# Case Report

# Left Paraduodenal Hernia As a Rare Cause of Small Bowel Obstruction in Elderly: A Case Report and Review of Literature

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*The authors presented a case of left paraduodenal hernia as a cause of closed loop small bowel obstruction in an elderly patient. Internal hernias are a rare cause of intestinal obstruction. Paraduodenal hernias are the most frequent especially left sided, which are believed to be the result of malrotation of the midgut during embryonic period. The clinical presentations varied, ranging from asymptomatic, chronic abdominal pain, or acute abdominal pain as acute abdomen. Most of the patients usually have early presentation in adult life with average age of 38.5 years at time of diagnosis. Late presentation in elderly patient (>70 years) is very rare due to its congenital in origin. This clinical entity is a diagnostic challenge, which happened in our case. When the diagnosis is late, the complication develops and may contribute to a fatal outcome if left untreated. Herein, the authors reported our case of left paraduodenal hernia with late presentation at age of 80, and reviewed literature.*

**Keywords:** *Paraduodenal hernia, Small bowel obstruction, Elderly*

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Internal hernias are a rare cause of intestinal obstruction[1]. Paraduodenal hernias are the most frequent, especially left sided, which are believed to be the result of malrotation of the midgut during embryonic period[2]. The clinical presentations are varied, ranging from asymptomatic, chronic abdominal pain or acute abdominal pain as acute abdomen. Most of the patients usually have early presentation in adult life with average age of 38.5 years at diagnosis[3]. Late presentation in elderly patient (>70 years) is very rare due to its congenital in origin. This clinical entity is a diagnostic challenge, which is showed in our case. When the diagnosis is late, complication develops and may contribute to a fatal outcome if left untreated. This was a rare case of left paraduodenal hernia with late presentation at age of 80, and review of relevant literature.

## Case Report

An 80-year-old man came to hospital with severe acute crampy abdominal pain for two hours. He had no history of nausea and vomiting and had not pass flatus since the abdominal pain had started. The patient had no previous history of abdominal surgery. He had previous history of TUR-P for benign prostatic hypertrophy 20 years ago and right inguinal hernia repaired 10 years ago. In addition, he had been diagnosed with gastric ulcer four years before by gastroscopy, and was treated with medication. He also had been diagnosed with hypertension, chronic kidney disease, and COPD. During the last three years, he suffered from chronic intermittent abdominal pain and experienced alternating diarrhea and constipation. On physical examination, the abdomen was distended with visible bowel loop in the left-sided with tenderness, involuntary guarding, and tympanic on percussion. Bowel sounds were normal. Per-rectal examination revealed empty rectum. Blood chemistries showed no leucocytosis ($7.75x10^3/\mu L$), and increased creatinine level (2.2 mg/dL).

Subsequently, an acute abdomen series film was performed, demonstrating mild dilatation of small bowel loops at left upper quadrant with air-fluid level (Fig. 1). The patient was observed at emergency room for another day. The symptoms were getting worse with severe constant abdominal pain and localized peritonitis at left sided abdomen. A non-contrast multislice computed tomography (CT) of abdomen

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was performed revealing a sac-like mass of the dilated small bowel loops lying just inferior to the pancreatic body and tail, in the left upper quadrant (Fig. 2). The cecum and colon were nearly totally collapsed. In addition, a cluster of small bowel loops at mid-lower abdomen was noted. This may be a second location of closed loop obstruction of small bowel. There was mild diffuse fat reticulation at peripancreatic region and left upper quadrant. The diagnosis of left paraduodenal hernia with closed loop small bowel obstruction was made. Therefore, surgical consultation was obtained and emergency laparotomy was scheduled.

At laparotomy, a moderate amount of serosanguinous ascites was found. In addition, there was a hernia sac of 30 cm in diameter arising from left retroperitoneum lateral to forth part of duodenum displacing sigmoid mesocolon and containing multiple small bowel loops. The small bowel loops were retrieved from the hernial sac, revealing gangrene of all entrapped proximal jejunal loops without perforation, starting from 60 cm below DJ junction. Small bowel resection was done with end-to-end anastomosis of proximal jejunum to the rest 60 cm segment of viable terminal ileum. The hernia orifice was not closed in this case due to its relatively big size compared with the rest of small bowel. The patient recovered uneventfully, had some wound dehiscence and lung complication due to underlying COPD, and was discharged 37 days after the surgery.

