

Totally Laparoscopic Distal Gastrectomy in Post Liver Transplant Patient

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The risk of malignancy after transplantation is higher than that of general population. Laparoscopic surgery has become a standard treatment of gastric cancer. However, there are no case reports evaluating totally laparoscopic gastrectomy in patients with previous liver transplantation. Herein we report our experience with a liver transplant recipient who underwent totally laparoscopic distal gastrectomy (TLDG) for gastric cancer. A 63 year-old man underwent orthotopic liver transplantation (OLT) for cryptogenic liver cirrhosis. 8 years later, gastric cancer was diagnosed during the follow-up. Endoscopic submucosal dissection was performed and additional surgical resection was needed. TLDG and D1+ lymph node dissection was performed, and the patient was discharged on the 8th post-operative day without any complications. To the best of our knowledge, this is the first case of de novo gastric cancer treated with TLDG after OLT. This suggests that TLDG is a feasible for patients after OLT.

Keywords: Gastrectomy, Laparoscopy, Gastric cancer, Liver transplantation

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INTRODUCTION

Long-term survival after liver transplantation has significantly improved with advances in immunosuppressive therapy and surgical techniques. However, prolonged immunosuppression has been reported to increase the risk of *de novo* malignancy.¹ These malignancies have become an important cause of death after transplantation.² The reported incidence of *de novo* malignancy following liver transplantation ranges from 2% to 14.4%.³⁻⁵ Unlike other countries, it is recognized that the most common *de novo* malignancy associated with liver transplantation is gastric cancer in Korea.³

Laparoscopic surgery has become a standard approach in the treatment of early gastric cancer.⁶ Likewise, the use of laparoscopy is markedly increasing in the field of liver trans-

plantation.⁷ In 2011, the first report was published regarding laparoscopy assisted distal gastrectomy to be a feasible method for gastric cancer treatment in patient with previous liver transplantation.⁸ However, there have been no more reports since then. To our knowledge, there is no case report evaluating the feasibility of totally laparoscopic gastric cancer surgeries in liver transplant recipients. Herein we report our experience with a liver transplant recipient who underwent totally laparoscopic distal gastrectomy (TLDG) for gastric cancer.

CASE REPORT

A 63 year-old man underwent orthotopic liver transplantation (OLT) for cryptogenic liver cirrhosis at our hospital in August 2009. He recovered without any complications. After

the transplantation, Tacrolimus (for one month), prednisolone (for three months) and mycophenolate mofetil (for twenty-seven months) were administered for immunosuppression. Currently, the patient is receiving cyclosporin A alone. In November 2017, esophagogastroduodenoscopy (EGD) was performed as a regular screening and gastric cancer was diagnosed incidentally. The lesion was located in the proximal antrum and measured 1.8 cm (Fig. 1); it was histologically well-differentiated adenocarcinoma. The depth of invasion in the gastric wall was estimated mucosal layer and no other distant metastasis or *de novo* malignancy was recognized by further examination. Endoscopic submucosal dissection (ESD) was performed, after which the biopsy result showed incomplete resection margin, undifferentiated histologic type and lymphovascular invasion; it was indication for surgery.

Totally laparoscopic distal gastrectomy (TLDG) and D1+

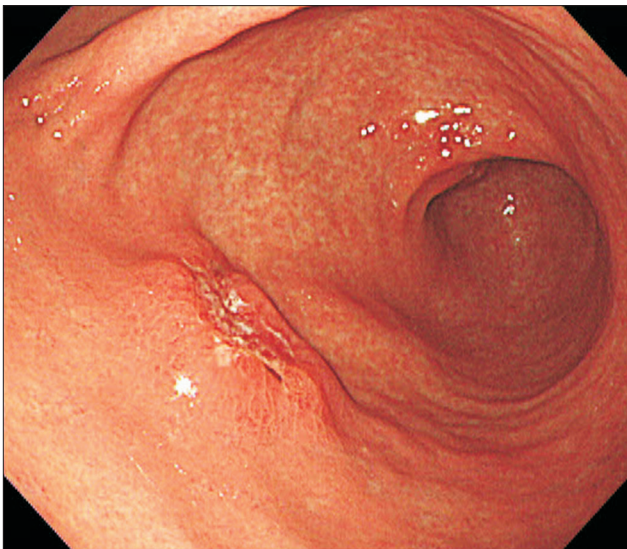


Fig. 1. Endoscopic finding showed early gastric cancer, type IIc+IIa lesion on anterior wall of the gastric antrum.

lymph node dissection was performed in December 2017 (Fig. 2A, B). Understanding the previous OLT is very important to avoid possible damaging the transplanted liver during gastrectomy. Therefore, consults from the liver transplant surgeons were sought before operation. The patient was laid supine under general anesthesia. Mercedes-Benz incision had been used for the previous OLT. For the laparoscopic surgery, a 12 mm trocar was carefully inserted through an umbilical incision using the Hasson open technique. Severe adhesions were present at upper abdomen. However, there was no evidence of metastasis. Additional right 12 mm and left 5 mm trocars were inserted at both mid-clavicular line 3 cm above the umbilicus. After carefully dissecting the adhesions so that the extra trocars could be inserted safely, two 5 mm trocars were inserted at both mid-axillary lines below the costal margin. The integrated bipolar and ultrasonic energy device (Thunderbeat™, Olympus, Japan) was used for dissection of adhesions and lymph nodes. Dissection of lymph nodes around the common hepatic artery was extremely challenging due to anatomical changes and severe adhesions after the OLT (Fig. 2C). However, other surgical procedures did not differ from those of usual TLDGs. The umbilical trocar site was extended to 4 cm vertically after distal gastrectomy; the specimen (Fig. 3) was extracted through this incision and intracorporeal gastrojejunostomy was performed. Operation time was 305 minutes, and the estimated blood loss was 200 ml.

