

Left Paraduodenal Hernia as a Cause of High Gut Obstruction in a Young Child: A Case Report

Kulpreeya Sirichamratsakul, MD¹

Wison Laochareonsuk, MD^{1,2}

Pattama Tanaanantarak, MD³

Surasak Sangkhathat, MD^{1,2}

¹ Division of Surgery, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand

² Division of Biomedical Science and Biomedical Engineering, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand

³ Division of Radiology, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand

Abstract

Although a paraduodenal hernia is the most common intraabdominal herniation causing intestinal obstruction, the condition comprises less than 2% of intestinal obstructions in the pediatric age group. Accurate diagnosis of this condition may help in preparing for surgery and selection of the right surgical choice. Herein, we report a pediatric case of left paraduodenal hernia who presented with intractable vomiting and dehydration without abdominal distension. An upper gastrointestinal study demonstrated a narrow segment of the proximal jejunum with severely delayed passage of contrast media. Surgical exploration found a left paraduodenal hernia and subsequent narrowing of the herniated segment, which was managed by a segmental resection. The patient had an uneventful post-operative course and could regained healthy status within a month of treatment.

Keywords: Paraduodenal hernia, Pediatric gut obstruction, Vomiting

INTRODUCTION

During the neonatal and infantile periods, intestinal obstruction is not an uncommon condition. They are mostly caused by congenital malformations of the gastrointestinal tract itself, while intestinal obstruction in older children is rare and usually related to an acquired condition such as adhesion caused by previous abdominal surgery, infection/infestation, inflammatory bowel diseases or a foreign body.¹ Apart from an inguinal hernia, internal herniations caused by abnormal recesses within the abdominal cavity are rare events, but may cause obstruction in various parts of the intestine.^{2,3}

According to a classic study by Hansmann and Morton, internal hernia can be categorized based on anatomical location into 7 groups, retroanastomotic, foramen of Winslow, paraduodenal, pericecal, intersigmoid, transmesenteric and transomental. Paraduodenal hernias are the majority of all internal hernias and are more frequent on the left side.⁴ Paraduodenal hernias are often associated with abnormal intestinal rotation and/or a midgut volvulus.⁵ Although a paraduodenal hernia is the most common form of internal hernia, it comprises less than 2% of intestinal obstructions and a correct diagnosis can be made only when the practitioner is aware of this potential diagnosis.^{6,7}

Received for publication 21 January 2022; Revised 25 April 2022; Accepted 27 April 2022

Corresponding author: Surasak Sangkhathat, MD, PhD, Department of Surgery, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand, 90110; Email: surasak.sa@psu.ac.th

In this report, we report a case of a left paraduodenal hernia in a 3-year-old boy who had no history of any type of gastrointestinal event before this problem.

CASE REPORT

A 3-year-old boy was referred to us with a problem of intractable vomiting for 5 days. The boy had been previously healthy until 2 weeks prior to the referral when the mother noticed that he began to have post-prandial vomiting with bile and food particles. The severity of vomiting increased over the next few days, and he eventually became weak and dehydrated. He was taken to a local hospital where a diagnosis of acute gastritis was made, and supportive care were given. The patient did not get better and was taken back to the same hospital 2 days before arrival at our hospital when serum electrolytes showed hyponatremia, hypokalemia, and severe metabolic alkalosis (Na 128.6 mmol/L, K 2.5 mmol/L, Cl 71.9 mmol/L, and CO₂ 40.1 mmol/L). The patient was resuscitated and transferred to our hospital for further management.

At the emergency department, vital signs were BT 38.1 C, RR 26/min PR 130/min, BP 95/72 mmHg and the SaO₂ was 100%. His body weight on admission was 10.6 kg (10th percentile for Thai Children) and the height was 100 cm (> 90th percentile for Thai children). The child was found to have upper abdominal distension with tympanic percussion. However, there were no signs of peritonitis. A rectal examination was unremarkable. The retained gastric tube was in-place and has drained 70 ml of green turbid fluid. Initial laboratory revealed Na 134.3 mmol/L, K 3.13 mmol/L, Cl 90.4 mmol/L, CO₂ 31.8 mmol/L, Ca 8.5 mmol/L, and PO₄ 2.8 mmol/L. A plain abdominal film showed a distended stomach and a duodenum with the presence of air in the colon (Figure 1). Abdominal ultrasonography reported no gross abdominal masses and no evidence suggestive of a midgut volvulus. The patient was admitted with a provisional diagnosis of incomplete obstruction of the proximal small bowel. During admission, the patient had no abdominal pain and could pass normal feces. The gastric output was about 90-140 ml/day and he still had occasional vomiting even on starvation.

