



Vagus nerve-preserving distal gastrectomy may improve the quality of life after gastrectomy in early stage gastric cancer patients

Souya Nunobe, Takeshi Sano

Department of Gastroenterological Surgery, Cancer Institute Ariake Hospital, Tokyo, Japan

Correspondence to: Souya Nunobe, MD. Department of Gastroenterological Surgery, Cancer Institute Ariake Hospital, 8-31, Ariake 3-chome, Koto-ku, Tokyo 135-8550, Japan. Email: souya.nunobe@jfc.or.jp.

Comment on: Kim SM, Cho J, Kang D, *et al.* A Randomized Controlled Trial of Vagus Nerve-preserving Distal Gastrectomy Versus Conventional Distal Gastrectomy for Postoperative Quality of Life in Early Stage Gastric Cancer Patients. *Ann Surg* 2016;263:1079-84.

Submitted Aug 28, 2016. Accepted for publication Sep 05, 2016.

doi: 10.21037/tcr.2016.10.08

View this article at: <http://dx.doi.org/10.21037/tcr.2016.10.08>

Gastric cancer is a serious health problem, with the fourth highest incidence rate and the second highest mortality rate in the world. As improvements have been made in diagnostic techniques, including gastroscopy screening, the frequency of diagnosis in the early stage has increased (1). Treatments for early stage gastric cancer include endoscopic therapy and gastrectomy with lymph node dissection. Cases of early gastric cancer that are not eligible for endoscopic treatment are often treated with laparoscopic surgery, particularly in Asian countries (2). Advantages of laparoscopic surgery include a good cosmetic outcome with small scars, less pain, early recovery from intestinal peristalsis, and a shorter hospital stay. However, the procedure performed intraoperatively, so-called radical gastric resection accompanied with lymph node dissection, is the same as a conventional gastrectomy. Although patients with early stage gastric cancer have a good prognosis, after gastric resection, they suffer from issues such as diarrhea, weight loss, and gastrointestinal symptoms, in the long-term (3,4).

To minimize these postoperative issues, a vagus nerve-sparing gastric resection technique has been attempted (5,6). Spared nerves are of the hepatic branch of the anterior vagal trunk and the celiac branch of the posterior vagal trunk. There have been no comparative studies on the outcome of vagus nerve-sparing surgeries versus non-nerve-sparing surgeries. Instead, all studies investigating the issue have been observational studies. These have reported that diarrhea and weight loss were reduced upon performing

nerve-sparing surgeries (6). However, observational studies are limited to verifying the superiority of nerve sparing.

Kim *et al.* had reported the results of a comparison of vagus nerve sparing in patients with gastric cancer in a randomized controlled trial (RCT) (7). The patients had stage I gastric cancer and were treated at the Samsung Medical Center in Korea from January 2006 to December 2007. Of the 163 patients in total, 85 were assigned to the nerve-sparing group and 78 were assigned to the non-nerve-sparing group. Although surgeons could not be blinded to surgery, the patients were blinded during postoperative follow-up. The surgery was a radical resection accompanied with a D2 lymph node dissection performed by three experts. In the nerve-sparing group, the hepatic branch of the anterior vagal trunk and the celiac branch of the posterior vagal trunk were spared without any damage. A postoperative quality of life (QOL) evaluation was performed using EORTC QLQ-30 (8) and EORTC STO22 (9,10). The main concern, diarrhea, was also evaluated. These evaluations were made preoperatively and at 3 and 12 months, postoperatively. In addition to QOL evaluation, the social background of the patients, clinical factors, gallstones, recurrence of cancer, and 5-year survival rates were evaluated.

Patient backgrounds showed that the mean age was 55.2 years, and there were more males (77.1%) than females. In addition, more than 92% of patients in each group were stage IA patients. On comparison with the baseline scores, the diarrhea score was significantly lower

for the nerve-sparing group than for the non-nerve-sparing group at 3 and 12 months postoperatively.

General QOL was evaluated using EORTC QLQ-C30. Compared with the non-nerve-sparing group, the score for anorexia was significantly reduced in the nerve-sparing group at 3 and 12 months postoperatively. There was no significant difference between the groups regarding weight loss. In both groups, fatigue, anxiety, eating restriction, and body image deteriorated at 3 months postoperatively and did not regain baseline levels 12 months postoperatively. There were no significant differences between the groups with regards to cancer recurrence and death over 5 years of follow-up.

