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Difficult Diagnosis and Surgical Procedure for Scirrhous Gastric Cancer Complicated by Upside-Down Stomach: A Case Report

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
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Conflict of interest: None declared

Patient: Female, 85-year-old
Final Diagnosis: Scirrhous gastric cancer • upside-down stomach
Symptoms: Heartburn • loss of appetite • vomiting
Medication: —
Clinical Procedure: Surgery
Specialty: Gastroenterology and Hepatology

Objective: Mistake in diagnosis

Background: The upper stomach can be involved in 1 type of esophageal hiatal hernia in which the degree of stomach insertion is considerable and accompanied by a twist in the shaft of the stomach. The diagnostic accuracy of upper endoscopy or barium meal examination decreases in patients with upside-down stomach, thus making diagnosis of stomach lesions very difficult. No previous reports have described scirrhous gastric cancer in a patient with upside-down stomach.

Case Report: An 85-year-old woman presented with loss of appetite and vomiting after eating oxalic acid-containing food 2 months previously. Computed tomography revealed an upside-down stomach, and upper endoscopy revealed loss of distensibility and superficial gastritis of the entire stomach. Upside-down stomach was diagnosed; accordingly, laparoscopic hernia repair was planned. Laparoscopic exploration revealed retention of serous fluid (i.e., ascites) containing gastric carcinoma cells (pathologically identified intraoperatively) and induration of the entire stomach. After converting to laparotomy, induration of the stomach was confirmed, continuing to the adjacent 4 cm of the distal esophagus. The patient was diagnosed with scirrhous gastric cancer. Esophageal hiatus hernia repair was performed due to the patient's age and the risks associated with esophagojejunostomy. Preoperative complaints of symptoms disappeared. The patient was transferred to the medical hospital on postoperative day 52 with no complications.

Conclusions: Specific symptoms of gastric cancer can mimic those of esophageal hiatal hernia in patients with hernia. In cases of upside-down stomach with loss of distensibility and increased wall thickness, physicians should be aware of the possibility of scirrhous gastric cancer.

MeSH Keywords: Adenocarcinoma, Scirrhous • Hernia, Hiatal • Stomach Diseases

Abbreviations: **CEA** – carcinoembryonic antigen; **CA19-9** – carbohydrate antigen 19-9; **POD** – postoperative day

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/926002

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Background

The upper side of the stomach can be involved in 1 type of esophageal hiatus hernia, in which the degree of stomach insertion is considerable, accompanied by a twist in the shaft of the stomach. Specific symptoms of gastric cancer can mimic those of esophageal hiatus hernia in patients with hernia. The accuracy of upper endoscopy or barium meal examination decreases in patients with upside-down stomach, thus making diagnosis of stomach lesions very difficult. To the best of our knowledge, there have been no previous reports describing scirrhous gastric cancer in a patient with upside-down stomach.

Case Report

An 85-year-old woman presented with loss of appetite, heartburn, and vomiting after eating 2 months previously. On physical examination, she was 140.0 cm tall and weighed 46.3 kg (body mass index, 23.6 kg/m^2), and exhibited kyphotic posture. She complained of symptoms, including all-day nausea and malaise, and dysphagia previous to eating 2 days previously. Laboratory investigations revealed a slightly elevated white blood cell count, while other hematological parameters were within normal ranges. Tumor markers, including carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA 19-9), were negative. She had diabetes, hyperlipidemia, and hypertension, for which she took medication. During regular check-ups, her primary care physician had not found any serious illnesses.

Contrast computed tomography (CT) revealed an upside-down stomach, with the entire organ inserted into the left chest cavity. There was no appearance of ischemia in the stomach; however, the wall thickness of the entire stomach was remarkable. The stomach wall thickness is 14 mm, and the size of the hernia gate was estimated to be 50 mm (Figure 1). Upper endoscopy revealed esophageal hiatus hernia, Los Angeles Grade A reflux esophagitis, the appearance of loss of distensibility, and superficial gastritis of the entire stomach. Therefore, observation of the prepyloric region of the antrum was difficult. There were no significant lesions within the observation field (Figure 2).

Upside-down stomach was diagnosed; accordingly, laparoscopic hernia repair was planned. The patient was positioned supine with head elevated. A 12-mm trocar at the right abdomen and three 5-mm ports in the left and right upper quadrants and left abdomen were placed. Laparoscopic coagulation shears were used as an energy device. Intraperitoneal retention of serous fluid (i.e., ascites) was noted. Towing the stomach into the abdominal cavity, induration of the entire stomach was evident (Figure 3). The bilateral crus of the diaphragm was exposed so that the esophageal hiatus was significantly

Figure 1. Contrast computed tomography (CT) revealing an upside-down stomach, with the entire organ inserted into the left chest cavity (white arrow). There was no appearance of ischemia in the stomach; however, the thickness of the wall of the entire stomach was remarkable. The stomach wall thickness was 14 mm, and the size of the hernia gate was estimated to be 50 mm.

