

Peer Review File

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Reviewer A

Nice study on liver TX techniques, with reasonable results from a single center.
several comments:

Abstract:

Groups ABC should be explained. The reader can not anticipate that A is cava replacement, B is Piggy Back and C is Modified Piggy back. This must be clear.

According to the comments on abstract, we have modified our text as advised: Six-hundred and seventy-four recipients' perioperative data were assessed and analyzed stratified by different surgical technics (Modified classic (MC), modified piggyback (MPB) and classic piggyback (CPB)). (see Page 4, line 69-71).

Manuscript:

The discussion ist far too long and not catchy. Concentrate on core benefits of the three techniques described. The length should be reduced to 50%.

According to the comments on abstract, we have cut off the length of our discussion to 1107 words to focus on the core benefits of the three techniques.

Introduction: generally fine

Material Methods: Description of surgical techniques is not fine. They can only be understood from surgeons performig LTX themselves, but not from a border audience.

We have added details on technique description in Figure 2 for better comprehension (See Figure 2).

Results: generally fine, lots of data..

Figures: Figure 1 is poor, you should produce better illustrations. Maybe an animated animation would be beneficial.

We have added details on exclusion criteria and rearrange the panel in Figure 1 (See

Figure 1).

Discussion

Include the topic of portocaval shunting options in both "cava replacement" and "piggy back" liver transplantation.

We have modified our text as advised: In our study, VVBP was not used in all groups. Because of the shortening of anhepatic time therefore the decrease of hemodynamic instability, VVBP is not commonly used in LT with MC; In addition, In MPB and CPB, because inferior vena cava is not blocked, VVBP is not needed, neither. (see Page 13, line 276-279)

Reviewer B

I think the authors have touched on a topic that is of interest to many surgical trainees. Differences in technique often originate from a kind of evolution that occurs over years of practice and as a result of complication. This study takes that and attempts to describe these observations which is commendable. However I do find quite a few things that would need to be addressed before I would consider it worthy of publication. I agree with their ultimate conclusion that no technique is inherently better but experience and familiarity with each technique will improve outcomes.

Major issues:

1. In Methods, it is preferable to start with the total liver transplants during the study period and then describe your exclusion criteria. It is unclear if the 112 patients excluded were different organs (lung, heart, pancreas, kidney, etc) or if they were liver transplant that were excluded due to other reasons (DCD donor, dual organ such as simultaneous liver kidney, or re-do liver transplant or fulminant liver failure transplant).

Please clarify this area.

We have modified our text and figure as advised: After excluding 112 other types of transplantations (combined liver and kidney transplantation, combined pancreas kidney transplantation, combined liver pancreas transplantation and combined upper abdominal organ transplantation), 686 patients underwent LT were taken into

consideration. During the follow-up period, 12 patients were lost to follow up (see Page 6-7, line 129-133 and Figure 1A).

2. The while the study benefits from three separate techniques within one institution over a relatively short study period which significantly limits confounding in studies comparing techniques, there is no discussion regarding which patients were chosen to undergo which technique. Was this surgeon dependent or patient dependent? Outcomes may reflect factors that are less tangible such as surgeon experience or patient factors such as presence of collaterals. If each technique was used in succession (for instance classic technique from 2009-2011, PB 2011-2012 and MPB 2012-2015), this should be stated.

We have modified our text and figure as advised: In general, Venous-venous bypass (VVBP) techniques were not used during operation in all groups. The selection of surgical techniques depends on the patient's conditions, including diagnosis, MELD score, pretransplant imaging and laboratory test results (see Page 7, line 143-145). All technics were used through the entire period and without succession.

3. The identification of the three group is unnecessarily complex. By substituting the technique grouping with "A B and C", it gives the impression that some sort of randomization or blinding was done.

According to the comments on abstract, we have modified our text as advised: Six-hundred and seventy-four recipients' perioperative data were assessed and analyzed stratified by different surgical technics (Modified classic (MC), modified piggyback (MPB) and classic piggyback (CPB)). (see Page 4, line 69-71).

4. In Table 3, it is not clear to me what is being described. What I would rather see is the relative risk of each technique on the outcome of interest. The cause of death, to me, is not a relevant endpoint, what would be telling is the relative risk of PB or MPB compared to classical LT on 30 day mortality. Or for instance the RR of each on EAD, outflow dysfunction, or AKI. I do agree with your final conclusion that these techniques do not cause a significant difference in outcome, which explains why all three techniques are still used at various institutions today.

We used Table 3 for explaining these techniques do not caused significantly difference

in outcome of morbidity, so we just investigated the posttransplant complications and peri transplant outcome.

Minor issues:

1. The use of venovenous bypass is brushed upon during the methods. It is not clear, but it appears VV bypass was not used in any of the techniques. However, in the methods, you explicitly say this is true only for classic and MPB. Again, in the discussion, you say VV bypass is not used in the classic and MPB groups but do not mention PB. I understand that for PB technique, IVC flow is maintained and there is less benefit of VV bypass, but I suggest simply saying explicitly that VV bypass was not used in any patients during this study to keep things clear.

