Peer review file
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Review A

Comment 1: All non-standard abbreviations should be explained at first use, even when they are evident for experts. This is also valid for the abstract. TAR (total arch replacement) should be explained at first use in the abstract. Consequently, it is not logical that total arch replacement is not abbreviated in the conclusion of the abstract. Cardiopulmonary bypass (CPB) is unexplained in the abstract.
Reply 1: Thanks for your comments. I have changed as your suggestions.
Change in the text 1: Abbreviations have been explant in the text.

Comment 2: This is not a randomized trial but concerns observational data. A potential problem is confounding by indication. This type of confounding arises from the fact that individuals who are selected for a specific type of procedure are inherently different from those who are selected for another type of procedure, because they is an underlying reason for the selection. This reason can be deliberate or not deliberate. This issue is specifically confirmed in the paper 'several methods for aortic arch management were applied according to the indications and surgeons selection.' What are the underlying reasons of the surgeons?
Reply 2: Thanks for your comments. I have clarified the indications in the methods part.
Change in the text 2: No change.

Comment 3: This is a retrospective cohort study. This implies that the authors use an existing database. The data were prospectively collected but the study design was defined a posteriori (prospective data collection, retrospective analysis). This should also clearly be stated in the abstract. When I read a paper, the first thing I need to know is the type of study design.
Reply 3: Thanks for your comments.
Change in the text 3: I have changed in the methods in abstract.

Comment 4: English language and grammar should be improved. It is e.g. not correct to start sentences with 'but'. I suggest that the paper is checked and corrected by a native English speaker.
Reply 4: Thanks for your comments. I have revised the language following a native English speaker.
Change in the text 4: Some language changes in the text.

Comment 5: How does this technique is unique compared to other techniques of conservative arch management?
Reply 5: Thanks for your comments. As I have introduced in the discussion part, the

MiTAR technique would achieve the effects of reducing surgical risks and increasing descending aorta reshaping effects the same time.
Change in the text 5: No change.

Review B

Comment 1: Please refrain from using p=0.000, should use p<0.001 instead. Please modify these numbers in the manuscript and the table.
Reply 1: Thanks for your comments. I have changed as your suggestions.
Change in the text 1: I have revised the p value in the all Tables.

Comment 2: Their title of Modified in-situ arch replacement is flaw, as the arch is not replaced and still subjected to aneurysmal dilatation. It is more appropriate to change it to modified "in-situ island" technique arch intervention and frozen elephant trunk
Reply 2: Thanks for your comments. I agree with your advices.
Change in the text 2: I have changed the title and all descriptions in the text.

Comment 3: In their 507 patients with acute Type A aortic dissection only 57 are suitable for this modified island technique as they excluded patients with Marfan syndrome, arch tear, tear in head and neck vessels and arch more than 45 mm. So the applicability of their modified in-situ technique is roughly one out of ten patients with TAAD. More importantly, what is the perceived advantage of their modified in-situ technique versus convention island total arch replacement ? They should be able to answer this in their manuscript.
Reply 3: Thanks for your comments. We have chosen the cases with strict standards in our early experiences, in order to avoid adverse complications. As compared to traditional island total arch replacement, we have treated extent arch repair with the aid of stent, and the intra-lumen anastomosis reduces the risk of bleeding.
Change in the text 3: I have revised in the last part of discussion.

Comment 4: The average age of their patients were from 48-52 year old, which were around 10 years younger than most of the reported series, can they explained why there is such a predilection? What is the average time from TAAD onset to operation?
Reply 4: Thanks for your comments. The average age in our cohort was younger with nearly 50 years (Axtell AL, **Xue Y**, et al. Type A aortic dissection in the East and West: A comparative study between two hospitals from China and the US. J Card Surg. 2020 Sep;35(9):2168-2174. doi: 10.1111/jocs.14766.), and the reported age from China were all much younger than western countries (Wang W, et al; Registry of Aortic Dissection in China Sino-RAD Investigators. Clinical features of acute aortic dissection from the Registry of Aortic Dissection in China. J Thorac Cardiovasc Surg. 2014 Dec;148(6):2995-3000. doi: 10.1016/j.jtcvs.2014.07.068.). The time from TAAD onset to operation was less than 20 hours (**Xue Y**, et al. Prompt surgery is effective for acute type A aortic dissection with cerebral ischemia. J Thorac Dis. 2021 Mar;13(3):1403-1412. doi: 10.21037/jtd-20-2349.).

Change in the text 4: No change.

Comment 5: Line 33, they mentioned conventional total arch replacement is a complex procedure and increased the risk of neurological complication. However, their modified island technique still have stroke rate of 8.8%. Is there any antegrade cerebral perfusion used during their MiTAR? Did they use any adjunct of cerebral protection such as thiopentone, topical cooling?

Reply 5: Thanks for your comments. According to previous reports, island TAR would decrease the risk of neurological complication, but it didn't exist in our cohort. One of the reason was that the sample size was small in our cohort. We have used uACP in MiTAR, topical cooling was regularly applied for every case.

Change in the text 5: No change.

Comment 6: What was the temperature during their DHCA? It seems there is quite significant ARF after their procedures despite short circulatory arrest time and relatively long ICU stay.

Reply 6: Thanks for your comments. The temperature was 22-24 ℃ in our cohort. You are right that the risk of ARF was higher in our cohort, but all cases were acute cases and the risk of ARF in acute TAAD were relative higher. And most of the cases can recover before discharge.

Change in the text 6: No change.

Comment 7: In line 63, they mentioned suitable device is used. How do they measure and choose the appropriate size of the graft/stent, especially when the true lumen in descending thoracic aorta is very small in some cases?

Reply 7: Thanks for your comments. All cases in this cohort were acute cases, and we measure the diameter of proximal part of descending aorta. We choose a real size stent instead of oversize stent. In acute cases, the true lumen can be dilated with the aid of stent.

Change in the text 7: No change.

Comment 8: Line 68, Syntax error "continuous anastomosis endovascular". What do they mean? When they are doing the in-situ island anastomosis, do the stitches take the whole thickness of the aorta? is there any chance that partial thickness was taken and lead to endoleak? On the other hand, if they take whole thickness, does it increase the chance of rupture / bleeding to mediastinum from needle holes? When the left subclavian artery is very deep in some cases, do they encounter any problem using their MiTAR technique?

Reply 8: Thanks for your comments. All cases in this cohort were acute cases, and we

measure the diameter of proximal part of descending aorta. We choose a real size stent instead of oversize stent. In acute cases, the true lumen can be dilated with the aid of stent.
Change in the text 8: No change.

Comment 9: They mentioned two side 4-O polypropylene, do they mean the double-needle 4-O?
Reply 9: Thanks for your comments. This is right.
Change in the text 9: No change.

Comment 10: It is better to use diagram/video to illustrate their procedure of the in-situ technique
Reply 10: Thanks for your comments.
Change in the text 10: I have supplied a video in the supplement materials.

Comment 11: Please rephrase line 111-112
Reply 11: Thanks for your comments.
Change in the text 11: I have changed as you suggest.

Comment 12: Their average follow up is just 10.7 months, in our experience is insufficient to tell the fate of the arch endoleak, as a seemingly thrombosed false lumen at 10 months could re-expand again in longer term follow up. Afterall, the arch is not resected and there is still a chance to have new forms of endoleak such as 1. Type 2 from the tear in the in-situ island; 2, persistently perfused distal false lumen resulted from Type Ib; 3. Type 2 endoleak from big bronchial artery.
Reply 12: Thanks for your comments. We have the same concern as you mentioned, the average follow-up period is nearly 2 years till now, and only six cases with endoleak we have observed, four of them have relieved and the other two cases had not progress.
Change in the text 12: No change.

Comment 13: Do they have any experience in second stage management of their in-situ island technique and how to deal with arch aneurysm and descending aneurysm after their frozen elephant trunk? How many of their patient required open/endovascular second stage procedure upon follow up?
Reply 13: Thanks for your comments. We have not treated a second stage repair till now.
Change in the text 13: No change.

Comment 14: Line 129. WC Hsieh et al should be modified to Hsieh et al
Reply 14: Thanks for your comments.
Change in the text 14: I have changed in this part.

Comment 15: Line 135. Li et al, omit the middle names
Reply 15: Thanks for your comments.
Change in the text 15: I have changed in this part.

Comment 16: Line 141. Di Eusanio et al. omit the middle names
Reply 16: Thanks for your comments.
Change in the text 16: I have changed in this part.

Comment 17: Syntax error in line 157-159, 160-161, I completely lost in context
Reply 17: Thanks for your comments.
Change in the text 17: I have changed in this part.

Comment 18: Line 164. GoreTAG, what is the made?
Reply 18: Thanks for your comments. The GoreTAG is a product used for dissection in TEVAR surgery (https://www.goremedical.com/products/ctagac).
Change in the text 18: No change.

Comment 19: Lines 169-170. Roselli…… reference?
Reply 19: Thanks for your comments.
Change in the text 19: No.14 is the reference.

Comment 20: Lines 174-175. Syntax error please rephrase
Reply 20: Thanks for your comments.
Change in the text 20: I have changed in this part.

Comment 21: Lines 188-191. What is the cause of endoleak in their opinion?
Reply 21: Thanks for your comments. I agree with your comments. The main cause of endoleak was from the needle hole inside the dissected aortic arch. As I have revised in the text, we tried to eliminate the endoleak risk with the aid of fixation the Dacron part of FET device with native aortic arch, and we have used stiches inside to outside.
Change in the text 21: I have revised the descriptions of surgical methods in the methods part.

Comment 22: Table please consider using the word outer curve and inner curve of aortic arch rather than larger and lesser curve
Reply 22: Thanks for your comments. I agree with your comments.
Change in the text 22: I have changed in the text and tables.

Comment 23: I appreciate the table showing the diameter changes at different levels after MiTAR and TAR, however, as we all know such changes are dynamic and we need

longer term follow up like 5 years or more to tell the real differences.
Reply 23: Thanks for your comments. I agree with your comments. We will continue to follow up the patients and observe the dynamic changes of aorta.
Change in the text 23: No change.
Review C

Comment 1: I commend you on your work and study, it is interesting to see more data are emerging in managing aortic arch diseases. However, I'm surprised about some of your writing. The what you call MiTAR is not new, it has been in practice for several years as en bloc or island technique and it has been practiced by many centres in USA, Europe and even in China by Sun et al. 2018 Volume 42, Issue 3, March 2019, Pages 482-487. I'm surprised that you it 'first time in this paper'

Furthermore, most of the literature describes that operative time are longer in en bloc cohort but yours are shorter, can you explain? I also think you hare way larger sample size in TAR vs MiTAR which can perhaps have negative impact on the stat calculations. So maybe a PSM will be useful to have a better stat figure?
Reply 1: Thanks for your comments. I agree with your comments. First of all, en bloc in situ arch replacement is not a new arch repair method in general, but every single center you have mentioned above had their own techniques, that's why we have introduced our special methods using a FET device which was anastomosed with the native arch endoluminal. That's can answer your second question, we have simplified the technique so as to shorter the time and reduce the risk. Finally, we have tried analyze the data through PSM way, but the total number during the observing period was limit, which induce losing a lot of cases (n=28 VS 28). More and more cases we have treated recently we have used MiTAR, and we will analyze through PSM way later.
Change in the text 1: I have revised the surgical method descriptions in the method part.

Review D

Comment 1: The authors reported their experience of total arch replacement for acute type A aortic dissection. Fifty-seven patients who had had a modified 'in situ' island total arch replacement (MiTAR) were compared to 138 patients who had undergone a TAR procedure with branched arch graft and FET. While MiTAR is an interesting way of performing TAR, there are unanswered questions in its procedural concept as well as in the presented data. Furthermore, there are methodological issues as below.

Given this is the first report of this technique, I recommend reporting the technical details. How was the overlap of the surgical graft and TEVAR graft created? How were the size of the arch surgical graft, and the size and length of the TEVAR graft decided? How injury to the recurrent nerve, trachea, esophagus and left pulmonary avoided when sewing the graft from inside of the aorta? What kind of strategy was

used for cerebral protection?

In the similar context, could you elaborate more on the utility and advantage of this technique over conventional TAR with FET? With a conventional technique, surgeon may reimplant the supra-arch vessels individually or may incise the arch to create the island of the supra-arch vessels.

If I understand correct, MiTAR is performed with the island of the supra-arch vessels sewn to the graft from inside of the dissected arch. How do you ensure the bites are full thickness? In fact, several patients had “endoleak”. Some of these leaks might have originated from an intimal tear due to partial thickness bites along the island suture line.

As the authors stated, MiTAR and TAR had different indications, and thus the unadjusted comparisons are biased. Simply describing the procedural detail and outcomes of MiTAR might make the message straightforward.

How were the variables assessed if they were normally distributed?

Figure 2 should include number at risk.

English check is recommended.

Reply 1: Thanks for your comments. First, the stent device is the same as traditional TAR procedure in China, we do not choose an oversize device for arch repair, and the usually used device was 10-12mm length. The previously reported rates of injury to the recurrent nerve, trachea, esophagus and left pulmonary avoided were low. All patients in MiTAR and TAR were received antegrade cerebral perfusion through axillary artery cannulation. Secondly, As compared to traditional island total arch replacement, we have treated extent arch repair with the aid of stent, and the intra-lumen anastomosis reduces the risk of bleeding. Thirdly, We have the same concern as you mentioned, the average follow-up period is nearly 2 years till now, and only six cases with endoleak we have observed, four of them have relieved and the other two cases had not progress. Fourth, I agree with you, but we have used MiTAR in part of patients who would receive TAR in the previous indications, and we can reduce surgical risks with this methods. Fifth, Continuous variables are presented as the mean±standard deviation (after verifying the normality of the distribution of the data). Differences in continuous variables were tested using the t-test, or the Mann–Whitney U-test, respectively.
Change in the text 1: We have changed some parts as suggestions in the text.