



# Pure Laparoscopic Living Donor Right Hepatectomy Using Real-Time Indocyanine Green Fluorescence Imaging

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## Abstract

**Introduction** In recent decades, the quantitative and technological development of laparoscopic liver resection has resulted in an extension into the transplantation area.<sup>1,2</sup> However, laparoscopic living donor hepatectomy is still in its infancy due to technical difficulties and extreme caution regarding donor safety.<sup>3</sup> Several experienced major centers have demonstrated the feasibility and safety of laparoscopic living donor hepatectomy, and recent advances in laparoscopic imaging technology support this move.<sup>4</sup> In particular, indocyanine green near-infrared fluorescence imaging helps determine the correct liver parenchyma anatomical resection and the exact point of bile duct division.<sup>4–6</sup> This video demonstrates the technique of pure laparoscopic living donor right hepatectomy and the usefulness of indocyanine green fluorescence imaging.

**Methods** The donor was a 32-year-old gentleman who decided to donate part of his liver to his wife who was suffering from viral liver cirrhosis and hepatocellular carcinoma. His BMI was 20.3 kg/m<sup>2</sup> and the preoperatively estimated donor's right liver volume was 836 ml, representing 63.6% of his entire liver. With the recipient's weight of 57 kg, the graft-to-recipient weight ratio (GRWR) was 1.6%. The liver had classic hilar anatomy except that the right posterior intrahepatic duct was joined separately to the left main hepatic duct. The patient setting and the placement of the trocars were the same as for our conventional laparoscopic right hepatectomy technique.<sup>7</sup> After right hepatic artery and portal vein isolation and clamping, 2.5 mg of indocyanine green was injected intravenously.

**Results** Total operation time was 370 min and estimated blood loss was 150 ml without transfusion. Indocyanine green fluorescence imaging clearly demonstrated the anatomical demarcation between the lobes and visualized the running of the biliary tree. His postoperative course was uneventful, and he was discharged on postoperative day 7.

**Conclusion** Real-time indocyanine green fluorescence imaging may be particularly helpful for delineating the anatomical surgical plane and determining the appropriate division point of the hepatic duct during laparoscopic living donor hepatectomy.

**Keywords** Laparoscopic · Hepatectomy · Donor · Fluorescence image

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- Agreement to be 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: Ye Seul Kim and Sung Hoon Choi

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

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