Response to the Reviewer's Comments

Dear editor,

We would like to thank Reviewers for taking the time and effort necessary to review the manuscript. We sincerely appreciate all valuable comments and suggestions, which helped us to improve the quality of the manuscript. Here is a point-by-point response to the reviewers' comments and concerns.

Reviewer #1:

Scientific Quality: Grade C (Good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Minor revision

Specific Comments to Authors: The authors of this preliminary study have proposed a novel surgical technique for complicated PVT in LT patients. Since there is no agreement on the best techniques for PV reconstruction, this is a significant issue. Although the write-up is good and the concept seems innovative, the study is constrained by its retrospective methodology, small patient population, and brief follow-up. It seems more like a case series than a proper original study.

Response: We would like to thank the Reviewer for the comments. As the Reviewer mentioned, this is a retrospective study with only 7 cases and a relatively short follow-up period (12-17 months). In the next step, we will continue to follow up these patients and continue to perform this type of surgery in the future to further evaluate the safety of the surgery. Thank you for this comment.

Reviewer #2:

Scientific Quality: Grade C (Good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Minor revision

Specific Comments to Authors: The manuscript is well written, and the topic of clinical interest. An alternative technique to approach complex portal vein thrombosis is described, although surgically complex and demanding (what makes its clinical applicability questionable). The manuscript has figures and tables which complement the text. Major comments are the need to discuss the results (morbidity and mortality) of alternative surgical approaches to complex portal vein thrombosis. Minor comments are the need to mention Figure 1 throughout the text and a careful language review.

Response: Thank you very much for your review. Your suggestions were greatly important and made our paper better. As you suggested, we have studied the comments carefully and made corrections which we hope will meet with your approval.

1. *Major comments are the need to discuss the results (morbidity and mortality) of alternative surgical approaches to complex portal vein thrombosis.*

Response: Thank you for your comments. In the second paragraph of the DISCUSSION section of the article, we add some discussion on the morbidity and mortality associated with alternative surgical approaches to complex portal vein thrombosis. Page 9 and 10, line 188-209.

Hibi T et al. [10] performed liver transplantation in 174 cases of PVT, among which 83 (47.7%) and 91 (52.3%) cases presented with complete and partial portal vein thrombosis. In terms of portal vein reconstruction, 149 cases underwent physiological reconstruction (thrombolectomy (n=123), interposition vein grafts (n=16), and mesoportal jump grafts (n=10)). There were 25 cases of non-physiological reconstruction (cavoportal hemitranspositions (n=18), renoportal anastomoses (n=6), and arterialization (n=1)). The study found that the non-physiological group suffered a

significantly increased incidence of rethrombosis of the portomesenteric veins and gastrointestinal bleeding, with a dismal 10-year overall survival rate of 42% (vs. no PVT, 61%; P = 0.002 and vs. PVT: physiological group, 55%; P = 0.043). Rodríguez-Castro et al. [18] reported that of 25,753 liver transplants, 2004 were performed in patients with PVT (7.78%), and complete thrombosis was observed in nearly 50%. TAA was performed in 75% of patients; other techniques included venous graft interposition and portocaval hemitransposition. It was found that PVT significantly increased post-LT mortality at 30 days (10.5%) and 1 year (18.8%) when compared to patients without PVT (7.7% and 15.4%, respectively). Moreover, rethrombosis occurred in up to 13% of patients with complete PVT, whereby no preventive strategies were used, leading to increased morbidity and mortality. In the present study, there was no recurrence of portal vein thrombosis, but one patient had portal venous insufficiency after liver transplantation. Accordingly, the optimal approach for portal vein reconstruction is the restoration of the physiological anatomy of the portal vein system while ensuring adequate portal venous flow [10,19].

2. *Minor comments are the need to mention Figure 1 throughout the text and a careful language review.*

Response: Thank you for your comments. We answered each of these questions one by one.

(1) Figure 1 is mentioned in the part of "MATERIALS AND METHODS" (Page 7, line 127) and "DISCUSSION" (Page 21, line 237).

(2) The revised manuscript has been reviewed by a professional native English speaker and issued a language qualification certificate. Thank you for this comment.