Is there role for laparoscopic gastrectomy for advanced gastric cancer

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Is there role for laparoscopic gastrectomy for advanced gastric cancer
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Introduction
Long-term results of KLASS-01, a randomized controlled study comparing open distal gastrectomy (ODG) versus laparoscopic (or assisted) distal gastrectomy (LDG), were reported in ASCO annual meeting of 2016. As the prognosis of both groups were so good, the study had to use point estimation method to evaluate the non-inferiority in overall and recurrent free survival. Although they concluded that LDG is not inferior to ODG, the impact of this study seems limited due to too small sample size to apply log rank method. Awaiting the publication for detailed analysis, the fact that, LDG has nearly two-percentage lower recurrent free survival (RFS), should not be underestimated for those who expect to be cured following distal gastrectomy. LDG for advanced gastric cancer (T2 or more) may carry much more probability of higher recurrence rate compared with ODG. On the other hands, surgeons not only in the East Asia but also in the West, perform more and more LDG for advanced tumors outside clinical trials and without rigorous audits that assure survival and quality of life in the long-term after surgery.

Advantage of laparoscopic surgery over open surgery
There are many general advantages of laparoscopic surgery. First, the small access of laparoscopic surgery incurs less damage to the abdominal wall and hence less pain and faster recovery. This benefit is especially appreciated when patients with extremely poor respiratory function undergo oncological surgery. It is obvious that the laparoscopic approach is cosmetically better than open surgery. Secondly, the visual field in a narrow space or deep body space, such as male pelvic space, is better than in open surgery and with the use of long instruments, dissection would be easier than human hands which obstruct the surgeon’s view. Thirdly, the magnifying view permits good visualization of anatomical details, which are sometimes missed under naked eyes of non-expert surgeons. Finally, education and learning of anatomical structures and surgical procedures are easier to follow on the imaging screen in laparoscopic surgery.
Constraints of laparoscopic surgery compared with open surgery

Endoscopic views are inferior to human vision because of two-dimensional imaging, the narrow field of endoscopic view and the dissociation between the sensory (visual) and motor (hand) fields. Mechanical constraints in laparoscopic surgery include the limited number of degrees of freedom of endoscopic instruments compared to human hand, diminished indirect tactile feedback through long endoscopic instruments and the fulcrum effect through abdominal wall. The limited intra-abdominal space in laparoscopic surgery makes the handling of large gastric tumours by long thin instruments very difficult and occasionally traumatic. Although technological advances are trying to overcome the above constraints, the performance in laparoscopic surgery is inherently more difficult than open surgery.

Current position of laparoscopic gastrectomy in Japan

The Japanese guideline issued by Japan Gastric Cancer Association states that LDG can be one of the options for stage I gastric cancer \(^1\). It cautions that long-term efficacy and quality of life after LDG and the safety of laparoscopic total gastrectomy (LTG) have not yet been confirmed by clinical studies. Therefore it mandates doctors to explain these uncertainties when they get informed consent of laparoscopic gastrectomy. On the other hand, the number of laparoscopic gastrectomy in the Japanese registry increases year by year. In some institutions, LDG is applied to more advanced stage, stage II or IIIA, and subsequently number of LDG with D2 dissection is increasing, while D1+ is popular for stage I. LTG is performed in specialized centers where surgeons have accumulated much experience of LDG, while feasibility study to evaluate safety of LTG is ongoing (Japan Clinical Oncology Group study 1401\(^2\)).

What is laparoscopic surgery in oncological aspects?

Laparoscopic gastrectomy (LG), either LDG or LTG, is a standard gastrectomy through minimal incisions. Surgical procedures themselves are the same as open gastrectomy (OG). Pioneer surgeons tried to perform exactly the same laparoscopic procedure as open surgery without any idea of performing oncologically better surgery than open gastrectomy. It is not a modified gastrectomy for better functional preservation. There is little evidence of a better quality of life after one-year. Some authors reports even worse quality of life due to more frequent occurrence of inner hernia\(^3\) (Petersen’s hernia). In general, we can expect a longer proficiency gain curve for LG than for OG with more surgical complications incurred when inexperienced surgeons perform LG.
Due to limited access of straight instruments and relative difficulty of suturing, reconstruction methods are often compromised, with potential worsening of quality of life in long-term. Also, the absolute superiority of short-term outcomes in LG has been recently challenged by pre-surgery preparation initiatives and enhanced postoperative recovery programs. The priority for surgery for advanced cancer should remain the long-term cure; otherwise laparoscopic surgeons will bring laparoscopic surgery into dispute.

