Editorial

# Laparoscopic liver resection in the treatment of HCC with liver cirrhosis: would it provide superiority to conventional open hepatectomy?

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Treatment of hepatocellular carcinoma (HCC) should focus on both curability and invasiveness. Liver resection is the ideal option for solitary or limited multifocal HCCs in patients with preserved liver function (1). The rate of HCC recurrence is known to be associated with cirrhosis progression. Surgical indications for HCC associated with portal hypertension remain controversial, however, liver resection could be one of option in selected patients with mild portal hypertension, considering the shortage of donors for liver transplantation (1). In this group of patients, careful consideration in surgical candidacy with assessment of hepatic functional reserve, as well as, management of portal hypertension are extremely important in order to avoid postoperative complications such as ascites and liver failure.

Due to technologic developments and refinement of endoscopic technique, laparoscopic liver resection (LLR) is recently considered the approach of choice and has been increasingly performed worldwide. In 2014, the 2$^{nd}$ international consensus conference on LLR concluded that minor LLR had become standard practice, and the experience of major or anatomical LLR has been gained (2).

Systematic reviews and meta-analyses of nonrandomized comparative or case-control studies of LLR for HCC suggested that LLR results in less blood loss and shorter postoperative hospital stays as compared with open liver resection (OLR) (3-7). Additionally, a meta-analysis comparing the outcomes of LLR and OLR for HCC in patients with chronic liver disease reported favorable short-term outcomes in LLR (8), which suggests that LLR provides in fewer postoperative complications owing to factors such as less bleeding, a simpler mobilization procedure, and minimal destruction of the body wall (9). With respect to oncological considerations, long-term outcomes showed no oncological disadvantage in LLR as compared with OLR in relation to disease-free or overall survival, especially in well compensated (Child–Pugh class A) liver cirrhosis (3,4,7).

Propensity score matching analysis has been assessed in order to minimize the bias in comparison between retrospective cohorts of OLR and LLR, in considering the difficulty to conduct a randomized controlled trial. Takahara *et al*. (10) compared outcomes between 446 patients who underwent LLR and 2,969 patients who underwent OLR, in a Japanese multicenter study. LLR also resulted in significantly less bleeding, shorter hospital stays, and fewer complications, with no difference in survival rates. Similar results were reported by Sposito *et al*. (11).

In most recent study, Cheung *et al*. described comparison of pure LLR versus OLR for HCC in 110 patients with Child A liver cirrhosis by propensity matched setting (12). Interestingly, their result has shown long-term

oncological superiority of LLR than that of OLR. Disease-free survival rates were not different in both groups, overall survival rates were favored in the laparoscopic group (P=0.033). The survival outcomes were comparable between LLR and OLR in patients with stage-1 HCC, however, the laparoscopic approach provides better disease free survival rate in patients with stage-2 HCC (P=0.045). The difference is suggested to be caused by less blood loss and less tissue manipulation expressed as "no-touch" in LLR than OLR.

Although, they have matched patients with tumor pathological features, the limitation in this study raised due to small clinical cases in single institution, difference in follow up period and bias in extent of resection between LLR and OLR should be pointed out. Their LLR patients were carefully selected with adaptation on their learning curve of laparoscopic technique. Antero-laterally located tumors which can be favorably approached by laparoscopy, would have been chosen. These biases might have been enhanced to their favorable results of long-term outcome in the laparoscopic group.

In order to create a more reliable evidence, a broad-based registry was recommended in the 2nd international Consensus Conference on LLR (2). In Japan, a prospective registry system for LLR was launched in October 2015 (13). All patients planned to perform LLR at registered institutions are requested to submit online at four time points: preoperatively, postoperatively, after discharge, and after readmission. The latest data have been obtained in this registry over the past year (14). This study has been expected to be one of the largest prospective databases of LLR in the world, and will serve to protect patients by accurately assessing the outcomes of LLR (15).

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## Footnote

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

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