

Totally laparoscopic distal gastrectomy reconstructed by Roux-en-Y with D2 lymphadenectomy and needle catheter jejunostomy for gastric cancer

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Abstract: A case of 69-year-old male patient with gastric cancer was reported in this article, who previously received endoscopic submucosal dissection (ESD) suspected as early gastric cancer and then underwent totally laparoscopic distal gastrectomy with D2 lymphadenectomy after the pathologic result of ESD showed positive resection margin. Roux-en-Y reconstruction was used in this patient with Type 2 diabetes mellitus, which was demonstrated to be helpful for maintaining glucose homeostasis in diabetes. Needle catheter jejunostomy (NCJ) was carried out together, which was used for nutrition support therapy in early postoperative period and during expected chemotherapy after surgery.

Key Words: Totally laparoscopic distal gastrectomy; Roux-en-Y reconstruction; D2 lymphadenectomy; needle catheter jejunostomy (NCJ); gastric cancer



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Patient information

A 69-year-old male patient was admitted to Department of General Surgery, who complained for continuing dull pain in subcostal area accompanied by anorexia and emaciation for five months. Gastroscopy (*Figure 1*) carried out when the patient came to see gastroenterology physician in our hospital one month ago showed an apophysis lesion on the front wall of gastric antrum along lesser curvature with central depression and overlying white moss and no infection of helicobacter pylori. Biopsy (*Figure 2*) showed chronic inflammation in gastric mucosa accompanied by mucosal erosion and severe intestinal metaplasia and high grade intraepithelial neoplasia in partial epithelial. Endoscopic ultrasonography (EUS) (*Figure 3*) showed middle and low echo changes and 0.6 cm thickness in the mucosal layer of the lesion with a complete submucosa. Early gastric cancer was suspected. PET-CT (*Figure 4*) showed increased metabolism in gastric antrum with the SUV value of 1.0-1.5 and no tumor metastasis. Tumor markers including CEA, CA199 and CA724 were normal. The patient was first admitted to Department of Gastroenterology two weeks ago and endoscopic submucosal dissection (ESD) (*Figure 5*) was carried out. Pathologic result (*Figure 6*) showed a moderately differentiated gastric adenocarcinoma involving the submucosa and cancer cells seen in the bottom margin with a negative circumferential margin. Then the patient was transferred to Department of General Surgery for surgical

