

Laparoscopic repair of a paraduodenal hernia

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Abstract. Paraduodenal hernias have traditionally been treated by conventional laparotomy. We report the first case of a left paraduodenal hernia treated laparoscopically. A 44-year-old man was admitted with abdominal pain and nausea. Computed tomography and an upper gastrointestinal series with small-bowel followthrough showed accumulation of the small bowel on the left side of the abdomen. A laparoscopic repair was performed. The small bowel was observed beneath a thin hernia capsule. Approximately 1.5 m of jejunum was easily reduced into the abdominal cavity. The hernia orifice (5-cm diameter) was closed intracorporeally with five interrupted sutures. Good exposure of the operative field is critical to this procedure; poor exposure may limit the applicability of the laparoscopic approach. This minimally invasive operation is currently indicated in nonobstructive paraduodenal hernias, especially on the left.

Key words: Paraduodenal hernia — Laparoscopic repair — Small bowel

Paraduodenal hernias are rare internal hernias that usually present acutely and are treated emergently via conventional laparotomy [1–3]. We made the diagnosis of paraduodenal hernia preoperatively, then reduced the jejunum and closed the hernia orifice laparoscopically.

Case report

A 44-year-old man presented with complaints of abdominal pain and nausea after straining at micturition. He had a long history of abdominal pain, nausea, and abdominal fullness that had occurred once every 2 weeks for the preceding 20 years. These complaints were aggravated by eating, standing, and straining in the lavatory. He had no significant medical history and had undergone no abdominal surgery.

On admission, a large soft mass was palpated on the left side of the abdomen. The patient reported tenderness over the mass. High-pitched bowel sounds were present. The laboratory examination was unremarkable.

Abdominal radiographs revealed a large soft-tissue density mass on the left. Abdominal ultrasonography showed dilated intestinal loops in the same area. Computed tomography (CT) demonstrated a mass of intestinal loops enveloped by a thin capsule on the left of the abdominal cavity (Fig. 1). These characteristic images were used to make the diagnosis of incarcerated left paraduodenal hernia. One hour after admission, the patient's general condition improved, and the abdominal pain resolved.

An upper gastrointestinal series (UGI) with small-bowel followthrough showed a mass of jejunum enveloped in a sac on the left side (Fig. 2). Further inquiry revealed prolapsed hemorrhoids that worsened with the onset of the abdominal complaints. Inferior mesenteric arteriography showed occlusion of the inferior mesenteric vein just left of the root of the inferior mesenteric artery. Collateral circulation was demonstrated via marginal veins of the descending and transverse colon. Malrotation of the colon was excluded by colography.

An operation was performed 20 days after admission. With the patient in the supine position, four trocars were placed through the abdominal wall. The first, which was used for the laparoscope, was placed between the umbilicus and the pubis. The next two trocars were placed in the right and left lower abdomen for the operator. The last was placed in the right upper quadrant for retraction. When the laparoscope was introduced, the abdominal cavity was relatively empty. The hernia orifice and the proximal and distal limbs of the jejunum were identified just caudal to the transverse mesocolon (Fig. 3). On the left side of the abdominal cavity, small bowel was seen beneath the transparent hernia capsule (Fig. 4). The inferior mesenteric vein was observed running in the thickened anterior edge of the hernia orifice. Approximately 1.5 m of jejunum was easily reduced into the abdominal cavity without widening of the hernia orifice, which measured 5 cm in diameter. After the reduction, exposure of the operative field was sometimes hindered by the freely movable jejunum. With the patient in head-down position to make the transverse colon move ventrally, and with the small bowel retracted to the right, the hernia orifice was kept under good vision. The hernia orifice was closed intracorporeally with five interrupted sutures. The four trocar wounds were closed (Fig. 5).

The postoperative course was uneventful. The patient noted improvement in his symptomatic hemorrhoids, and he was discharged 8 days after the operation. He has been well over the 2-year follow-up period.

Discussion

Paraduodenal hernias are a rare cause of small-bowel obstruction, occurring in <1% of cases [4]. The exact incidence of this disease is unknown. As of 1981, there were 477 reported cases of paraduodenal hernia [1]. Paraduodenal hernias comprise 53% of internal hernias and occur three times more commonly on the left side.

