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A Rare Case of Internal Gastroduodenal Hernia Through the Fundoplication Wrap Two Years Following Laparoscopic Nissen Fundoplication for the Treatment of Gastroesophageal Reflux Disease

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Female, 19-year-old
Final Diagnosis: Internal gastroduodenal hernia through the fundoplication wrap
Symptoms: Anorexia • epigastric pain
Medication: —
Clinical Procedure: Exploratory laparoscopy
Specialty: Surgery

Objective: Unusual clinical course

Background: Gastroesophageal reflux disease (GERD) is a common condition that may be refractory to medical treatment with proton pump inhibitors (PPIs). Laparoscopic Nissen fundoplication is the recommended surgical treatment for GERD and is safe and effective. This report is of a rare case of internal gastroduodenal hernia as a late complication of laparoscopic Nissen fundoplication for the management of GERD in a 19-year-old woman.

Case Report: A 19-year-old woman was admitted to the emergency department with a three-day history of epigastric pain, anorexia, and altered bowel habit. She had a history of GERD that was treated two years previously by laparoscopic Nissen fundoplication. On the most recent hospital admission, abdominal computed tomography (CT) showed an internal hernia of the gastroduodenal junction through the tissues used as a fundoplication wrap of the abdominal esophagus. The imaging findings were confirmed at exploratory laparoscopy, at which time surgical takedown of the fundoplication was performed.

Conclusions: This report is of a rare case of gastroduodenal hernia through a fundoplication wrap two years after a Nissen fundoplication. However, clinicians should be aware of this rare diagnosis in patients with a history of Nissen fundoplication who present with acute upper gastrointestinal symptoms.

MeSH Keywords: Fundoplication • Hernia • Laparoscopy

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Background

Gastroesophageal reflux disease (GERD) is common in Western countries, and there has been an increase in prevalence since 1995, particularly in North America and East Asia [1]. The prevalence of GERD has been estimated to be between 18.1–27.8% in North America, 8.8–25.9% in Europe, 2.5–7.8% in East Asia, 8.7–33.1% in the Middle East, 11.6% in Australia, and 23.0% in South America [1]. The symptoms of GERD can be well controlled medically in most patients with the use of proton pump inhibitors (PPIs). Despite their widespread use, PPIs are associated with complications that include gastrointestinal infection, hypocalcemia, hypomagnesemia, osteoporosis, and an increased risk of bone fracture [2]. However, some patients are refractory or resistant to medical treatment and require surgical management [3,4]. The most common indications for surgical treatment of GERD include lack of response to medical treatment, erosive GERD, Barrett esophagus, hiatus hernia, and severe symptoms of GERD, particularly at night time. Before surgical treatment, three tests are required that include gastroscopy, 24-hourly ambulatory pH measurement with multichannel intraluminal impedance monitoring, and esophageal manometry.

Laparoscopic surgery for GERD is now the gold-standard treatment for patients with symptoms that are refractory to PPIs, with the most common procedure being laparoscopic Nissen fundoplication, which involves the use of the upper part of the gastric fundus as a fundoplication wrap for the abdominal esophagus [5]. The efficacy and the longterm effects of laparoscopic Nissen fundoplication were initially described in 1994 by Cadière et al. [6]. Laparoscopic Nissen fundoplication is a safe and effective procedure, but as in other surgical procedures, complications may occur, which include bleeding, gastric fistula formation, migration of the fundoplication wrap, tissue ischemia, postoperative dysphagia, and residual symptoms of regurgitation [4,7]. However, in 2013, a cost-effectiveness study showed that laparoscopic surgery was more cost-effective than medical management for GERD [8]. This report is of a rare case of internal gastroduodenal hernia through the fundoplication wrap as a late complication of laparoscopic Nissen fundoplication for the management of GERD in a 19-year-old woman.

Case Report

A 19-year-old woman was admitted to the emergency department with a three-day history of epigastric pain, anorexia, and altered bowel habit. Two years previously, the patient had undergone a laparoscopic Nissen fundoplication at a different institution for the treatment of gastroesophageal reflux disease (GERD).

