

Diagnosis of A large Left Paraduodenal Hernia: a case report

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Internal hernia is a rare cause of intestinal obstruction and most cases of internal hernia are left paraduodenal hernia. It typically involves the fossa of Landzert just lateral to the fourth portion of the duodenum. Patients with left paraduodenal hernia do not have specific clinical manifestations and preoperative radiological diagnosis is difficult. Mortality increases significantly with delay in surgical treatment. It is difficult to diagnose large left paraduodenal hernia because the grouped bowel loops not easy to look like an agglomerated mass. We now present a case of large left paraduodenal hernia which was not diagnosed in preoperative images. By retrospectively reviewing the images, we correlate the operative and the imaging findings and propose some clues that may increase the accuracy of diagnosis.

Key words: Intestine, hernia; Duodenum, abnormalities; intestine, obstruction

Internal hernia only accounts for 0.2% to 0.9% of intestinal obstruction [1] and has a very high mortality rate, exceeding 50% in most series [2]. Several articles on internal hernia have been reported in the radiology and surgery literatures. Most reported it difficult to diagnose internal hernia with both clinical signs and imaging studies, even though several useful radiographic criteria have been derived to assist in diagnosis.

Left paraduodenal hernia is responsible for most cases of internal hernia, and it is believed to have a relatively higher diagnostic rate before operation than all other types of internal hernia. Also, it seems that if there are only a few intestinal loops in the hernia sac, it would be easier to diagnose. In contrast, when there are almost all small bowel loops in a very big, loose hernia sac, it becomes more difficult to diagnose the hernia because the bowel loops look like they are normally distributed in the abdomen and not grouped in a sac.

Here we report a case of left paraduodenal hernia with about 430 cm small intestine in the herniated sac. After surgical intervention, the patient recovered without any complication.

CASE REPORT

A 34-year-old man suffered from acute intermittent abdominal pain at left upper quadrant, nausea, abdominal fullness and distention for one day. The abdominal pain then became diffuse but remained intermittent. The patient denied any major systemic disease, and he had no history of abdominal surgery.

Physical examination revealed a soft abdomen with diffuse tenderness. There was tympanic sound in percussion and hyperactive bowel sound. Laboratory data including blood counts and biochemistry were normal except mildly prolonged prothrombin time and active partial thromboplastin time.

Initial plain abdominal film revealed dilated ascending and transverse colon without any visible

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descending colonic gas (Fig. 1a), and clustered dilated small bowel loops with air collection in the left abdomen was noted at follow up plain film one day later (Fig. 1b). The small bowel series at 480-minute film showed dilated small bowel loops with stasis of the barium gathered in the left and lower abdomen with a convex inferior margin (Fig. 2a). Follow up plain film 4 days later displayed grouped dilated small bowel loops in the left and lower abdomen with medial displacement of the descending colon (Fig. 2b). Computed tomography (CT) demonstrated grouped small bowel loops between the pancreatic tail and stomach at a point above of the ligament of Treitz (Fig. 3a). They caused mass effect to the stomach and adjacent bowel loops, including mild indentation to the stomach (Fig. 3a), duodenojejunal junction depression (Fig. 3b) and medial displacement of the descending colon (Fig. 3b, 3c). The mesenteric vessels that supplied the herniated small intestines were stretched, crowded and engorged (Fig. 3b). Thickened bowel walls of the herniated small intestines (Fig. 3b) were also noted, indicating ischemic change.

The operative findings revealed about 430 cm of bowel loops herniating via a defect on the left side mesocolon from the Treitz ligament into the left abdominal cavity. The herniated small bowels were covered by peritoneum as a big sac and their lumen was filled with barium. Edematous change of the bowel walls with mesentery congestion were also

noted. The diameter of the afferent loop was 4 cm and that of the efferent loop was 1 cm. There was mild adhesion between the small bowel loops in the orifice and within the sac. The descending colon was displaced to the right side near the ascending colon. The final diagnosis was a large left paraduodenal hernia. After surgical intervention with enterolysis and repair of the aperture, the patient had an uneventful recovery.

DISCUSSION

Internal hernia account for 5% of all hernia. The incidence of internal hernia at autopsy has been reported to be between 0.2 and 0.9%. It is defined as protrusion of a viscus through a normal or abnormal aperture within the abdominal cavity, and the viscus moves into another compartment of the abdomen where it should not be. The hernia orifice may be a preexisting anatomic structure, such as foramen of Winslow, or a pathologic defect of congenital or acquired origin [2]. Based on their anatomic location of origin, internal hernia may be classified into groups such as paraduodenal, foramen of Winslow, pericecal, intersigmoid, transmesenteric and transmesocolic, retroanastomotic, supra- and/or perivesical, omental hernias, etc.

