



## Left Paraduodenal Hernia Presenting as Acute Intestinal Obstruction

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### Abstract:

Paraduodenal hernias also known as congenital mesocolic hernia or retroperitoneal hernias is defined as protrusion of bowel into the retroperitoneal space through peritoneal defects near the third and fourth portion of duodenum. Though the disease is rare, the lifetime risk of obstruction and bowel strangulation is around 50% with a mortality of 20% and higher. We report a case of left paraduodenal hernia in a young adolescent male with intestinal obstruction, who underwent subsequent laparotomy with hernia repair.

**Key words:** Duodenum, Hernia, Herniorrhaphy, Intestinal Obstruction, Laparotomy.

### Introduction

Paraduodenal hernia (PDH) is the most common form of congenital internal hernia accounting for half of all cases and 1% of all small bowel obstructions. PDH is a protrusion of bowel into the retroperitoneal space through peritoneal defects near the third and fourth portion of the duodenum [1]. Presentation can range from acute intestinal obstruction (the most common clinical presentation) to chronic history of vague abdominal pain, often relieved by changes in position [2-4]. We present a case of left PDH in a young adolescent male with intestinal obstruction, who underwent subsequent laparotomy with hernia repair.

### Case Report

A 15 year old boy presenting to casualty with intermittent colicky abdominal pain around

the umbilicus with nausea for 1 day. There was no previous history of similar episodes or any abdominal surgery. Clinical examination at the time of presentation revealed a soft, non distended abdomen with no visible gastric peristalsis or visible intestinal peristalsis. On auscultation bowel sounds were normal and erect X-ray abdomen showed no features of intestinal obstruction or perforation [Fig.1]. Blood and urine examination were within normal limits. The boy was kept on nil orally, Ryles tube was inserted and started on intravenous fluids.

The boy continued to have intermittent colicky abdominal pain and had mild upper abdominal distension after twelve hours. Auscultation revealed hurried bowel sounds. Repeat erect X-ray abdomen showed multiple air fluid levels [Fig.2]. Laparotomy with upper abdominal

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incision revealed a left paraduodenal hernia. The entire jejunum with proximal ileum was covered in a sac like peritoneal layer [Fig.3]. The distal edge of this sac was formed by inferior mesenteric vessels acting as the constricting ring above which the small intestine was trapped [Fig.4]. The small intestine was reduced from underneath, without injuring the inferior mesenteric vessels. Viability of the small intestine was confirmed. The defect was narrowed by suturing the edges of the sac to the posterior abdominal wall [Fig.5]. The post-operative period was uneventful and patient was discharged on 8<sup>th</sup> post-operative day.

## Discussion

Paraduodenal hernias (PDH) or mesocolic hernias are unusual congenital internal hernias presenting as sub-acute or acute intestinal obstruction, which are a result of abnormal rotation of mid-gut. In our case, the patient presented with pain abdomen, clinical examination did not reveal any signs of obstruction. The patient developed signs of intestinal obstruction the next day, we did not suspect the possibility of PDH clinically as the diagnosis of PDH is often difficult, due to its ambiguous presentation. On laparotomy, a left PDH was noticed, the entire jejunum with proximal ileum was covered in a sac like peritoneal layer. The distal edge of this sac was formed by inferior mesenteric vessels acting as the constricting ring above which the small intestine was trapped.

PDH is a rare condition, they pose a significant surgical problem, as the lifetime risk of obstruction/strangulation is 50%-66% with a mortality of 20% and more [5,6]. Meyers classified internal hernias according to their location [7]. Among the congenital hernias (paraduodenal, transmesenteric, pericecal, transmesosigmoid, peri- and supramesocolic, further hernias through Winslow's foramen, the mesoappendix, broad ligament, omentum or mesentery of a Meckel's diverticulum), PDH are most common, representing 50% of the cases.