Paraduodenal hernias are a congenital condition that results from a failure of the mesentery to fuse with the parietal peritoneum in association with an anomaly of rotation of the

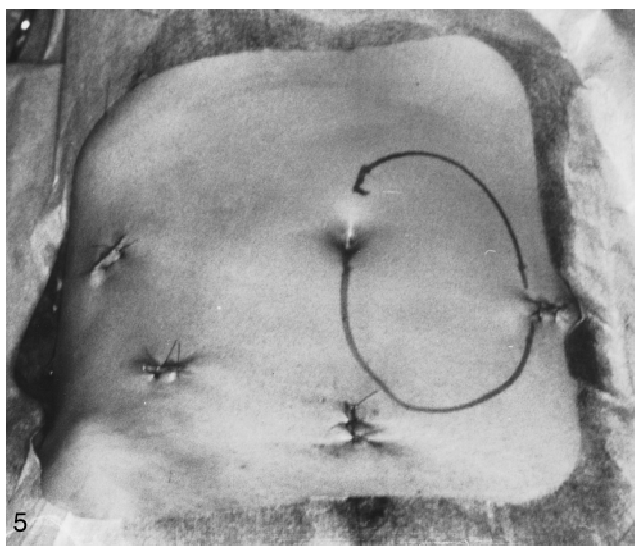
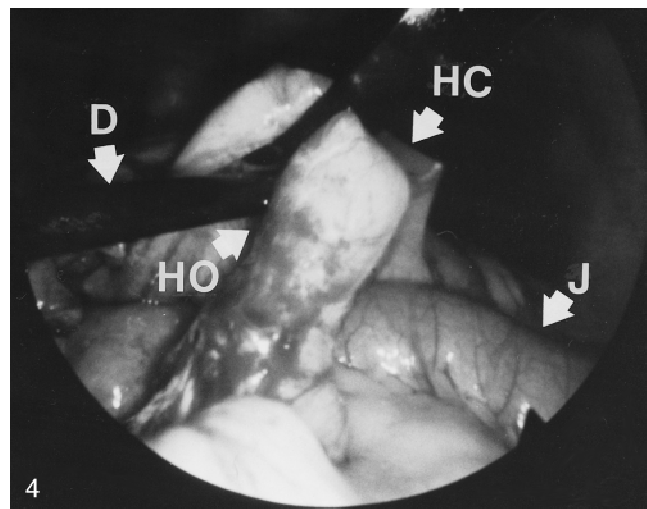
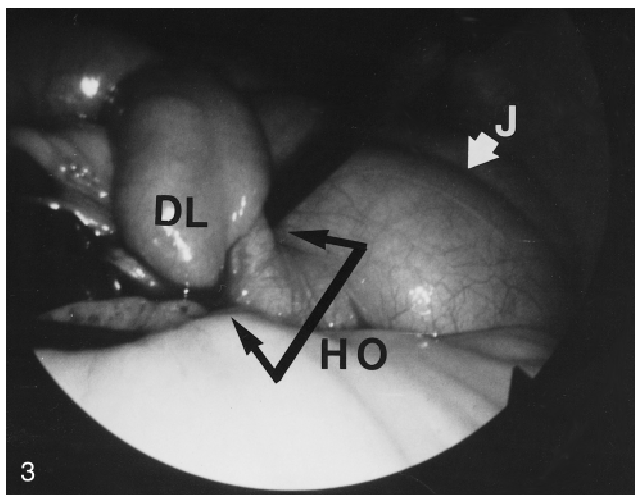
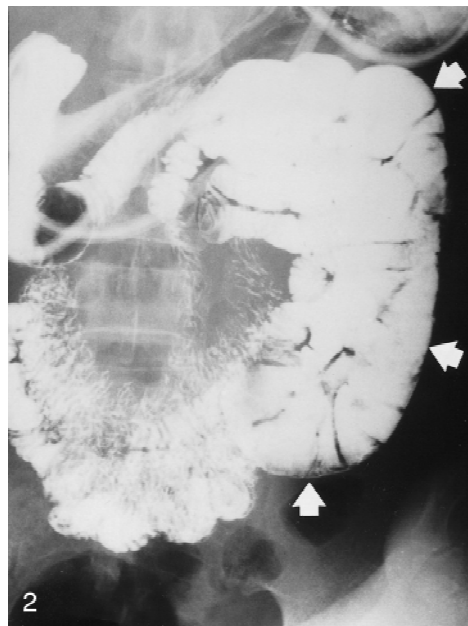
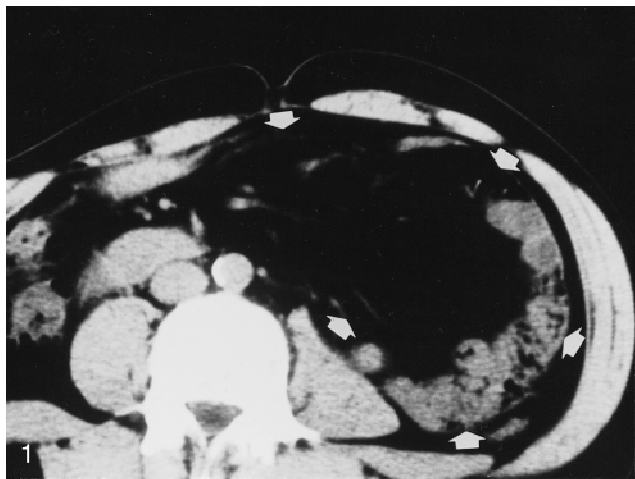


