

Laparoscopic approach for hepatocellular carcinoma: where is the limit?

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Hepatocellular cancer (HCC) is the sixth most common malignant tumor worldwide and the most common primary liver cancer (1). Liver resection or liver transplantation is the therapeutic gold standards in patient with HCC. Due to advanced disease, extrahepatic metastases, or inadequate liver reserve, only 15% to 30% of patients with HCC can undergo to surgery (2). Five-year risk of recurrence of HCC after resection is as high as 70% because the underlying chronic liver disease continues to put the patient at risk for the development of new cancer nodules (3). Starting from the assumption that recurrence may be newly treated with surgery, laparoscopic approach is recommended, when applicable, for limiting the abdominal adhesions. Since 2000, more than 600 cases of laparoscopic resection for HCC have been reported, with no difference on the oncologic outcomes between open or laparoscopic approach (4). In 2008, the Louisville consensus of experts suggested that the best indications for laparoscopy were solitary lesions less than 5 cm, located in the anterior segments, at a distance from the line of transection, the hepatic hilum, and the vena cava (5). Nowadays, those indications seem to be implemented.

Piardi *et al.* (6) have analyzed the laparoscopic resection for HCC in the Western and in the Middle-Eastern World. The authors have reviewed English and Chinese literature of papers with up-to-15 cases reported, with intent to compare resection approach, technical approaches, postoperative course and outcomes. All series were composed by retrospective analyses. For Western experience, 11 studies were analyzed, two of them with more than 100 patients. Thirteen studies were analyzed from Middle Eastern experience, with only one study with more than 100 patients. Patient selection

appeared to be quite uniform between the two regional scenarios. Laparoscopic approach was recommended for lesions within 5 cm. In Western experience, Child-Pugh score indication was uniform in all series, Child B/C being only sporadically reported. On the other hand, in Middle Eastern series, patients with Child B/C were more frequently resected with laparoscopic approach. For Middle East authors tumor location does not seem to be a selection criterion compared with Western authors, as reported in the Louisville statements (5), where resection in posterior segment are more difficult to planned. This difference may be explain by the characteristics of patients, in Middle Eastern (BMI<25) patient seem to be leaner than in Western (BMI>26). Morbidity and mortality were acceptable in both groups. Resection margin in Middle East was reported to be <1 cm in 62.5% of cases. These results are in contrast with the >2 cm-free margin recommended by Shi M *et al.* (7). However, a recent comparative study of oncologic and clinical outcomes demonstrated that there is no difference between open or laparoscopic approaches in relation to resection margin, and oncologic outcomes of laparoscopic liver resection for HCC is not inferior to open liver resection (8). Ettore *et al.* compared laparoscopic liver resection (38 were HCC) in two groups with underlined liver disease and normal liver, without detecting differences in terms of morbidity and mortality risks (9). A French multicentric study concludes that laparoscopic approach should be proposed as a first-line treatment in patients with HCC (10). A report of five patients treated with intercostal laparoscopic approach for the resection of segments 7-8 has been proposed (11). A Chinese group suggested pushing up to 10 cm of diameter the limit of HCC treatable with

laparoscopic resection (12). Mini-invasive approach is commonly adopted as a bridge treatment for HCC-patients waiting for liver transplantation (13). Laparoscopic approach presents the advantages of a minimally invasive procedure (less postoperative pain, fast recovery and early return to work). In case of recurrence, a first laparoscopic approach does not contraindicate a new laparoscopy, consenting to present few adhesions.

In conclusion, we can assume that laparoscopic liver resection is commonly performed worldwide in patients with HCC and underlined liver disease. Even if the surgical cohort have a small difference in these two worlds (HBV infection more frequent in Middle Eastern). Western and Middle Eastern scenarios present comparable experiences and good results in terms of patient survival. Laparoscopic approach should be routinely performed as first-line approach in patients with HCC.

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