



Spontaneous transomental hernia: a case report of a rare internal hernia with a challenging diagnosis

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Introduction and Importance: Transomental hernia (TOH) is an extremely rare clinical condition that represents 1–4% of all internal hernias. Spontaneous TOH occurs in patients with no history of surgery or previous abdominal trauma. It happens after protrusion of the abdominal viscera, commonly the small bowel loops through a defect on the great omentum.

Presentation of the case: We present a case of occlusion due to TOH in a 66-year-old man who underwent a laparotomy, and operative exploration showed 10 cm of small bowel incarcerated through a defect in the right side of the greater omentum of 4 cm in diameter.

Discussion: The diagnosis is usually delayed because symptoms are nonspecific. Postoperative morbidity and mortality are important because patients present most frequently with gangrenous bowel, making morbidity and mortality higher. Therefore, it constitutes a critical surgical emergency and must be quickly recognized and managed. Computed tomography (CT) scan plays a prominent role in diagnosis. Midline laparotomy is the main emergency approach for patients with unknown bowel obstruction. Some authors suggest a laparoscopic approach, but it requires a surgeon's experience and propitious patient's conditions.

Conclusion: TOH is the rarest type of internal hernia with extremely difficult preoperative diagnosis due to nonspecific semiology. This type of hernia has the highest morbidity and mortality rates of all internal hernias. Thus, it must be suspected whenever there is bowel obstruction of unknown origin and quickly managed.

Keywords: case report, computer tomography, internal hernia, surgery, transomental

Introduction and importance

Transomental hernia (TOH) is a rare clinical condition that represents 1–4% of all internal hernias^[1,2]. It happens after protrusion of the abdominal viscera; most commonly, the small bowel loops through a defect on the great omentum. It occurs particularly in patients with no history of surgery or previous abdominal trauma. The diagnosis is usually delayed because symptoms are nonspecific and can range from mild and intermittent abdominal

HIGHLIGHTS

- Transomental hernia is a rare type of internal hernia.
- The diagnosis is usually delayed because symptoms are nonspecific.
- Computed tomography plays a prominent role in diagnosis, but it requires a skilled radiologist.
- It represents a surgical emergency due to the high risk of gangrenous bowel.

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pain to acute and continuous pain following bowel obstruction associated with nausea and vomiting. Compared with other types of internal hernias, it represents a life-threatening entity because patients present most frequently with gangrenous bowel, making postoperative morbidity and mortality higher. TOH represents a critical emergency that must be quickly recognized and managed due to the high risk of bowel necrosis and peritonitis. TOH postoperative mortality in such instances may exceed 30%^[3]. Accordingly, this condition constitutes a critical emergency and must be quickly recognized and managed^[4]. Computed tomography (CT) scan plays a prominent role in diagnosis thanks to the multidetector's properties, with its thin-section, high-resolution multiplanar reforming pictures^[5]. Surgery is the only treatment and must be initiated as soon as possible. We illustrate the case of a 66-year-old man who had an intestinal obstruction due to TOH to show its diagnosis and prognosis particularities. This case is reported in line with SCARE guidelines^[6].

Presentation of the case

A 66-year-old man was referred to our department with 24-h features of acute obstructive syndrome with vomiting, abdominal bloating, and pain. He had a history of diabetes and renal failure and no previous surgical history. Physical examination showed normal vital signs and mild distension of the abdomen with no peritoneal signs. Groin hernias were not found on deep palpation. There was no history of abdominal trauma or weight loss with a body mass index (BMI) of 32. Blood tests showed a minimal inflammatory reaction: white blood cells (WBC)=13 200 elmt/mm³; C-reactive protein (CRP)=23 g/dl, hypokalemia at 3.3 mmol/l and normal blood urea and creatinine. An emergency computed tomography (CT) scan was performed on admission, showing a cluster of dilated small bowel loops located in the right flank with the presence of a double 'beak sign', whirl sign, and fat densification at the right hypochondrium (Fig. 1). An acute intestinal obstruction caused by a congenital band was suspected. A laparotomy was performed.

