# General indications of laparoscopic liver resection for hepatocellular carcinoma

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## 1. Introduction

Hepatocellular carcinoma is the most common primary carcinoma of the liver, in particular occurred in chronic liver disease. In management of HCC, multidisciplinary treatment is used, and nowadays surgical treatment (resection and transplantation) is the gold standard of care. In particular, resection is safe and has excellent results than other locoregional therapy and can be a good bridge-therapy before transplantation, and in that way have open and laparoscopic surgery. In many HCC patients with chronic liver disease, even minor operation may induce severe postoperative complications and mortality. Laparoscopic surgery has some advantages that the wound is small, and the pain is less and ever faster recovery of the patient, in addition to the advantage, it has the excellent treatment results of malignant disease, and also it is safe in patients with chronic liver disease, so many attempts have been made. However, indications for laparoscopic liver resection in patients with hepatocellular carcinoma should be considered in accordance with the degree of liver function, tumor size, location, and other considerations (transplantation..) carefully.

## 2. General Indications of LLR for HCC

The general indications for laparoscopic liver resection are not much different from the open approach. Because of most patients with cirrhosis, after preoperative evaluation of the liver function, the patient within the Child-Pugh A is considered, and the balance between remnant liver volume after resection and liver function will be considered. Through the Imaging study including CT, MRI, pet-CT, we evaluate tumor characteristics like the number, size and location of tumor, and identify whether the metastasis. According to the BCLC algorithm, patients with no portal hypertension and single HCC within milan criteria is best indications of resection. However slightly different indications for the resection have shown in each country. In Korea, if the patient within Child-Pugh A, single HCC should be considered, and in HCC patients with Child-Pugh super B accompanied by mild portal hypertension, restricted surgical resection less than hemihepatectomy could selectively be considered. Lee et al. reported good results for resection in huge HCC more than 10cm, also some paper reported 1, 3 year survival rate were 73%, 48% after hepatic resection for patients with portal vein thrombus. So, practical indications of resection for hepatocellular carcinoma (HCC) is expanded. However, after considering multiple risk factors, resection should be carefully applied and the same indications of resection for HCC should be considered in laparoscopic area.

Especially, the location and size of the tumor is an important consideration, before determining whether laparoscopic liver resection will be feasible technically. In 2008 the Louisville statement declared that most favorable indications for the laparoscopic resection was a solitary lesions, 5cm or less, located in peripheral liver segments 2 to 6 and tumor located in the difficult posterior segments (4a,7,8) was limited for resection. Many authors also announced that above indications was the optimal. However, Yoon et al. report that LLR can safely performed in selected patients with HCC located in all segments of the liver, including the posterosuperior segments, and Ai et al. presented feasibility and safety of LLR for HCC with more than 5cm. Indications of laparoscopic liver resection is also expanding. However, through multidisciplinary conference, individual treatment plan for HCC should be established before surgery, and overcoming of the limitation of laparoscopic liver resection through the improvement of surgical experiences and the development of instruments will make that laparoscopic liver resection will become the standard of treatment of HCC as soon as possible.

**Table 1. Indications of laparoscopic liver resection for HCC**

| | Best indication | Consideration |
|---|---|---|
| Liver function | Child A | Super Child B |
| Tumor number | 1 | No limitation (one lobe) |
| Tumor location | Peripheral 2-6 | Most favorable: II, III, Iva, V, VI (peripheral)<br>Challengeable: I, VII, VIII (superficial)<br>Only experts: I, VII, VIII (deep) |
| Tumor size | < 5cm | large (exophyting, left) |
| Multinodular tumor | no | Can be (one lobe) |
| Major vascular invasion | no | ?? |

## 3. References


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