



Reply to: The letter to the editor “Laparoscopic liver resection for malignancies confined to Couinaud’s segment VII in the robotic surgery era” by Zizzo *et al.*

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We would like to thank you and other reviewers for reading our papers and sharing valuable comments. We are also appreciative of your conscientiousness and broad knowledge on relevant research fields. Recent advances in robotic hepatectomy (RH) were briefly summarized in your letter, especially its non-inferiority compared with the conventional laparoscopic liver resection (LLR). Here, we would like to address several points relevant to the comments.

The recent establishment of international guidelines on hepatic robotic surgery is a milestone, marking the point at which the clinical application of RH has taken a giant step forward (1). The guideline worked out 7 recommendations, suggesting the oncological comparability between RH, laparoscopic hepatectomy (LH) and open hepatectomy (OH). We have reasons to believe that, in the near future, there will be a promising prospect for RH. This is because the fast development of robotic system is overcoming technical challenges of conventional approaches, especially respecting surgical dexterity. However, evidence is still insufficient to provide more conclusive evaluations. In a recently published meta-analysis specifying retrospective studies, 17 studies were included, among which 487 patients underwent RH (2). This relatively low sample size could lead to a restrained level of evidence, not to mention the lack of randomized-controlled trials. This could partly be attributed to: (I) less attraction to patients due to higher cost; (II) the influenced choice of surgeons due to limited availability of device, relative fixed patient position and compromised assistant aiding, as have

been discussed in our initial review (3).

However, we are still inspired by your progress in applying RH in posterosuperior segments, especially in segment VII. Compared with conventional approaches, RH is characterized by its meticulous operation and minimally invasive nature. The recent da Vinci Surgical System, for instance, provides recreated three-dimensional visualization allowing surgeons to negotiate the contours of the liver (4). This may be helpful with the resection of segment VII lesions, especially when it needs to mobilize right liver from diaphragm, right adrenal gland and vena cava and divide inferior right hepatic vein (5). Nonetheless, technical barriers still exist under current conditions. The absence of tactile haptic feedback during tissue manipulation can lead to parenchymal damage and tumor rupture (6). To facilitate the resection of tumor located at segment VII, most experts advocated a lateral decubitus position during resection, which will be difficult in RH for limited area for trocar distribution (7). Still, we have reasons to believe that indications for both LLR and RH will be extended in the near future (8). Under adequate insurance coverage policies to promote the application of RH, more evidence could be collected to guide an evidence-based standard to choose between robotic and conventional procedures.

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Footnote

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

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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