On hospital admission, physical examination revealed that the patient was hemodynamically stable. She had generalized abdominal pain and tenderness on palpation and rebound in the epigastric and left hypochondrial regions with absent bowel sounds. Laboratory tests revealed an increase in serum C-reactive protein (CRP) l (35.6 mg/L) without leukocytosis. Abdominal computed tomography (CT) revealed that following Nissen fundoplication two years previously there was an internal hernia of the gastroduodenal junction through the gastric fundus used to wrap the abdominal esophagus, with no other abnormalities (Figure 1).

The patient underwent an exploratory laparoscopy that confirmed the CT findings (Figure 2). An internal hernia of the gastroduodenal junction through the gastric fundus used to wrap the abdominal esophagus was identified with complete herniation of the stomach, but no attachment was found to the esophagus, and no intrathoracic hernia was found. The tissues forming the fundoplication wrap were poorly vascularized, and a decision was made to resect the tissue using an endoscopic linear cutter. A drain was sited, and surgical takedown of the fundoplication was performed. Because no clinical notes were available to identify the nature of the surgical procedure performed two years previously, the findings at exploratory laparoscopy identified that a Nissen fundoplication had been previously performed. Also, at exploratory laparoscopy, the tissue used as a fundoplication wrap was found to have no esophageal attachment.

The postoperative clinical course for this patient was uneventful. The nasogastric tube was removed, and the patient was able to drink on the first postoperative day. On the second postoperative day, she began to eat a soft diet. On the third postoperative day, the patient underwent a water-soluble esophagogram that confirmed the restoration of the esophagogastroduodenal outlet (Figure 3). The patient was discharged from the hospital on the fourth postoperative day. At a three-month follow-up, the patient was in good health, and her symptoms of GERD were well controlled with the use of a proton pump inhibitor (PPI).

Discussion

Laparoscopic Nissen fundoplication is a safe and effective procedure for the treatment of gastroesophageal reflux disease (GERD), and the most common complications of this surgical procedure are now well known [5]. A feature of laparoscopic Nissen fundoplication is the use of the upper part of the gastric fundus as a fundoplication wrap for the abdominal esophagus [5]. This report presented a rare case of internal gastroduodenal hernia two years after laparoscopic Nissen fundoplication, which occurred through the fundoplication wrap.

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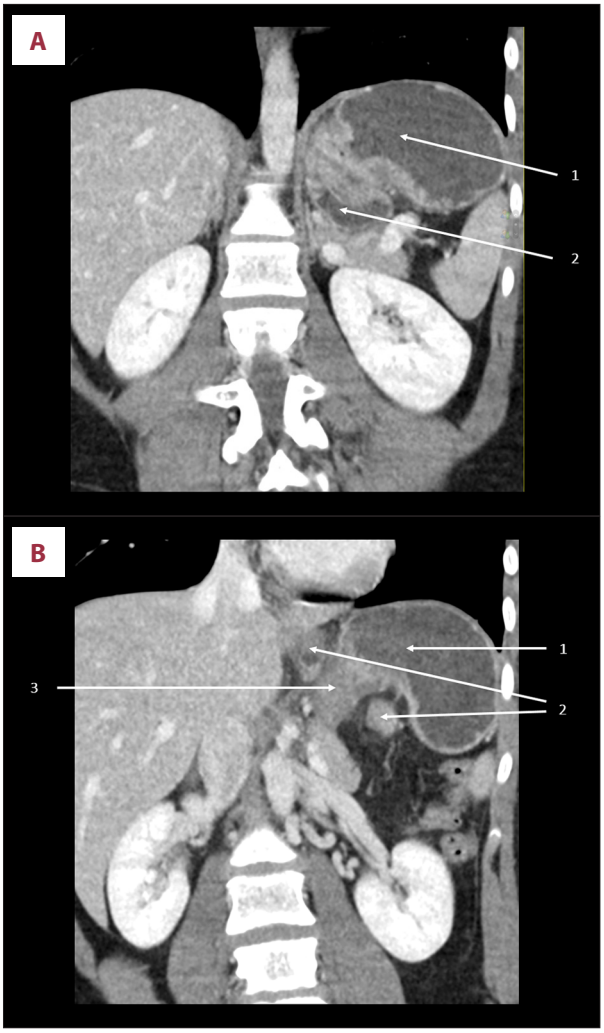