**Fig.1:** Erect X-Ray abdomen - shows no intestinal obstruction or perforation.



**Fig.2:** Erect X-Ray abdomen showing multiple air fluid levels.



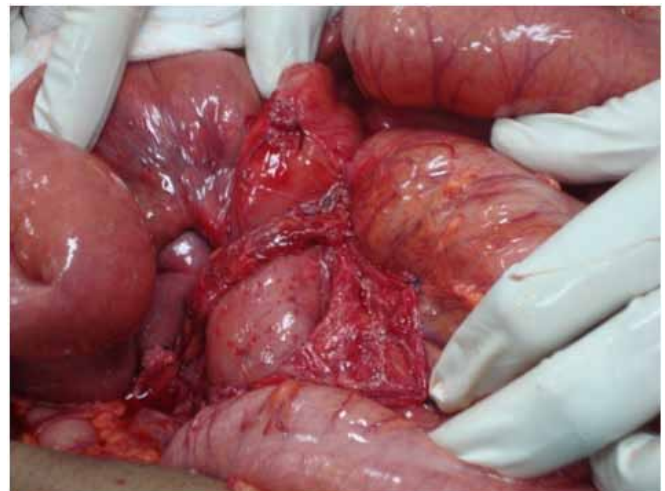
**Fig.3:** Jejunum with proximal ileum, covered in a sac like peritoneal layer.

Neubauer in 1756 described paraduodenal hernia at autopsy. In 1857, Trietz described the various peritoneal folds and fossae which are potential sites of internal herniation [1]. Andrews proposed that PDH occurs as a result of a congenital anomaly in development of the peritoneum that arises during midgut rotation [8]. As the midgut rotates in the 5<sup>th</sup> to 11<sup>th</sup> weeks of gestation, the mesentery becomes fused to the posterior abdominal structures from the ligament of Treitz inferolaterally to the right iliac fossa. This process of attachment may be complete, except for a small zone just below the duodeno-jejunal junction where the former emerges from its retroperitoneal position. The pocket thus formed may either extend to the right, behind the mesentery or ascending colon, or to the left behind the descending colon or mesocolon. When the small bowel enters these two spaces, the resulting condition is called right or left PDH.

A right PDH occurs from arrest of rotation of pre-arterial segment & continued rotation of post-arterial segment leading to entrapment of small intestine behind the mesentery of the right colon. A left PDH occurs by in-utero herniation of small bowel between inferior mesenteric vein and descending



**Fig.4:** Inferior mesenteric vessels acts as the constricting ring above which the small intestine is trapped.



**Fig.5:** Edges of the sac is sutured to the posterior abdominal wall.

mesocolon (attached to retro-peritoneum) making the inferior mesenteric vessels an integral part of hernia sac.

Approximately 75% of PDH are left sided. Male prevalence is noted with mean age of presentation, between 38 and 45 years. Clinical manifestations are indistinguishable from other causes of obstruction with majority presenting with

signs and symptoms of acute or chronic intermittent small bowel obstruction. The diagnosis of PDH is often difficult, due to its ambiguous presentation. This makes CT scan a valuable tool for investigation. The findings, include clustering of small bowel loops, a sac like mass at or above the ligament of Treitz, duodenojejunal junction depression, mass effect on the posterior stomach wall, engorgement and crowding of the mesenteric vessels with frequent right displacement of the main mesenteric trunk, and depression of the transverse colon [9].

Treatment of PDH should follow principles of hernia surgery, including reduction of hernia, resection of hernia sac, restoration of normal bowel anatomy and repair of hernia defect. A right PDH is treated by incising the lateral peritoneal reflections along the right colon, with reflection of right colon and caecum to left. The entire gut then assumes a position of non-rotation of the pre-arterial & post-arterial segments of midgut. Care is to be taken not to open the anterior wall of the sac as it contains superior mesenteric vessels.

The operative procedure for left PDH involves incising the peritoneal attachments along avascular plane to the right side of inferior mesenteric vein, with reduction of herniated bowel from beneath the inferior mesenteric vessels, allowing the vessels to return to its normal position of left side of base of mesentery. The neck of hernia can be narrowed by suturing the peritoneum adjacent to vessels to the retroperitoneum. Recently, there have been reports of laparoscopic left PDH repair [4,10].

## Conclusion

PDH is an unusual internal hernia with clinical manifestations akin to other causes of small bowel

obstruction and a high index of suspicion for pre-operative diagnosis.

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