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Case report

Minimally invasive abdominal and left thoracic approach for adenocarcinoma of the esophagogastric junction with severe stenosis: a case report

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Running title: MALTA for AEG with severe stenosis

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Abstract

We report a novel technique for combined laparoscopy and thoracoscopy for far-advanced adenocarcinoma of esophagogastric junction (AEG). A 56-year-old man presented with far-advanced AEG; an esophagogastroduodenoscopy revealed a type 2 lesion with its entire circumference circling the esophagogastric junction (EGJ). Computed tomography revealed EGJ stenosis, suspected invasion into the left-side diaphragm, and lymph node metastases in the abdomen. We diagnosed Siewert type II AEG (cT4aN1M0, cStage IIIA) according to the Japanese Classification of Gastric Carcinoma, version 14. Laparoscopic and thoracoscopic proximal gastrectomy and lower esophagectomy with double-tract reconstruction were performed via a minimally invasive abdominal and left thoracic approach (MALTA). He was discharged with no postoperative morbidity. Hence, MALTA provides good visualization and is safe for lower esophagus transection and intrathoracic anastomosis to treat locally advanced AEG invading the surrounding tissues.

Keywords: Adenocarcinoma of esophagus; esophagogastric junction; minimally invasive surgery

Introduction

The incidence rate of adenocarcinoma of the esophagogastric junction (AEG) has been increasing worldwide.[1] However, the optimal surgical approach for Siewert type II AEG has not been determined,[2] including for palliative treatments of patients with dysphagia due to severe stenosis.[3] Laparoscopic transhiatal esophagectomy is challenging owing to poor visualization because of the large tumor volume and invasion into the crus of the diaphragm. Herein, we report a patient with a locally advanced Siewert type II AEG that was treated using the novel, minimally invasive abdominal and left thoracic approach (MALTA) technique, which provided good visualization during resection of the lower esophagus.

Case presentation

A 56-year-old man with dysphagia underwent an esophagogastroduodenoscopy that revealed a type 2 lesion with its entire circumference around esophagogastric junction (EGJ). He was diagnosed with AEG via biopsy and was referred to our department. Endoscopy revealed an elevated mass (type 2 lesion) with a reddened EGJ circumference (Figure 1A) that was impenetrable using a regular endoscope. Contrast radiography revealed severe stenosis in the EGJ as well as irregularity between the EGJ and cardia (Figure 1B). Computed tomography revealed EGJ stenosis owing to the wall thickening by approximately 4 cm; invasion into the left side diaphragm was also suspected (Figure 2) although there was no evidence of metastasis. We diagnosed Siewert type II AEG (cT4aN1M0, cStage IIIA according to the Japanese Classification of Gastric Carcinoma, version 14), and planned a proximal gastrectomy and lower esophagectomy. Because the huge tumor prevented adequate visualization when using the transhiatal approach, we

performed MALTA to ensure an adequate upper-side margin.[4]

Under general anesthesia, the patient was placed in a reverse-Trendelenburg position with the left upper body lifted and legs spread. A small amount of bloody ascites was observed and peritoneal cytology was positive; moreover, frozen sections of white nodules detected in the left-side diaphragm were confirmed to be adenocarcinoma. Laparoscopic and thoracoscopic proximal gastrectomy, lower esophagectomy, and double-tract reconstruction were performed. First, we performed laparoscopic proximal gastrectomy using 5 ports. A margin around the diaphragm was created by excising a section that was approximately 2 cm in circumference to improve visibility. As it was also difficult to secure a good thoracic view to dissect the lower esophagus using laparoscopy because of the huge tumor (Figure 3), 3 ports were added in the 8th, 9th, and 11th intercostal spaces with the patient in the same body position, and thoracoscopic lower esophagectomy was performed using an artificial pneumothorax with an intrathoracic pressure of 8–10 mmHg to allow the ventilation of both lungs. The lower esophagus was then resected under the thoracoscopic view to ensure an adequate margin. Following resection, intrathoracic esophagojejunostomy was performed using a transoral anvil (OrVil™) and circular stapler (EEA25™) via laparoscopy and thoracoscopy. Additionally, an oblique jejunogastrostomy for double-tract reconstruction was performed as we previously described.[5] The operation lasted 439 minutes and entailed 15 g of blood loss.