**Discussion**

Internal hernias are rare cause of intestinal obstruction in adult, responsible for 0.3 to 0.9% of patients with small bowel obstruction[1]. First description of paraduodenal hernia was made from autopsy case by Neubauer in 1756. Treitz, in 1857, was the first who had formal scientific description of this condition as a retroperitoneal protrusion of abdominal organ through a peritoneal fold[4].

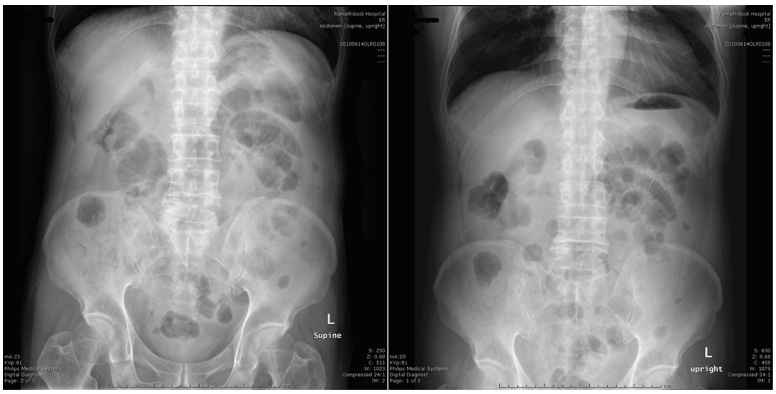


**Fig. 1** Plain abdominal images in supine and upright position showing dilatation of small bowels loops at left upper quadrant with air-fluid level.

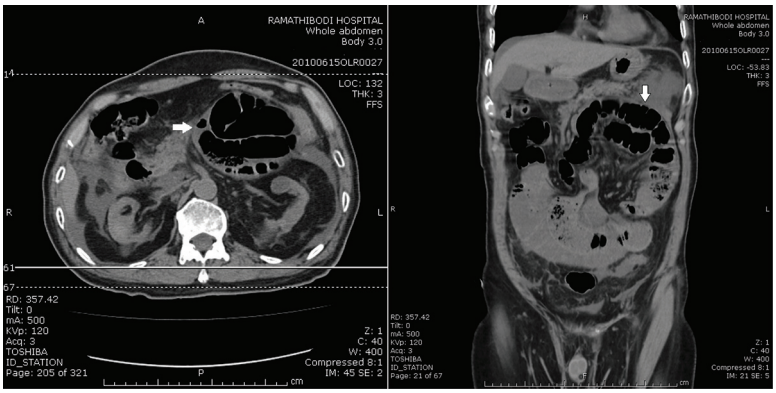


Fig. 2 CT scan abdomen revealed sac-like mass (arrow) of the dilated small bowel loops located inferior to pancreatic body and tail in the left upper quadrant of abdomen.

**Table 1.** Anatomical names of paraduodenal fossae responsible for paraduodenal hernia

| Name of fossa | Percent |
|---|---|
| Inferior paraduodenal fossa of Treitz | 60 |
| Combined superior and inferior paraduodenal fossae | 30 |
| Superior paraduodenal fossa | 5 |
| Paraduodenal fossa of Landzert | 2 |
| Duodenojejunal or mesocolic fossa | 2 |
| Fossa of Waldeyer | 1 |

Paraduodenal hernias are the most common internal hernias, comprising nearly 50% of all internal hernia in adult[5]. The true incidence is unknown because of difficulty in assessment in asymptomatic patients. Approximately 75% occur on the left sided with males sex predilection by a ratio of 3:12. First unusual case of bilateral paraduodenal hernias was reported by Oriuchi et al in 1998[6].

This condition was believed to be congenital, resulting in incomplete fusion of the retroperitoneum during the rotation of the gut, making various fold and fossae[7]. Autopsy studies reported distinct anatomical relation of the paraduodenal fossae, which could be the cause of paraduodenal hernia[8]. The anatomy of various folds and fossae adjacent to the forth part of duodenum have been described, in order of frequency as shown in the Table 1.