Operative findings showed a distended intestine and 10 cm of small bowel incarcerated through a defect in the right side of the greater omentum of 4 cm in diameter (Fig. 2A, B, 3A). Subsequently, the small intestine was carefully liberated. It looked congested but not ischemic after reduction and there was no hernial sac (Fig. 3B). The closure of the omentum defect was performed with a continuous suture. The postoperative course was uneventful, and the patient was discharged on the third postoperative day. The patient was followed up in the outpatient clinic for a period of 6 months and no recurrence was mentioned.

Discussion

TOH is the rarest type of internal hernia (1–4%). Para duodenal (53%) and pericecal (13%) hernias are the most

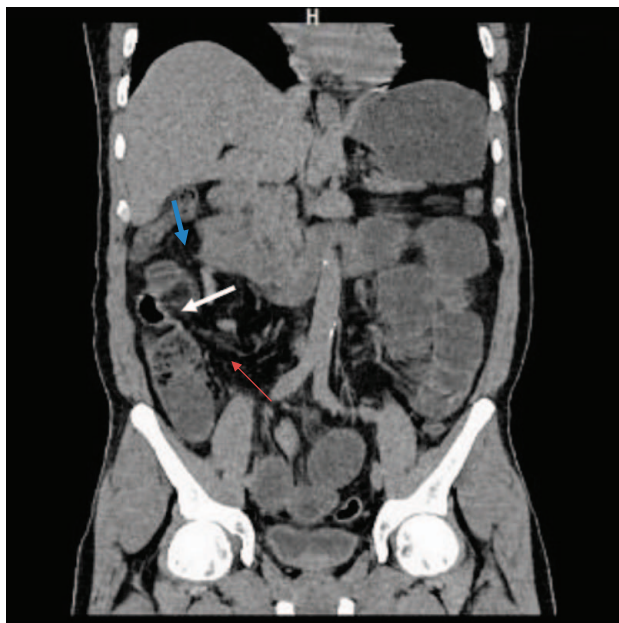


Figure 1. Coronal CT scan showing transomental herniation of the greater omentum. Small bowel loops with caliber change (white arrow); whirl sign (red arrow); fat densification (blue arrow).

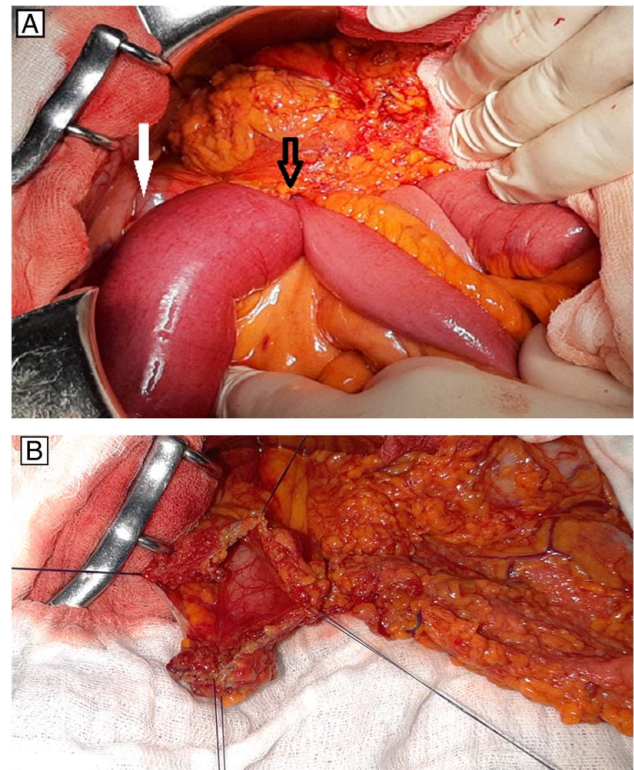


Figure 2. Intraoperative findings. (A) Intraoperative image showing the incarcerated small bowel with caliber change (black arrow) close to the right colic flexure (white arrow). (B) Transomental hernial defect in the right side of the greater omentum.