We have modified our text as advised: In general, Venous-venous bypass (VVBP) techniques were not used during operation in all groups (see Page 7, line 143-144).

2. Figure 2 should contain explicit inclusion and exclusion criteria. If undergoing a liver transplant and having follow up are the only branch points, this does not merit a figure.

We have added details on exclusion criteria in Figure 1 (See Figure 1).

3. Figure 2 is mislabeled I believe. Again this demonstrates the confusion that making these groups named A, B and C causes. Figure 2B depicts the MPB, MPB is group B in your study, but the figure legend labels this panel as classic piggy back. Figure 2C depicts classic PB and is group C, but the legend labels this MPB.

We have corrected our legends as advised: Figure 2 Various Surgical Techniques in Orthotopic Liver Transplantation. A Modified classic; B Modified piggy-back; C Classic piggy-back (See page 18-19, Line 457-458).

4. Figure 3. Please include y axis labels on panels D and E. This could be reasonably interpreted as both number of patients as well as percent of patients.

We have added details on axis labels in Figure 3 (See Figure 3).

Reviewer C

This paper is a comparative paper on various liver transplant techniques.

1)Abstract section

The three groups were compared, but the definition of the group is not clear in the abstract, so it is difficult to understand the contents only with the abstract. In addition, in comparing the three groups, background factors such as MELD score and CTP score were not considered.

We have modified our text as advised: Six-hundred and seventy-four recipients' perioperative data were assessed and analyzed stratified by different surgical techniques (Modified classic (MC), modified piggyback (MPB) and classic piggyback (CPB)).

MELD score and Child-pugh scores was significantly higher in CPB groups ($P=0.008$ and 0.003 , respectively).

(See page 4, Line 69-73)

2)Methods

When comparing the three groups, the ANOVA test should be used, but there is no description for this. The chi-square and Fisher exact test alone cannot perform this study.

We have modified our text as advised: For comparison between groups, chi-square and the ANOVA test were performed for frequencies and continuous data, respectively. (See page 9, Line 185-186)

3)Result & discussion

The result should have been displayed by drawing a graph using cox-proportional regression analysis, not a kaplan-Meier graph.

We have modified our text as advised: Overall survival was compared using the Kaplan–Meier method with a log-rank test. The Cox proportional hazards model was used for multivariate analysis. (See page 9, Line 186-188)

The figure is too simple to describe the surgical technique. I think it is difficult for readers to understand when they read it.

We have added details on technique description in Figure 2 for better comprehension (See Figure 2).

Reviewer D

The authors present a series of more than 600 patients comparing outcomes of three different implantation techniques for liver transplantation. The manuscript is written well and makes interesting observations. The paper might be improved by addressing the following.

-In the abstract, please define the three different groups. The labels as A, B, and C are unclear as written.

-It would be helpful to include a figure or illustration of the "modified classic LT technique." The description on page 6 lines 116-119 is not completely clear.

-Finally, can the authors make general recommendations for which technique might be preferred for which recipients? How have the results of the study changed practice at the authors' institution? How can the results of the study be applied at other centers across the globe?

We have added details on technique description in Figure 2 for modified classic LT technique (Figure 2A)

We have corrected details on description as advised: In this technique, it is not necessary to isolate the IVC neither dissect the posterior space of the IVC and right adrenal vein. The IVC would be clamped directly from front to back and sutured continually from front to back after dissection of the liver. (See page 6, Line 118-121)

Reviewer E

The authors have described the advantages and disadvantages of three surgical techniques used in liver transplantation. First of all, congratulations on their work.

However, there are several issues which should be addressed.

-As I understand, this is a retrospective review using prospectively collected data. But in the manuscript, for example the last paragraph in the Introduction section, the authors described "prospectively analyzed". Is it correct?

We have corrected our text as advised: In this study, we retrospectively analyzed a

single-center case series (674 cases) at our center and compared the advantages and disadvantages of each method. We present the following article in accordance with the STROBE checklist (See page 6, Line 124-126).

-There are many redundant details in Introduction section and Discussion section.

We have simplified our introduction and discussion as advised.

-How long was the hospital stay. Please insert in the Table 2.

We have added the comparison of hospital stay in table 2 (See table 2).

-As the authors mentioned, there are several differences in preoperative details among the 3 groups, for example gender, MELD score, Child-Pugh score, and previous abdominal surgery. With this significant difference in preoperative factors, is it really meaningful to compare the postoperative outcomes among the 3 groups directly?

This is a summary of our experience in all patients with liver transplantation of different surgical methods from 2015-2019. Therefore, there may be deviation in preoperative baseline data.

-In table 3, 'tumor' was a significant cause of short-term death. What do you mean tumor? Is it tumor recurrence? It is difficult to understand 'tumor' as a cause of short-term death.

We have corrected the “tumor” into “Pretransplant diagnosis with Tumor” in Table 3

-There are several typos.