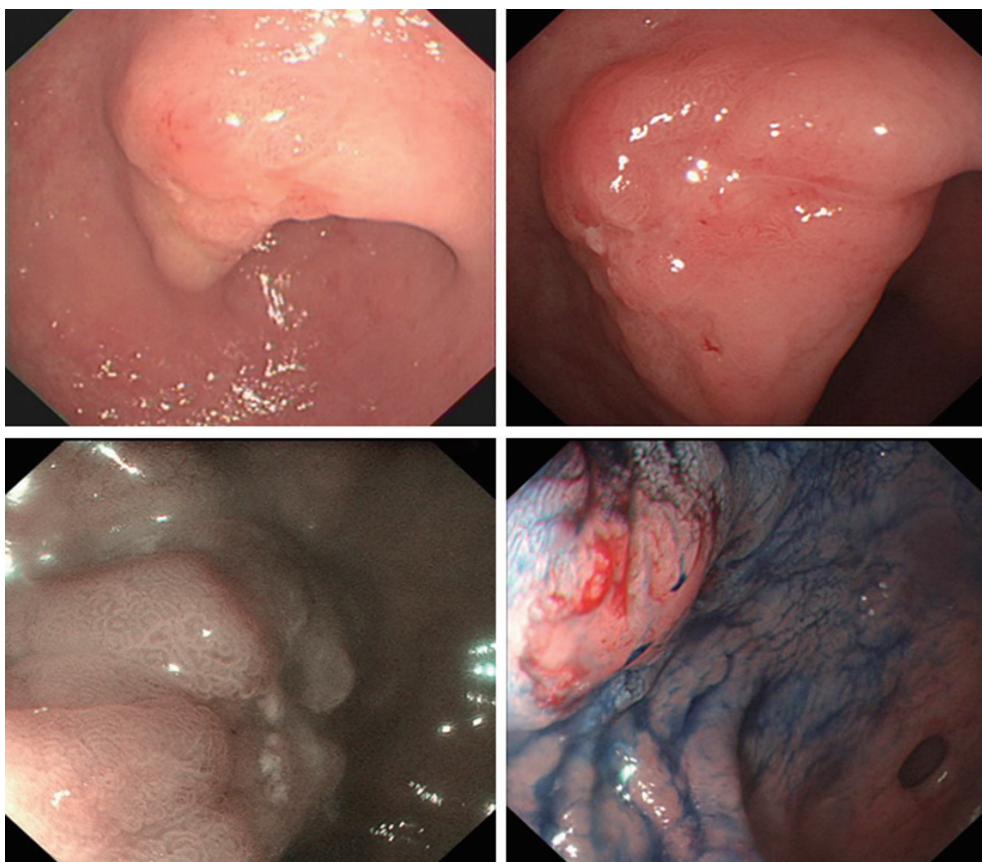


Figure 1 Gastroscope showed an apophysis lesion on the front wall of gastric antrum along lesser curvature with central depression and overlying white moss

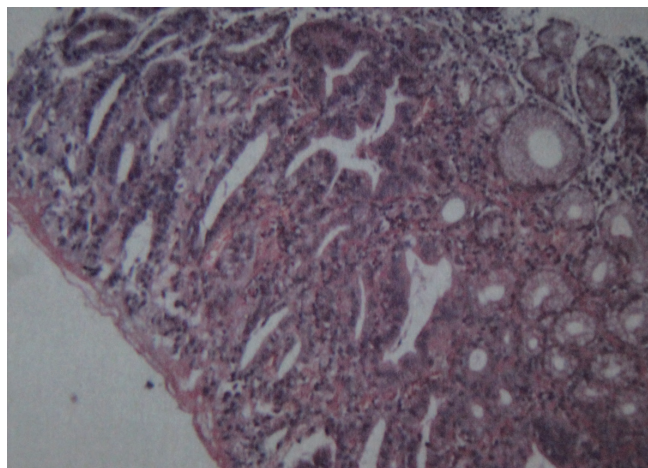


Figure 2 Gastroscopic biopsy showed chronic inflammation in gastric mucosa accompanied by mucosal erosion and severe intestinal metaplasia and high grade intraepithelial neoplasia in partial epithelial

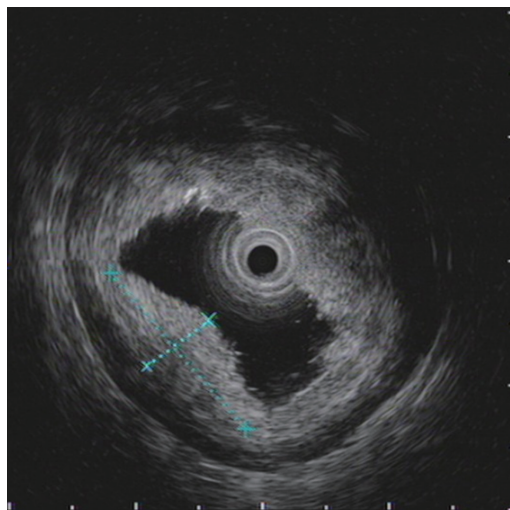


Figure 3 Endoscopic ultrasonography (EUS) showed middle and low echo changes and 0.6 cm thickness in the mucosal layer of the lesion with a complete submucosa



Figure 4 PET-CT showed increased metabolism in gastric antrum with the SUV value of 1.0-1.5 and no tumor metastasis

treatment. The patient's past history included hypertension for 20 years controlled well by oral drugs and Type 2 diabetes mellitus for 11 years controlled well by insulin. There was no positive finding in physical examination. Further examinations were carried out after the admission for the preparation of surgery. Routine blood test showed hemoglobin of 119 g/L. Fecal occult blood test was positive. Biochemical tests and coagulation function test were normal. Echocardiography showed enlargement of both atriums and right ventricle and mild tricuspid regurgitation with mild pulmonary hypertension. Lung function test showed obstructive ventilatory dysfunction and decreased diffusion function. Three-dimensional reconstructive CT (*Figure 7*) showed thickened wall in gastric antrum and visible enlarged lymph nodes along lesser curvature.

Plan of surgical strategy

According to the pathologic result of ESD which showed tumor invasion to submucosa or perhaps more deep and suspected lymphatic metastasis from CT scan, laparoscopic distal gastrectomy with D2 lymphadenectomy was arranged. Intraoperative gastroscope was also planned to help locate the tumor position accurately and confirm the extent of resection because of relatively early T staging of tumor.

