



Case report

Internal herniation of the right colon through the foramen of Winslow: A case report

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ABSTRACT

Introduction and importance: Herniation through the Foramen of Winslow, also known as the epiploic foramen, is an extremely rare phenomenon with less than 200 cases reported in medical literature. Internal hernias account for less than 1% of all hernias and roughly 8% of all internal hernias occur through the foramen of Winslow. We present a case of a foramen of Winslow hernia that was not detected until direct visualization with laparoscopy.

Presentation of case: A 52 year-old healthy female with a surgical history of a Caesarean section presented to the ER with severe epigastric pain radiating to her back. Physical exam was positive for abdominal tenderness and guarding. Vital signs were within normal limits. Murphy's sign and Rovsing's sign were negative. Initial imaging studies, including a CT scan of the abdomen, and laboratory findings were unremarkable. A hepatobiliary iminodiacetic acid (HIDA) scan was performed and demonstrated non-visualization of the gallbladder suggestive of acute vs. chronic cholecystitis. Following these results the patient elected to undergo exploratory laparoscopy with potential cholecystectomy. Intra-operatively, the colon was noted to be herniated through the foramen of Winslow. The procedure was converted to an open laparotomy. The hernia was manually reduced, and a right hemicolectomy was performed to prevent recurrence of the hernia.

Discussion: Reports list an enlarged foramen of Winslow, excessive viscera mobility (i.e., persistent ascending mesocolon or long small bowel mesentery), and an increase in intra-abdominal pressure as potential risk factors for this particular hernia. In our case, the patient was noted to have excessive mobility of the viscera with the presence of persistent ascending mesocolon and an abnormally long right mesentery. Physical exam is usually nonspecific and laboratory findings are typically unremarkable, posing a diagnostic challenge. Additionally, radiological findings indicating presence of an internal hernia were missed in the initial CT scan read by the radiologist. Internal hernias need to be managed surgically as there is a risk of strangulation with bowel ischemia.

Conclusion: This rare radiographic phenomenon is difficult to diagnose radiographically and warrants further workup due to the potential risk of bowel strangulation despite negative clinical and laboratory findings.

1. Introduction

Herniation through the foramen of Winslow, also known as the epiploic foramen, is an extremely rare phenomenon. Less than 200 cases have been reported in the medical literature [1]. Internal hernias account for less than 1% of all hernias and roughly 8% of all internal hernias occur through the foramen of Winslow [1]. The foramen of Winslow is a normal communicating orifice between the greater and lesser peritoneal cavities. The borders are the liver, the hepatoduodenal ligament, the duodenum, and the posterior peritoneal covering above

the inferior vena cava [2]. Herniation through the foramen of Winslow is rare since it is usually closed because of intra-abdominal pressure. Internal hernias may be identified on computed tomography (CT) scan. We present a case of a foramen of Winslow hernia that was not detected until direct visualization of the hernia during laparoscopy. Our work has been reported in line with the SCARE 2020 criteria [3].

2. Case description

A 52-year-old female with no past medical history and a past surgical

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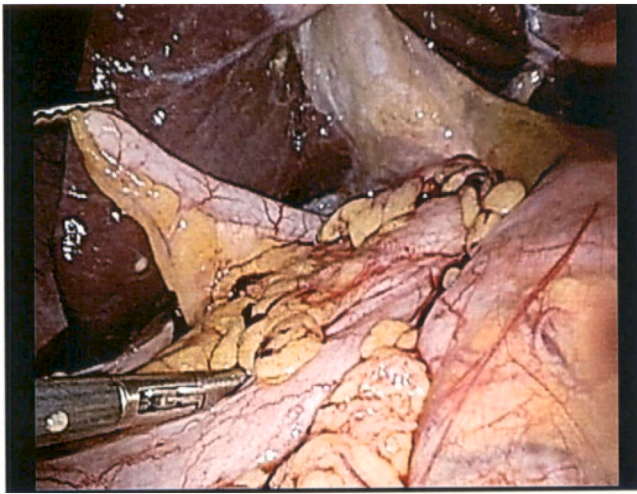


Fig. 1. Gallbladder retracted cephalad and the appendix retracted laterally with the right colon herniating through the foramen of Winslow.

history of Caesarean section presented to the emergency room from home with severe epigastric abdominal pain that radiated to her back. She stated the pain began in the morning and was progressively worsening throughout the day. She also reported nausea but denied fever or vomiting. The patient reported normal bowel habits and denied recent diarrhea or constipation. She denied any inciting events or history of the pain in the past. Family and social history were non-contributory. Physical exam was positive for abdominal tenderness and guarding. Murphy's sign and Rovsing's sign were negative.

Labs including complete blood count, complete metabolic panel, lipase, and troponin were found to be unremarkable, as was an electrocardiogram. Additionally, imaging studies including right upper quadrant ultrasound, chest X-ray and computed tomography (CT) of the chest and abdomen were found to be unremarkable. Ultrasound of the gallbladder did not show evidence of acute cholecystitis or cholelithiasis. CT of the abdomen was significant for a liver hemangioma, uterine fibroids, and nonspecific hypodensities of the spleen. Urinalysis was positive for ketones, leukocytes, and white blood cells so intravenous ceftriaxone was initiated and the patient was admitted to the hospital for observation. Intravenous ketorolac and hydromorphone were given for pain relief along with pantoprazole for gastrointestinal symptoms.

