



# Less is more for laparoscopic ultrasound-guided liver resection for hepatocellular carcinoma

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Despite surgical resection is the treatment of choice for hepatocellular carcinoma (HCC), long-term prognosis remains unsatisfactory with rate of recurrence of approximately 50% at 3 years and more than 70% at 5 years (1,2).

For an historical point of view the knowledge of the liver anatomy yield to the “liver vertical surgery”, an approach that used the hepatic veins as reference resection margin. This type of approach standardized the resection techniques to left lateral sectionectomy (LLS), right-anterior (or posterior) sectionectomy, trisectionectomy. Yet, these operations often resulted in insufficient liver remnant with a high rate of postoperative organ dysfunction and failure. With the development of intra-operative ultrasound (IOUS), surgeons were able to better localize the liver vascular structures and to identify the vascular pedicle of each single segments. This technique allowed a single liver segment removal, while avoiding major hepatectomies (3), but without compromising the principles of surgical oncology.

The article by Kobayashi and colleagues (4) evaluates the impact of the extension of liver surgery on the time needed for postoperative liver regeneration. In their retrospective cohort, the laparoscopic resection of a single left segment was superior to the LLS on parenchyma volume recovery at one month after the operation. The results may suggest a possible way to facilitate future “redo-hepatectomy” in case of local disease relapse. Currently, the LLS is considered the gold-standard when laparoscopic liver resection is performed (5,6) because, according to the survey results from the Consensus Conference, is technically less

demanding than other liver procedures (7). However, in several other reviews on laparoscopic liver surgery (8,9), the most common type of operation (45%) was a wedge or non-anatomical resection. More recently, the oncologic benefit of anatomic segmental resections (AR) has been challenged since parenchyma-sparing resections (an approach allowing even smaller liver volume removal than AR) appears to offer similar results in terms of disease recurrence and long-term patient survival (10-14).

The Kobayashi *et al.* results confirmed that less aggressive resections are possible with a laparoscopic approach without jeopardizing the patient long-term prognosis. But still they performed a single segment anatomic resection which may be too much particularly for patient with a limited baseline liver function. It will be much more appealing in the next future to examine short- and long-term outcomes of a true parenchyma-sparing resection versus an anatomic segmental resection performed with a laparoscopic approach and to confirm the existing promising findings of open surgery (13,14).

While awaiting for an integration of different therapeutic strategies to improve the results of HCC treatment, the ideal magnitude of parenchyma resection that combines the best principles of surgical oncology with less invasive techniques and with optimal postoperative liver function remains to be determined.

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