The most common internal hernia is paraduodenal hernia and it accounts for about 30% to 53% of all internal hernia [1]. Paraduodenal hernia results from incomplete rotation of the midgut with part of

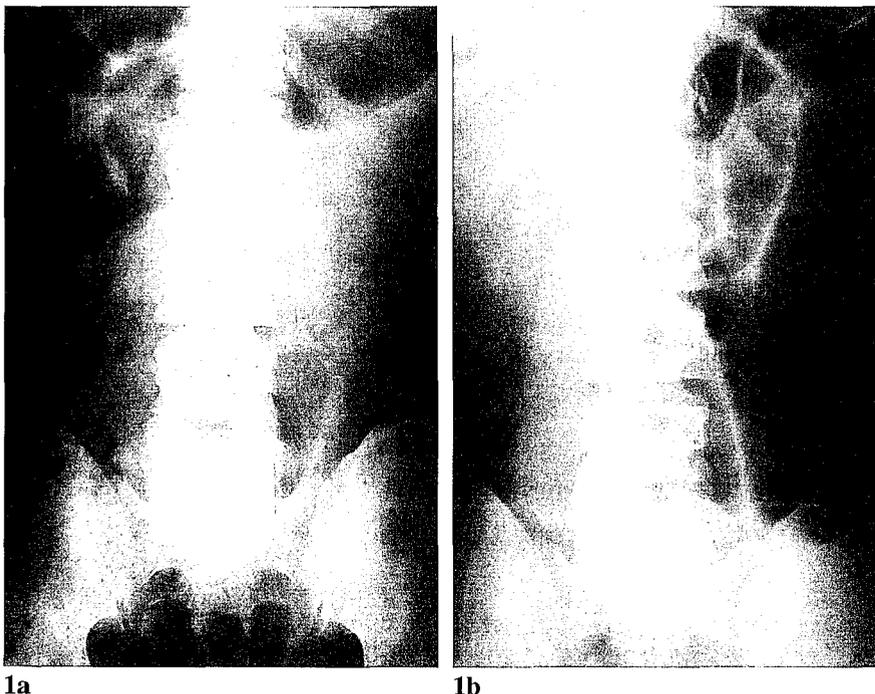


Figure 1. a. Initial plain film revealed prominent ascending and transverse colon gas without visible descending colonic gas. b. Follow up plain film one day later manifested clustered dilated small bowel loops with air collection in the left abdomen.