Fig. 1. Computed tomography demonstrating a mass of intestinal loops covered by a thin capsule (arrows) on the left of the abdomen.

Fig. 2. Upper gastrointestinal series showing an accumulation of the jejunum (arrows).

Fig. 3. Under laparoscopy, the hernia orifice (HO) and the proximal and distal limbs (DL) of the jejunum are observed just caudal to the transverse mesocolon. The jejunum (J) is encased in the sac.

Fig. 4. During the reduction, a dissector (D) is introduced from the hernia orifice (HO) into the sac. On the left of the abdominal cavity, the jejunum (J) is seen beneath a transparent hernia capsule (HC). The thickened anterior edge of the hernia orifice is lifted with forceps.

Fig. 5. Postoperative view of the location of the hernia and the four trocar wounds.

midgut. There are two types of hernias, which have been classified according to their site. The left paraduodenal hernia develops through a peritoneal defect situated to the left of the fourth part of the duodenum, extending into the descending mesocolon and the left portion of the transverse mesocolon. The anterior edge of the hernia sac contains the inferior mesenteric vein and left colic artery.

The most common clinical presentation of the paraduodenal hernia is acute onset of abdominal pain resulting from small-bowel obstruction. The majority of patients have a history of chronic digestive complaints such as vague or colicky abdominal pain, nausea, and abdominal fullness, which can be exacerbated by eating, straining, or standing erect. On the other hand, many paraduodenal hernias are

asymptomatic and found incidentally at laparotomy or autopsy [5].

To make the diagnosis, radiologic studies are essential. The UGI often reveals the characteristic pattern of bunched-up small bowel, as if it were contained in a bag [6]. CT usually shows a cluster of dilated loops behind the pancreas, contrasted against the left psoas muscle [7]. When an unexplainable obstruction is encountered, this rare disease must be included in the differential diagnosis.

The basic principles of surgery for paraduodenal hernias are reduction of the hernia contents and repair of the defect by either closure or wide opening of the hernia orifice. The optimal operation for paraduodenal hernia is different for those on the right and the left. The right paraduodenal hernia is often associated with malrotation of the midgut and is sometimes complicated by strangulation. Therefore, in patients with a right paraduodenal hernia, division of the lateral attachments of the ascending colon with retraction to the left is needed to allow the reduction of the small bowel [1]. The left paraduodenal hernia usually can be reduced manually without much difficulty. When difficulty in reduction is encountered, widening of the hernia orifice or division of the inferior mesenteric vein is performed [2, 8]. Reduction of the invaginated intestine and suture closure of the hernia orifice have been recommended [6].

Because of the small wounds, diminished postoperative pain, and shortened hospital stays, laparoscopic surgery is now widely applied to many kinds of hernias [9, 10]. However, there have been no prior reports of the laparoscopic repair of a paraduodenal hernia. In the case reported here, the initial vision was better than expected due to the incarceration of the small bowel. This finding has been referred to as "the empty abdomen sign" [1]. After reduction, the reduced intestine occupied considerable space, sometimes hindering the exposure of the hernia orifice. It is vital for laparoscopic repair of the paraduodenal hernia to gain good exposure of the operative field. Massive incarceration and

malrotation of the midgut may result in poor exposure of the operative field.

Currently, the laparoscopic approach is indicated in nonobstructive left paraduodenal hernias, although the techniques may be applied to more complicated situations in the future. Once a paraduodenal hernia is identified, surgical management is essential. Mortality rates may exceed 20% [1, 2]. At least 50% of patients ultimately develop intestinal obstruction [1, 4]. Although spontaneous reduction has been reported, elective repair should be performed [11]. The laparoscopic repair is minimally invasive and can be recommended for most patients.

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