

A CASE OF SMALL BOWEL OBSTRUCTION SECONDARY TO TRANSVERSE MESOCOLIC INTERNAL HERNIATION

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Abstract

Internal abdominal herniation can be a cause for bowel obstruction and still being under diagnosed. Transmesenteric internal herniation is increasing in occurrence as more surgical intervention being performed. Clinical diagnosis of internal herniation can be very challenging. Computed tomography could be the first imaging modality to discover a clinically unsuspected internal herniation especially in patient with previous surgical intervention. Radiologist should be aware of computed tomography features like reversal of the normal anatomical arrangement of the bowels as well as the mesenteric vessel changes, which raise the suspicion of internal hernia in patient presenting with bowel obstructive symptoms.

Keywords: Small Bowel Obstruction, Transverse Mesocolic Internal Herniation, CT Features

Introduction

Internal hernia is protrusion of a viscus through a normal or abnormal mesenteric or peritoneal aperture but remains within the peritoneal cavity (1). It can be acquired through trauma, surgical procedure or can be related to congenital peritoneal defect.

Paraduodenal hernias are the commonest type of internal abdominal hernia. However, the occurrence of transmesenteric hernia is also increasing in number as more surgical interventions are being performed especially the bariatric surgery. Internal hernia has an overall incidence of less than 1% and constitutes up to 5.8% of all small bowel obstruction (1). Imaging test for diagnosing internal hernias is relevant however can be very challenging. Nonetheless, exploratory surgery is still necessary when clinical features are uncertain.

Herewith we present a case of a 50-year-old Chinese male with previous surgical history, diagnosed with small bowel obstruction secondary to transverse mesocolon internal herniation.

Case report

A 50-year-old Chinese male with underlying ischemic heart disease (single vessel disease) presented to emergency department for sudden abdominal pain over the operation site. This was associated with nausea, vomiting, reduced oral intake and no bowel opening for a day duration. Two weeks ago, he has prior history of laparotomy and underrunning duodenal vessels for bleeding ulcers at first and second part of the duodenum (D1 and D2). All the symptoms started four days after patient was discharged home from the first hospitalization. There was no history of fever.

Upon examination his abdomen was soft and not distended. The previous operation wound was clean. His vital signs and blood parameters were normal with no documented temperature spike. Patient was admitted and investigated for intestinal obstruction. The initial abdominal radiograph showed no evidence of bowel obstruction. Ryle's tube was inserted as patient was unable to tolerate feeding due to persistent nausea and vomiting. Esophagogastroduodenoscopy (OGDS) was performed to rule out gastric outlet obstruction few days after the admission due to high free flow of non-bile-stained undigested food particles from the Ryle's tube. The OGDS showed the body of the stomach filled with semi-digested food with inflamed mucosa. This raised the suspicion of gastro paresis with gastritis. Thus, patient underwent gastrograffin small bowel follow through study with complementary computed tomography (CT) of abdomen

and pelvis, which revealed delayed gastric emptying time with reduced peristalsis of the stomach, prolonged small bowel transit time and small bowel obstruction likely secondary to adhesion. In both studies, the contrast opacification was seen till the dilated mid jejunum. On the complementary CT the small bowel loops were dilated with the reversal of the anatomical location of the small bowel and large bowel whereby the small bowels were seen periphery to the large bowels (Figure 1 and 2). There was also stretching and engorgement of the mesentery noted at the level of L4/L5. The transition point of contrast opacification is seen at mid ileum level with surrounding fat stranding at this region. The bowel loops distal to this were collapsed. These findings were not seen on previous CT abdomen performed before the laparotomy for the bleeding duodenal ulcers.

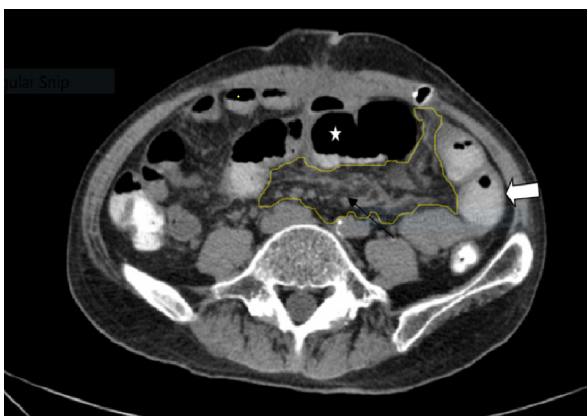


(a)

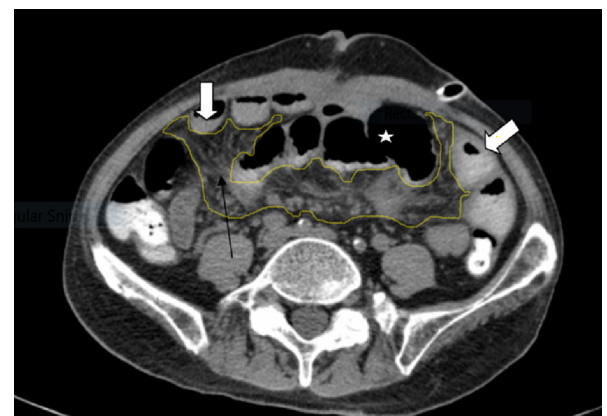


(b)

Figure 1: (a) and (b) contrast enhanced CT through the abdomen (during first admission) showing normally distributed bowel loops; small bowel loops centrally (white arrows) and large bowel loops peripherally (white stars)



(a)



(b)

Figure 2: (a) and (b) contrast enhanced CT abdomen and pelvis (imaging after laparotomy for bleeding D1, D2 ulcer) in axial view at the level of L4/L5, showing dilated small bowel loops (white arrows) which are seen periphery to the large bowel (white stars) with stretching and swirling of the regional mesentery (yellow highlight area). No obvious mesenteric defect seen.