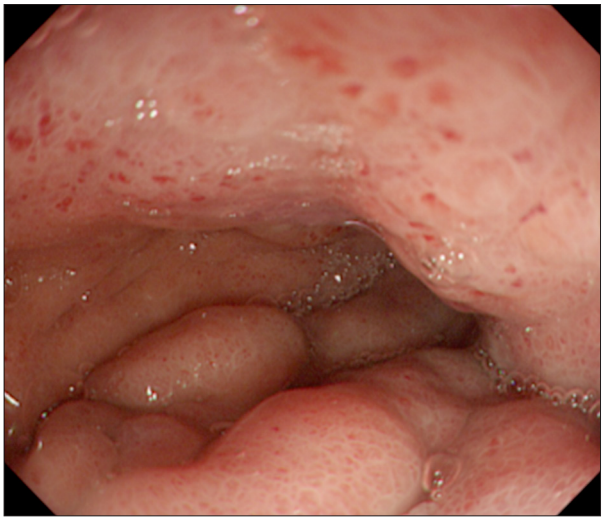

Figure 2. Upper endoscopy revealing the appearance of loss of distensibility and superficial gastritis of the entire stomach. There was no obvious cancer lesion(s) within the observation field.

opened (Figure 4). There was strong adhesion surrounding the lower esophagus, which was noted by peeling it away through left thoracotomy. The patient's blood pressure dropped suddenly; accordingly, the procedure was immediately converted to laparotomy. Intraoperative cytological examination of ascites

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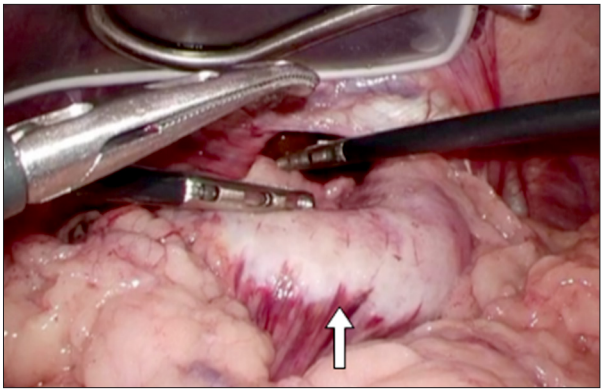

Figure 3. After towing the stomach into the abdominal cavity, induration of the entire stomach was confirmed with forceps (white arrow).

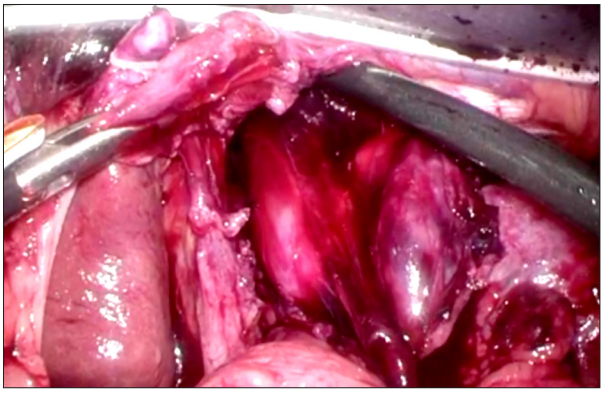

Figure 4. The esophageal hiatus was opened wide.

revealed poorly differentiated adenocarcinoma. Intraoperative upper endoscopy revealed esophageal hiatal hernia, the appearance of diastolic failure, and superficial gastritis of the entire stomach, confirming observations during preoperative upper endoscopy. Palpation of the upper digestive tract revealed the possibility of spread of gastric cancer from the stomach to approximately adjacent 4 cm of the distal esophagus. The patient was diagnosed with scirrhous gastric cancer. Considering the patient's age and the potential risks associated with esophagojejunostomy, only esophageal hiatus hernia repair was performed by suturing the bilateral crus of the diaphragm using 4-0 absorbable twist suture. Considering the presence of malignant tumor components, an artificial mesh for hernia repair was not used. The greater omentum was fixed to the abdominal wall of the stomach, and not inserted into the chest cavity after surgery.

The duration of surgery was 267 min and estimated blood loss was 520 mL, with no intraoperative complications. Complaints of severe symptoms before surgery, including all-day nausea and malaise, decreased. Oral gastrocontrast revealed remarkably delayed excretion of gastrographin from the lower esophagus to the anal side (Figure 5), the cause of which appeared

