



Does laparoscopic-assisted surgery outperform open surgery for esophagogastric junction carcinoma?

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Incidence rate of adenocarcinoma of the esophagogastric junction (AEG) is increasing (1,2). Surgical resection is the gold standard therapy for cure of this disease and open total gastrectomy (OTG) plus lower esophagectomy has been regarded as a standard approach to Siewert type II or III esophagogastric junction cancer (3).

With the advancement of surgical instruments and laparoscopic surgical skills, laparoscopic surgery has been widely used for the treatment of various cancers. Regarding early stage distal gastric cancer, laparoscopic distal gastrectomy has been proved to have the potential benefits of short- and long-term outcomes (4-6). For the treatment of locally advanced gastric cancer, laparoscopic distal gastrectomy was proved to outperform open distal gastrectomy in terms of short-term outcomes (7,8).

On the other hand, laparoscopic-assisted total gastrectomy (LATG) has not been as widely performed as laparoscopic distal gastrectomy is because of the technical difficulty of esophagojejunostomy. The guideline of Japan Society for Endoscopic Surgery says that laparoscopic surgery may be considered for cStage IA-IB gastric cancer, but scientific evidence is insufficient to support this recommendation (9). To establish robust scientific evidence, Japan Clinical Oncology Group is now conducting a phase II trial to confirm the safety and efficacy of LATG for upper third gastric cancer, though the trial excluded patients with esophagogastric junction cancer because the esophagojejunostomy becomes much more difficult in these patients than in patients without esophageal invasion (10).

It has been assumed that using laparoscopy would

enable precise resection and reconstruction, which would contribute to improve not only short-term but also long-term survival outcomes. However, no study has ever demonstrated the superiority of laparoscopic approach in survival outcomes as compared with open approach with robust evidence. The esophagogastric junction is located at the deep portion of the body where the working space is so narrow that dissection and anastomosis are difficult to perform. Laparoscopic approach could make horizontal visualization of this deep area in the lower mediastinum easier than open approach. Because of that, we can imagine that laparoscopic surgery would be a better approach for carcinoma of this area.

Huang *et al.* have recently published a propensity score-matched case-control study comparing LATG and OTG for Siewert type II and III esophagogastric junction carcinoma (11). In their single-center retrospective review, they have analyzed 171 patients undergoing LATG and 171 patients undergoing OTG using propensity score matching method. According to their study, decreases in the operative time, amount of blood loss, time to resumption of a semifluid diet, and length of hospital stay and an increased number of lymph nodes retrieved were observed in the LATG group compared with the OTG group. The authors concluded that LATG is associated with better short-term outcomes for Siewert type II and III AEG. In addition, a significantly higher 3-year overall survival rate (81.3% *vs.* 66.4%; $P=0.011$) and disease-free survival rate (77.5% *vs.* 63.8%; $P=0.040$) were observed for the Siewert type II AEG patients in the LATG group compared with those in

the OTG group. The authors speculate that an increased number of retrieved lymph nodes led to better long-term survival for Siewert type II AEG patients.

This study was conducted by extraordinary expert surgeons who had experienced more than 500 laparoscopic gastrectomy; anastomotic leakage and stricture which are the most concerned problems in LATG occurred only in 2 of 171 patients (1.2%) and 1 of 171 patients (0.6%), respectively. According to their manuscript, they probably performed esophagojejunostomy using circular stapler. In the review of esophagojejunostomy after LATG by Umemura *et al.*, incidence rates of anastomotic leakage and stricture using circular staplers were reported to be 4.7% and 8.3%, respectively (12). Their results of extremely low rates of anastomotic leakage and stricture would probably be made possible only by such an extraordinary surgeon.

Although there are some limitations in their study including selection bias, they demonstrated that not only the short-term outcomes but also the long-term outcomes including overall survival were better in the LATG group for Siewert type II AEG. Surprisingly, patients with Siewert type II AEG undergoing LATG gained about 15% increase of 3-year overall survival rate as compared with those undergoing OTG. Of course this may result from stage migration because the harvested lymph nodes in LATG group outnumbered those in OTG group, but it is meaningful that phase III randomized controlled trial would be conducted by expert surgeons to confirm this result.

On the other hand, whether total gastrectomy should be performed or not is still a controversial issue in Siewert type II AEG (13). In fact, dissection benefit of lymph nodes around the pylorus is reported to be quite small (14). The nation-wide study in Japan more recently revealed quite a little benefit in the dissection of these lymph nodes (15). It is true that performing LATG is inevitable when R0 resection could not achieved without resecting the whole stomach. But whenever we could reserve more than two thirds of the stomach, we should reserve the stomach as best we can to maintain the postoperative quality of life (QoL) of the patients (16).

The authors excluded patients undergoing neoadjuvant chemotherapy or chemoradiotherapy and unmentioned postoperative adjuvant chemotherapy in their manuscript. In the western countries, the survival benefit of perioperative chemotherapy or preoperative chemoradiotherapy was demonstrated and they are routinely performed for the treatment of AEG (17,18). Preoperative chemotherapy or chemoradiotherapy seems to be a promising strategy

for AEG since it could shorten the resection length of the esophagus as well as control hematological metastasis which relatively frequently occurs in the AEG (19). In addition, by reducing the size of primary tumors, neoadjuvant chemotherapy or chemoradiotherapy enables the laparoscopic surgery easier to perform. Those are the reasons why the neoadjuvant therapy is a promising treatment strategy for Siewert type II or III AEG. We might need to conduct randomized controlled trials of the patients undergoing preoperative chemotherapy or chemoradiotherapy.

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