An upper gastrointestinal study was performed on the second days of admission which showed distension from the stomach down to the third part of the duodenum and collapsed forth part of the duodenum (Figure 2). An esophagogastroduodenoscopy was then performed, during



Figure 1 A plain abdominal radiograph of the patient, showing dilated stomach and duodenum

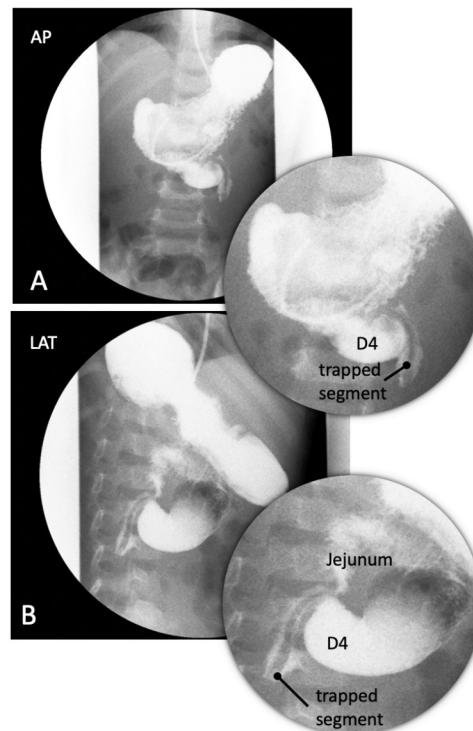


Figure 2 Upper gastrointestinal contrast study of the patient, showing the trapped segment of the proximal jejunum

which the scope could be passed to the third part of the duodenum with unremarkable findings. The decision was made to perform an exploratory laparotomy which revealed that the distal part of the duodenum together with a short part of the proximal jejunum was trapped in a recess behind the inferior mesenteric vein (Figure 3).

There were spots of calcification on the mesentery of the trapped segment. The herniated segment was released from the pouch and was seen to be stiffly stenosed with severe proximal dilatation. The decision was made to resect the stenosed segment, followed by an end-to-end anastomosis.

The patient had an uneventful post-operative course and could be discharged on post-operative day 7. On a follow-up visit at one month, the patient had gained 4 kilograms of weight and was able to eat and defecate normally.

