

Early intrathoracic herniation and rupture of the stomach after laparoscopic Nissen fundoplication

Laparoskopik Nissen fundoplikasyonu sonrasında erken toraks içi herniasyon ve mide rüptürü

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Although intrathoracic gastric herniation of a fundoplication wrap is a well-known complication of laparoscopic Nissen fundoplication, perforation is quite rare. In this article, we report a 30-year-old male case who underwent a laparoscopic Nissen fundoplication complicating an intrathoracic gastric herniation and perforation of the fundoplication wrap. He was admitted to the emergency department with severe vomiting, fever, nausea and chest pain at postoperative fifth day. Radiological and endoscopic examination revealed intrathoracic wrap herniation and rupture of the stomach. The perforation was primarily repaired and the stomach was placed back to the abdominal cavity through left thoracophrenotomy.

Key words: Herniation; Nissen fundoplication; perforation.

Plike edilen midenin toraks içine herniasyonu laparoskopik Nissen fundoplikasyonunun bilinen bir komplikasyonu olmakla birlikte, perforasyonu oldukça seyrekdir. Bu yazıda, laparoskopik Nissen fundoplikasyonu uygulanan ve plike edilen midenin toraks içi herniasyonu ve perforasyonu gelişen 30 yaşında bir erkek olgu sunuldu. Hasta ameliyat sonrası beşinci gün şiddetli bulantı, ateş, kusma ve göğüs ağrısı yakınması ile acil servise başvurdu. Radyolojik ve endoskopik incelemede plike edilen midenin toraks içi herniasyonu ve rüptürü ortaya konuldu. Sol torakofrenotomi ile mide primer tamir edilerek, tekrar karın boşluğuna yerleştirildi.

Anahtar sözcükler: Herniasyon; Nissen fundoplikasyonu; perforasyon.

The Nissen fundoplication procedure is commonly performed for the treatment of reflux, and the laparoscopic version of this procedure has less morbidity, although certain complications have been known to occur. For example the gastric wrap may dislocate, partially or totally disrupt, obstruct, or become incompetent, and the gastric mucosa may intussuscept, ulcerate, or perforate. In addition, a gastric wrap slipped into the chest may become incarcerated or strangulated and cause an obstruction or perforation.^[1]

Herein, we present the diagnosis and treatment of a patient who had a herniation of the stomach into the chest followed by the perforation of the stomach within the early period after laparoscopic Nissen fundoplication.

CASE REPORT

A 30-year-old male patient who had laparoscopic Nissen fundoplication after being diagnosed with gastroesophageal reflux was discharged without any complications on the postoperative first day. Three days after being discharged, he complained of dysphagia, abdominal pain, and excessive vomiting, but the dysphagia and excessive vomiting disappeared suddenly on the postoperative fifth day after that he ate lunch. Nevertheless, he was admitted to the emergency department with fever, nausea, and night chest pain on the same day with an elevated temperature of 38.2 °C and leukocytosis of 15,100. In addition, his breathing sounds were absent on the left side. Chest radiography revealed massive pleural effusion and a pneumothorax on the left hemithorax, and



Available online at
www.tgkdc.dergisi.org
doi: 10.5606/tgkdc.dergisi.2013.5677
QR (Quick Response) Code

Received: May 08, 2011 Accepted: August 09, 2011

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chest computed tomography (CT) revealed massive pleural effusion, a pneumothorax, and extension of the stomach into the chest on the left side. A nasogastric tube was inserted, and a tube thoracostomy was immediately performed. Dark-colored empyema fluid (2000 mL) and air leakage came out of the chest tube. At the control chest X-ray after the tube thoracostomy, it was determined that lung expansion had not been achieved and that the nasogastric tube had migrated into his chest (Figure 1).

An endoscopic examination showed a perforated stomach along with lung parenchyma. The chest tube was visible through the perforated area. A left thoracotomy revealed that the fundus of the stomach was edematous and that it had totally herniated into the chest. In addition, its venous circulation was also disrupted, and the stomach was perforated as well (Figure 2). However, all of the fundoplication sutures were detached, and the perforated part of the stomach measuring approximately 5 cm in diameter was primarily repaired. The stomach was so edematous that it could not be pushed into the abdominal cavity; therefore, the esophageal hiatus was enlarged via a phrenotomy. Afterwards the stomach was placed into the abdomen from this hiatal orifice. Next, the phrenotomy was primarily closed with nonabsorbable suture material to narrow the hiatus, and this was followed by copious irrigation of the chest cavity. Two chest tubes were then inserted. The chest incision was closed, but no drainage tube was inserted into the



Figure 1. A chest X-ray of the patient after a tube thoracostomy.

abdominal cavity. Furthermore, no leakage was noted on the esophagogastrography taken on the postoperative fourth day. Oral enteral nutrition was initiated on the postoperative fifth day with no complications. The remainder of the postoperative course was uneventful, and the patient was doing well two months after the surgery.