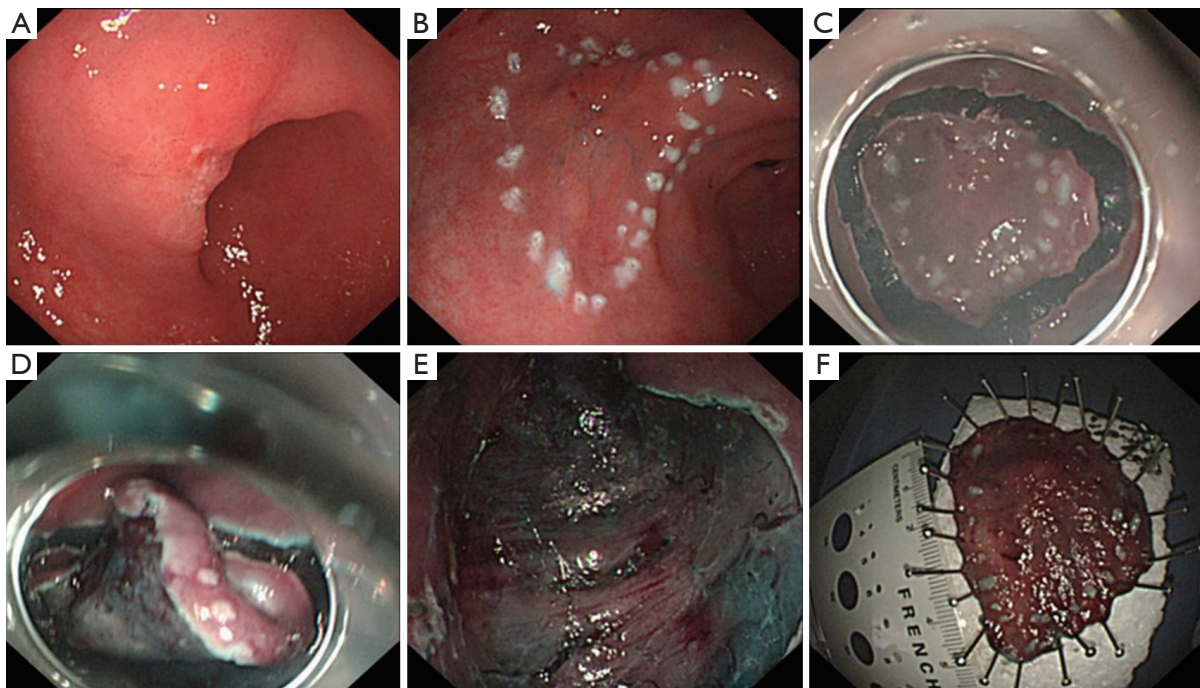


Figure 5 The process of endoscopic submucosal dissection (ESD)

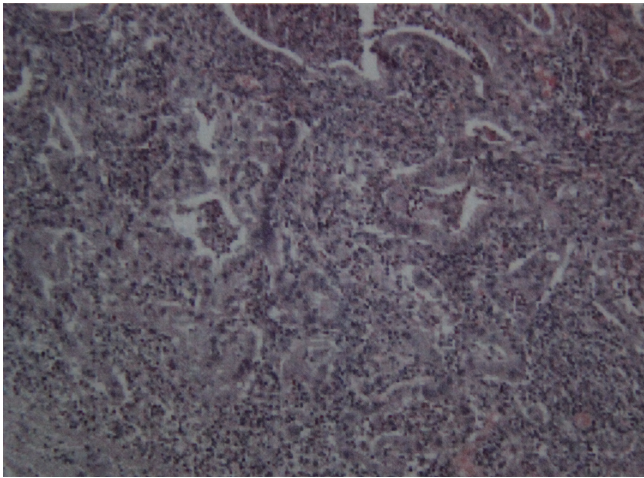


Figure 6 Pathologic result of ESD showed a moderately differentiated gastric adenocarcinoma involving the submucosa and cancer cells seen in the bottom margin with a negative circumferential margin

