Intestinal Malrotation in an Elderly Man: A Case Report and Review of the Literatures

VA-KEI KOK, TEH-KUANG WANG1, YAW-CHING CHEN

Malrotation is defined as an anomaly of rotation and fixation of the midgut. It can lead to acute intestinal obstruction and is a rare but important cause of bowel obstruction in adults. A 76-year-old man was brought to the Emergency Room (ER) due to vomiting, anorexia and abdominal pain over the past three days. Routine abdominal X-ray revealed interposition of the hepatic flexure of the colon and gas distention of the small and large bowel. Computed tomography (CT) of abdomen showed exchanged position of the superior mesenteric artery (SMA) and the superior mesenteric vein (SMV). Under suspicion of intestinal obstruction, an exploratory laparotomy was performed, which confirmed the anomalous position of the colon at the right side of the abdominal cavity. Although usually an incidental finding, it is important to diagnose such a malrotation because it may cause acute abdominal symptoms.

Key words: intestinal malrotation, acute intestinal obstruction

Introduction

Intestinal malrotation can be broadly defined as any deviation from the normal 270° counterclockwise rotation of the midgut during embryologic development. Malrotation of the midgut occurs when the normal rotational process and fixation of the intestine fail to take place. Congenital malrotation of the midgut often presents within the first month of life. The overall incidence of malrotation, however, is unknown because some patients will present years later or remain asymptomatic for life. Since presentation is nonspecific and the alertness to possible malrotation decreases with patient age, clinical diagnosis is usually not considered at initial evaluation. We describe a case of intestinal malrotation causing abdominal pain and acute bowel obstruction in an elderly man.

Case Report

A 76-year-old man presented with vomiting, anorexia and intermittent cramping abdominal pain over the past three days.

In the ER, he appeared in a distressed condition and physical examination revealed diffuse abdominal tenderness with distension and with rigidity. Biochemical data and hematological studies were normal. Plain abdominal X-ray film revealed interposition of the hepatic flexure of colon and gas distention of the bowel loops (Fig. 1). Abdominal ultrasound (US) was not informative because of excessive bowel gas. CT scan of the abdomen revealed that the abnormally distended bowel loops occupied the right side of the abdominal cavity and showed the exchanged position of the mesenteric vessels (Fig. 2). The superior mesenteric vein (SMV) was found be
abnormally located to the left of the superior mesenteric artery (SMA) as opposed to its normal position. Right sided position of the sigmoid colon was noted. Under suspicion of intestinal obstruction and malrotation of the colon, an exploratory laparotomy was carried out immediately.

Surgery revealed that the entire small bowel presented in the left side of the abdominal cavity enclosed in a caul, which included the entire jejunum and a portion of the proximal ileum. This had caused duodenal outlet obstruction and the development of stomach developed distention. Complete absence of a flexure of the colon was found near the spleen with transposition of the distal colon to the opposite side of the abdomen. Enterolysis of the small bowel interloop was performed releasing it from the peritoneal band. The sigmoid colon was entirely on the right side of the abdominal cavity along with the descending colon and splenic flexure. The cecum and ascending colon were observed in front of the descending colon and were compressed in the right side of the abdominal cavity. The sigmoid colon was also found twisted by an adhesive band. The SMA was observed to pass anterior to the distal limb of the transverse colon, anteriorly to the fourth part of the duodenum, and posteriorly to the proximal limb of the transverse colon. Thus, malrotation of the colon was impressed and enterolysis was performed.

The postoperative course was uneventful. The patient was discharged two weeks after surgery.

**Discussion**

Intestinal obstruction is encountered virtually every day in the ER. Eighty percent of all bowel obstruction is caused either by adhesions (50%), hernia...
Intestinal malrotation (15%), or neoplasm (15%) and about one third of bowel obstruction cases have multiple causes\(^2\). Malrotation of the intestine is usually observed in the neonatal period with signs of acute intestinal obstruction due to Ladd’s bands compression of the duodenum and/or volvulus\(^3,4\). In contrast, symptomatic malrotation in adults is unusual. Commonly it occurs with the vague symptoms\(^5,6\) and can be mistaken for irritable bowel syndrome, adhesions, Crohn’s disease, pancreatic and biliary disease, or even psychiatric illness. Malrotation has a high association with peptic ulcer disease, which may be caused by chronic partial gastric or duodenal outlet obstruction\(^7\).