The following day the patient denied any relief of symptoms. Gastroenterology was consulted and the patient underwent an esophagogastroduodenoscopy (EGD). Prior to the EGD a repeat abdominal ultrasound demonstrated a contracted gallbladder, without evidence of cholelithiasis. During the EGD, the stomach was found to be inflamed however there was no evidence of infiltrative disease or active ulceration. It was noted that there did appear to be extrinsic compression pushing down on the lesser curvature of the stomach. The gastroenterology service ordered a hepatobiliary iminodiacetic acid (HIDA) scan which demonstrated non-visualization of the gallbladder that suggested chronic cholecystitis and/or acute cholecystitis. Following the results of the HIDA scan the patient was kept nothing by mouth and the general surgery service was consulted. The surgical team consisted of a fellowship-trained vascular surgeon, a board-certified general surgeon, and a first-year medical resident. After discussing the findings and treatment options with the patient she elected to undergo exploratory laparoscopy with potential cholecystectomy.

After general anesthesia was found to be adequate the patient was prepped and draped in sterile fashion. The abdomen was insufflated after laparoscopic trocars and camera were placed. The gallbladder was found to be unremarkable. There was straw-colored ascites noted in the right para-colic gutter. Additionally, the porta hepatis was extremely edematous. The gallbladder was grasped and retracted cephalad. It was

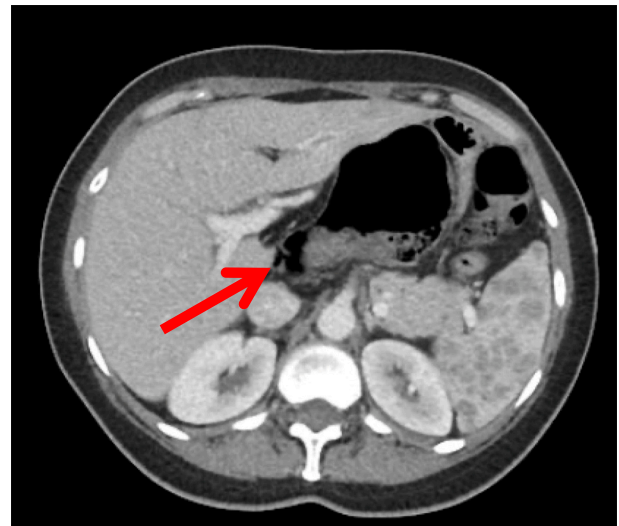


Fig. 2. CT of our patient demonstrating loops of bowel between portal vein and vena cava.

noticed that the colon had herniated through the foramen of Winslow (Fig. 1). The cecum was in the right upper quadrant with the appendix posterior to the gallbladder. The right colon was found to be compressing the stomach. Initial attempts at reducing the hernia internally were unsuccessful due to adhesions. After speaking with the patient's family, the procedure was converted to an exploratory laparotomy. The colon was manually reduced from the foramen of Winslow and the bowel was determined to be viable. At this point it was noted that the right colon was on a long mesentery and was quite redundant. A right hemicolectomy was performed to prevent recurrence of the internal hernia. The foramen of Winslow not closed surgically.

Following the procedure, the patient was extubated and taken to the recovery room in stable condition. The patient convalescence was uncomplicated, and the patient was discharged on post-operative day five. The patient was seen in follow up and was doing well without lingering effects of the hernia or subsequent surgery.

3. Discussion

While the exact mechanism of herniation through the foramen of Winslow is unknown recent reports list an enlarged foramen of Winslow, excessive viscera mobility (i.e., persistent ascending mesocolon or long small bowel mesentery), and an increase in intra-abdominal pressure as potential risk factors [2]. In our case, the patient was noted to have excessive mobility of the viscera with the presence of persistent ascending mesocolon, no lateral attachment, and an abnormally long right mesentery.

Symptoms are usually related to bowel obstruction. The typical symptoms include moderate-to-severe mid-epigastric pain with nausea and vomiting [2]. Physical exam is usually nonspecific and laboratory findings are typically unremarkable, posing a diagnostic challenge. Most internal hernias need to be managed surgically as there is a risk of strangulation with bowel ischemia [2]. Options include reducing the hernia or removing part of the bowel [2]. In our case the decision was made to remove a portion of the bowel due to excessive mobility of the viscera and the increased risk of hernia recurrence. While laparoscopic repairs have been described in the literature the majority of foramen of Winslow hernias are managed with open surgery due to diagnostic uncertainty, even with CT imaging.

Computed tomography of the abdomen is considered the gold standard of the diagnosis of an internal hernia through the foramen of Winslow [1]. Typical CT findings include intestinal loops between the portal vein and vena cava with a "bird's beak" pointing towards the

foramen of Winslow and intestinal loops posterior to the stomach [1]. Upon further review of the CT scan in our case, it is clear that loops of bowel are visible between the portal vein and vena cava (Fig. 2). This finding was missed in the initial read by the radiologist. In our case either oral contrast or a barium study may have led to recognition of the internal hernia on imaging. This rare radiographic phenomenon is difficult to diagnose radiographically and warrants further workup due to the potential risk of bowel strangulation despite negative clinical and laboratory findings.

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Ethical approval

Study exempt from ethical approval.

Consent

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Author contribution

Vishwant Tatagari – writing manuscript.
Adam Devine – writing manuscript.
Brian Cronin – manuscript review, image review.
David Vaughn – manuscript review, image review.

Research registration

N/A.

Guarantor

Vishwant Tatagari.

Declaration of competing interest

None declared.

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