

A Novel Navigation for Laparoscopic Anatomic Liver Resection Using Indocyanine Green Fluorescence

Takeo Nomi, MD, PhD, Daisuke Hokuto, MD, PhD, Takahiro Yoshikawa, MD, Yasuko Matsuo, MD, and Masayuki Sho, MD, PhD, FACS

Department of Surgery, Nara Medical University, Kashihara-shi, Nara, Japan

ABSTRACT

Background. Among all laparoscopic liver resection techniques, anatomic liver resection is one of the most challenging procedures, with disorientation readily occurring during the laparoscopic approach compared with the open approach.¹ Thus, navigation is warranted for laparoscopic anatomic liver resection. Recent research has remarkably established intraoperative fluorescence imaging techniques using indocyanine green fluorescence (ICG) in the field of liver surgery.^{2–4} This report describes real-time navigation for anatomic liver resection using the novel ICG system, PINPOINT (Stryker, Kalamazoo, MI).

Methods. The target Glissonian pedicle was identified and temporally clamped after confirmation of blood supply to the preserved adjacent segment using ultrasonography. Next, 1.5 mg of ICG was intravenously administered using the negative counterstaining method. After 3 min of administration, the ICG-stained area could be readily recognized. Parenchymal transection was subsequently initiated along the interface between the ICG-positive and ICG-negative areas using the Pringle maneuver.

Results. Using PINPOINT, laparoscopic anatomic liver resection was performed for 16 patients. The extent of liver resection comprised two left hepatectomies, three right-anterior sectionectomies, three right-anterior sectionectomies, and eight segmentectomies. The identification rate

of clear demarcations in the ICG images was 100%. The intraoperative blood loss was 226 mL, and the operative time was 305 min. Only one patient encountered the major postoperative complication of ascites, and all the patients attained R0 resection.

Conclusions. Because the images provided by the ICG system are clearer than conventional ICG images, it could facilitate real-time navigation for laparoscopic anatomic liver resection.

CONFLICT OF INTEREST There are no conflicts of interest.

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T. Nomi, MD, PhD

e-mail: nomi@naramed-u.ac.jp