Commentary

# Perspective of new techniques overcoming laparoscopic sentinel node biopsy for early gastric cancer

**Shinichi Kinami**

Department of Surgical Oncology, Kanazawa Medical University,Uchinada, Ishikawa, Japan
*Correspondence to:* Shinichi Kinami, M.D. Department of Surgical Oncology, Kanazawa Medical University, Uchinada, Ishikawa, Japan.
Email: kinami@kanazawa-med.ac.jp.

Received: 07 August 2016; Accepted: 08 August 2016; Published: 22 August 2016.
doi: 10.21037/tgh.2016.08.01
**View this article at:** http://dx.doi.org/10.21037/tgh.2016.08.01

The modern standard curative procedure for early gastric cancers falling outside the indication parameters for endoscopic resection is laparoscope-assisted gastrectomy with lymph node dissection. Patients undergoing standard gastrectomy with lymph node dissection experience postgastrectomy symptoms. These symptoms often pose life-long problems for patients. Thus, lymph node dissection should be avoided to preserve the stomach, alleviate the aforementioned symptoms, and improve postoperative quality of life. At present, sentinel lymph node (SN) biopsy is the most reliable method for identification of node-negative cases.

A standard method of SN biopsy for early gastric cancer is combination mapping with technetium-99m-tin colloid and isosulfhan blue (1). However, blue dye deteriorates quickly, and radioactive colloids exhibit a shine through effect during gamma probe detection of hot nodes in the surgical field. We believe that combination mapping is not suitable for laparoscopic gastrectomy.

Lee *et al.* developed a new technique for SN mapping using a fluorescent dye and visible light for early gastric cancer that was published in *Annals of Surgery* (2). This fluorescein method is a totally new technique and is superior because of its low cost and because it is suitable for laparoscopic surgery. I am favorably inclined towards this paper because they described the decision process of the optimal setting of the mapping to the last detail. We developed the optimal setting for ICG fluorescent mapping and also struggled through the decision process (3).

Unfortunately, this paper contains a regrettable point, that is the optimal timing of the judgment about the lymphatic basins and SNs. Lee *et al.* stated that the number of lymphatic basins was only one in all patients, but I think this was a false conclusion. This error may be caused by a misunderstanding of the SN concept, and the setting of the timing of judgment. Sentinel nodes are defined as the first draining nodes from the primary tumor. The definition of the "first node" is the node directly receiving the lymphatics from the tumor, not the node dyeing the fastest. The lymphatic flow of the stomach is complicated, and the direction of the lymphatics from the tumor is not the sole direction; often there are two or three directions. As a result, the number of SNs in early gastric cancer is generally five to eight nodes (1,3,4). The lymphatic basins are thought to be the primary lymphatic drainage area in each patient, and patients with gastric cancer often have two or three basins (1,3-5). The authors need to take sufficient time for detection of and decisions about the SNs and lymphatic basins, while dyeing all of the direct nodes. I am one of the individuals involved in the development of blue dye mapping for gastric cancer, and the optimal timing for the decision about the SNs in blue dye mapping was about 20 minutes after intraoperative endoscopic injection (4).

In recent years, one of the topics under discussion on SN mapping for gastric cancer has been ICG fluorescent mapping. We concluded that ICG fluorescent mapping is feasible in both, open and laparoscopic surgery for early gastric cancer (3). The weaknesses of ICG fluorescent mapping are the need for laparoscopic equipment that can detect the ICG fluorescence, and the subjectivity of SN evaluation and potential secondary node contamination (3). In comparison with ICG fluorescent mapping, the advantage of the Fluorescein method developed by Lee *et al.* is that it does not need special expensive equipment.

Nevertheless, the weakness of the subjectivity of SN evaluation is the same in both methods. This is a common problem in dye mapping. In ICG fluorescent mapping, one attempt to overcome this weakness is adopting new fluorescent agents with both, ICG fluorescence and colloid particle characteristics, such as liposomal ICG or nano-colloidal ICG (6,7). These agents detect only fluorescent SNs and not secondary nodes, and could potentially be useful in laparoscopic SN biopsy in cases of gastric cancer. For the fluorescein method, it will be necessary to develop a new agent having fluorescing equal to Fluorescein and exhibiting nano-colloidal performance. If such an agent is successfully developed, it may be used alone as a standard tracer instead of in combination with other SN mapping tracers.

## Acknowledgements

None.

## Footnote

*Provenance:* This is a Guest Commentary commissioned by Section Editor Rulin Miao, MD [Key laboratory of Carcinogenesis and Translational Research (Ministry of education/Beijing), Gastrointestinal Tumor Center, Peking University Cancer Hospital & Institute, Beijing, China].
*Conflicts of Interest:* The author has no conflicts of interest to declare.

*Comment on:* Lee CM, Park S, Park SH, *et al.* Sentinel Node Mapping Using a Fluorescent Dye and Visible Light During Laparoscopic Gastrectomy for Early Gastric Cancer: Result of a Prospective Study From a Single Institute. Ann Surg 2016. [Epub ahead of print].

doi: 10.21037/tgh.2016.08.01
**Cite this article as:** Kinami S. Perspective of new techniques overcoming laparoscopic sentinel node biopsy for early gastric cancer. Transl Gastroenterol Hepatol 2016;1:64.

## References

1. Kitagawa Y, Takeuchi H, Takagi Y, et al. Sentinel node mapping for gastric cancer: a prospective multicenter trial in Japan. J Clin Oncol 2013;31:3704-10.
2. Lee CM, Park S, Park SH, et al. Sentinel Node Mapping Using a Fluorescent Dye and Visible Light During Laparoscopic Gastrectomy for Early Gastric Cancer: Result of a Prospective Study From a Single Institute. Ann Surg 2016. [Epub ahead of print].
3. Kinami S, Oonishi T, Fujita J, et al. Optimal settings and accuracy of indocyanine green fluorescence imaging for sentinel node biopsy in early gastric cancer. Oncol Lett 2016;11:4055-4062.
4. Miwa K, Kinami S, Taniguchi K, et al. Mapping sentinel nodes in patients with early-stage gastric carcinoma. Br J Surg 2003;90:178-82.
5. Kinami S, Fujimura T, Ojima E, et al. PTD classification: proposal for a new classification of gastric cancer location based on physiological lymphatic flow. Int J Clin Oncol 2008;13:320-9.
6. Toyota T, Fujito H, Suganami A, et al. Near-infrared-fluorescence imaging of lymph nodes by using liposomally formulated indocyanine green derivatives. Bioorg Med Chem 2014;22:721-7.
7. Brouwer OR, Buckle T, Vermeeren L, et al. Comparing the hybrid fluorescent-radioactive tracer indocyanine green-99mTc-nanocolloid with 99mTc-nanocolloid for sentinel node identification: a validation study using lymphoscintigraphy and SPECT/CT. J Nucl Med 2012;53:1034-40.

 