Concomitant Cholelithiasis, Isolated Colonic Hiatal Hernia, and Umbilical Hernia: Evaluation with CT

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ABSTRACT

A 58-year-old woman suffered from dyspnea, epigastric pain, and abdominal fullness for 1 day. She was overweight, with a body mass index (BMI) of 27.8 kg/m². Laparoscopic cholecystectomy had been performed 2 months prior for cholelithiasis and acute cholecystitis. The blood analysis revealed elevated liver enzymes (glutamic oxaloacetic transaminase, 199 µ/L; glutamic pyruvic transaminase, 125 µ/L). Contrast-enhanced multidetector row computed tomography (MDCT) of the abdomen showed a short segment of the small bowel loop incarcerated inside the umbilicus causing a closed-loop obstruction and dilatation of the proximal small bowel loop, a segment of the transverse colon herniated through the esophageal hiatus into the posterior mediastinum, with the gastroesophageal junction and stomach in the normal intra-abdominal location. Therefore, CT diagnosis of incarcerated umbilical hernia and isolated colonic hiatal hernia was established. Emergent laparotomy was performed with segmental resection of the incarcerated small bowel loop, end-to-side anastomosis, and hernioplasty of the umbilical hernia. The hiatal hernia was not closed because it was not incarcerated. The patient was discharged 10 days after the operation with an uneventful course.

Keywords: cholelithiasis; isolated colonic hiatal hernia; umbilical hernia; Saint’s triad

INTRODUCTION

Saint’s triad (concomitant occurrence of cholelithiasis, hiatal hernia, and colonic diverticulosis) is not a rare condition and has been increasingly reported [1]. However, the simultaneous occurrence of umbilical hernia and two diseases of Saint’s triad (i.e., cholelithiasis and hiatal hernia) is very rare, but it has a clinical entity similar to that of Saint’s triad. Isolated colonic hernia through the esophageal hiatus is also very rare [2-3]. Herniosis, or a connective tissue abnormality, may be responsible for the co-occurrence of the above diseases [4]. We present a case of concomitant cholelithiasis, isolated colonic hiatal hernia, and an umbilical hernia in a middle-aged woman.

CASE REPORT

A 58-year-old woman suffered from dyspnea, epigastric pain, and abdominal fullness for 1 day. She was overweight, with a BMI of 27.8 kg/m². Laparoscopic cholecystectomy had been performed 2 months prior for cholelithiasis and acute cholecystitis. A history of pregnancy and chronic gastroesophageal reflux disease (GERD) was noted. The blood analysis revealed elevated liver enzymes (glutamic oxaloacetic transaminase, 199 µ/L; glutamic pyruvic transaminase, 125 µ/L); the other blood analyses, including white blood cell count and C-reactive protein, were within normal limits. A chest radiograph showed cardiomegaly and atherosclerosis of tortuous aorta. Contrast-enhanced multidetector computed tomography (MDCT) of the abdomen was performed (Fig. 1). A short
concomitant cholelithiasis, isolated colonic hiatal hernia, and umbilical hernia

Figure 1

**Figure 1.** a. Surgical clips are seen in the gallbladder fossa after cholecystectomy for cholelithiasis and acute cholecystitis. b. Consecutive upper to lower axial images with 5 mm slice thickness from left upper to right lower figures seen horizontally. A short segment of small bowel loop is incarcerated in the umbilical hernial sac (thick arrow), with a dilated proximal small bowel loop (S-shaped arrow) and collapsed distal small bowel loop (arrow). c. Consecutive anterior to posterior reformatted coronal images with a 5-mm slice thickness from left upper to right lower figures seen horizontally. A segment of transverse colon (arrow) is herniated into the posterior mediastinum, causing leftward deviation of the esophagus (S-shaped arrow). The gastroesophageal junction (open arrow) and the stomach (thick arrow) are in the normal intra-abdominal location. Surgical clips are found in the gallbladder fossa (long arrow in the left upper image).
segment of small bowel was incarcerated inside the umbilical sac causing a closed-loop obstruction, with distension of the proximal small bowel loop and collapse of the distal small bowel loop. A segment of the transverse colon was herniated through the esophageal hiatus into the posterior mediastinum, with the gastroesophageal junction and the stomach in the normal intra-abdominal location. No distension of the proximal colonic loop was identified. Therefore, a diagnosis of incarcerated umbilical hernia and isolated colonic hiatal hernia was made.

