Long-term results of laparoscopic liver resection for the primary treatment of hepatocellular carcinoma: Role of the surgeon in anatomical resection

Woo-Hyung Kang1, Ki-Hun Kim2, Dong-Hwan Jung2, Gil-Chun Park3, Kim Seok-Hwan4, Hwud-ong Cho5, Sung-Gyu Lee6

1. Department of Surgery, Division of HBP Surgery and Liver Transplantation, Korea University Medical Center, Korea University Medical College, Seoul, Korea
2. Division of Hepatobiliary Surgery & Liver Transplantation, Department of Surgery, Asan Medical Center, University of Ulsan, Seoul, Korea
3. Department of Surgery, Chungnam national university hospital, Daejon, Korea

Background
Liver resection is a potentially curative therapy for hepatocellular carcinoma (HCC). LLR is a newly developed and safe technique associated with shorter hospital stay, less pain, better cosmetic outcomes, and similar complication rates as open surgery. Our centers have performed the greatest number of anatomical resections within a short period. In the present study, we aimed to evaluate the long-term oncologic outcomes, treatment effectiveness, and factors affecting the prognosis of patients who underwent LLR. Furthermore, we also aimed to analyze the effect of anatomical resection on liver resection through the laparoscopic approach, and how it affects prognosis.

Methods
In the present study, we enrolled 234 patients who had undergone LLR for HCC between July 2007 and December 2015 at Asan Medical Center. All included patients had not received prior treatment prior to HCC, such as transarterial chemoembolization (TACE), radiofrequency ablation, and surgery (Fig. 1), as these treatments can influence HCC progression. All operations were performed by a single experienced surgeon (K.H. Kim) who has been performing liver donor hepatectomy and hepatobiliary surgery for > 15 years. The medical records of patients were retrospectively reviewed for demographic characteristics, clinical presentation, operative results, hospital course, complications, mortality, and pathological findings.

Patient selection for LLR
We selected patients with good general performance before surgery, and all patients had an American Society of Anesthesiologists (ASA) grade of 1–3. Concerning liver function, most patients were classified as having cirrhosis with a Child–Pugh class of A or B, without any evidence of severe portal hypertension on computed tomography (CT). Patients who had residual liver volume ≥ 35% after surgery were selected.

The indications for LLR were not significantly different from those for open liver resection (OLR). However, the following criteria were applied selectively: the tumors should be solitary, did not exceed 7 cm in size, and did not involve any of the major vessels and hilar structures.

Pathologic and perioperative features

Results

Patient characteristics

Postoperative outcomes

No mortality.

The overall morbidity rate was 7.7% (18 patients) and the overall major morbidity (Clavien–Dindo grade ≥ 3) rate was 2.1% (5 patients).

Conclusion

LLR is acceptable as the primary treatment for patients with HCC with good hepatic function and with an appropriate anatomical structure, and is associated with an improved prognosis. LLR can achieve lower recurrence rates through anatomical resection.