Advancement of single-port, reduced-port laparoscopic gastrectomy for gastric cancer

In 1994, Kitano *et al.* reported a first case of laparoscopy-assisted distal gastrectomy (LADG) for gastric cancer (1). Since then, the spread of laparoscopic gastrectomy for gastric cancer has been explosive. A recent nationwide survey by the Japanese Society for Endoscopic Surgery reported that laparoscopic gastrectomy for gastric cancer was performed more than 10,000 cases in a year. Moreover, LADG is regarded as a standard procedure for c-stage I gastric cancer in the Japanese gastric cancer treatment guidelines (ver.3). A phase III study comparing laparoscopic and open distal gastrectomy (JCOG 9201 study) is going on in Japan. A nationwide study reported the efficacy and the safety of LADG for early gastric cancer and this method established the firm position as the minimally invasive surgery in this field (2). According to the surgical learning curve, the intracorporeal reconstruction has provided complete laparoscopic procedure without the skin incision in the upper median portion and the cosmetic benefit has been improved (3). As the second stage, laparoscopy-assisted total gastrectomy (LATG) has been developed following the extension of the surgical technique of LADG. In this method, the reconstruction methods are important. Initially, the esophagojejunostomy was performed through the small skin incision in the upper median portion. However, it is difficult to carry out this procedure through the small skin incision in a well-built male. So, some studies reported the usefulness of a transorally inserted circular stapler (OrVil) (4). In this method, the high incidence of anastomotic leakage and the stenosis were pointed out. It was, therefore, necessary to establish another useful method. Recently, the esophagojejunostomy has been intracorporeally performed using the linear stapler [overlap anastomosis (5) and functional method (6)] or the circular stapler (7). Although LATG needs the high level of surgical technique, this method is widely adopted.

As the third step, laparoscopic gastrectomy for advanced gastric cancer has been employed in some high volume centers (8,9). Although the basic laparoscopic surgical techniques for advanced gastric cancer are as same as early gastric cancer, we have to pay attention to some important points. For advanced gastric cancer, it is difficult to examine peritoneal dissemination precisely using laparoscopic procedure, it is necessary to manipulate the operation meticulously not to scatter the tumor cells from the primary lesion or metastatic lymph nodes. Now, the nationwide trials to show the feasibility of laparoscopic gastrectomy for advanced gastric cancer are going on. The outcomes of these trials are anticipated.

As the fourth step, reduced-port laparoscopic gastrectomy was devised by a subset of experienced laparoscopic gastric surgeons (10,11). These surgeons aimed to provide an ultimately minimal invasive gastrectomy with high quality of oncological surgery for gastric cancer patients. However, less operative scar does not always mean minimal invasive surgery. Many previous studies reported longer operation time, less blood loss, same degree of postoperative morbidity, acceptable long-term survival, and patients' cosmetic satisfaction in patients receiving single-port, reduced-port laparoscopic gastrectomy (12,13). In this method, small number of the ports and the conflict of the surgical devices sometimes disturb smooth and meticulous manipulations. So, a surgeon with sophisticated surgical skills should perform this limited operation. Previously, a gastric surgeon with negative opinion against this technique argued that the relevance of merely reducing the ports would seem trivial (14). This method dose not aim to merely reduce the number of the ports, but to cure gastric cancer by additionally providing satisfactory cosmetic benefit. A author also mentioned that laparoscopic surgery for challenging types of cancers should be performed with standard many ports or using new technologies available. I total agree with this opinion. Single-port and reduced-port gastrectomy should be introduced step by step after sufficient experience of standard laparoscopic gastrectomy. In the early phase of this method, some studies introduced the outcomes of reduced-port laparoscopic distal gastrectomy. After that phase, they gradually used this complex method for challenging type of surgery. However, we have to carefully decide whether it is appropriate to employ reduced-port laparoscopic gastrectomy for total gastrectomy or advanced gastric cancer.