Most reports of left paraduodenal hernia have occurred in paraduodenal fossa of Landzert, located to the left of forth part of the duodenum, posterior to the inferior mesenteric vein and left branches of the middle colic artery[9]. The hernial sac was formed by mesocolon and part of inferior mesenteric vein as anterior wall of the sac and may be situated anterior or posterior to the pancreas (Fig. 3).

Some of patients with paraduodenal hernia may be asymptomatic but when symptomatic, intestinal obstruction is the most common presentation. Clinical pictures are not different from classic small bowel obstruction including crampy abdominal pain, nausea, vomiting, abdominal distention, and obstipation if complete obstruction occurred just like in our case. Some patients can present with unexplained recurrent abdominal pain[10] or even left flank pain[11]. Abdominal rebound tenderness, advanced leukocytosis (>18,000/mm$^3$), or a high level of band form (>6%) were the positive predictive factors for bowel ischemia[12]. Usually more than half of the patients will have their first presentation early in adult life with average age of 38.5 years at diagnosis[3], leaving few to reports with late presentation in elderly as shown in Table 2.

Computed tomography (CT) of abdomen has been reported to clearly demonstrate both right and left paraduodenal hernias. The classic CT findings of left paraduodenal hernia included clustering of small bowel loop in left upper quadrant of abdomen between stomach and pancreas, behind pancreas itself, or between transverse colon and left adrenal gland. Evidence of dilated small bowel loops with air-fluid level may be present resembling small bowel obstruction[1]. Recently reported of left paraduodenal hernia was made preoperatively by CT scan[19-21]. Additional finding include the presence of inferior mesenteric vein in neck of hernia sac with pathognomonic anterior and upward displacement of this vessel[22].

When this condition was diagnosed, surgical treatment is mandatory because there is 50% lifetime risk of intestinal obstruction with incarceration or strangulation[2,23]. The principles of surgical treatment are reduction of all hernia content, recheck the bowel viability, and prevention of re-herniation. Lacking a true hernia sac, the prevention of recurrence can be accomplished by closure of the small hernia defect with absorbable suture. In case with the large orifice, the hernia sac should be opened by an incision in an avascular area of the mesocolon, avoiding injury to the inferior mesenteric vein and left colic artery so the small bowel can be delivered back into peritoneal cavity. This will make hernial sac to become a part of the peritoneal cavity[7].

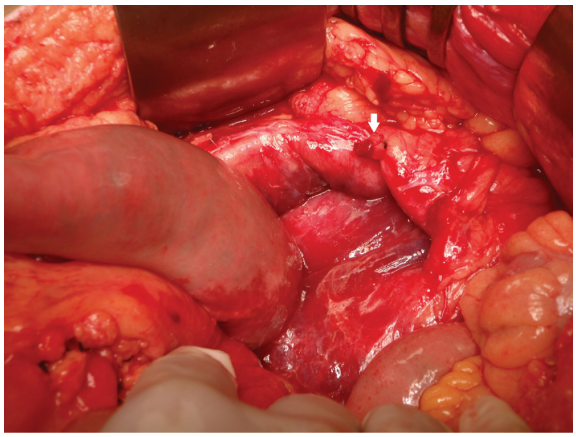

**Fig. 3** Showing left paraduodenal hernia sac with inferior mesenteric vein ligated (arrow) at anterior wall of the sac.

**Table 2.** Review literatures of elderly presentation of left paraduodenal hernia

| Authors | Year | No. | Sex | Age | Main symptoms | Imaging | Type of repair | Viability of bowel | Result |
|---|---|---|---|---|---|---|---|---|---|
| Peltokallio et al.[13] | 1968 | 1 | F | 71 | Pain | Plain abdomen | Open | N/A | Improved |
| Goodney et al.[14] | 2004 | 1 | M | 75 | Pain | CT | Open | Viable | Improved |
| Catalano et al.[15] | 2004 | 1 | M | 82 | Pain | CT | Open | Gangrenous | Improved |
| Zonca et al.[4] | 2008 | 1 | F | 82 | Pain | Plain abdomen | Open | Gangrenous | Improved |
| Uchiyama et al.[16] | 2009 | 1 | F | 80 | Pain | CT | Lap | Viable | Improved |
| Seya et al.[17] | 2010 | 1 | F | 77 | Incidental during colon cancer resection | CT | Open | Viable | Improved |
| Omland et al.[18] | 2011 | 1 | F | 73 | Pain | Plain abdomen | N/A | Gangrenous | Death (autopsy case) |
| Our case | 2012 | 1 | M | 80 | Pain | CT | Open | Gangrenous | Improved |