The postoperative course was generally uneventful. The patient resumed drinking and eating on the 3rd and 6th postoperative days, respectively; contrast radiography revealed smooth contrast medium flow into the stomach. He was discharged on the 15th

postoperative day.

The pathological diagnosis was poorly differentiated adenocarcinoma, 45 × 32 mm, pT4b(SE), ly3, v0, N3a, M1, P1, pStage IV. After adjuvant chemotherapy with capecitabine and oxaliplatin, his current regimen is ramucirumab monotherapy. Computed tomography revealed solitary lung metastasis 24 months after the operation. The patient provided written informed consent.

Discussion

AEGs are classified into 3 types according to their locations.[6] Siewert types I and III are treated with Ivor Lewis surgery and total gastrectomy with a distal esophagectomy, respectively. However, the optimal surgical approach for Siewert type II is controversial; subtotal esophagectomy with a proximal gastrectomy or total gastrectomy with a partial esophagectomy are suggested, and both the transhiatal and transthoracic approaches are considered. The randomized, controlled trial JCOG9502 that compared the transthoracic and transhiatal approaches for Siewert types I and II tumors found that the transthoracic approach provided a more direct view but produced more complications than the transhiatal approach.[2] Conversely, the transhiatal approach likely obstructs visualization during mediastinal lymphadenectomy, particularly with huge tumors. In terms of laparoscopy, the transhiatal approach provides improved visualization for adequate mediastinal lymphadenectomy.[1]

Mine et al. advised that a proximal margin length of >20 mm is needed for Siewert type II/III AEG treatment.[7] MALTA provides good visualization via thoracoscopy, and is easy to perform for intrathoracic esophagojejunostomy by using simultaneous laparoscopic and thoracoscopic views.

Peritoneal dissemination or metastasis may occur as the tumor progresses. Local or distant metastasis can also cause various symptoms such as dysphagia, stenosis, occlusion, and/or bleeding. The optimal treatment for patients with such symptoms is unclear, and may encompass chemotherapy, stenting, or surgery.

Chemotherapy as a first-line treatment for patients who can tolerate it.[8] Primary chemotherapy regimens for AEG in Japan include capecitabine- or S-1 (tegafur, gimeracil, and oteracil)-based regimens.[9] However, such chemotherapies are administered orally, which is difficult in patients with tumors that cause stenosis; therefore, excision is prudent. Some patients may also not be able to complete chemotherapy owing to adverse effects or performance status; Yann et al,[8] stated that 42.9% of their patients with malignant dysphagia who were undergoing chemotherapy required additional stents. Self-expanding metal stents are widely used for patients with dysphagia[10]; they are easy to install across the EGJ and provide safe palliative treatments.[10] Moreover, stenting to ease dysphagia combined with chemotherapy enables patients to resume consuming solid foods earlier,[8] although this combination is also associated with various complications such as reflux esophagitis, perforation, tumor regrowth, stent migration, and aspiration pneumonia.[8,10]

The surgical indication for AEG also is unclear. Mariette et al.[3] recommended palliative resection for American Society of Anesthesiologists score I–II AEG patients with (1) incomplete primary tumor resection without metastasis or peritoneal dissemination, (2) single-site solid organ metastasis without peritoneal dissemination, or (3) localized peritoneal dissemination without signet ring cell histology. Even for palliative resection, MALTA is less invasive than a subtotal esophagectomy with a proximal gastrectomy or a total gastrectomy with a partial esophagectomy.

In summary, MALTA is a suitable palliative treatment option as it provides good visualization during the transection of the lower esophagus in case of AEG invasion into surrounding organs. Moreover, simultaneous laparoscopy and thoracoscopic views improve the safety of intracorporeal esophagojejunostomy.

Conflict of interest: The authors have no conflicts of interest to declare.

