

Totally laparoscopic total gastrectomy and the challenge of esophagojejunostomy

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Laparoscopic surgery for the treatment of resectable and potentially curable gastric cancer has rapidly evolved over the last two decades. In a recent editorial analyzing the results of small randomized controlled trials and large-scale retrospective studies, it was pointed out that laparoscopy-assisted distal gastrectomy appears to be feasible and safe and does not affect the oncologic outcome of the patients with early gastric cancer. However, data on the safety and effectiveness of laparoscopic totally intracorporeal distal or total gastrectomy for early and advanced stages II and III disease are still insufficient to draw definitive conclusions [1].

The report by Bracale et al. [2] in the October issue of *Surgical Endoscopy* is important for three reasons: first, it provides data on totally laparoscopic total gastrectomy. Second, it includes the patients with advanced stages II and III disease. Third, the study comes from Europe, as opposed to Korean and Japan, from where most laparoscopic gastrectomy experiences derive.

Evidence accumulating from Asian and Western countries suggests that laparoscopic gastrectomy with adequate D2 lymphadenectomy is superior to open surgery because it improves short-term outcomes with an identical effect on long-term oncologic outcomes and survival [3–6]. D2 gastrectomy has been the standard of care at least in the patients with stage II or III disease in the open approach and should be adopted as the standard procedure in the minimally invasive approach [7, 8]. This evidence is consistent with the superiority of laparoscopic versus open

surgery for other gastrointestinal tumors such as colorectal cancer [9, 10].

Bracale et al. [2] evaluated the safety of totally laparoscopic total gastrectomy with focus on esophagojejunostomy. Data from 56 totally laparoscopic gastrectomies (TLGs) (83.6%) and 11 totally laparoscopic degastrogastrectomies (TLDGs) (16.4%) with intracorporeal side-to-side EJS were analyzed. The average operating time was 249 min. The average time required for both anastomoses was 44 min. Conversion and reoperation rates were 10.4 and 13.4%, respectively. The mean hospital stay was 12.4 days. There were four patients with anastomotic leakage (6%), five with postoperative bleeding (7.5%), and two with duodenal stump leakage (3%). There was one death (1.5%). The authors concluded that laparoscopic intracorporeal side-to-side esophagojejunostomy is a safe and feasible technique.

There can be no progress in health care without innovation. However, it is still unclear whether a robot-assisted technique is superior to the laparoscopic approach for tumors located in the distal or middle third of the stomach. Comparative-effectiveness research is required to assess whether robot-assisted surgery is more beneficial for, e.g., gastroesophageal junction cancer. Incorporation of this surgical innovation and more recent developments in the systemic treatment of gastric cancer such as the addition of trastuzumab to chemotherapy as the standard of care in the patients with advanced gastric cancer [9, 10] indicate the need for treatment of the patients with gastric cancer in specialized institutions.

Although the rates of serious postoperative complications in this series can be considered relatively high compared to those of reports on open D2 gastrectomy from specialized hospitals, considering the innovation of totally laparoscopic intracorporeal total gastrectomy, the results of

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this study can be seen as completely satisfying. In the Western world, only a few institutions perform such a highly demanding procedure using the latest laparoscopic technology. Innovation in technology and surgery by using minimally invasive approaches can dramatically improve the quality of life of the patients with gastric cancer. However, incorporation of these novel techniques outside of experienced centers and high-volume surgeons cannot be recommended because the harms can outweigh the potential benefits.

Apart from the expected improvements in short-term outcomes by an increasing use of laparoscopic techniques over the coming years, the improvement of long-term survival and cure rates still remains the biggest challenge. The recent clinical success with the monoclonal antibody trastuzumab represents an important step toward improvement in survival rates. Indeed, this anti-HER2 agent that inhibits the HER2 signalling pathways in the patients with HER2-positive advanced or metastatic gastric cancer can improve oncological outcomes. However, trastuzumab plus chemotherapy resistance among HER2-positive patients and the lack of drugs for treating HER2-negative patients who account for 75% of all gastric cancer patients represents an emerging major problem [11, 12].

Current and emerging advances with the latest complete and partial genome sequencing technologies and improvements in assessing epigenetic alterations such as DNA methylation provide hope for the development of more effective and less toxic targeted agents, which, with the discovery of new robust biomarkers, could be tailored for individual patients with solid cancers, including gastric cancer. The era of personalized medicine is ahead of us [13–26].

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