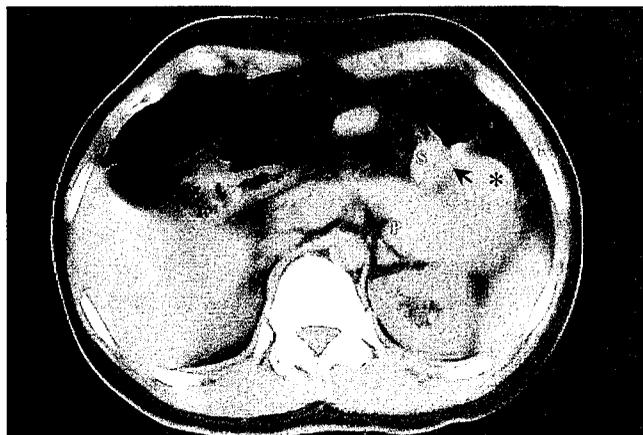


2a

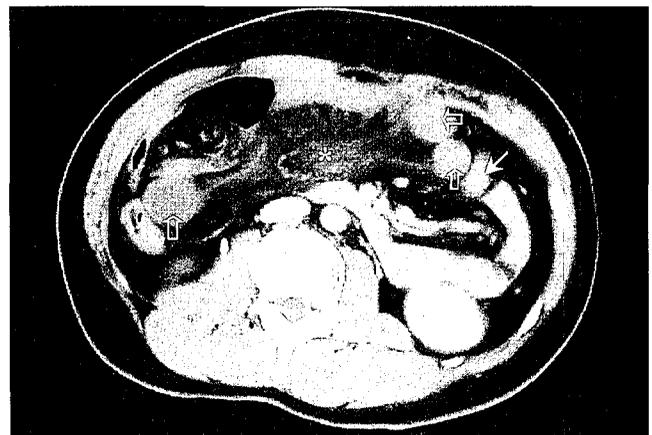


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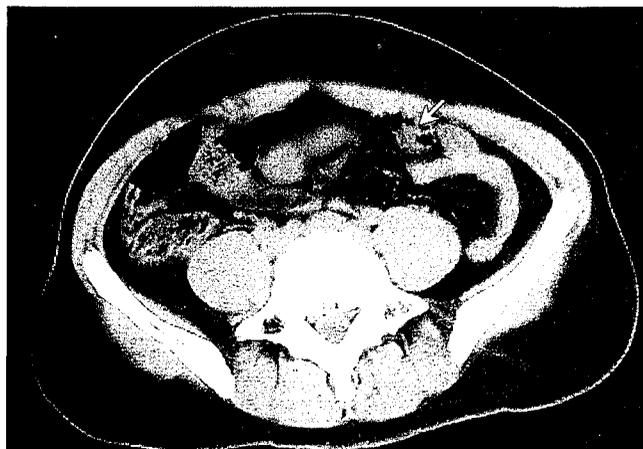
Figure 2. a. Small bowel series at 480-minute film showed dilated small bowel loops with stasis of the barium gathered in the left and lower abdomen with a convex inferior margin. b. Follow up plain film 4 days later displayed grouped dilated small bowel loops in the left and lower abdomen with medial displacement of the descending colon (white arrows).



3a



3b



3c

Figure 3. a. Pre-contrast CT scan at the level of the pancreatic body and tail demonstrated grouped small bowel loops (black asterisk) lying between the pancreatic tail (P) and stomach (S) and extending to above the ligament of Treitz with a pressure effect upon the posterior wall of the stomach (black arrow). b. Contrast-enhanced CT scan at the Treitz ligament level disclosed the crowded, engorged mesenteric vessels (white asterisk) of the herniated small bowel segments with thickened intestinal walls (white open arrows) and mild medial displacement of the descending colon (white arrow). The fact that the scanning level was 8 cm below the duodenal bulb, meant that the duodenojejunal junction was depressed by these herniated bowel loops. c. Pre-contrast CT scan of the upper pelvis revealed the medially displaced descending colon (white arrow).

the small intestine trapped posterior to the mesocolon [1]. The ratio of left sided to right sided paraduodenal hernia is 3:1.

Left paraduodenal hernia is a result of anomalous rotation of the midgut into the developing mesentery of the descending colon. It involves the fossa of Landzert, which originated from raising up of peritoneal folds by the inferior mesenteric vein (IMV) and ascending left colic artery as they run along the lateral side of the fossa and then above it. The formation of these peritoneal folds is due to their failure to be fixed to the posterior parietal attachment. In left paraduodenal hernia, the small intestine may be herniated through this congenital defect of the descending mesocolon, moving posteriorly and downward to the left side, lateral to the ascending limb of the duodenum, and extending into the descending mesocolon and left portion of the transverse mesocolon. The free edge of the hernia thus contains the IMV and the ascending left colic artery [2].

Left paraduodenal hernia occurs more frequently in males and the average age at diagnosis is 30 to 50 years. It may be discovered as an incidental finding at laparotomy or autopsy, or it may give rise to chronic digestive complaints or acute bowel obstruction, which can lead to strangulation and perforation. It also may present as a complication of pregnancy due to distortion of the hernia sac and conversion of partial obstruction into complete one [3]. The most common symptoms of left paraduodenal hernia include nausea, abdominal distention and abdominal pain. The pain may be described as acute cramp-like or chronic and intermittent. The history of the abdominal pain may be traced back to childhood with characteristic postprandial pain which could be relieved by postural changes. The abdominal distention usually is of mild degree due to the obstructive level being high in the intestinal tract. Other symptoms, such as compression of the IMV at the neck of the hernia sac, may result in venous obstruction and possibly present as hemorrhoid, spider angioma, venous congestion, or infarction of the bowel. In rare cases, it may present as acute aortic occlusion [4].

The hernia may contain only a few bowel loops and be spontaneously reduced. But sometimes it contains a large number of bowel loops with strangulation and incarceration in the sac. In such condition, these bowel loops may show ischemic change, gangrene and finally induce peritonitis. The mortality rate is high if there is delay in surgical intervention.