Plain abdominal X-rays are usually diagnostic of malrotation in the neonate. Air fluid levels in the stomach are suggestive of volvulus, which more frequently occurs with malrotation in the neonate. In older children and adults, however, the plain films are usually suggestive of partial small bowel obstruction and less specific for malrotation\(^8\). In Spigland et al series, plain abdominal X-rays were diag-

Fig. 2 (A) Computed tomography scan showing distension of the stomach (asterisk) and marked distension of the large bowel (LB) located at anterior and superior to the liver.
(B) Computed tomography scan showing the splenic vein has crossed to the superior mesenteric artery. Vertical orientation of the superior mesenteric artery (small white arrow) and superior mesenteric vein (large white arrow).
(C) Computed tomography scan demonstrating the exchanged position of the superior mesenteric artery (small white arrow) and the superior mesenteric vein (large white arrow).
(D) Computed tomography scan showing normal rectum (R) position and right side position of the sigmoid colon (S).
nostic in less than 30% of the patients with proven malrotation. However, our patient’s abdominal radiography illustrates the clinical importance of the association of incorrect position of a gas retention bowel loop, which was high in the right upper quadrant.

The accuracy of the upper gastrointestinal series (UGI) is reported to be over 80% in diagnosing malrotation in the child and adult. The sensitivity and specificity of the barium enema is less than that of the UGI. The abnormal position of the cecum, high in the right upper quadrant on barium enema, is suggestive of malrotation. We believed that these diagnostic tools were contraindicated in our case. In addition, barium enema is associated with an increased risk of barium inspissations and may necessitate a delay before surgery to adequately clean the colon.

Assessment of the position and relative relationship of the superior mesenteric vessels by ultrasound has been advocated as a rapid, non-invasive method of diagnosing malrotation. Another study showed a high diagnostic yield by color Doppler ultrasonography, suggesting that the clockwise “whirlpool sign” on sonography is diagnostic for midgut volvulus. Angiography and CT scan examinations have also been used as adjuncts in the diagnosis of malrotation. In the angiographic diagnosis of malrotation, the appearance of the SMA had been described as “corkscrew” or a “barber pole sign”, but such time-consuming and invasive studies are not clinically practical.

Recently, in older patients with acute abdominal symptoms, CT scan is generally performed and considered instead of a barium examination or angiography. The CT findings in malrotation with midgut volvulus are characteristic “whirl” or “whirlpool sign” described as the swirling appearance of bowel and mesentery twisted around the SMA axis.

Surgical correction of malrotation is straightforward but it must be complete to prevent recurrence of volvulus. Successful management of midgut volvulus mandates expeditious celiotomy, detorsion of the volvulus and restoration of intestinal perfusion. Necrotic areas should be resected, with efforts being made to preserve intestinal length. Early diagnosis and surgical treatment are of utmost importance to avoid bowel necrosis. When such an unexpected anomaly is encountered during abdominal surgery there may be increased difficulty, and increased operative morbidity and mortality. Therefore, for best results, early preoperative recognition or suspicion is important.

Correlation of clinical symptoms with the intestinal anomaly was difficult in our case of acute abdominal pain. Our patient did not receive enhancement image studies because he had chronic renal insufficiency and bowel loop distention. The SMV had rotated only 180 degree from SMA in our case. The malrotation of the colon and right side position of the sigmoid colon were confirmed during surgery. Although usually an incidental finding, it is important to diagnose such a malrotation because it may cause acute abdominal symptoms. In older patients who present with acute intestinal obstruction related to unsuspected malrotation, rapid imaging diagnosis and surgery may be life-saving. Surgical treatment is urgently indicated for acute symptomatic intestinal obstruction with malrotation. If the diagnosis or treatment of intestinal obstruction is delayed, bowel necrosis and death can result.

References


老人腸迴轉不全症：病例報告和文獻回顧

郭華基 王得光 陳曜卿

腸迴轉不全，是指腸腔在胚胎發育階段，腸的旋轉和固定發生異常。腸迴轉不全症和其併發症，常早期出現在嬰幼兒；至於造成老人急性腸阻塞則是罕見。本文報告一例76歲男性，因三天間歇性腹痛、噁心和嘔吐，急診就醫。腹部放射線檢查結果顯示右上腹腸腔積氣，電腦斷層掃描發現上腸系靜脈迴轉180度，移至在上腸系動脈左側。手術探查證實腸迴轉不全和大腸集中在右腹腔；查閱文獻記載，既往相類同的病例報告，都是意外發現居多，腸迴轉不全症在老人症狀病徵表現，可能因併發腸阻塞，引起急性腹痛合併症，避免腸系缺血壞死，所以儘早手術治療有其必要性。

關鍵詞：腸迴轉不全，急症腸阻塞