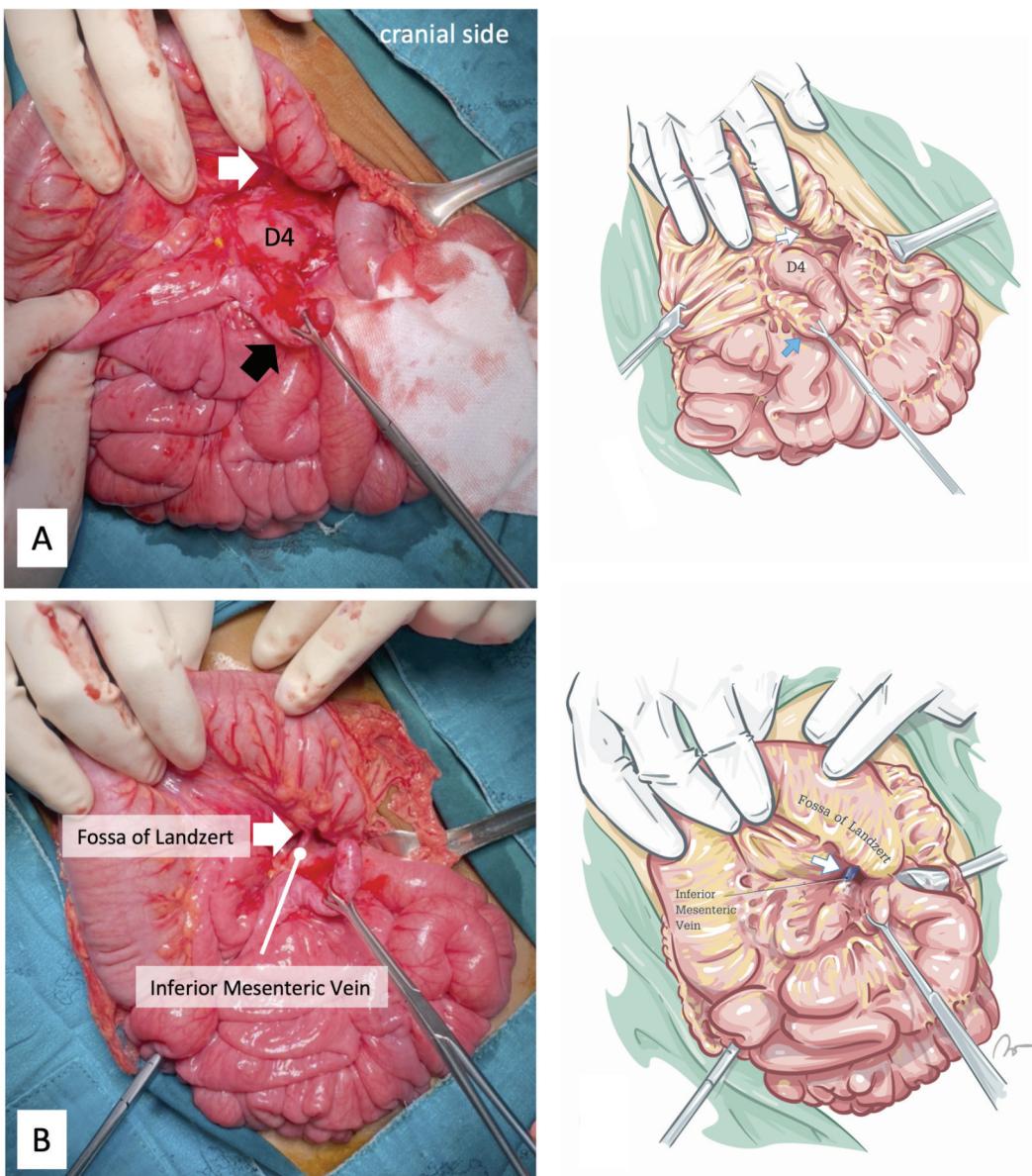


Figure 3 Operative findings A: Reduced bowel from the herniation, B: depicting the fossa of Landzert

DISCUSSION

Although intestinal obstruction caused by a congenital anomaly of the gastrointestinal tract is not common in children older than 1 year of age, an acute obstructing event caused by a midgut volvulus or internal herniation can occasionally occur in this age group.⁸ Other conditions that are more common in this age include intussusception, obstructing foreign body, adhesion in a case with previous abdominal surgery or trauma-related obstruction. When these acquired conditions can be ruled out and the symptoms of obstruction are apparent, a rotation abnormality and an internal hernia should be looked for. In our case, protracted vomiting, dehydration and electrolyte imbalance prompted the diagnosis of intestinal obstruction. Less severe abdominal pain and normal defecation suggested that the obstruction was unlikely to be a complete one, which indicated a contrast study with an aim to differentiate other causes of vomiting that might not require surgery. As the contrast study showed a significant delay at the duodenojejunal junction with severe size disparity, the decision was made to explore the abdomen.

A left paraduodenal hernia is defined as herniation of a part of the intestine through an internal defect of the mesentery, dorsal to the inferior mesenteric vein and lateral to the fourth part of the duodenum.⁹ The defect is named 'the fossa of Landzert', which is believed to be a result of abnormal rotation of the midgut, involving incomplete fixation of the mesocolon near the inferior mesenteric vein to the posterior peritoneum.¹⁰ The herniated intestine is usually located at the proximal jejunum, which can be a short segment as in our case or a large cluster of bowel segments as reported in other studies.^{11,12} An upper gastrointestinal study with a small bowel follow-through is a valuable tool for assessing location and nature of a proximal intestinal obstruction. In our case, the study nicely demonstrated a partial obstruction at the most distal part of the duodenum with a u-shaped streak of contrast passing through the trapped segment before entering the jejunum.