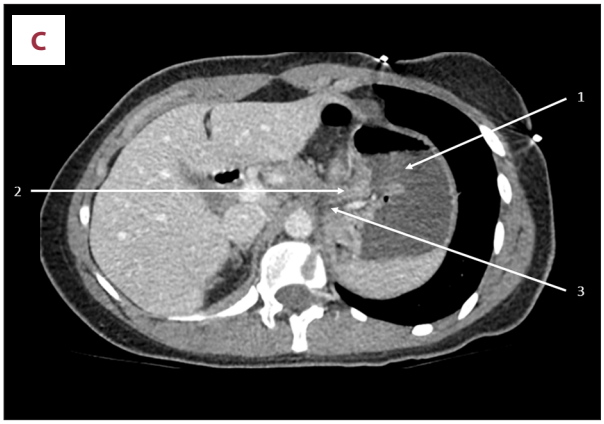
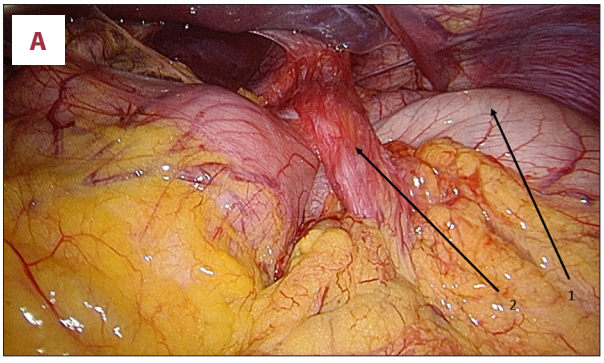


Figure 1. Abdominal computed tomography (CT) in a 19-year-old woman who developed an internal gastroduodenal hernia two years after laparoscopic Nissen fundoplication for gastroesophageal reflux disease (GERD). The coronal view of the abdominal CT scan (**A**) shows the stomach (1), the Nissen fundoplication wrap (2). The coronal view of the abdominal CT (**B**) shows the stomach (1), the Nissen fundoplication wrap (2), and the pylorus (3). The axial view of the abdominal CT (**C**) shows the stomach (1), the Nissen fundoplication wrap (2), and the pylorus (3).



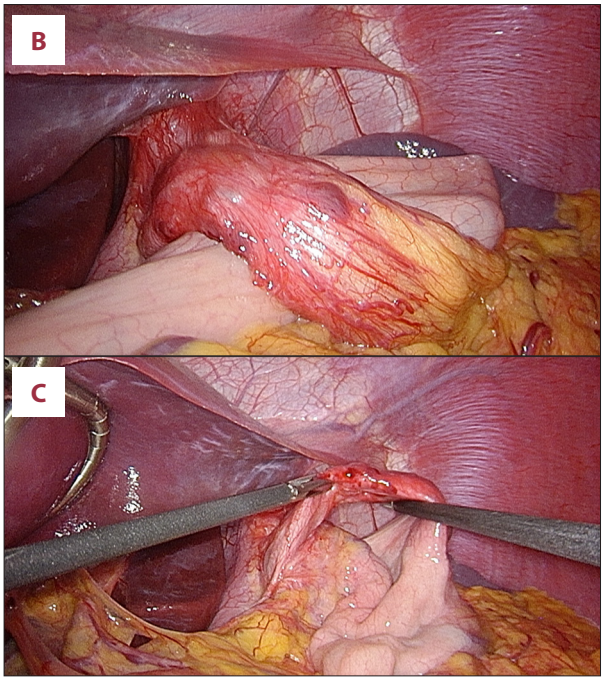


Figure 2. Findings at exploratory laparoscopy in a 19-year-old woman who developed an internal gastroduodenal hernia two years after laparoscopic Nissen fundoplication for gastroesophageal reflux disease (GERD). The images taken during exploratory laparoscopy show the appearance of the stomach (**A**) and the Nissen fundoplication wrap (**C**). Progressive laparoscopic reduction of the internal hernia through the fundoplication wrap (**B**).

In the English literature, there have been few previously reported cases of this rare complication of laparoscopic Nissen fundoplication [4].