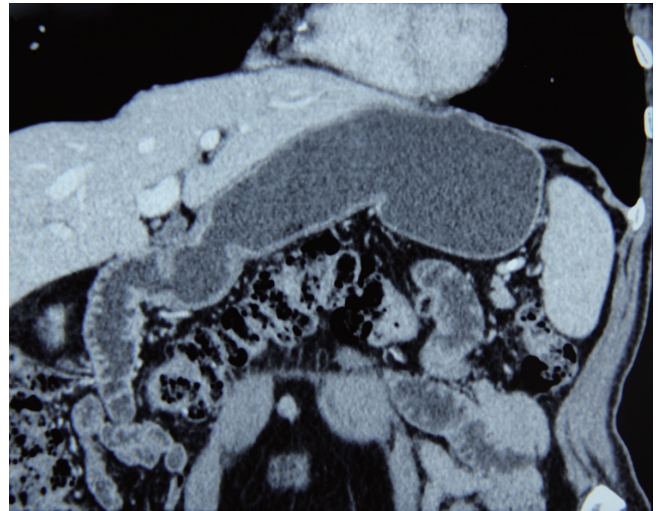


Figure 7 Three-dimensional reconstructive CT showed thickened wall in gastric antrum and visible enlarged lymph nodes along lesser curvature



Video 1 Totally laparoscopic distal gastrectomy reconstructed by Roux-en-Y with D2 lymphadenectomy and needle catheter jejunostomy for gastric cancer

Roux-en-Y reconstruction was demonstrated to be helpful for maintaining glucose homeostasis in diabetes (1), so it was chosen in this patient with Type 2 diabetes mellitus. NCJ was arranged for nutrition support therapy in early postoperative period and during expected chemotherapy after surgery according to suspected lymphatic metastasis from CT scan (2).

Operating procedure

The operation was performed in a regular way. After establishment of pneumoperitoneum and placement of laparoscopic instruments, adhesion between gastric antrum and gallbladder was revealed and no organic or peritoneal metastasis was seen during exploration. There was no gastric serosal involvement due to the tumor. Enlarged lymph nodes were detected along lesser curvature. ESD wound was located at the gastric angle by intraoperative gastroscope and distal gastrectomy was confirmed. Gastrocolic ligament was divided toward the splenic flexure of colon until cutting some of short gastric arteries and then toward the liver flexure until 3 cm distal to pylorus. Anterior lobe of transverse mesocolon and capsula pancreatic were removed until the superior margin of pancreas. The right gastroepiploic vessels were dissected and No.6 and No.14 lymph nodes were removed. The hepatoduodenal ligament was then dissected and No.12 Lymph nodes were cleaned. The right gastric artery was exposed and cut off and No.5 and No.8 lymph nodes were dissected. The left gastric vessels were exposed and cut off and No.7, No.9 and No.11 lymph nodes were removed. The soft tissues along lesser curvature and the right side of cardia including No.1 and No.3 lymph nodes were removed. The omentum along greater curvature including No.4 lymph nodes was divided. Gastroscope was used again to help

determine the proximal cutting edge. Duodenum was cut off at 3 cm distal to pylorus by an endocutter. Jejunum was cut off at 40 cm distal to the ligament of Treitz. A precolonic anastomosis was made between the distal stump and posterior wall of stomach by an endocutter. The distal stomach with omentum was cut off at 6 cm proximal to the tumor. An anastomosis was made between the proximal stump of jejunum and the distal jejunum at 40 cm distal to the gastrojejunal anastomosis. NCJ was performed at 40 cm distal to the jejunojejunal anastomosis through the port on left upper quadrant. The whole resected specimen was got out of abdomen in a specimen bag through the prolonged 3 cm incision on right upper quadrant. The abdomen was irrigated with distilled water and no evidence of bleeding noted. A drainage tube was positioned adjacent to the gastrojejunal anastomosis through the incision on right upper quadrant. All the wounds were closed carefully.

Postoperative management

Postoperative treatment included fasting, fluid infusion and acid suppression. The blood pressure and sugar levels were monitored and controlled well. A small amount of enteral nutrition was given through NCJ tube on the first day after surgery. The volume of enteral nutrition was increased gradually and fluid infusion was reduced. The patient began to drink and eat on the fifth day after surgery and the drainage tube was removed. The patient recovered well and was discharged one week after surgery. The final pathologic result showed no residual cancer or lymph node metastasis. Inflammatory cells infiltration was seen in the ESD area. There was lymph node reactive hyperplasia in totally twenty-five resected lymph nodes (No.1 0/3, No.3 0/2, No.4 0/4,

No.5 0/0, No.6 0/3, No.7 0/3, No.8 0/1, No.9 0/0, No.11 0/0, No.12 0/5, No.14 0/4). Immunohistochemical stain showed AE1/AE3(-), CD68(+), CEA(-) and Ki-67 index 15%. The final pathologic staging is pT1bN0M0 according to the pathologic result of ESD which showed tumor invasion to submucosa. Chemotherapy was not recommended and the patient followed up regularly in outpatient clinic.

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