



The need for “practical guidelines” of laparoscopic liver resection enabling appropriate patient selection

Takeaki Ishizawa, Kiyoshi Hasegawa

Hepato-biliary-pancreatic Surgery Division, Department of Surgery, Graduate School of Medicine, the University of Tokyo, Tokyo, Japan

Correspondence to: Kiyoshi Hasegawa, MD, PhD, FACS. Hepato-biliary-pancreatic Surgery Division, Department of Surgery, Graduate School of Medicine, the University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan. Email: kihase-tyk@umin.ac.jp.

Provenance: This is an invited Editorial commissioned by the Editor-in-Chief Giovanni Battista Levi Sandri (Division of General Surgery, Santa Scolastica Hospital, Cassino, Lazio, Italy).

Comment on: Cho JY, Han HS, Wakabayashi G, *et al.* Practical guidelines for performing laparoscopic liver resection based on the second international laparoscopic liver consensus conference. *Surg Oncol* 2018;27:A5-9.

Received: 02 July 2018; Accepted: 10 July 2018; Published: 17 July 2018.

doi: 10.21037/ls.2018.07.02

View this article at: <http://dx.doi.org/10.21037/ls.2018.07.02>

In 2014, the Second International Consensus Conference on Laparoscopic Liver Resection (2nd ICLLR) was held in Morioka, Japan, with the aim to provide recommendations for laparoscopic liver resection (LLR) through thorough review of previous literature followed by opinion exchange among experts of laparoscopic and open liver resection (OLR) (1). Recently, Cho and colleagues (2) have published a short review paper, entitled “practical guidelines for performing laparoscopic liver resection based on the second international laparoscopic liver consensus conference”. In this report, the authors provide valuable recommendations on eight topics, including “indications”, “tumor size”, “tumor location”, “major LLR”, “anatomical LLR”, “donor hepatectomy”, “techniques and essentials for bleeding control”, and “education and learning curve”, for the clinical applications of LLR. Herein, we would like to highlight questions on clinical utility and relevance of this guideline, focusing on indications of LLR and donor hepatectomy.

Indications

Based on 170 case series/cohort studies and 12 meta-analyses on postoperative outcomes of LLR compared with OLR, the 2nd ICLLR concluded that LLR might be associated with lower incidence of postoperative complications and shorter length of postoperative hospital stay, without deteriorating postoperative mortality, margin negativity, or long-term outcomes (1). However, the evidence level for the consensus on postoperative outcomes of LLR was still defined as

“LOW” because of a lack of prospective randomized controlled trials (1). Following the 2nd ICLLR, several studies using propensity score-matched analysis have demonstrated favorable postoperative outcomes of LLR over OLR for hepatocellular carcinoma (3-5) and colorectal liver metastasis (4,6), which led Cho and colleagues to conclude that “LLR for malignant tumors shows better short-term outcomes and similar long-term outcomes compared with those of open surgery in specialized centers” (2). However, this statement in their guideline may overstress the positive aspects of LLR, because case-matched studies with propensity score matching have limitations in reflecting underlying differences in patients’ demographic background and tumor factors between the two procedures encountered in clinical settings, which usually make hepatectomy procedures more difficult and increase the risk of postoperative complications in patients undergoing OLR. In other words, favorable operative outcomes after LLR revealed in previous comparative studies were mainly due to appropriate patient selection between laparoscopic and open approaches. Detailed evaluation of patients who were excluded after propensity score matching may elucidate clinical factors enabling selection of patients eligible for LLR. Potential disadvantages in LLR, such as longer operation time and higher operative cost, should also be commented in the practical guideline.

Donor hepatectomy

Since the first description by Cherqui and colleagues in

2002 (7), more than 100 cases of pure-laparoscopic hepatectomy for procurement of the left lateral section graft have been reported with acceptable operative outcomes (1). Regarding adult-to-adult liver transplantation, however, only 19 cases of pure-laparoscopic major donor hepatectomy (12 left hepatectomy and 7 right hepatectomy) had been reported at the time of the 2nd ICCLR in 2014 (1). Therefore, the consensus committee simply stated that “this procedure cannot be recommended for wide introduction at this time”. In 2017, the following international meeting focusing on laparoscopic donor hepatectomy was held in Seoul. Despite a limited number of the latest reports on pure-laparoscopic (in total, 5 cases) (8-10) or robotic (13 cases) (11) donor hepatectomy since 2014, the expert panel seemed to strengthen recommendation for pure-laparoscopic donor hepatectomy at the time of the 2nd ICCLR (1) by concluding that laparoscopic donor left hepatectomy could be a standard procedure in the near future, while donor right hepatectomy was still in a developing stage (12). The current practical guideline proposed by Cho and colleagues may also emphasize the role of LLR in donor hepatectomy by stating that “laparoscopic donor right hepatectomy is recommended in high-volume LLR and LDLT centers” (2).

