

Reply: Factors Favorable to Reducing the Learning Curve of Laparoscopic Gastrectomy for Gastric Cancer

Yoon Young Choi, Jeong Ho Song, and Ji Yeong An¹

Department of Surgery, Yonsei University Health System, Yonsei University College of Medicine,

¹Department of Surgery, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea

To the Editor:

We appreciate the interest and comments from Kong et al. on our recent manuscript, "Short-Term Outcomes of Laparoscopic Total Gastrectomy Performed by a Single Surgeon Experienced in Open Gastrectomy: Review of Initial Experience" (doi: <http://dx.doi.org/10.5230/jgc.2015.15.3.159>).¹ We agree with their opinions and would like to add some comments on the learning curve of laparoscopic total gastrectomy.

The surgeon in the study¹ was trained as a gastrointestinal surgery fellow and has worked in a high volume hospital, where over 1,000 gastrectomies for gastric cancer have been performed per year. Thus, this surgeon has been exposed to a large number of cases of laparoscopic gastrectomy for gastric cancer, within a short period of time, which may result in a more favorable learning curve and low morbidity and mortality.² According to the United States (US) Graduate Medical Education General Surgery Report, a US general surgery residency graduate only experiences an average of five cases of gastrectomy for gastric cancer (including 0.9 cases of total gastrectomy); thus, it would be difficult to generalize the present results to the situation in the US.³

Standard surgery is important in the prognosis of patients with gastric cancer.⁴ Despite past arguments that laparoscopic

surgery is not adequate for gastric cancer because it does not achieve appropriate lymph node dissection, brave and innovative surgeons have further developed and propagated laparoscopic techniques.⁵ Laparoscopic surgical techniques have evolved from laparoscopic-assisted to fully laparoscopic gastrectomy as well as from circular staplers to linear staplers for anastomosis.^{6,7} Although experienced surgeons have their own knowledge base when performing laparoscopic gastrectomy for gastric cancer, laparoscopic procedures have been standardized because of the efforts of the first generation of laparoscopic surgeons and surgical societies including the Korean Gastric Cancer Association. Thus, this technically mature laparoscopic procedure may allow easier learning curves for recently trained surgeons and the next generation.

One advantage that could reduce the learning curve of laparoscopic gastrectomy for gastric cancer is that laparoscopic procedures are easy to record and share compared to open surgery. Surgeons can record video and review their own procedure after the operation, to aid self-examination of their surgical technique. Furthermore, young surgeons can learn from video recordings of operations performed by experts and can adapt techniques for their own use. The popularity of general laparoscopic surgical procedures is another factor that is favorable to reduce the learning curve of laparoscopic surgery for gastric cancer. Recently, relatively simple surgeries such as appendectomy, herniorrhaphy, and cholecystectomy have been performed by laparoscopic procedures; thus, surgeons are more familiar with laparoscopic instruments compared to surgeons in the past. Taken together, the recent environment is favorable for allowing

Correspondence to: Ji Yeong An

Department of Surgery, Samsung Medical Center, Sungkyunkwan University School of Medicine, 81 Irwon-ro, Gangnam-gu, Seoul 06351, Korea

Tel: +82-2-3410-0498, Fax: +82-2-3410-6981

E-mail: ugids@naver.com

Received June 13, 2016

Accepted June 13, 2016

surgeons to improve and refine their surgical skills, which helps to reduce the learning curve for laparoscopic surgery for gastric cancer.

Lastly, as Kong et al. commented, it is difficult to define the learning curve of laparoscopic total gastrectomy by a single parameter. The operative time, complication rate, and number of retrieved lymph nodes have been used as parameters to measure the learning curve of laparoscopic surgery for gastric cancer.^{8,9} However, these factors are not only influenced by the surgeon's ability, but also by the assistant surgeon's experience and ability, as well as patient factors. Thus, no single parameter can be used to measure the learning curve of this surgery. Additionally, increasing popularity and interest in proximal gastrectomy for gastric cancer make it difficult to determine the learning curve of laparoscopic total gastrectomy. Thus, a new statistical model that can consider and integrate these complicated factors is required to quantify the learning curve for surgical procedures.

References

1. Song JH, Choi YY, An JY, Kim DW, Hyung WJ, Noh SH. Short-term outcomes of laparoscopic total gastrectomy performed by a single surgeon experienced in open gastrectomy: review of initial experience. *J Gastric Cancer* 2015;15:159-166.
2. Casella G, Soricelli E, Giannotti D, Bernieri MG, Genco A, Basso N, et al. Learning curve for laparoscopic sleeve gastrectomy: role of training in a high-volume bariatric center. *Surg Endosc* 2015. doi: 10.1007/s00464-015-4670-3 [In print].
3. Accreditation Council for Graduate Medical Education. General surgery case logs [Internet]. Chicago (IL): Accreditation Council for Graduate Medical Education; 2012 [cited 2016 Jun 13]. Available from: <http://www.acgme.org/acgmeweb/Portals/0/GSNatData1112.pdf>.
4. Yang K, Choi YY, Zhang WH, Chen XZ, Song MK, Lee J, et al. Strategies to improve treatment outcome in gastric cancer: a retrospective analysis of patients from two high-volume hospitals in Korea and China. *Oncotarget* 2016. doi: 10.18632/oncotarget.9378 [In print].
5. Choi YY. The era of laparoscopic surgery for gastric cancer: what is the present territory and what will be next? *Transl Gastroenterol Hepatol* 2016;1:42.
6. Yang K, Bang HJ, Almadani ME, Dy-Abalajon DM, Kim YN, Roh KH, et al. Laparoscopic proximal gastrectomy with double-tract reconstruction by intracorporeal anastomosis with linear staplers. *J Am Coll Surg* 2016;222:e39-e45.
7. Kim DG, Choi YY, An JY, Kwon IG, Cho I, Kim YM, et al. Comparing the short-term outcomes of totally intracorporeal gastroduodenostomy with extracorporeal gastroduodenostomy after laparoscopic distal gastrectomy for gastric cancer: a single surgeon's experience and a rapid systematic review with meta-analysis. *Surg Endosc* 2013;27:3153-3161.
8. Jeong O, Ryu SY, Choi WY, Piao Z, Park YK. Risk factors and learning curve associated with postoperative morbidity of laparoscopic total gastrectomy for gastric carcinoma. *Ann Surg Oncol* 2014;21:2994-3001.
9. Lee JH, Ryu KW, Lee JH, Park SR, Kim CG, Kook MC, et al. Learning curve for total gastrectomy with D2 lymph node dissection: cumulative sum analysis for qualified surgery. *Ann Surg Oncol* 2006;13:1175-1181.