frequent, followed by hernias through the foramen of Winslow (8%) and the transmesenteric (2%)^[7]. The incidence of TOH may be underestimated. In fact, Blachar *et al.*^[8] found that TOH constituted 5.5% of internal hernias, and Ghiassi *et al.*^[9] reported 10%. Furthermore, the literature review conducted by Inukai *et al.*^[1], which found only 24 cases of TOH over 57 years from 1960 to 2017, only looked at papers written in English and published on PubMed and not all literature. TOH results from the passage of abdominal viscera, most commonly the intestinal loops, rarely the cecum or sigmoid colon, through a congenital or acquired defect of the greater omentum ranging from 2 to 10 cm in diameter involving both leaves (four peritoneal layers) and located peripherally near the free edge^[5]. Sometimes TOH occurs through the lesser omentum, and this creates a problem of differential diagnosis with Winslow's foramen hernia, whose treatment is different. In our case, TOH involved the right side of the greater omentum. Spontaneous TOH is diagnosed generally after the age of 50 years^[1]. Some factors reported in the literature contribute to the occurrence of transomental hernias. First, factors that increase intra-abdominal pressure such as chronic cough, heavy lifting, or obesity, in addition to the presence of certain intra-abdominal pathologies such as ascites or others involving significant intestinal distension can push the abdominal contents leading to a hernia. In addition, disturbances in normal peritoneal dynamics, such as those caused by surgery or inflammation, can also predispose individuals to transomental hernias. For example, inflammatory changes or fibrosis in the omental region. Then, previous abdominal surgery or trauma can

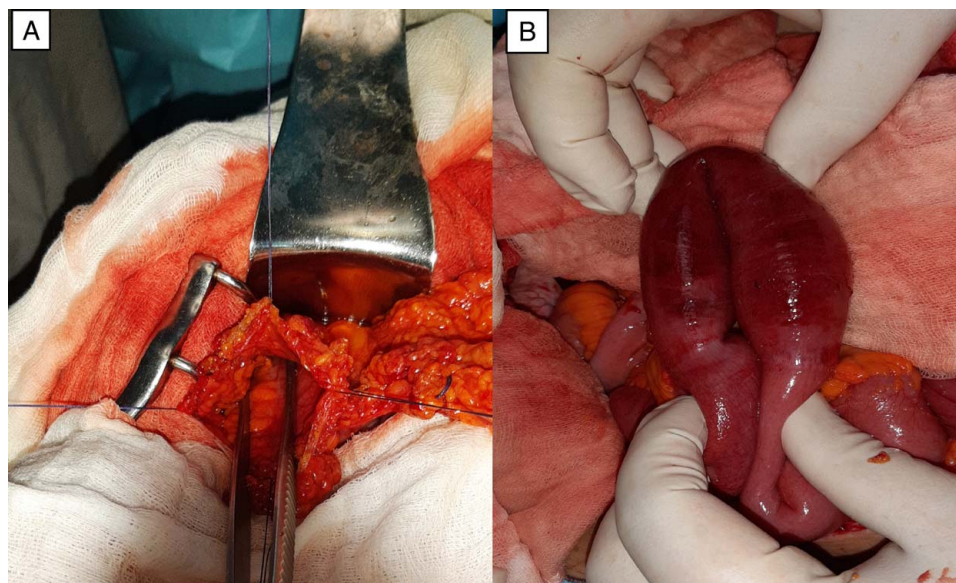


Figure 3. Intraoperative findings. (A) Defect of 4 cm in diameter without hernia sac. (B) Congested small bowel loops after liberation.

