

LETTER TO THE EDITOR

Detection of Sentinel Node by Fluorescence and Infrared Ray Imaging System in Gastric Cancer

TO THE EDITOR:

We are interested in the establishment by Miyashiro et al. of a new technique that uses indocyanine green (ICG) fluorescence for sentinel node (SN) detection in gastric cancer surgery.¹ Diagnostic validity of SN mapping has been shown in various types of cancer surgery, including breast cancer and gastrointestinal cancer surgery. In surgery for gastric cancer, acceptable detection rates of SNs and accuracy of intraoperative SN examination have been reported that use the dye-guided or radio-guided method.^{2,3}

We have recently reported that infrared ray electronic endoscopy (IREE), combined with ICG injection, can efficiently detect SNs in patients with gastric cancer.⁴ More recently, Kusano et al. proposed that SN mapping guided by ICG fluorescence imaging would be a promising tool for SN navigation surgery for early gastric cancer.⁵ We agree with the authors' comments that the dye-guided method is potentially safer, more convenient, and more cost-effective compared with the radioactive probe-guided method.

However, we have some different opinions on the usefulness of the ICG fluorescence method for open and laparoscopic gastric cancer surgery. We performed a similar study to compare an imaging system by IREE with a fluorescence imaging system that used the photodynamic (PDE) system (Hamamatsu Photonics, Japan) for detection of ICG-stained SNs.⁴ In this study, an ICG solution was prepared at a concentration of 5 mg/ml, and a total dose of 10 mg was injected around the cancer at the beginning of surgery. As in the current study, the sensitivity of our fluorescence imaging system for detecting of ICG-stained SNs was very high, but this does not necessarily mean that the fluorescence imaging system is better than the infrared system. First, the latter procedure enables us to perform real-time observation of the lymphatic vessels and selective detection of SNs, while ICG injection 1 day before surgery in the fluorescence method eliminates such an advantage. Furthermore, the dark environment necessary for the fluorescence method seems to

prohibit continuation of surgical procedures, whereas IREE does not disturb such continuity. Second, the PDE system that was used for the current study may be too large to use intracorporeally during surgery, whereas an IREE system (Olympus, Japan) can be easily used for laparoscopic surgery.

Although the PDE system may be as useful as the IREE system under certain condition, we believe that further technical and instrumental developments are required for the PDE system.

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REFERENCES

1. Miyashiro I, Miyoshi N, Hiratsuka M, et al. Detection of sentinel node in gastric cancer surgery by indocyanine green fluorescence imaging: comparison with infrared imaging. *Ann Surg Oncol.* 2008;15:1640–3.
2. Aikou T, Kitagawa Y, Kitajima M, et al. Sentinel lymph node mapping with GI cancer. *Cancer Metastasis Rev.* 2006;25:269–77.
3. Kitagawa Y, Fujii H, Kumai K, et al. Recent advances in sentinel node navigation for gastric cancer: a paradigm shift of surgical management. *J Surg Oncol.* 2005;90:147–51.
4. Nimura H, Narimiya N, Mitsumori N, et al. Infrared ray electronic endoscopy combined with indocyanine green injection for detection of sentinel nodes of patients with gastric cancer. *Br J Surg.* 2004;91:575–9.
5. Kusano M, Tajima Y, Yamazaki K, et al. Sentinel node mapping guided by indocyanine green fluorescence imaging: a new method for sentinel node navigation surgery in gastrointestinal cancer. *Dig Surg.* 2008;25:103–8.