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FIGURE LEGENDS

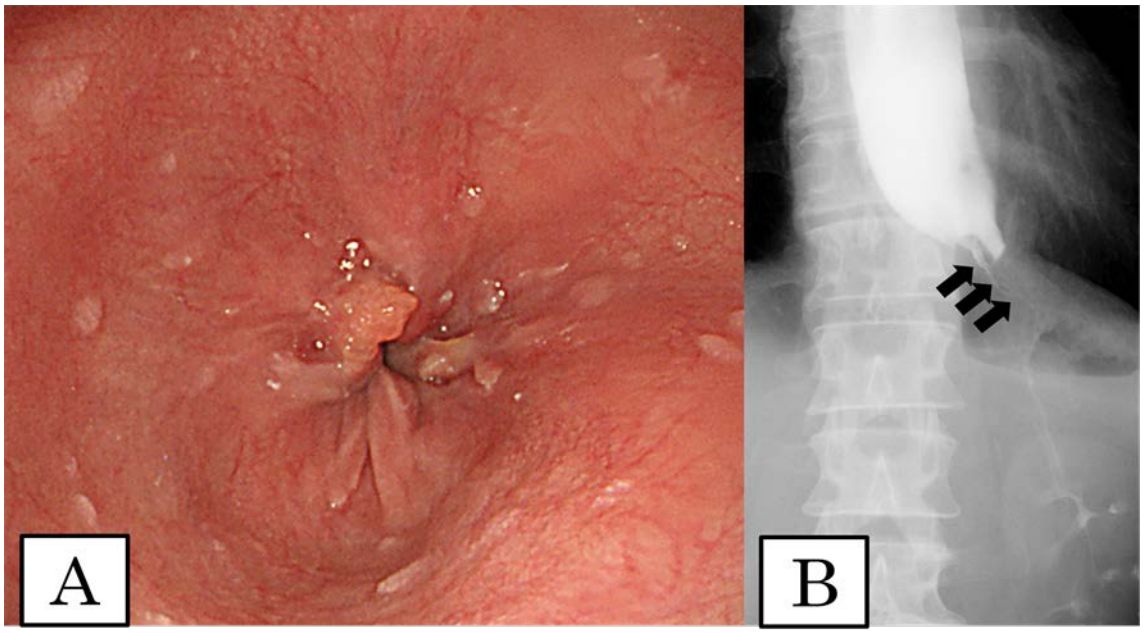

Figure 1. A: A tumor located at the esophagogastric junction (EGJ) and is causing stenosis around the entire circumference. B: Contrast radiography revealing severe EGJ stenosis (arrows).

