed, due to high risk of obstruction with associated mortality. Barium studies, CECT and magnetic resonance imaging (MRI) have been used to diagnose internal hernias preoperatively as in our reported case, showing a cluster of well-circumscribed

loops of small bowel in an abnormal location. In the case of left PDH, bowel loops are found interposed between the descending colon and the adrenal gland, displacing the stomach, pancreas and duodeno-jejunal junction. The IMV runs along the anteromedial border of the hernia and is laterally and superiorly displaced. In right PDH the small bowel is clustered behind the ascending and proximal half of the transverse mesocolon. The SMA and ileocolic artery run along the anterior border of the hernial neck and both bowel loops and mesenteric vessels can loop around the SMA.[4,5] The surgical principles are reduction and closure of the hernia defect without mesh or widening of the hernial neck if the contents are not reducible. With left PDH, as in our case, the bowel can often be easily reduced and the peritoneum of the descending mesentery adjacent to IMV, which may be saved or incorporated in repair, can be easily approximated with the posterior abdominal wall lateral to the fourth portion of the duodenum. Right PDH is often difficult to repair, due to the high risk of injury of superior mesenteric artery. To date, 500 cases were reported in total in literature Since, minimally invasive diagnosis and treatment of PDH has become a feasible and safe option, 29 cases; excluding our case, were reported in literature as they were laparoscopically repaired successfully. Of these 73% were left sided and in 77% of cases the hernia was primarily closed. In the remainder of the cases the hernial orifice was widened. Closure of the hernial defect can be done with a continuous (purse-string) or interrupted nonabsorbable figure of eight sutures.[9,11-16]

## CONCLUSION

PDH is difficult to diagnose, requiring a high index of suspicion. Surgery is the only treatment once diagnosed. Reduction of the contents and obliteration of the hernia defect by simple closure or by wide opening of the sac. Our case report demonstrates a rare presentation that was successfully managed laparoscopically.

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