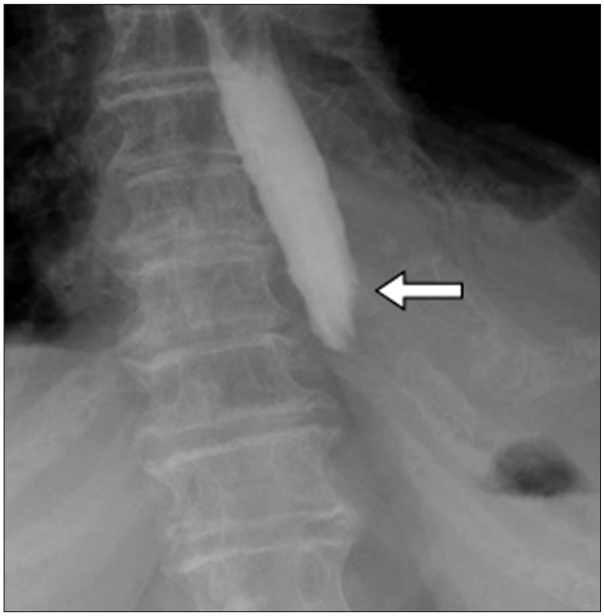

Figure 5. Oral gastrocontrast revealed remarkably delayed excretion of gastrographin from the lower esophagus to the anal side (white arrow), which appeared to be invasion of the lower esophagus by scirrhous gastric cancer.

to be invasion of the lower esophagus by scirrhous gastric cancer. Oral intake of food was difficult. A central vein port was embedded on postoperative day (POD) 18, and the patient was transferred to a medical hospital on POD 52, with no complications.

Discussion

The upper side of the stomach can be involved in 1 type of esophageal hiatal hernia, in which the degree of insertion of the stomach is considerable, accompanied by a twist in the shaft of the stomach [1]. The upper side of the stomach is involved in ≤2% of esophageal hiatal hernias [2]. A kyphotic posture is a risk factor promoting the occurrence and progression of esophageal hiatal hernia [3]. A previous study reported that 7 of 10 patients with upside-down stomach exhibited kyphotic posture [4]. Nagai et al. [5] reported that upside-down stomach could be caused by both a reduction in elasticity of supporting structures, such as the hepatoduodenal, hepatogastric and hepatic diaphragmatic ligaments, the gastrosplenic ligament fixing the stomach, and relaxation of the esophageal hiatus. In a study involving 51 patients (45 females [90.2%], 6 males [9.8%]) with upside-down stomach, Asada et al. [6] reported a mean age 75.3 years.

A few reports have described cancer in the upper side of the stomach [4]. Functional reflux exchange of stomach acid can

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promote carcinogenesis in the upper digestive tract [7]; therefore, advanced esophageal hiatus hernia appears to be a risk factor for carcinogenesis in the stomach. However, it is very difficult to detect gastric cancer in the upper side of the stomach. Specific symptoms of gastric cancer are quite vague and, if there are such symptoms in the upper side of the stomach, virtually all would be interpreted as advanced upside-down stomach [8]. Therefore, detection of gastric cancer according to symptoms in patients with upside-down stomach, in both the early and delayed stages, appears to be difficult. Moreover, in advanced esophageal hiatal hernia with upside-down stomach, the accuracy of upper endoscopy and barium meal examination may be not high due to advanced shaft twist and stomach transformation [9]. In patients with advanced esophageal hiatal hernia and upside-down stomach, there is a high risk for overlooking the lesion itself and possible multiple lesions, and misdiagnosing of the depth of invasion of the lesion.

In the patient described in this report, kyphotic posture and reduction in the elasticity of supporting structures, such as the hepatoduodenal and hepatogastric ligaments, and relaxation of the esophageal hiatus due to aging, may have caused esophageal hiatus hernia, and stiffening of the stomach wall caused by scirrhous gastric cancer could be an advanced feature of hernia. By repeated prolapse and remission of hernia over a span of many years, scirrhous gastric cancer was believed to progress to the upper side of the stomach from an esophageal hiatus hernia. Moreover, scirrhous gastric cancer spreads extensively through the entire stomach and part of the esophagus. To the best of our knowledge, this is the first report to describe scirrhous gastric cancer progressing to an advanced level in a patient with upside-down stomach. Although we preoperatively diagnosed loss of distensibility of the stomach, we failed to consider the possibility of malignancy because we believed the reason for loss of distensibility was the insertion of the entire stomach in the left chest cavity. We considered there was no significant appearance of the mucous membrane other than superficial gastritis, resulting in an inadequate preoperative diagnosis. In retrospect, we should have considered biopsy, as the upper endoscopy revealed diffuse irregular nodular thickening of the gastric folds, which is also another feature of scirrhous gastric carcinoma. In cases of significant loss of distensibility in patients with upside-down stomach, the possibility of scirrhous gastric cancer should be considered.

Conclusions

Specific symptoms of gastric cancer can mimic those of esophageal hiatal hernia in patients with hernia. The diagnostic accuracy of upper endoscopy or barium meal examination decreases in patients with upside-down stomach. Physicians should be aware of the possibility of scirrhous gastric cancer in cases with marked loss of distensibility of the stomach and difficulty observing the prepyloric region of the antrum using endoscopy, and wall thickness on CT in the upside-down stomach.

Acknowledgements

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Conflict of interests

None.

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