During laparoscopic Nissen fundoplication, the attachment of the fundoplication wrap to the lower esophagus and the use of posterior gastropexy are used to prevent complications that include para-esophageal herniation and migration of the

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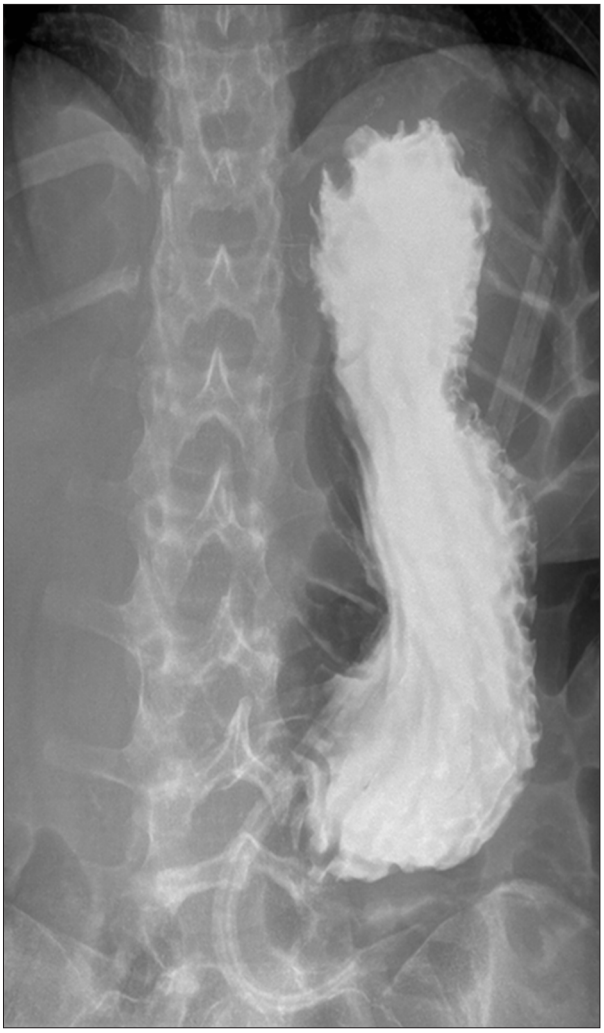

Figure 3. Findings at water-soluble esophagogram on the third postoperative day in a 19-year-old woman who developed an internal gastroduodenal hernia two years after laparoscopic Nissen fundoplication for gastroesophageal reflux disease (GERD). On the third postoperative day, the patient underwent a water-soluble esophagogram that confirmed the restoration of the esophagogastroduodenal outlet.

fundoplication wrap [5,9]. However, in this case, no esophageal attachment was found, which might explain the migration of the fundoplication wrap and the development of an internal gastroduodenal hernia.

In cases of internal gastroduodenal hernia, the lack of specific symptoms can result in a delay in diagnosis. Late diagnosis can result in gastric perforation and peritonitis, or respiratory compromise. Early abdominal computed tomography (CT) should be performed to identify cases of internal gastroduodenal hernia. However, both radiologists and surgeons should be aware of this rare complication of fundoplication procedures. In this case, exploratory laparoscopy confirmed the imaging findings and allowed surgical takedown of the fundoplication. This surgical approach was chosen, rather than anti-reflux surgery, because the patient was at high risk of ischemia of the stomach due to occlusion of the arteries in the fundoplication wrap. Also, further surgery may have extended the duration of the paralytic ileus and resulted in bowel perforation. The alternative surgical procedure for GERD, laparoscopic Toupet fundoplication, was not routinely used at our center. Therefore, to control the patient's symptoms of GERD, she was medically treated postoperatively with a proton pump inhibitor (PPI). This case also highlights the importance of accessing accurate details of previous surgical procedures performed on all patients who present to the emergency department with acute symptoms.

Conclusions

A rare case is presented of a 19-year-old woman who developed an internal gastroduodenal hernia two years after laparoscopic Nissen fundoplication for the management of gastroesophageal reflux disease (GERD). Although Nissen fundoplication is a safe procedure for the management of GERD, attention must be paid to the possibility of this rare complication in patients who present with acute abdominal symptoms and a history of this surgical procedure.

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