

Case Report

Internal hernia caused by the appendix adhering to the right ovary: a case report

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Abstract: Internal hernias are a rare condition and sometimes life-threatening, and they need an emergency exploratory laparotomy. Appendectomy for chronic appendicitis is controversial. Without timely treatment, chronic appendicitis may develop into a ruptured appendix and an infection that spreads to other parts of the body, and other serious complications. Here we report the case of 48-year-old female who had intestinal ischemia secondary to internal hernia caused by the appendix adhering to the right ovary. Her medical history indicated a chronic, right lower abdominal pain for three years.

Keywords: Chronic appendicitis, internal hernia, intestinal ischemia

Introduction

Internal hernias are caused by adipose tissue or organs such as the intestine, which is the most common organ to extrude into the crevice on the peritoneum or mesentery, forming an obvious protuberance under the skin and leading to discomfort and pain in patients [1-3]. The incidence of internal hernias is 0.2-0.9% among patients with bowel obstructions, so it is a rare cause of bowel obstruction [4]. Herniation may be caused by abnormal anatomic structures or by pathologic defects secondary to congenital abnormalities, inflammation, trauma, or previous surgery such as Roux-en-Y anastomosis [5]. Due to the growing development and application of various surgical procedures, the overall incidence of internal hernias has been increasing recently [6].

Patients with acute appendicitis often need emergency surgery. Appendectomy is one of the most common procedures in general surgery. But appendectomy for chronic appendicitis is controversial. Without timely treatment, chronic appendicitis may develop into a ruptured appendix and an infection that spreads to other parts of the body, and other serious

complications. Here we report the case of 48-year-old female, who was found to have intestinal ischemia secondary to internal hernia caused by the appendix adhering to the right ovary. We hope to provide some insights for the treatment of similar patients to other clinicians.

Case presentation

A 48-year-old female consulted in the emergency department of our hospital. She had lower abdominal pain, nausea, and had vomited for 5 hours in April 2020. She had a history of chronic, right lower abdominal pain for three years. On physical examination, her right lower quadrant was tender and had rebound tenderness. A contrast enhanced CT was performed on her abdomen and pelvis, and the results showed multiple fluid-filled, dilated small bowel loops in the right lower quadrant and the ileum mesentery was rotated, and the appendix was in the anterolateral position of the dilated bowel loops (**Figure 1**). An axial CT demonstrated that the dilated bowel had a diminished enhancement (**Figure 2**). Viewing the CT scan, a closed loop obstruction was discovered, so an emergency exploratory laparotomy was performed. During



Figure 1. The ileum mesentery was rotated. The appendix was in the anterolateral position of the dilated bowel loops.



Figure 2. The dilated bowel had a diminished enhancement.

the surgery, the patient was diagnosed with internal hernia with closed loop obstruction as the patient had a herniation of the small bowel through an adhesion of the appendix to the right ovary. The herniated small bowel was nonviable. About 30 cm of small bowel was resected (**Figure 3**). The pathological diagnosis was chronic appendicitis. The patient had an uneventful postoperative course and was dis-

charged to her home on the eighteenth post-operative day. The patient attended a follow up appointment every two months. To date, no abdominal pain has been reported in the 5 months following the surgery. This case report has obtained an informed consent from the patient.

Discussion

Internal hernia can be divided into many types, such as paraduodenal, foramen of Winslow, sigmoid mesocolon, pericecal, transmesenteric, transomental, supravescical, and pelvic [7]. In this case, the patient had a pericecal hernia, of which the incidence is 0.1-6.6% among internal hernias [8]. In the pericecal region, the folds of the peritoneum can cause four types of recesses: superior and inferior ileocecal recesses, retrocecal recess, and paracolic sulci [9, 10]. The clinical manifestations of pericecal hernias include epigastric discomfort, abdominal distention, nausea and vomiting. These non-specific clinical manifestations often lead to a delay in the diagnosis. If the treatment is not done on time, the patient who suffers from hernias may experience a potentially life-threatening condition because the bowel entrapment can lead to acute intestinal obstruction, such as strangulation and ischemia [11].

It is reported that patients with pericecal hernias often have occlusive symptoms which can rapidly progress to strangulation, and the mortality rate is as high as 75% [12, 13]. In this case, the clinical presentation from silent to small bowel ischemia is only 5 hours. Computed tomography (CT) is the most common diagnostic method used for internal hernias in the clinic. Compared to conventional imaging methods, CT has more advantages in the identification of the lesion site, level, cause of the obstruction, and the presence of ischemic changes [14].

In this case, the patient's past medical history was chronic, right lower abdominal pain for three years. The most common cause for chronic right lower abdominal pain is chronic appendicitis [15], which is rare in the clinic. As a majority of patients present with atypical symptoms, the diagnosis and treatment strategy is difficult for clinicians. Chronic or recurrent appendicitis may induce persistent or recurrent pain in the right lower quadrant [16].

The appendix adhering to the right ovary

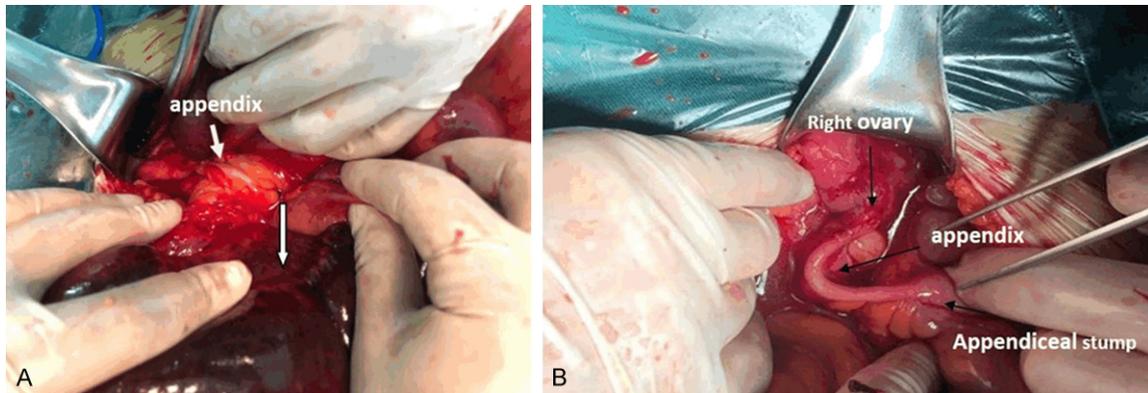


Figure 3. The herniated small bowel had ischemic changes and was nonviable (A) and the closed loop obstruction was caused by the appendix adhering to the right ovary (B).

Appendicectomy for chronic right lower abdominal pain is controversial. Some studies have shown that the appendix has an important immune function both in health and disease [17]. The appendix has been shown to have an important interaction with the intestinal flora [18-20]. But other studies demonstrated that chronic appendicitis can lead to chronic right lower abdominal pain or even other serious complications such as a ruptured appendix and infections, and in some cases, elective laparoscopic appendicectomy may be an effective therapeutic method for patients with chronic right lower abdominal pain [21].

In conclusion, we report a patient with intestinal ischemia secondary to internal hernia caused by the appendix adhering to the right ovary, which is a rare condition. Chronic appendicitis should be considered in the differential diagnosis of patients with recurrent appendicitis or chronic right lower abdominal pain. Appendicectomy for chronic right lower abdominal pain should be considered.

Disclosure of conflict of interest

None.

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