Author’s response to reviews

Title: The effect of low central venous pressure on hepatic surgical field bleeding and serum lactate in patients undergoing partial hepatectomy: a prospective randomized controlled trial

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Author’s response to reviews:

Dear Guangde Tu, PhD:

Thanks for your letter about our manuscript No. BSUR-D-19-00459R1 Title: The effect of low central venous pressure on hepatic surgical field bleeding and serum lactate in patients undergoing partial hepatectomy: a prospective randomized controlled trial. According to reviewers’ advice, we have amended the relevant part of the manuscript. The correction sections have been marked red in our revised manuscript. We have addressed the comments raised by the reviewer and made responses to the comments individually as follows.

1. Intra-op blood loss/bleeding measures: why not mention swab and suction losses, find it odd for a paper on liver surgery to use a bleeding score derived from ENT surgery.
Response: Once again, thank you very much for your comments and suggestions. It is really true as reviewer suggestion that the intraoperative blood loss can be estimated by recording the collected blood in the suction container(s) and by weighing surgical swabs. We have done a pre-experiment in order to find a method for measuring blood loss during liver resection. However, it is difficult to measure the blood loss by estimating suction losses and swab during a special stage, such as the stage of liver lesions removing. All gauze (including the gauze under diaphragm or liver) and suction containers need to be replaced. The surgical professor could not cooperate especially when the surgical process was not smooth.

The blood loss during hepatectomy is caused by the destruction of vessels and bleeding from venous origin in the sectioned liver surface. We cannot play a role on the surgical techniques that apply for better control of blood vessels during hepatic resection. As an anesthesiologist, however, we focus on creating good surgical conditions for operation, provide the clear and dry surgical field by anesthetic techniques.
The bleeding score is used to describe surgical conditions of the operative field during functional endoscopic sinus surgery [reference 18], pituitary surgery [Morgan Le Guen et al. Impact of the modality of mechanical ventilation on bleeding during pituitary surgery, Medicine (Baltimore). 2019 Sep; 98(38): e17254] and orthognathic surgery [reference 17]. There is a 4-level score adapted from Ryu HG et al [reference 13] who used it to describe surgical conditions during hepatectomy surgery. The surgical field grading was performed by assessing the degree of bleeding, tension of the inferior vena cava and hepatic veins, and ease of operability. This method for bleeding score is similar with the 6-level score. Therefore, we used the bleeding score of the hepatic surgical field as our primary outcome of interest.

The intraoperative blood loss is not primary outcome, so we only estimated the intraoperative blood loss, and not calculated accurately the amount of blood loss in our study. However, we found that there was no significant difference in intraoperative blood loss between the two groups in this study. And there was no significant difference in blood transfusion requirement and hemoglobin level at any time point between the two groups either. Therefore, our study suggested that inaccurate estimation of blood loss might not affect the conclusion.

2. Parenchymal transection technique in each group should be stated, it is a confounding factor for this study.
Response: Considering the reviewer’s suggestion, we have deleted the sentence “Liver resection is performed by ultrasonic dissection for parenchymal transection, ligation or clamping of blood vessels, and coagulation dissectors for vessel sealing in our hospital.” in the Discussion section on page 12. We have added the sentence” Liver resections were performed by the same surgical team in both groups. Intermittent PTC using a vascular tourniquet was applied during parenchymal resection whenever needed. Liver resection was performed by ultrasonic dissection for parenchymal transection, ligation or clamping of blood vessels, and coagulation dissectors for vessel sealing.” in the Method section in line 1-4 on page 8.

Furthermore, we have made some changes in the Method section as follows.

1. We have added a subtitle “Data collection and surgical procedures”. in line 6, page 7.

2. we moved the sentence on page 7 “Adverse events such as postoperative delirium, delayed recovery, urine output of &lt;20 ml/h, and emergence agitation were recorded.” to the line 9-10, page 7.

3. Should state number of cases for which PTC was used in each group, in addition to its duration of application.
Response: Thanks for your suggestion. All patients in both groups accepted PTC maneuver. We have added this sentence in line 8-9, page 10. The duration of PTC was described in table 4.

4. You should state your age limits for this study ie 17-70years, as listed in Chinese Clinical Trial Registry.
Response: Thanks for your suggestion. “Patients with age of 17-70 years” had added in the line 3-4, page 5.

5. Page 13, you mention liver transplantation, make it clearer that the manoeuvres undertaken during transplantation are focused on reducing portal hypertension bleeding. Response: Thanks for the insightful comments and suggestions. This comment is valuable for revising and improving our paper. What’s your said is right. We are very sorry for our mistakes. The removal of the diseased liver during liver transplantation does not involve transecting the liver parenchyma. Less intraoperative blood loss in lower CVP patients was associated with lower portal pressure. A sentence in 3th paragraph of the Discussion section on page 13, “A lower CVP maintained by limiting the infusion volume and administering somatostatin and nitroglycerine is necessary to decrease intraoperative blood loss in patients undergoing liver transplantation with a longer operation time and wide extent of liver resection [5].” have deleted in revised manuscript.

6. Page 3, maybe better to rephrase "harvest" to remove R/L lobe for living donation. Response: Thanks for your advice. We had amended the sentence according to your advice. See line 14, page 3. We have made correction with red marked text which we hope meet with your approval. Thanks for your suggestion again.