Imaging findings of plain radiography, ultrasonography, small bowel series, abdominal CT, and angiography have been reported. The plain film may

demonstrate signs of bowel obstruction, or rarely, mass effect with displacement of other abdominal organs by the herniated small-bowel segments [5]. Ultrasonography shows a heterogeneous echoic abdominal mass with presence of changing cystic or tubular internal components and a surrounding membrane [6]. The small bowel series of small left paraduodenal hernia reveals a circumscribed group of a few bowel loops, mostly jejunum, which can be seen in the left upper quadrant, lateral to the ascending duodenum and behind the stomach. The herniated loops may depress the distal transverse colon, displace the descending colon to the medial aspect, and indent the posterior wall of the stomach. Stasis of barium within the herniated contents, dilatation of the herniated loops and mild dilatation of the duodenum may also be noted. Large paraduodenal hernia contains most of the small bowel loops in a sac, resulting in images of grouped dilated small bowel loops, like a big circumscribed ovoid mass with its main axis lateral to the midline and its inferior border convex downward. Stasis of the contrast material and dilatation of the herniated loops may also be evident. During fluoroscopic manipulation, the hernia sac prevents separation or displacement of the individual loop from the rest of the hernial contents. At the hernia orifice, the efferent loop of the left paraduodenal hernia shows an abrupt change of caliber [7] but that would not be found in the afferent loop. The CT findings in left paraduodenal hernia include: (1) encapsulation of small bowel loops lying between the pancreatic body and/or tail and the stomach [5] to the left side of the ligament of Treitz or behind the descending colon [2] and distal transverse colon; (2) dilatation of bowel loops with air-fluid level in the bowel loops proximal to and/or in the hernia sac [8]; (3) narrowing of the efferent loop [2]; (4) mass effect causing displacement and indentation of the posterior wall of the stomach, inferior displacement of the duodenojejunal junction and transverse colon, and medial displacement of the descending colon [5]; (5) the IMV and ascending left colic artery being displaced anterolaterally [9] or upward [7]; (6) normal vascular relationship, although there might be mild displacement caused by the herniated loops [2]; and (7) the mesenteric vessels that supply the herniated small bowel segments crowded together at the entrance of the hernia sac and the vessels in the hernia sac often engorged [5]. However, in our case we could not identify the IMV and left ascending colic artery on routine CT scan films. It was also difficult to identify the afferent and efferent loops in the CT images. Angiography has been reported to show an abrupt

change of course of the vessels which supply the herniated bowel loops along the medial border of the hernia orifice, and these vessels are redirected posteriorly behind the IMV to accompany the herniated loops. Connecting the points of these arteries as they suddenly change their course indicates the medial border of the hernia orifice, beyond which are the herniated small intestinal loops [2]. Also, the vessels in the hernia orifice seem crowded together and the vessels in the hernia sac appear engorged.

Most authors believe that for patients with left paraduodenal hernia who receives examination during symptomatic periods, a combination of a small bowel series and CT provides the diagnosis with good sensitivity in the majority of cases.

The management of left paraduodenal hernia is early surgical intervention to avoid bowel incarceration or strangulation. Understanding the anatomy and the pathogenesis of its entity can reduce the complications during surgery such as injury to the major mesenteric vessels juxtaposed to the hernia orifice [1].

Making a diagnosis of an internal hernia is also difficult during surgery due to a variety of reasons: the hernia may reduce spontaneously or inadvertently reduce at surgery without recognition; the hernia may be overlooked during laparotomy if the peritoneal cavity is not explored thoroughly, especially with the presence of multiple adhesions, or if the orifice is of relatively small size at the peritoneal fossa.

For the large paraduodenal hernia it may not be easy to find out if the herniated bowel loops are in group, but one should seek other clues to make a diagnosis and thus ensure prompt surgical treatment. Even if the patients are asymptomatic, early diagnosis is important, since they may cause potentially lethal complications such as obstruction, gangrene and bowel perforation. ◆

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左側十二指腸腹內腸疝脫：病例報告

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腹內腸疝脫是造成腸阻塞的少見原因之一。大部分腹內腸疝脫的病例均是左側十二指腸腹內腸疝脫，它是因為腸子經由十二指腸第四部份的左側疝脫入Landzert小窩內所造成的；病人並不會有特殊的臨床症狀而且術前的影像學診斷相當困難，然而若因此延遲了手術治療，會明顯增加死亡的機會。在影像上要辨識大量疝脫的腸子呈現聚集在一起、形成團塊的樣子很不容易，造成診斷大量左側十二指腸腹內腸疝脫更是困難。在這裡我們報告一個未能術前診斷的大量左側十二指腸腹內腸疝脫的案例，藉著探討病人的影像學檢查，與術中的發現比對，提出一些線索來增加它的診斷率。

關鍵詞：腸疝脫；十二指腸；腸阻塞