A reduction in loss of appetite and ghrelin secretion due to nerve sparing was studied. According to a report by Takiguchi *et al.*, sparing the celiac branch of the vagus nerve was associated with ghrelin secretion postprandially after surgery for gastric cancer (11). Explaining the postoperative loss of appetite to patients with gastric cancer and ghrelin is debatable and further examination is required. Postoperative loss of appetite in patients with gastric cancer may also be associated with changes in movement of the fundus. By vagus nerve sparing, nerve branches to the fundus are also spared, allowing better movement maintenance and reducing anorexia.

The limitations of this study are the small sample size, the fact that this was a single-facility study, and that the questionnaire was self-administered by the patients. There was also an issue with the surgeons' techniques. Although it has not been discussed, more oncological discussion may be needed. In the present study, stage IA patients accounted for $\geq 92\%$ in both groups. Thus, most patients did not exhibit lymph node metastasis. Vagus nerve sparing makes the most important procedure in surgery for gastric cancer, i.e., *en-bloc* resection of lymph nodes around the left gastric artery and the celiac artery, difficult. In cases with metastasis, oncological issues are likely. From the present test results, it is difficult to conclude that all stage I cases are suitable for nerve-sparing surgery.

However, the present study is significant as it is the first RCT that questioned the need for vagus nerve sparing in surgeries for gastric cancer. Results showed that diarrhea and anorexia could be reduced by vagus nerve sparing. In future, an evaluation using a larger sample size is required.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned and reviewed by the Section Editor Fengbo Tan, MD (Department of Gastrointestinal Surgery, Xiangya Hospital, Central South University, Changsha, China).

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/tcr.2016.10.08>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Moriwaki Y, Kunisaki C, Kobayashi S, et al. Progressive improvement of prognosis for patients with gastric cancer (dynamic stage grouping) with increasing survival interval from initial staging: how much longer can a given survivor expect to live? *Surgery* 2003;133:135-40.
2. Kitano S, Shiraishi N, Uyama I, et al. A multicenter study on oncologic outcome of laparoscopic gastrectomy for early cancer in Japan. *Ann Surg* 2007;245:68-72.
3. Tomita R, Fujisaki S, Tanjoh K, et al. Relationship between gastroduodenal interdigestive migrating motor complex and quality of life in patients with distal subtotal gastrectomy for early gastric cancer. *Int Surg* 2000;85:118-23.
4. Nunobe S, Okaro A, Sasako M, et al. Billroth 1 versus Roux-en-Y reconstructions: a quality-of-life survey at 5 years. *Int J Clin Oncol* 2007;12:433-9.
5. Kojima K, Yamada H, Inokuchi M, et al. Functional evaluation after vagus-nerve-sparing laparoscopically assisted distal gastrectomy. *Surg Endosc* 2008;22:2003-8.
6. Kim HH, Park MI, Lee SH, et al. Effects of vagus nerve

- preservation and vagotomy on peptide YY and body weight after subtotal gastrectomy. *World J Gastroenterol* 2012;18:4044-50.
7. Kim SM, Cho J, Kang D, et al. A Randomized Controlled Trial of Vagus Nerve-preserving Distal Gastrectomy Versus Conventional Distal Gastrectomy for Postoperative Quality of Life in Early Stage Gastric Cancer Patients. *Ann Surg* 2016;263:1079-84.
 8. Aaronson NK, Ahmedzai S, Bergman B, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst* 1993;85:365-76.
 9. Vickery CW, Blazeby JM, Conroy T, et al. Development of an EORTC disease-specific quality of life module for use in patients with gastric cancer. *Eur J Cancer* 2001;37:966-71.
 10. Blazeby JM, Conroy T, Bottomley A, et al. Clinical and psychometric validation of a questionnaire module, the EORTC QLQ-STO 22, to assess quality of life in patients with gastric cancer. *Eur J Cancer* 2004;40:2260-8.
 11. Takiguchi S, Hiura Y, Takahashi T, et al. Preservation of the celiac branch of the vagus nerve during laparoscopy-assisted distal gastrectomy: impact on postprandial changes in ghrelin secretion. *World J Surg* 2013;37:2172-9.

Cite this article as: Nunobe S, Sano T. Vagus nerve-preserving distal gastrectomy may improve the quality of life after gastrectomy in early stage gastric cancer patients. *Transl Cancer Res* 2016;5(Suppl 4):S882-S884. doi: 10.21037/tcr.2016.10.08