Emergent laparotomy was performed, with segmental resection of the incarcerated small bowel loop and end-to-side anastomosis, and hernioplasty of the umbilical hernia. The hiatal hernia was not closed because after surgical repair of the umbilical hernia, the small bowel loop was not distended any more, resulting in decreased intraabdominal pressure and finally spontaneous reduction of the herniated transverse colon back into the intraabdominal cavity. The patient was discharged 10 days after the operation with an uneventful course.

**DISCUSSION**

Saint’s triad is characterized by the concomitant occurrence of cholelithiasis, hiatal hernia, and colonic diverticulosis. It is not a rare condition and has been increasingly reported [1]. The clinicians taking care of patients for one particular disease are not usually interested or aware of Saint’s triad, and therefore, the number of reported cases of Saint’s triad are fewer than the actual number of cases.

Charles M. Saint, the first Chairman of Surgery at Cape Town University, noticed the concomitant occurrence of gallstones, colonic diverticulosis, and hiatal hernia in elderly patients, especially women, in the 1940s [1, 4]. Muller, one of his students who became a radiologist, described these phenomenon by a barium gastrointestinal series, a barium enema and gallbladder series, and then coined the term Saint’s triad in 1948. These three conditions are associated with one another with an incidence of 3.4%.

The risk factors for the development of the individual diseases of the Saint’s triad may be variable. Obesity is thought to be the only risk factor in common with all conditions of the Saint’s triad [1]. Other risk factors, including pregnancy, female sex, and older age (> 60 years of age) may be responsible for three of the four conditions (Saint’s triad and umbilical hernia) [1]. Obesity, female sex, and a history of pregnancy are the risk factors found in our case. Therefore, when a patient has one or more risk factors and has already had one of the four diseases, the other conditions may occur simultaneously.

The development of Saint’s triad may be related to a connective tissue abnormality or to herniosis [4]. Herniosis causes colonic diverticulosis and hernia. Other diseases associated with Saint’s triad and herniosis include chronic obstructive pulmonary disease (COPD), hypertension, aortic aneurysm, heart or renal disease, and diabetes mellitus. Aging may exacerbate herniosis and therefore increase the incidence of Saint’s triad. Therefore, a clinical tetralogy (Saint’s triad and umbilical hernia) and pentad (Saint’s triad, duodenal diverticulosis, and cardiomyopathy) are the expanded forms of Saint’s triad [1, 5]. Patients with Saint’s triad are recommended to be screened for cardiomyopathy.

Diaphragmatic hiatal hernias are classified into four types according to the anatomy [2-3, 6]. In type I or sliding hiatal hernia, the gastroesophageal junction slides into the posterior mediastinum above the diaphragm. Gastroesophageal reflux may occur due to an incompetent lower esophageal sphincter. In type II or paraesophageal hernia, the gastroesophageal junction is in its normal intra-abdominal location, but the gastric fundus protrudes into the posterior mediastinum. Type III (mixed) hiatal hernia is the combination of the sliding and paraesophageal hernias. In type IV hiatal hernia, the gastroesophageal junction is in its normal intra-abdominal location, but the stomach herniates upward, along with the other organs such as the colon, small bowel loop, or omentum. A solitary organ other than the stomach, such as an isolated segment of transverse colon, rarely migrates into the posterior mediastinum.

The hiatal hernia is caused by laxity of the phrenic-esophageal ligament and widening of the esophageal hiatus. Increased intra-abdominal pressure and obesity are the causative factors. These large hernias have a risk of incarceration or gastric volvulus, and need to be operated on as soon as possible. In our case, after operation and surgical repair for the incarcerated umbilical hernia, the complete remission of the small bowel loop distension led to a significant improvement in the high intra-abdominal pressure. The decreased intra-abdominal pressure caused spontaneous reduction of the herniated intrathoracic transverse colon back into the abdominal cavity. Therefore, the hiatal hernia was not repaired, and the patient’s condition remained stable at the longest follow-up time.

In conclusion, the simultaneous occurrence of umbilical hernia and two diseases of the Saint’s triad (i.e. cholelithiasis and hiatal hernia) is very rare, and has a clinical entity similar to Saint’s triad. Isolated colonic hernia through the esophageal hiatus is also very rare. To the best of our knowledge, no previous report of the concomitant occurrence of isolated colonic hiatal hernia, umbilical hernia, and cholelithiasis (although cholecystectomy had been performed prior to the time of the CT scan in our patient) was described. Herniosis, or a connective tissue abnormality, may be responsible for the concurrent presentation of the above disease processes.
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