**Role of the first surgery in gastric cancer patients**

In gastric cancer surgery, quality of the first operation decides the fate of patients, whether they will be cured or not. Gastric cancer surgery cannot be repeated after knowing the pathological evaluation of the tumor spread and metastasis in the majority of cases. Even additional stomach resection for positive surgical margins or additional nodal dissection may be theoretically possible, it carried enormous stress for both patients and surgeons and also a high risk for patients. It is known that less than D2 dissection carries higher risk of treatment failure for stage II or more advanced gastric cancer and benefit of performing less than D2 surgery is quite unclear. The current standard D2 surgery does not include splenectomy and does not have increased risk of surgical complication compared with D1+. Limited nodal dissection with ordinary gastrectomy cannot provide better quality of life in terms of sequelae of gastrectomy. As surgical perfection cannot be compensated by radiotherapy or chemotherapy in gastric cancer, surgeons should perform sufficient surgery. When we have recurrence after insufficient surgery, we have serious regret that we could have avoided it by appropriate surgery.

**Balance of benefit and increased risk of recurrence in laparoscopic gastrectomy for advanced gastric cancer**

Why patients prefer LG than OG “a priori”? If exactly the same results can be obtained by LG as OG, preference of smaller incisions, which is based on the instinctive fear of patients, is natural and reasonable. However, first priority should always be a better cure or better quality of life in the long-term for most patients. When patients give informed consent for gastrectomy, they should be informed about all benefits and disadvantages of different treatment options. Surgeons should inform patients that gastrectomy always impair their digestive function even if it's performed by laparoscopy. Benefit of laparoscopic surgery should not be over-estimated as there is so little evidence for better quality of life after a few months. I have performed LG for more than
100 patients and noticed that their performance and quality of life are not different from those who underwent OG at the first outpatient clinics, usually 5-6 weeks after surgery.

Lack of tactile sensation makes decision of resection line more difficult than in OG where we can palpate the thickened wall corresponding to unexpected wider spread in submucosa or deeper layers. When treating advance tumors, it is sometimes indispensable to pinch or stick or at least touch primary tumors by metal graspers, which may cause cancer cell spillage, a potential risk of peritoneal metastasis. A large tumor may hamper smooth movements of straight devices and even disturb getting good visual field. In case of LG, we can use only sense of sight and diminished tactile feedback. Therefore much less information can be obtained about tumor spread, invasiveness and micrometastasis.

**My concerns during surgery as surgical oncologist**

My primary concerns during surgery are safety and maximum probability of cure. On listening to enthusiastic laparoscopic surgeons’ presentations, I often have impressions that their prior concern is how to ensure surgery done laparoscopically but not how to minimize the risk of recurrence. Some people say “We will do a better surgery for the next patient”. Primary surgery for gastric cancer is once in a life occasion for each patient. It’s not a computer game in which we can easily reset for next challenge.

Even in the East Asian countries, we are getting more tumors of gastric cardia and proximal gastric body for which a total gastrectomy should be performed. Risk of anastomotic complication is higher in LTG than LDG and same in LG than OG. Majority of advanced gastric cancer have poorly differentiated histology or signet ring cell, which have more tendency to develop peritoneal spread and extra-nodal metastasis as well. Therefore meticulous technique to dissect lymph nodes overlapped by intact membrane like structure is mandatory but is less feasible in case of LG. Before starting surgery, I always pray God, “Assist me to recognize the nature and spread of the cancer and conform the procedure accordingly and achieve best cure for the patient”, since it’s the only one chance for him or her.

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**Reference**

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