Two days later, patient went for diagnostic laparoscopy, converted to open adhesiolysis with small bowel repair and peritoneal washout. Intraoperative findings revealed internal hernia at the transverse mesocolon where small bowel herniated through the transverse mesocolon defect. Dilatation of the proximal small bowel loops noted. Adhesiolysis was done, the hernia was released and the transverse mesocolon defect was sutured. Patient was kept in intensive care unit for close monitoring before being transferred out to ward.

Patient's symptoms improved as he was able tolerate oral feeding with no symptoms of bowel obstruction throughout his stay in the ward. Patient was discharged well, with one month appointment to surgical outpatient department.

Discussion

Internal hernia is defined by the protrusion of a viscus through a normal or abnormal peritoneal or mesenteric aperture which confines to the peritoneal cavity. These openings can be acquired such as from post-surgical, traumatic or inflammatory defect. Internal hernia can also occur via the normal aperture like Foramen of Winslow. The internal hernias are further classified into several types based on their location i.e., paraduodenal (53%), pericecal (13%), foramen of Winslow (8%), transmesenteric and transmesocolic (8%), intersigmoid (6%), and retroanastomotic (5%) (1). Internal hernias have been one of the causes for bowel obstruction in 5.8% of cases (1). Internal hernia has no gender or age predilection. Paraduodenal internal hernia is the commonest type of internal hernia, however the occurrence of the transmesenteric internal hernia is increasing in number especially in patients with post liver transplantation and Roux-en-Y gastric bypass surgery (1, 2).

Internal hernia through a transverse mesocolon defect is a type of transmesenteric hernia which commonly happens following the Roux-en-Y gastric by-pass surgery. In our case, the cause for the defect in the transverse mesocolon is unknown. Prior to this, patient had history of exploratory laparotomy with underrunning of vessel for bleeding duodenal ulcers and this procedure could have impaired the mesenteric wall and caused the defect. Another possible cause is congenital defect in the mesocolon that could have been the cause of the internal hernia even though it is very unusual in the elderly (3-5).

When there is a defect in the mesentery or mesocolon, the small bowel can herniate through the defect and it gets compressed against the abdominal wall. The herniated bowel will appear clustered and located periphery to the colon and the colon lie centrally. This is just a reversal of the normal anatomic arrangement. The herniated bowel may undergo complications like torsion or volvulus, thus prone to ischemia. Diagnosing internal hernia preoperatively is very difficult as the clinical symptoms are not specific. The

most common clinical presentation would be small bowel obstruction.

Imaging may play an important role in diagnosing internal hernia even though it is very challenging to identify the typical features of internal hernia. Besides the knowledge of the peritoneal cavity anatomy, the pathophysiology and anatomical location of different types of internal hernia would be helpful in the diagnosing the pathology. Signs of small bowel obstructions can be seen on plain radiograph, rarely mass effect by the herniated bowel loops may cause displacement of the other abdominal organs (2). In small bowel follow through the hernia can be seen as crowding of bowel loops in abnormal location of the abdomen with signs of small bowel obstruction and delay in passage of the contrast through the bowel lumen (2). CT may enable the diagnosis of internal hernia in most of the cases based on certain features, however it is still challenging. There are no classical CT signs for internal hernia but certain features in combination with history and clinical findings may be useful in diagnosing internal hernia (2). Based on previous case reports and studies, diagnosing transmesenteric internal hernia on CT was very difficult as compared to paraduodenal hernias. This is because there is lack of confining sac in transmesenteric hernia which gives variable appearance of the bowel loops. Nevertheless, in patient with previous surgical history, there will be adhesions and partial small bowel obstructions which may cause difficulty in differentiating the two conditions (2). This might be the cause for inability to identify the hernia from the CT in our patient. Despite all these, there are few CT features that enable the diagnosis of transmesenteric hernia to be made. These include some degree of small bowel obstruction with a point of transition, variable location of the herniated bowel due to lack of hernia sac and the reversal of the normal anatomical arrangement of the bowel where the cluster of herniated bowels seen peripheral to the colon. Engorgement, crowding, twisting and stretching of the mesenteric vessels are common in transmesenteric hernia (2, 5). Indeed, both CT features were seen in our case. Besides that, bowel wall thickening and ascites may represent bowel ischemia and presence of whirl sign may indicate volvulus.

Conclusion

Diagnosing internal herniation is very challenging and imaging plays an important role, especially CT scan in arriving at the diagnosis and at times. A radiologist plays important role in suggesting the diagnosis when there is no definite etiology for obstructive bowel symptoms. Radiologist should be aware and pay more attention to CT features like reversal of the normal anatomical arrangement of the bowels as well as the mesenteric vessel changes, in patient presenting with acute abdominal symptoms especially in the background of previous surgical history.

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Consent

Verbal informed consent was obtained from the patient's next of kin for inclusion in this report. Research and ethics committee approval for case reports is not a requirement according to Medical Research and Ethics Committee and Institute for Clinical Research Malaysia.

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Competing interests

I would like to declare that there is no conflict of interest during completion of this case report.

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