F = female; M = male; CT = computed tomography; N/A = not available

Laparoscopic repair of paraduodenal hernia was firstly reported by Uematsu et al in 1998[24]. Since then, the use of laparoscopy to diagnose and treat both right and left paraduodenal hernia is increasing due to advances in surgical technique, instrument, and surgeon's experience[25]. With this approach, surgeons are required to have a definite diagnosis of this condition and clear relevant anatomy of hernial sac and nearby vasculature before operation by computed tomography of abdomen. This treatment can be advantageous in selected cases in terms of shortened hospital stay and decrease postoperative pain[26,27]. However, this approach is still not recommended in case with suspicious intestinal strangulation[28].

## Conclusion

Paraduodenal hernia is a rare congenital pathology arising because of an incomplete fusion of the retroperitoneum from malrotation of midgut, with left paraduodenal hernia as the most common type. Most of the patients will have early presentation in adult life, but few can have late presentation in elderly. Diagnosis should be suspected in any patient with clinical signs and symptoms of small bowel obstruction without previous history of abdominal operation. Because of difficulty to diagnose paraduodenal hernia preoperatively, computed tomography of abdomen is a useful tool before surgical intervention. Early surgical treatment is warranted to prevent strangulation of entrapped bowels in hernial sac. After reduction of hernia content, convention repair consists of either closure of small hernial orifice or open the large hernial sac to become part of the peritoneal cavity. Laparoscopic repair has been emerged as one alternative option of treatment of this condition in experienced surgeons.

## What is already known on this topic?

This is a rare condition of small bowel obstruction in virgin abdomen and very difficult to diagnose clinically without appropriate imaging.

## What this study adds?

This study emphasized that the condition should be in differential diagnosis of patient with small bowel obstruction in virgin abdomen even in elderly age group.

## Potential conflicts of interest

None.

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## *ผู้ป่วยสูงอายุที่มีอาการของลำไส้เล็กอุดกั้นจาก left paraduodenal hernia: รายงานผู้ป่วยและทบทวนวรรณกรรม*

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*ผู้นิพนธ์รายงานผู้ป่วยสูงอายุที่ได้รับการวินิจฉัยว่าเป็น left paraduodenal hernia และมีอาการของลำไส้เล็กอุดกั้น การเกิดไส้เลื่อนภายในช่องท้องเป็นสาเหตุสำคัญของภาวะลำไส้เล็กอุดกั้น ไส้เลื่อนชนิด paraduodenal hernia พบได้บ่อยที่สุดทางด้านซ้าย และเชื่อว่าเกิดจากความผิดปกติของการบิดหมุนตัวของลำไส้ในช่วงอยู่ในครรภ์มารดา อาการและอาการแสดงของภาวะนี้ไม่แน่นอน อาจเป็นได้ตั้งแต่ไม่มีอาการ มีอาการปวดท้องเรื้อรัง หรือ มีอาการปวดท้องเฉียบพลัน ส่วนใหญ่แล้วผู้ป่วยมักจะมีอาการตั้งแต่อายุไม่มาก โดยค่าเฉลี่ยของอายุที่เริ่มมีอาการ คือ อายุ 38.5 ปี โอกาสที่จะพบภาวะนี้ในผู้ป่วยสูงอายุมีน้อยมากและทำให้การวินิจฉัยทำได้ยาก และอาจเกิดภาวะแทรกซ้อนรุนแรงถึงชีวิตได้ ถ้าได้รับการวินิจฉัยช้า ผู้นิพนธ์ได้รายงานผู้ป่วยชายไทยอายุ 80 ปี ที่ได้รับการวินิจฉัยว่าเป็นลำไส้เล็กอุดกั้นจากภาวะ left paraduodenal hernia และทบทวนวรรณกรรม*