Considering the extremely limited number of pure-laparoscopic donor major hepatectomies reported previously, we are concerned about the statement classifying pure-laparoscopic donor hepatectomy as a recommendable surgical procedure (2), even if it is limited to high-volume centers. In our experience of open donor hepatectomy (close to 600 cases), procurement of the right or left hemiliver for adult-to-adult liver transplantation is technically quite different from major hepatectomy as a cancer treatment in that hepatic vessels should be divided with attention to both ends (donor side and graft side) for assuring donor safety and graft function. Most importantly, in donor hepatectomy, the acceptable incidence of operative complications is far lower than that of LLR for other etiologies, and every effort should be made to achieve zero-donor mortality (13). To issue further recommendations on laparoscopic donor hepatectomy, we need adequately designed larger prospective studies under careful monitoring of operative data and graft function, without extrapolating previous results of major LLR to treat tumors into donor hepatectomy. We would also like to point out that donor left hepatectomy can be more complicated than procurement of the right liver graft, especially in donors with the posterior branch of the right hepatic duct draining

into the left hepatic duct.

In the present study, Cho and colleagues (2) provided cutting-edge and highly valuable information on operative outcomes after LLR compared with OLR, referring to the latest case reports and multicenter/nation-wide studies using propensity score-matched analysis, which had been reported following the 2nd ICCLR. In contrast, this report should be considered as “expert opinions” rather than “guidelines”, because it was not based on systematic reviews or evaluation by experts of open hepatectomy as well as laparoscopic surgeons. In clinical settings, surgeons first plan the optimal hepatectomy procedures (extent of resection), balancing oncological efficacy and preservation of postoperative hepatic function, irrespective of the surgical approaches. Then, applicability of LLR for completing the planned hepatectomy procedure should be assessed based on the patients’ and surgeons’ factors. At this stage, we need “practical” guidelines to allow us to make an accurate judgment on indications of LLR in each individual case, to assure favorable operative outcomes as reported in previous comparative studies with OLR.

Acknowledgements

Funding: This work was supported by a grant from the Japanese Foundation for Research and Promotion of Endoscopy.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Wakabayashi G, Cherqui D, Geller DA, et al. Recommendations for laparoscopic liver resection: a report from the second international consensus conference held in Morioka. *Ann Surg* 2015;261:619-29.
2. Cho JY, Han HS, Wakabayashi G, et al. Practical guidelines for performing laparoscopic liver resection based on the second international laparoscopic liver consensus conference. *Surg Oncol* 2018;27:A5-9.
3. Takahara T, Wakabayashi G, Beppu T, et al. Long-term and perioperative outcomes of laparoscopic versus open liver resection for hepatocellular carcinoma with propensity score matching: a multi-institutional Japanese study. *J Hepatobiliary Pancreat Sci* 2015;22:721-7.

4. Takahara T, Wakabayashi G, Konno H, et al. Comparison of laparoscopic major hepatectomy with propensity score matched open cases from the National Clinical Database in Japan. *J Hepatobiliary Pancreat Sci* 2016;23:721-34.
5. Xu HW, Liu F, Li HY, et al. Outcomes following laparoscopic versus open major hepatectomy for hepatocellular carcinoma in patients with cirrhosis: a propensity score-matched analysis. *Surg Endosc* 2018;32:712-9.
6. Beppu T, Wakabayashi G, Hasegawa K, et al. Long-term and perioperative outcomes of laparoscopic versus open liver resection for colorectal liver metastases with propensity score matching: a multi-institutional Japanese study. *J Hepatobiliary Pancreat Sci* 2015;22:711-20.
7. Cherqui D, Soubrane O, Husson E, et al. Laparoscopic living donor hepatectomy for liver transplantation in children. *Lancet* 2002;359:392-6.
8. Han HS, Cho JY, Yoon YS, et al. Total laparoscopic living donor right hepatectomy. *Surg Endosc* 2015;29:184.
9. Chen KH, Huang CC, Siow TF, et al. Totally laparoscopic living donor right hepatectomy in a donor with trifurcation of bile duct. *Asian J Surg* 2016;39:51-5.
10. Hong SK, Suh KS, Kim HS, et al. Pure 3D laparoscopic living donor right hemihepatectomy in a donor with separate right posterior and right anterior hepatic ducts and portal veins. *Surg Endosc* 2017;31:4834-5.
11. Chen PD, Wu CY, Hu RH, et al. Robotic liver donor right hepatectomy: A pure, minimally invasive approach. *Liver Transpl* 2016;22:1509-18.
12. Han HS, Cho JY, Kaneko H, et al. Expert Panel Statement on Laparoscopic Living Donor Hepatectomy. *Dig Surg* 2018;35:284-8.
13. Ishizawa T, Hasegawa K, Kokudo N. Laparoscopy-assisted hybrid left-side donor hepatectomy: is it truly less invasive for living donors? *World J Surg* 2014;38:1560-1.

doi: 10.21037/ls.2018.07.02

Cite this article as: Ishizawa T, Hasegawa K. The need for “practical guidelines” of laparoscopic liver resection enabling appropriate patient selection. *Laparosc Surg* 2018;2:34.