lead to adhesions or weakened areas in the greater omentum. Finally, hereditary weaknesses in the connective tissues or other structural components of the abdominal wall can create conditions conducive to hernia^[1,7]. The clinical diagnosis is extremely difficult and generally made intraoperatively. It often delays treatment and leads to intestinal necrosis and significant morbidity, explained by the absence of a hernial sac and the narrowness of the transomental defect. The clinical signs are not specific and may be limited to paroxysmal and transient abdominal pain of moderate intensity, but most often intestinal obstruction associated with nausea and vomiting is the revealing mode^[1,4,7]. Even on imaging, TOH can still be misdiagnosed due to multiple factors, including its rarity and, therefore, the lack of radiologists' experience, the variable positioning of small bowel in the abdomen, and the transient or intermittent nature of associated bowel obstructions. In a series of 49 surgically diagnosed internal hernias, it was reported that only 16% of preoperative CT scans were considered suspicious for an internal hernia^[9]. Additionally, bowel obstruction may not be present in some cases, and in others, an adhesion-related obstruction may mimic a TOH^[4,10]. TOH through the greater omentum usually occurs in the right lower quadrant with posterior and medial displacement of the ascending colon by the loops of the small intestine detected on CT^[11]. Vascular landmarks can identify TOH. Indeed, the omental branches of the left and right gastrotro-omental arteries and veins are identified as running vertically toward the involved small intestine^[4,5]. Furthermore, TOH should be strongly considered when the small intestine strangulation is visualized in a peripheral location within the peritoneal cavity^[2,5]. Moreover, Ito *et al.*^[12] affirmed that the displacement of the transverse colon is a highly specific CT finding for the preoperative diagnosis of a TOH. In their study, the proportion of transverse colon loops posterior to dilated intestinal loops (PTPI) was calculated. When the PTPI was at least 57%, its sensitivity and specificity for a TOH were 71% and 94%, respectively. Concerning our patient, imaging results showed a small

bowel occlusion caused probably by a congenital band. All the specific signs cited above were not sought by the radiologist preoperatively. This is probably due to the lack of experience of the young trainee doctor on-call who interpreted alone the CT and the rarity of this type of hernia.

Compared with other types of internal hernias, TOH represents a critical emergency that must be quickly recognized and managed due to the high risk of bowel necrosis and peritonitis. TOH postoperative mortality in such instances may exceed 30%. That is why treatment based on surgery must be established as soon as possible^[3]. Midline laparotomy is the most commonly used emergency approach for patients with unknown bowel obstruction. It ensures perfect exposure and meticulous manual reduction of hernia contents and allows bowel resection if necessary. Hernia repair is based on a simple division of the omental defect or its closure with interrupted or continuous sutures to prevent recurrences^[11,13]. Accordingly, for our patient, a midline laparotomy was performed. We reduced the congested small bowel, and we closed the hernia defect of the great omentum with continuous sutures. Furthermore, the primary laparoscopic approach without even resorting to other complementary exams such as CT has been recommended by some authors given the low sensitivity of CT^[1,14]. Laparoscopic repair of transomental hernia is a valid approach that allows for rapid recovery and minimal complications when performed correctly. Most transomental hernias can be safely treated laparoscopically, provided that the surgeon is experienced in advanced laparoscopic techniques, the patient is hemodynamically stable and there is no need to shorten the procedure, and the intestinal ischemia is not too extensive to prefer an open approach for better control. In summary, the decision should be tailored to the individual patient's condition, the surgeon's expertise, and the specific characteristics of the hernia. Other authors have recommended laparoscopic surgery assisted by a small laparotomy to assess the viability of the involved intestinal tract^[15].

Conclusion

TOH is a very rare type of internal hernia with extremely difficult preoperative diagnosis due to nonspecific semiology. This type of hernia has the highest morbidity and mortality rates of all internal hernias. Thereby, it should be suspected whenever there is a bowel obstruction of unknown origin. Indeed, the MCT can be helpful in identifying a TOH, and early surgical intervention must be set up. Although midline laparotomy remains the most common method of repair, the laparoscopic approach may represent an appropriate therapeutic modality but requires the surgeon's experience and patient-conducive conditions.

Ethical approval

It is exempt from ethical approval because it is an observation report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

M.B.K., M.M., and A.S.: study concept, data collection, and surgical therapy for the patient; M.B.K. and S.A.: writing – original draft preparation; M.B.K. and M.G.: editing and writing; M.B.: senior author and manuscript reviewer.

Conflicts of interest disclosure

The authors declare no conflicts of interest.

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Datasets generated during and/or analyzed during the current study are publicly available.

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