Internal transomental herniation with a trapped small bowel mimicking acute appendicitis

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**ABSTRACT**

**INTRODUCTION:** Internal herniation with subsequent bowel obstruction is uncommon, and making a correct diagnosis prior to surgery is often difficult.

**PRESENTATION OF CASE:** In this case report we present a man, who suffered from sudden extreme right-sided abdominal pain. The diagnostic workup was inconclusive. Emergency surgery was indicated with a suspicion of acute appendicitis. We found a strangulated ileus caused by an internal herniation of the small intestine through a hole in the greater omentum. The patient had no history of surgery or other physical disorders explaining this finding. The obstruction was resolved and the postoperative clinical course was uncomplicated.

**DISCUSSION:** A thorough diagnostic workup including CT scan would most probably have given the correct diagnosis. However, the clinical course and initiation of the correct treatment would have been delayed significantly.

**CONCLUSION:** We suggest that the diagnostic workup of patients with unclear lower abdominal pain should be limited and that acute clinical symptoms require rapid laparoscopic evaluation and surgical treatment.

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1. Introduction

Internal herniation is a rare circumstance that can lead to intestinal obstruction. In most cases an unusually large fossa or foramen in the abdominal cavity or an acquired or congenital defect leads to protrusion of the bowel, leading to obstruction. A transomental herniation with no previous abdominal surgery is extremely rare, with roughly 50 cases reported to date. Various causes of omental defect have been discussed in the literature, such as trauma, inflammation, congenital defects or age-related atrophy. Nevertheless, the causes of omental defects remain unclear in most cases.

Here we report on a healthy man who presented with acute right-sided abdominal pain in our emergency department.

2. Presentation of case

A 45-year-old man was admitted to our hospital 2 h after the initiation of acute abdominal pain. His medical history showed him to be a healthy, slender adult (body mass index (BMI) = 21.9) with no history of abdominal surgery, trauma or inflammatory diseases, and no other chronic illnesses. A physical examination disclosed a tense abdomen in the right lateral segment below the umbilicus. Auscultation findings were normal. Body temperature was found to be normal with 36.8 °C (98.2 °F). Ultrasonography was inconclusive but showed a small amount of free abdominal fluid in the recto-uterine pouch, and no further specific findings. A laboratory workup was insignificant. In detail leucocytes 4.9/ml, erythrocytes 4.13/ml, hemoglobin 8.7 mmol/l, hematocrite 40.6%, thrombocytes 177/ml, C-reactive protein < 3 mmol/l, sodium 137 mmol/l, potassium 4.1 mmol/l, calcium 2.28 mmol/l and creatinin 60.2 μmol/l were measured. Because of this and the short history of pain, the patient was given further in-house surveillance. Early the next morning – 5 h after initiation of the symptoms – the patient presented with persistent right-sided abdominal pain, colic-type intestinal cramps and nausea without diarrhea or vomiting. The clinical findings indicated immediate surgery for suspected acute appendicitis with paralysis of the bowel. Mechanical intestinal obstruction was not considered because of the absence of scars or signs of external incarcerated herniation.

Laparoscopy was performed with the patient under general anesthesia, with the first trocar placed at the umbilicus. Two further trocars were placed in the left lower abdomen and suprasympophysically. Putrid fluid was found in the pouch of Douglas and was reserved for microbiological and cytological examinations. The
Interestingly, the abdominal cavity was explored and revealed an internal hernia. Upon further exploration of the abdominal cavity, we found a discrepancy between the dilated and collapsed regions of the small bowel. A systematic examination revealed an internal hernia with a defect of the greater omentum (Fig. 1). There were no signs of an affected or attenuated omentum, but the "hole" was in the very thin almost transparent part of the greater omentum (Fig. 2).

The small bowel was freed (Fig. 3) and part of the omentum resected to eliminate the defect and prevent any recurrence of an internal herniation. Immediately after repositioning the trapped small intestine, normal peristalsis resumed, and the incongruity of the lumen disappeared. No resection of small bowel was necessary.

The postoperative course was uneventful. The patient was discharged four days after surgery. Microbiology, histopathology, and cytology revealed no new aspects of this defect. The cause of the hole in the omentum remained unclear.

3. Discussion

Internal herniation is a rare cause of small intestinal obstruction with an incidence of 0.6–5.8%. Among internal hernias, the incidence of transomental hernias is even more rare, accounting for only 1–4% of cases.

Here we describe an uncommon case of acute right-sided abdominal pain caused by an internal herniation through a defect in the greater omentum, resulting in small bowel obstruction. A literature search revealed about 50 published cases to date with an incidence of 1–4% of transomental hernias within the group of internal hernias. Interestingly, neither clinical examinations nor a basic diagnostic workup led to the right diagnosis in most cases. Irrespective of the lack of diagnostic procedures, the clinical examination should have led to the correct treatment: surgical intervention.

Differential diagnosis and treatment of abdominal pain – especially in the right lower quadrant – is often difficult. Is an extensive diagnostic workup necessary and useful? Or is a prompt decision for surgery in this era of minimal invasive techniques the method of choice?

In this case inconclusive findings in the laboratory and the ambiguous clinical presentation of the patient delayed a further diagnostic workup. In the case of suspected acute appendicitis, the diagnostic accuracy rates are still only 66.9–91.3% in men and as low as 61.7–83.1% in women, irrespective of age. The accuracy is especially low in women aged under 50 years of age and in men over 45 years of age.

Unfortunately, no diagnostic tool at present is able to give absolute diagnostic security. The rate of use of computed tomography – claimed to give diagnostic accuracy – has increased remarkably from 18.5% in the 1990s to 92.3% in the first decade of the new millennium. Nevertheless, the increase in the use of CT scans has not decreased the number of negative appendectomy, especially in men of all ages and women over 45 years. The risk of exposing young patients to radiation has to be taken into account when considering CT as a diagnostic tool. However, in elderly patients with lower abdominal pain CT scans might give valuable additional information. In these patients, the detection of colon cancer or of complicated diverticulitis disease is of significance for the treatment of choice.

In our case, a thorough diagnostic workup including CT scan would most probably have given the correct diagnosis – of small intestinal obstruction caused by internal herniation. However, the clinical course and initiation of the correct treatment would have been delayed significantly. Thus, such a diagnostic workup would have prolonged suffering for the patient, with potential negative consequences for the further clinical course resulting in an ischemic bowel and the need for enteric resection with all subsequent potential risks and complications. Also, the risk of aspiration after administration of oral contrast media should be taken into account.

Therefore, we advocate the rapid use of laparoscopic surgery in patients with unclear and acute abdominal pain when other nonsurgical treatments are ruled out. Laparoscopy serves as both
4. Conclusion

Internal herniation with abdominal pain caused by a trapped small intestine is very rare, and the clinical presentation is non-specific in most cases. However, for the surgeon in charge an immediate diagnosis – given the risk of bowel damage and ischemia – is mandatory, but sometimes challenging. At the same time, relevant differential diagnoses have to be ruled out – especially in elderly patients.

Therefore, we propose a liberal indication for laparoscopic surgery in such cases and a reduction in the diagnostic workup. This is because laparoscopy is of little risk for the patient and leads to a quick and definitive diagnosis and treatment.

Conflicts of interest statement

The authors report there are no conflicts of interest.

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Ethical approval

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.

Author contributions

Claudia Rudroff: study design, writing, data analysis, literature research; Adam Balogh: data collection; Sarah Hilswicht: data analysis, literature research.

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