Author’s response to reviews

Title: A modified axillo-femoral perfusion for acute type A aortic dissection accompanied with lower limb malperfusion

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Author’s response to reviews:

Thank you very much for your letter and the comments from the referees about our paper. We have learned much from the reviewers’ comments, which are fair, encouraging and constructive. After carefully studying the comments and the advice, we have made corresponding changes. Our response of the comments is enclosed at the end of this letter. If you have any question about this paper, please don’t hesitate to contact us.

Reviewer #1: Thank you for your submission titled "A modified axillo-femoral perfusion for acute type A aortic dissection accompanied with lower limb malperfusion." I believe this is an important article in the field of complex aortic surgery. Absent in this article is the experience and volume present at institution described as type A aortic dissection is not a common pathology including a subset with descending aorta (Debakey type I) involvement as well as the even smaller subset of clinical presence of distal malperfusion. The methods do not describe a timeline of these 30 cases or surgeon number involved in this study. I find the inclusion of these aspects important as a single surgeon may improve their technique over time, we can reduce era bias and understand the implication of surgeon variability.

Reply: Thank you for the comment. There were 503 patients with acute type A aortic dissection (AAD) admitted to our center, 34 cases among them were accompanied by lower limb malperfusion. Fifteen patients (2 with lower limb ischemia) died for aortic rupture before sending to operation room, and 9 patients (2 with lower limb ischemia) refused surgery for personal reasons. The other 479 patients received open aortic repair, 30 cases among them suffered from lower limb ischemia. All surgeries were performed by one surgeon. The timeline was listed below.

Reviewer #2: Good paper and good results with difficult cases.

Reply: Thank you very much!

Reviewer #3: The aim of the paper is to establish surgical technical recommendation in handling of
Type A aortic dissections with lower limb malperfusion as complication to the disease. This is serious problem where clear guidelines are lacking and this paper is elaborating on different technical aspects of value.

Comment and reply:

1. The language may have passed linguistic review, but is still not acceptable and has to be improved. Reply: Thank you. We have modified the language.

2. The patient material needs better classification particularly within Stanford and DeBakey grading. Reply: All the acute type A aortic dissection including in this manuscript were DeBakey type I aortic dissection.

3. Whether direct aortic cannulation was considered should be discussed more in detail.
   Reply: The advantages of central cannulation strategy may be the avoidance of an extra incision, in addition to good volume of antegrade perfusion. However, the locating cannulation is of paramount of importance since the sequence of false lumen cannulation can be catastrophic. Computed tomography, transthoracic echo, and direct epicardial echo are to obtain precise anatomical information. Therefore, we had never performed this approach before. In addition, the central cannulation seems to have the same effect as the axillary arterial cannulation in treating lower limb ischemia.

4. It is not clear whether intracerebral CT angiography was done prior to surgery and whether bilateral ACP was used in all or in a certain number of cases.
   Reply: Cerebral CTA was done prior to surgery. Bilateral antegrade cerebral perfusion via the right axillary artery and left carotid artery could be applied in case poor cerebral lateral circulation was detected by cerebral CTA before the surgery. The perfusion volume was controlled depending on the changes of the cerebral saturation.

5. It is unclear how many operations was done with simple tube graft/hemiarch or as total arch replacement and whether this made any difference.
   Reply: Twenty-eight patients received total arch replacement. The procedure for total arch replacement could be Sun’s procedure, or triple-branched stent graft implantation as we previous reported (1-3). Only two patients received hemi-arch repair. One was Marfan’s syndrome, and there’s no tear occurred on the intima of the arch. The other one was an old-aged (74-year-old) patient with a transient coma. We performed hemi-arch on this patient to reduced cerebral ischemic time. We believe that the stent on the descending aorta brings more benefits for lower body malperfusion, because it could maximum-likelihood eliminate the false lumen of the descending aorta, contributed to restore the blood flow the lower body.

6. It is also unclear whether any operations was consider done in a hybrid suite or whether a hybrid room would have made an impact on the solution.
   Reply: It is obviously safer to perform the surgery in a hybrid room. Because it brings risks while
transferring patients from operating room to hybrid room if interventional therapy is required, especially when the patient’s hemodynamic is unstable. Unfortunately, there is no hybrid room in our center. Therefore, we performed all the open aortic surgery in a common operating room. We found that it’s available to perform this procedure without hybrid room for the low incidence of secondary intervention.

Reviewer #4: The authors have to be congratulated to an impressive number of patients treated for a rare complication of an acute Type A Dissection.

The Manuscript is well written and the message clear.

There is just one minor comment I have for the authors. I would add to the discussion also the some thoughts on the protective effects of hypothermia that can be achieved as the leg is already reperfused during cooling.

Reply: We started CPB before cannulation of the femoral artery. The ischemic leg is lack of perfusion because of the obstruction. The reperfusion of the leg would not begin unless the cannulation of the ischemic leg is set up.

Reviewer #5: This study reports clinical outcome of acute type dissection in 30 patients with lower limb malperfusion who underwent aortic repair with axillary arterial perfusion and simultaneous femoral arterial perfusion for the ischemic leg. 28 patients did not require additional surgery for limb malperfusion after the aortic repair.

They concluded that the modified axillary-femoral perfusion could restore the lower limbs' perfusion simultaneously during the aortic surgery without neither delaying dissection repair nor prolonging the ischemic time.

The paper is well written. However, this technique is standard procedure for AAD patients with limb malperfusion. There is nothing special unique.

Reply: In a patient with aortic dissection and lower extremity ischemia one option may be to repair the aorta to reestablish flow within the true lumen and restore flow to the lower extremities. However, Elefteriades and coworkers (5) reported 25% of patients who underwent aortic graft replacement still required subsequent fenestration for persistent lower extremity ischemia. Percutaneous procedures such as balloon fenestration or stent grafting could be effective. However, should these techniques not be available, or if they are not successful, open procedures should be employed. Open techniques include cross-femoral bypass in the case of unilateral ischemia, axillary-bifemoral bypass for bilateral involvement, and femoro-femoral bypass should the dissection extend into the femoral bifurcation. The site for the cannulation of the lower body was rarely mentioned. Syed T. Hussain and his colleagues (6) had reported a case in which the femoral cannulation was on the ischemic site. He directly connected the axillary artery and femoral artery to restore the perfusion (normal temperature) of the ischemic leg before CPB. However, we believe that cold perfusion may bring more protect effect to ischemia-reperfusion injury of the leg. In addition, Syed T. Hussain only reported one case, he did not summarize a series of cases who suffered from such situation to evaluate the effect of his approach. Thus, we though this study was useful.
Reference:


