

Peer Review File

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Reviewer A

Comment 1: English language of the paper needs extensive editing.

Reply 1: Thank you very much for your precious advice, the English language of the revised manuscript has been extensively edited by the medical writing service (AME Editing Service, <http://editing.amegroups.cn/#editing>) recommended by the ATM journal.

Changes in the text: All changes made to the text are in red color.

Comment 2: The term “application” used in the title is unclear. Please make the title clearer, like the effect of a new treatment.

Reply 2: Thank you very much for your precious advice, the term “application” used in the title has been replaced by the word “effect”. The new title “Effect of novel bicaval anastomosis technique for transplantation with and without prior cardiac surgery history” is indeed clearer than the previous one.

Changes in the text: We have modified the title of the manuscript as advised (see Page 1, line 1).

Comment 3: Abstract. In the part of methods, please specify the variables to be compared, in particular outcome variables. In the results part, please provide detailed data for postoperative complications, 30-day mortality and postoperative survival rates. The conclusion should be made with cautions because the study is observational in nature and the sample size of B group is very small.

Reply 3: Thank you very much for your precious advice. In the part of methods and results of the revised Abstract, we have specified some main variables and provided detailed data for some key postoperative complications, 30-day mortality and postoperative survival rates. Due to the limitation of the total number of words in the abstract of this journal, please forgive us for not being able to list all variables and postoperative complications in detail.

The conclusion has been rewritten as the “Four-corner traction bicaval anastomosis combined with a continuous everting suture technique may result in approximately comparable prognoses for heart recipients with a history of cardiac surgery when compared with those without a history of cardiac surgery and this technique may reduce the incidence of left atrial thrombosis and distortion. Further follow-up of the long-term outcomes will be required to validate these results”.

Changes in the text: We have modified the abstract of the manuscript as advised (see Page 2-3, line 24-49).

Comment 4: Introduction. Line 53-55, please provide examples or references for this statement. A brief review on this may be necessary for this part. The novel technique, four-corner traction bicaval anastomosis combined with continuous everting suture, cannot be written so simple, at least, please introduce why and how it was developed.

Reply 4: Thank you very much for your precious advice. As for the sentence in line 53-55 of the introduction, we have added 3 references to the revised manuscript to support the statement.

Regarding the novel technology, four-corner traction bicaval anastomosis combined with a continuous everting suture, why and how to developed, we have described in detail in the third and fourth paragraphs of the DISCUSSION section (line 224-257). In order to avoid duplication between this part and the INTRODUCTION, we can only describe the novel technology in the introduction part relatively simply.

Changes in the text: We have added 3 references to the revised manuscript (see Page 17, line 362-370).

Comment 5: Methodology. One major concern is the very small sample size of B group, n=10, making findings from comparisons at greater risk for false-negative. The results are very likely to be not valid. The second concern is the comparability between A and B groups in terms of the history of blood transfusion, resulting systematic bias in the findings.

Reply 5: Thank you very much for your precious advice. For the first major concern, the total number of heart transplantation in China every year is actually small, and even fewer recipients have a history of prior cardiac surgery. Moreover, in order to make the preoperative variable difference between the two groups relatively small, we excluded some patients who did not meet the criteria, so the sample size of group B was only 10 cases. This may indeed increase the false-negative probability of the comparison results, but it is inevitable as an observational study rather than a randomized controlled trial. We will include more cases and perform longer follow-up to reduce false negatives caused by the observational study at later times;

For the second concern, since this is an observational study, the systematic bias caused by this established attribute is inevitable. The results of blood transfusion history are only an indicator of prior cardiac surgery history, rather than the criteria for inclusion in this study. All the recipients in Group B had a history of prior cardiac surgery, and the results in this study showed that 90% of them had a history of blood transfusion. Recipients in Group A underwent the heart transplantation as their first cardiac surgery, and the results showed that none of them had a history of blood transfusion before

transplantation. Moreover, it's precisely because the recipients in group B have a history of cardiac surgery, the level of PRA in group B is higher than that in group A, which is consistent with the previous reports.

Changes in the text: This section has not been modified.

Comment 6: Statistics. Line 148, please specify the groups are frequency-matched or individual matched, because their corresponding t tests are different. The authors should explain their considerations for the sample size here. Please also describe the $P < 0.05$ is two-sided or not.

Reply 6: Thank you very much for your precious advice. The description of the Statistics section was consulted on my previous article (Shi F, et al. 2020, J Cardiothorac Vasc Anesth). After careful checking, the paired test was not used in this study, so the description of the paired test in the Statistics section of the revised manuscript has been deleted.

Considering the sample size of this study, we conducted the power analysis. According to the current ratio of the number of patients in group A and group B, in order to achieve power greater than 80%, the number of patients in Group A needs at least 36, while that in Group B needs at least 6, and the total number is not less than 42. The total number of patients in this study is 70, and the power is more than 80%.

The $P < 0.05$ is two-sided in this study.

Changes in the text: We have modified the title of the manuscript as advised (see Page 8, line 156-165).

Reviewer B

Comment 1: The authors have reported the outcomes of their novel four-corner traction bicaval anastomosis combined with continuous everting suture technique by categorizing the patients into two groups: 60 patients without previous cardiac surgery and 10 patients with previous surgery. In addition, PRA and CDC were examined. While I would like to congratulate for their excellent results, I wondered what is the main focus of this paper. I was unable to figure out the relationship among introduction of new technique, history of previous cardiac surgery, and laboratory examinations. As the surgical technique is new and unlikely to be published elsewhere, I thought more details of surgical procedures (including comprehensive illustrations) as well as technical tips and potential pitfalls of this technique. If the authors consider it preferable to include other two issues, discussion on the implications of this novel technique on these results. I felt that these three are fairly unrelated to each other.

Reply 1: Thank you very much for your precious advice. Since all recipients in this study adopted the novel anastomotic technology for heart transplantation, the biggest

difference is whether they have a history of prior cardiac surgery, the main focus that the author of this study attempt to expound is that the four-corner traction bicaval anastomosis combined with continuous everting suture technique may bring approximately comparable prognosis to heart recipients with prior cardiac surgery history when compared with those without history of cardiac surgery; Secondly, the novel anastomotic technology may effectively reduce the incidence of postoperative left atrial thrombosis and heart distortion. Because the previous biatrial anastomosis method and the current popular bicaval anastomosis have a high incidence of postoperative left atrial thrombosis and donor heart distortion, which seriously affects the survival of recipients after surgery, while no cases of postoperative left atrial thrombosis and donor heart distortion were observed in this study after using the novel anastomotic technology.

As for the relationship among introduction of new technique, history of previous cardiac surgery, and laboratory examinations, the relationship between the former two has been elaborated in the paragraph above, and the laboratory examination is a confirmation of the history of previous cardiac surgery. All recipients in group B had a history of previous cardiac surgery and 90% of them had a history of blood transfusion. The preoperative laboratory examinations found that the PRA level of group B was higher than that of group A in this study, which is consistent with the previous report that blood transfusion during the previous cardiac surgery caused an increase in the level of PRA.

As for more details of surgical procedures, a comprehensive illustration (Figure 1) has been made and added to this revised version of the manuscript. The technical tips have been described in detail in the Surgical procedure section of MATERIALS AND METHODS. The potential pitfalls of this technique mainly include the following points: First, instead of the previous one suture line anastomosis, four-corners traction divided left atrial anastomosis into four shorter lines so as to adjust the distance with ease leading to precisely match, which poses a higher technical challenge for the surgeon and a longer learning curve; Secondly, this technique will cause the ischemia time of the operation to be prolonged, potentially leading to more postoperative complications (Detailed technical tips and potential pitfalls about this technique have been included in another article of our team, which mainly compared the clinical effect of this technique with the classic bicaval anastomosis in the treatment of recipients without previous cardiac surgery history. The article has not yet been published).

Discussion on the implications of this novel technique on these results had been detailed in the third to sixth paragraphs of the DISCUSSION section in the manuscript.

Changes in the text: We have added an illustration (Figure 1) and the figure legend about the novel technique (see Page 20, line 420-427).