When introducing this technique initially, the indication should be limited in a slim, younger patient who strongly hopes to receive this method after sufficient explanation of advantages and disadvantages of this surgical technique. According to the surgical learning curve, we can safely step up to the next stage. We can use another option in addition to this method. Needlescopic surgery may overcome the disadvantages of single-port, reduced-port laparoscopic gastrectomy. Additional

needlescopic forceps help us to manipulate more conveniently. Cosmetically, this new technique also provides patients satisfaction.

When standard LADG was initially introduced, many surgeons said that laparoscopic surgery has no impact on surgical treatment for gastric cancer in Japan. However, this technique has been widely spread not only in Japan but also in East Asia. Similarly, reduced-port laparoscopic gastrectomy has a possibility for wide spread in the near future. To succeed this purpose, a standardization of this technique is mandatory.

In this special issue of advancement of single-port, reduced-port laparoscopic gastrectomy for gastric cancer, ambitious gastric surgeons reported their recent data. I hope this issue encourages gastric surgeons to challenge this surgical procedure steadily beyond the standard procedures.

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Footnote

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References

1. Kitano S, Iso Y, Moriyama M, et al. Laparoscopy-assisted Billroth I gastrectomy. Surg Laparosc Endosc 1994;4:146-8.
2. Kim HH, Han SU, Kim MC, et al. Prospective randomized controlled trial (phase III) to comparing laparoscopic distal gastrectomy with open distal gastrectomy for gastric adenocarcinoma (KLASS 01). J Korean Surg Soc 2013;84:123-30.
3. Lin M, Zheng CH, Huang CM, et al. Totally laparoscopic versus laparoscopy-assisted Billroth-I anastomosis for gastric cancer: a case-control and case-matched study. Surg Endosc 2016;30:5245-54.
4. Zuiki T, Hosoya Y, Kaneda Y, et al. Stenosis after use of the double-stapling technique for reconstruction after laparoscopy-assisted total gastrectomy. Surg Endosc 2013;27:3683-9.
5. Kitagami H, Morimoto M, Nakamura K, et al. Technique of Roux-en-Y reconstruction using overlap method after laparoscopic total gastrectomy for gastric cancer: 100 consecutively successful cases. Surg Endosc 2016;30:4086-91.
6. Tsunoda S, Okabe H, Obama K, et al. Short-term outcomes of totally laparoscopic total gastrectomy: experience with the first

consecutive 112 cases. World J Surg 2014;38:2662-7.
7. Amisaki M, Kihara K, Endo K, et al. Comparison of single-stapling and hemi-double-stapling methods for intracorporeal esophagojejunostomy using a circular stapler after totally laparoscopic total gastrectomy. Surg Endosc 2016;30:2994-3000.
8. Park DJ, Han SU, Hyung WJ, et al. Long-term outcomes after laparoscopy-assisted gastrectomy for advanced gastric cancer: a large-scale multicenter retrospective study. Surg Endosc 2012;26:1548-53.
9. Hu Y, Ying M, Huang C, et al. Oncologic outcomes of laparoscopy-assisted gastrectomy for advanced gastric cancer: a large-scale multicenter retrospective cohort study from China. Surg Endosc 2014;28:2048-56.
10. Kunisaki C, Ono HA, Oshima T, et al. Relevance of reduced-port laparoscopic distal gastrectomy for gastric cancer: a pilot study. Dig Surg 2012;29:261-8.
11. Kawamura H, Tanioka T, Funakoshi T, et al. Dual-ports laparoscopy-assisted distal gastrectomy compared with conventional laparoscopy-assisted distal gastrectomy. Surg Laparosc Endosc Percutan Tech 2011;21:429-33.
12. Kunisaki C, Makino H, Yamaguchi N, et al. Surgical advantages of reduced-port laparoscopic gastrectomy in gastric cancer. Surg Endosc 2016;30:5520-8.
13. Omori T, Fujiwara Y, Moon J, et al. Comparison of Single-Incision and Conventional Multi-Port Laparoscopic Distal Gastrectomy with D2 Lymph Node Dissection for Gastric Cancer: A Propensity Score-Matched Analysis. Ann Surg Oncol 2016;23:817-24.
14. Kodera Y. Reduced port surgery for gastric cancer: another giant leap for mankind? Gastric Cancer 2013;16:457-9.

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