Considering the weight percentile of the patient and the evidence of a hard stricture of the trapped segment together with surrounding calcification, it seemed that the obstruction had occurred long before the symptoms developed. Although most reported cases presented with an acute intestinal obstruction, there have been several reports of chronic recurrent abdominal pain in adults as

a result of intermittent obstruction by a left paraduodenal herniation.^{13,14} Once this diagnosis is made, surgery is the only choice of treatment. Surgical abdominal exploration aims to confirm the diagnosis, reduce the herniated segment and resect the non-viable bowel, if present. Care should be taken not to injure the inferior mesenteric vessels to avoid ischemia of the descending colon. In uncomplicated cases, laparoscopic surgery has been reported to offer a better cosmetic outcome and quicker recovery.¹⁵⁻¹⁷

In conclusion, we report a case of a paraduodenal hernia in a child with radiological findings and corresponding operative findings that might increase awareness that this entity can be a cause of proximal intestinal obstruction. The condition should be one of differential diagnosis in a case of proximal intestinal obstruction in children.

ACKNOWLEDGEMENT

The drawing were provided by Wisthawash Tang-on of the Book Unit, and the English language in the manuscript was edited by Dave Patterson of the International Affairs Unit, Faculty of Medicine, Prince of Songkla University.

REFERENCES

1. Hryhorczuk A, Lee EY, Eisenberg RL. Bowel obstructions in older children. *AJR Am J Roentgenol.* 2013;201(1):W1-8.
2. Blachar A, Federle MP. Internal hernia: an increasingly common cause of small bowel obstruction. *Semin Ultrasound CT MR.* 2002;23(2):174-83.
3. Fan HP, Yang AD, Chang YJ, et al. Clinical spectrum of internal hernia: a surgical emergency. *Surg Today.* 2008;38(10):899-904.
4. Hansmann GH, Morton, S.A. Intraabdominal hernia. *Arch Surg.* 1939;97:3-7.
5. Martin LC, Merkle EM, Thompson WM. Review of internal hernias: radiographic and clinical findings. *AJR Am J Roentgenol.* 2006;186(3):703-17.
6. Manojlovic D, Cekic N, Palinkas M. Left paraduodenal hernia - A diagnostic challenge: Case report. *Int J Surg Case Rep.* 2021;85:106138.
7. Rajput D, Rai A, Gupta A, et al. Left Paraduodenal Hernia Presenting as Closed Loop Jejunal Obstruction in a Young Female: An Enigmatic and Perilous Differential of Acute Abdomen. *Surg J (N Y).* 2021;7(3):e212-e5.
8. Hryhorczuk AL, Lee EY, Eisenberg RL. Esophageal abnormalities in pediatric patients. *AJR Am J Roentgenol.* 2013;201(4):W519-32.
9. Martins A, Goncalves A, Almeida T, et al. Left Paraduodenal Hernia. *J Gastrointest Surg.* 2018;22(5):925-7.

10. Vanmali A, Maharajh J, Haines M. Left paroduodenal hernia: Embryological and radiological findings. SA J Radiol. 2021;25(1):1979.
11. Cundy TP, Di Marco AN, Hamady M, Darzi A. Giant left paroduodenal hernia. BMJ Case Rep. 2014;2014.
12. Xu H, Nie N, Kong F, Zhong B. Large left paroduodenal hernia with intestinal ischemia: a case report and literature review. J Int Med Res. 2020;48(9):300060520955040.
13. Chikara A, Karnati SR, Kurdia KC, Sakaray Y. Rare cause of chronic abdominal pain: left paroduodenal hernia and its surgical management. BMJ Case Rep. 2021;14(12).
14. Moshref LH, Alqahtani SH, Majeed ZA, Miro J. Left paroduodenal hernia: a rare cause of recurrent abdominal pain: case report. Pan Afr Med J. 2021;40:135.
15. Moon CH, Chung MH, Lin KM. Diagnostic laparoscopy and laparoscopic repair of a left paroduodenal hernia can shorten hospital stay. JSLS. 2006;10(1):90-3.
16. Sakamoto T, Lefor AK. Laparoscopic reduction and repair of a left paroduodenal hernia. BMJ Case Rep. 2019;12(12).
17. Hasegawa N, Takeyama H, Suzuki Y, et al. Left paroduodenal hernia treated by single-incision laparoscopic surgery: a case report. Surg Case Rep. 2021;7(1):213.