After the surgery, routine post-operative care was performed and the adequate immunosuppressive medications were administered. The histopathological examination of the resected stomach revealed no residual malignancy. Total number of retrieved lymph nodes was 22, and one lymph node metastasis was present in lymph node station 7 (pT1bN1M0). The patient recovered well and was discharged on postoperative day 8 without any complications (Fig. 4).

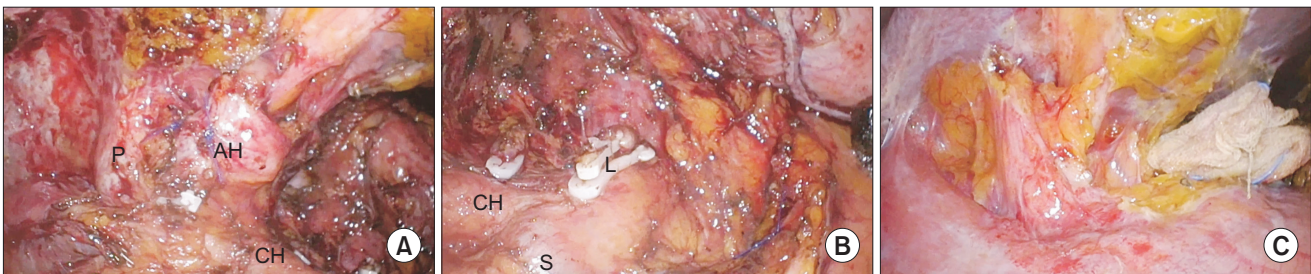


Fig. 2. (A) Intraoperative view after dissection of the D1+ lymph node around the hepatoduodenal ligament. (B) Intraoperative view after dissection of the D1+ lymph node around the celiac axis. (C) Intraoperative view of hepatoduodenal ligament that can not distinguish anatomical structures due to very severe adhesions. P = portal vein; AH = anastomosed hepatic artery; CH = common hepatic artery; S = splenic artery; L = divided left gastric artery.



Fig. 3. There was a well demarcated, ulcerative lesion (3.0×3.0 cm) in the proximal antrum along the anterior wall.

DISCUSSION

De novo malignancy after organ transplantation has become an important risk factor affecting the long term survival of the recipients. Moreover, the incidence is expected to increase in patients who underwent liver transplantation, so *de novo* malignancy is anticipated to be the principal cause of death among recipients in the near future.

Previous study has emphasized the necessity for frequent clinical follow-ups for early cancer detection in transplant patients.⁹ Gong et al. showed that the prognosis of *de novo* gastric cancer in liver transplantation patients was good because the proportion of early gastric cancer was higher than that of advanced gastric cancer.⁹ However, currently there is no widely accepted screening protocol for malignancies after liver transplantation, especially for gastric cancer. In Korea, the National Health Insurance Service recommends EGD once every 2 years for people age 40 and older. Therefore, considering that liver transplant patients have a higher risk of gastric cancer, they should receive routine screening tests, including EGD, at least once a year.

In liver transplant recipients, additional gastric cancer surgery is more difficult due to several factors such as severe post-operative adhesions, changes in anatomy, and the risk of graft loss with vascular injuries. For this reason, almost all patients had been treated with conventional open surgery or ESD. Laparoscopic gastrectomy has several advantages compared with open gastrectomy: less pain, faster recovery of bowel function, and shorter hospital stay. In addition, the long-term oncologic outcomes were comparable.⁶ In another study, laparoscopic gastrectomy showed fewer inflammatory and immunologic reactions compared to open gastrectomy.¹⁰

In contrast to the increased role of diagnostic and therapeutic

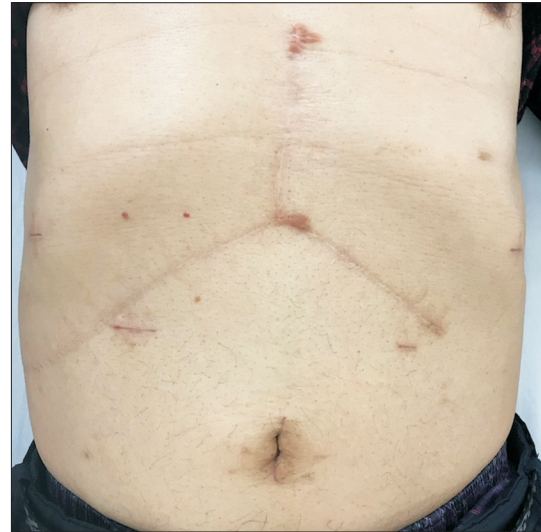


Fig. 4. Post-operative wound after discharge. Previously used Mercedes-Benz incision and trocar insertion site.

laparoscopy in liver transplantation,⁷ only one case report was published; laparoscopy assisted distal gastrectomy in liver transplantation patient. No more report has been reported since then.

Laparoscopic gastrectomy after liver transplantation is a difficult procedure. Especially, lymph node dissection around the hepatoduodenal ligament and the hepatic artery must be very carefully performed with accurate anatomical information. With development of instruments and surgical techniques, several barriers in the field of laparoscopy have been overcome. Although a lot of effort and experiences are needed, laparoscopic gastrectomy eventually will be an alternative to open gastrectomy even in patients with previous liver transplantations. To the best of our knowledge, there are no case reports about TLDG in patients with prior liver transplantation. This is the first case of *de novo* gastric cancer treated with totally laparoscopic techniques. This suggests that TLDG is a feasible method for patients with liver transplantation requiring surgical therapy for gastric cancer.

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