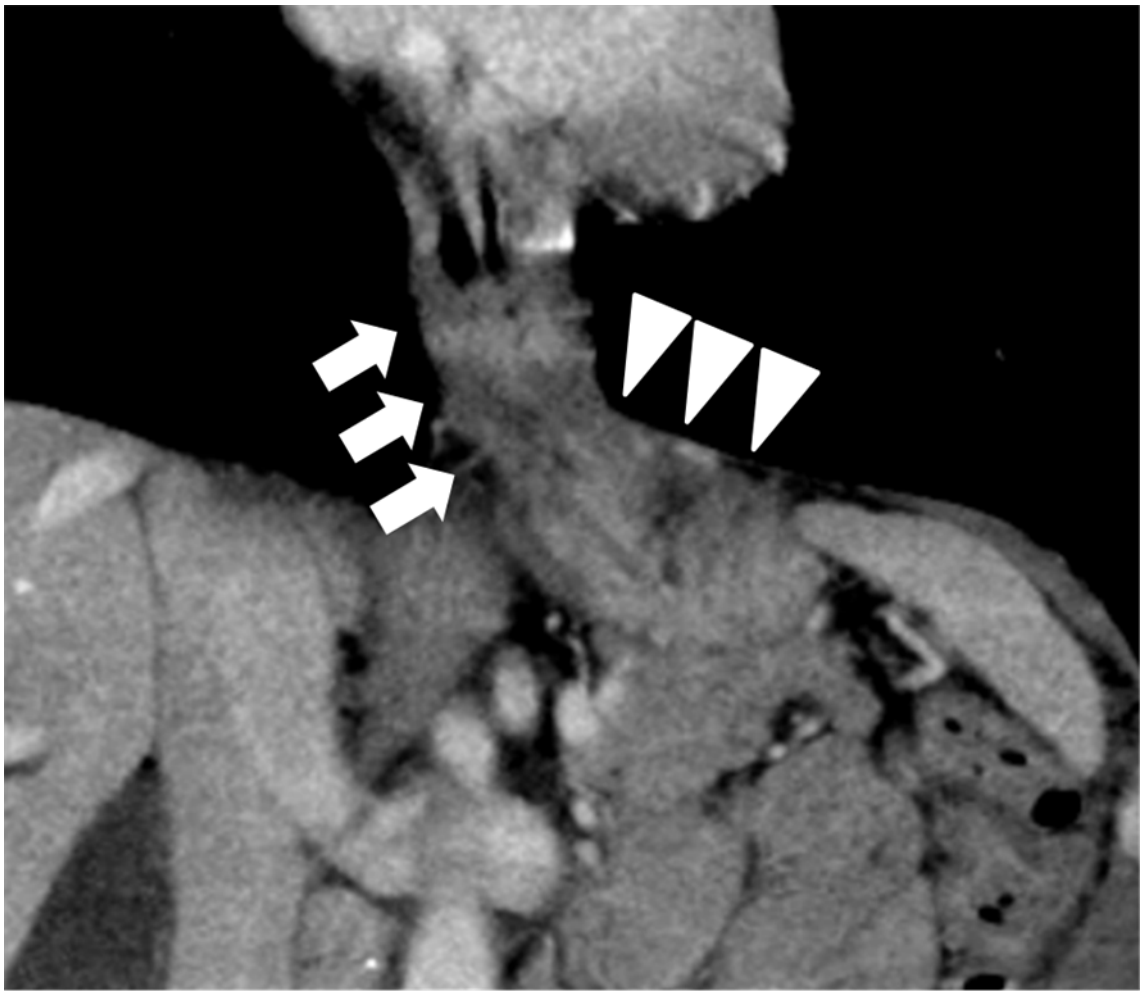

Figure 2. The esophagogastric junction wall is thickened (arrows). Tumor invasion into the left crus is suspected (arrowheads).

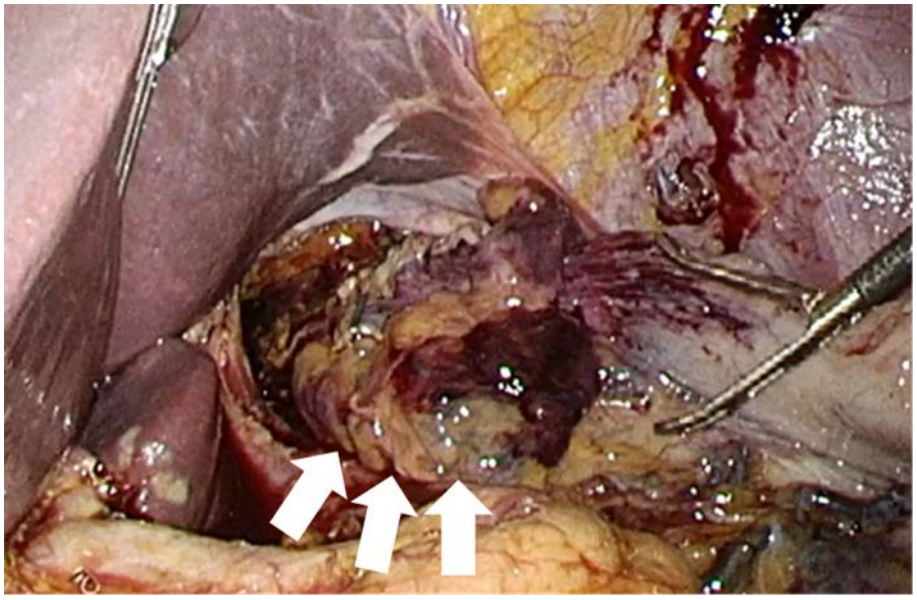

Figure 3. It is difficult to secure a thoracic view from the laparoscopic angle because of the huge tumor (arrows).