DISCUSSION

Laparoscopic Nissen fundoplication has become a standard procedure that is frequently performed for the surgical treatment of gastroesophageal reflux disease (GERD). Complication rates are low, and they decrease significantly according to the surgeon's experience.^[2] One of the rare but well-documented complications of fundoplication is the herniation of the abdominal contents through the esophageal hiatus. Intrathoracic gastric herniation after laparoscopic Nissen fundoplication is a rare but life-threatening complication that may be seen in the early or late postoperative period.^[3] Moreover, postoperative symptoms such as dysphagia may occur even after uncomplicated fundoplication. This may be due to tight or herniated fundoplication as well as delayed gastric emptying^[4] and can occur in up to 7% of patients.^[5,6] Furthermore, inadequate crural closure and postoperative hiatal rupture may cause intrathoracic wrap migration.^[7]

Incarceration, strangulation, and perforation may occur in conjunction with wrap herniation, and all reported cases of gastric perforations after laparoscopic Nissen fundoplication have been caused by this condition.^[1] According to Huguet,^[8] possible



Figure 2. A left thoracotomy revealed all of the detached fundoplication sutures and allowed for the exploration of the perforated stomach.

mechanisms responsible for these gastric perforations include full-thickness ulceration caused by the suture material or the use of Teflon pledgets to secure the fundoplication, whereas the presumed cause has been late herniation associated with ischemia. In the literature, cases of gastric herniation and perforation after Nissen fundoplication have been reported in the late postoperative second week.^[1,8] However, in our case, the complaints started on the postoperative third day, and the gastric perforation occurred on the postoperative fifth day. The dysphagia and abdominal pain, which started on postoperative third day, were considered to be the result of the herniation of the gastric wrap into the chest. We believe that the reason for the sudden relief and disappearance of the dysphagia on the postoperative fifth day was due to the disruption of the 360° Nissen fundoplication followed by the gastric perforation. In the laparoscopic Nissen procedure, fixation stitches may be placed between the crura and the wrap, but we do not usually do this if there is no laxity in the hiatus and no paraesophageal hernia is observed preoperatively during the investigation via a Barium evaluation and laparoscopy. Since the presented case was primary in nature, and no factors existed that could have complicated the procedure, such as a short esophagus, achalasia, previous surgery, or adhesion, the procedure was completed without any difficulty. However, the esophageal hiatus was determined to be loose when explored during the thoracotomy, and closure was accomplished via a narrowing procedure with non-absorbable material after the phrenotomy.

An endoscopic examination is significant for evaluating symptoms after fundoplication. If the entire fundoplication has herniated above the diaphragm but remains in position at the gastroesophageal junction, an endoscopy will show it to be intact, even though the fundoplication and a portion of the proximal stomach will be above the diaphragmatic pinch across the stomach. This can be recognized by a concentric narrowing that moves with respiration. In addition, paraesophageal hernias are identified by a pouch of stomach extending above the diaphragm, either through or around the fundoplication.^[4] In our case, an endoscopic investigation was performed in order to reveal the herniation since it can be easily overlooked because of the higher pressure and increase in the faucial reflex. Lung parenchyma and the chest tube were observed through the perforated gastric fundus that had herniated into the chest. The diagnosis of herniation and the localization of the perforation were thus confirmed by the endoscopic examination.

We believe that the wide perforation in this case occurred because of the blast effect from the increased gastric pressure due to the excessive faucial reflex, the vomiting associated with the herniation, and the edema that resulted from ischemia. The endoscopic examination revealed both the diagnosis of the herniation and the exact localization of the perforation. Hence, surgical intervention was performed before broad ischemia and infection could take place, and healing occurred over a short period of time.

Patients undergoing a laparoscopic Nissen fundoplication may complain from nausea and vomiting in the early postoperative period. Severe vomiting in these cases should alert the surgeon to the possibility of intrathoracic wrap herniation and a perforated stomach.

Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

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