Afferent loop (A-loop) obstruction and efferent loop (E-loop) retroanastomotic hernia is an acute abdominal condition encountered after gastrojejunostomy. We present a case of adult male (34 years old) who received subtotal gastrectomy with gastrojejunostomy 24 years ago, because of perforation of peptic ulcer (PPU). He was admitted to our hospital because of acute abdominal pain. The laboratory data showed high serum amylase and lipase, and acute pancreatitis was suspected. However abdominal computed tomography (CT scan) revealed regional small bowel dilatation over upper abdomen, suggesting of regional small bowel obstruction and possible internal herniation. Following surgery confirmed that the A-loop was dilated and incarcerated in the retroanastomotic space. The characteristic CT findings will give some experience and awareness for a radiologist or a clinician.

Key words: Afferent loop; Efferent loop; Retroanastomotic hernia; Gastrojejunostomy; Computed tomography

Complications of subtotal gastrectomy with gastrojejunostomy may result from adhesion, retroanastomotic hernia, kinking, intussusception, stomal stenosis or carcinoma [1-3]. We report a case who underwent Billroth II gastrojejunostomy in the past because of PPU. He suffers from acute abdominal pain and surgery confirms the presence of adhesion, A-loop obstruction and retroanastomotic hernia of E-loop.

CASE REPORT

A 43-year-old male was sent to our emergency department because of sudden onset of severe abdominal pain. Physical examination showed diffuse abdominal tenderness and muscle guarding. There was no chill or fever, no vomiting or diarrhea. The lab data showed elevation of amylase (365 U/L) and lipase (5680 U/L). Under the impression of acute pancreatitis, he was admitted for further evaluation and management. His past history included an operation for PPU when he was 19 years old. He denied any history of hypertension, diabetes or hepatobiliary disease, but has smoking and alcohol drinking habits. The main lab data showed WBC of 15700/cmm. (Segment form of 71%) serum amylase of 365 U/L, lipase of 5680 U/L.

He was sent to our radiological department for taking a plain abdominal radiograph and further examination by abdominal CT scan. The supine plain abdominal radiograph showed increased soft tissue density or a soft tissue mass at right and upper abdomen which indented an adjacent bowel loop. (Fig. 1) The CT scan of abdomen showed regional bowel dilatation over the upper abdomen, suggesting local small bowel obstruction and a possible internal herniation of retroanastomotic space. (Fig. 2-b,c,d)

The following surgery revealed the status of subtotal gastrectomy with antecolic gastrojejunostomy. Adhesion was found in the anastomotic area, which forms a hernia sac around 8 cm in diameter. The E-loop was incarcerated into the retroanastomotic space by about 12 cm in length, and the space formed between a portion of A-loop and retroperitoneum. The A-loop measured about 20 cm in length, and markedly
dilated due to adhesion band and incarcerated E-loop compression (Fig. 2-a). A serosal tear and hyperemic change were seen in the dilated A-loop, without definite wall necrosis or perforation. After lysis of the adhesion, retrograde decompression of the dilated bowel loop, and closure of the potential channel, this patient recovered quickly and was discharged several days later.

**DISCUSSION**

In a case who has a history of subtotal gastrectomy with gastrojejunostomy, the following changes such as adhesion, retroanastomotic hernia of efferent jejunal loop, or obstruction of A-loop may be encountered [4,5]. They may occur individually or combined with two or three events, but adhesion is always present. In our case, these above conditions are all present.

Approximately half of these complications occur in the first postoperative month and the others within 1 year or several years after surgery [6], but in our case occurs 24 years later. The clinical manifestations are cramping abdominal pain and signs of high small bowel obstruction. In many instances, these nonspecific findings may be mistaken for stomal edema, dumping or pancreatitis. Clinically, A-loop obstruction, vomitus that does not contain bile, and usually elevation of serum amylase and lipase [7] present, as same as our case.

Radiologic diagnosis of a retroanastomotic hernia requires careful fluoroscopic evaluation of the upper gastrointestinal tract (UGI) after administration of barium or water-soluble contrast medium. The examination reveals that the site of obstruction is not the gastric stoma, but is more distal in either of the anastomotic limbs [6,8]. UGI series may suggest the diagnosis of A-loop obstruction because of non-filling of the loop [9].

In a case mimicking pancreatitis, CT scan is usually performed firstly. CT scan of abdomen usually discloses the obstructed afferent or efferent loop as a fluid-filled and markedly distended tubular or cyst-like structure (Fig. 2-b.c.d.). Sonography may demonstrate cystic masses of upper abdomen similar to that seen on CT scan [10,11]

Radionuclide examination with 99m TcHIDS or $^{131}$I rose Bengal may show persistent activity in the dilated A-loop and the site of obstruction [12,13]. No radionuclide study was done for our case.

Computed tomography has a high sensitivity and specificity in diagnosis of small bowel obstruction. It may uncover a clinically unsuspected incarcerated external or internal hernia, strangulation, or closed-loop obstruction, all of which require prompt surgical intervention to prevent bowel infarction [14]. Strangulation of bowel refers to interference with the blood supply associated with an intestinal obstruction. It is often difficult to diagnose radiographically, but several signs and findings may suggest bowel strangulation and its complication [14,15] (Fig. 2-b.c.)

The CT scan of retroanastomotic hernia and its related complications can make a correct diagnosis before surgery, and this is rarely reported in literatures.

The following surgical intervention in our case confirms congestion and hyperemic change of the obstructed bowel loop, with a serosal tear. No evidence of bowel necrosis or perforation is found.

Like any other symptomatic internal hernia, hernias involving the retroanastomotic space also require surgical correction. More important, however, this iatrogenic hernia should be prevented during initial gastric operation by the use of a short A-loop and the closure of the retroanastomotic space with sutures placed between the jejunal mesentery and the transverse mesocolon [5,15]
REFERENCE

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接口後疝造成入向腸段阻塞之CT發現—病例報告

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在胃空腸吻合術後，可發生入向腸段阻塞與出向腸段接口後疝，臨床上可出現急性腹痛，乃是外科急症。我們報告一個病例，他是34歲男性，24年前因胃穿孔曾接受胃次切除與胃空腸吻合術。他被送到急診室的主訴是急性腹痛，理學檢查有全腹壓痛，抽血檢查Amylase與Lipase都很高，因此被懷疑有急性胰臟炎。於是送到本院接受腹部CT掃描，CT的影像顯示上腹部局部小腸腫脹，有腸阻塞現象，且高度懷疑有腸內疝現象。後來經由外科開刀亦證實有入向腸段阻塞與出向腸段接口後疝。其腹部CT的影像令人印象深刻，將可提供給放射診斷科醫師與臨床醫師一些經驗與警覺。

關鍵詞：入向腸段，出向腸段，接口後疝，胃空腸吻合術，電腦斷層檢查術