Peer Review File
Article information: https://dx.doi.org/10.21037/jtd-23-561

Reviewer A

Despite a solid protocol per se and well written manuscript, I need to make a critical comment on it from the clinical point of view.

Comment 1: The authors aimed to apply this GDP to acute type A aortic dissection, which is totally different pathology from others targeted for investigation previously. It shows extremely acute progression in nature and there are not a few patients who die before operated or even transferred to the hospital. This should be included in "limitations".
Reply 1: We agree with this helpful comment from the Reviewer. Hence, we have included this part in the limitation in the revised manuscript (***Line 216-217, Page 9*****).**

Comment 2: Furthermore, multiple organs can be involved and affect the prognosis but all of those are included in GDP. Obviously each pathology (rupture, malperfusion, etc) needs to be managed individually. This seems to be the main reason that GDP had not been investigated in aortic dissection. Therefore, I could not figure out how the authors would utilize the knowledge obtained in this study for management of each patient.
Reply 2: Thanks for the Reviewer's valuable questions. Preoperative abdominal organ malperfusion or rupture was excluded in the present study. We only included the patients who met the ATAAD diagnostic criteria in 2022 ACC/AHA Guidelines for the Diagnostic and Management of Aortic Disease and underwent emergent ATTAD repair under cardiopulmonary bypass.

Reviewer B

Comment 1: What do authors mean by no intervention was performed?
Reply 1: Thanks to the insightful comment from the Reviewer. This sentence means it is retrospective observational study without any intervention. We have deleted this sentence which reader may be confused.

Comment 2: The name of two groups is confusing. The authors applied the new strategy and it is not "conventional" (is what I understood). I would name it hypoxic group vs. normoxic or GDP strategy group etc.
Reply 2: Thanks to the helpful comment from the Reviewer. We have replaced "conventional group" in the manuscript with "normoxic group" following your suggestion.

Comment 3: The authors mention conventional precharge was performed for CPB.

Why and when was the left common carotid artery cannulated?
Reply 3: Left common carotid artery was cannulated after systemic heparinization. Left common carotid artery was cannulated to ensure sufficient cerebral perfusion.

Comment 4: The authors also mention that bilateral cerebral perfusion was conducted when the nasopharyngeal temperature reaching 26℃. How was the cerebral perfusion monitored?
Reply 4: Cerebral perfusion was monitored and adjusted according to the oxygen saturation of brain (55-85%) by the near-infrared spectroscopy (NIRS) technology.

Comment 5: The authors mention that full rewarming was started after the end of DHCA. When was DHCA discontinued, immediately after distal anastomosis? What was the conduct? Was proximal anastomosis performed after distal anastomosis? When were the supraaortic branches reattached?
Reply 5: DHCA was discontinued after distal anastomosis. Proximal anastomosis was usually performed before distal anastomosis. And the supraaortic branches were reattached after DHCA.

Comment 6: Why did the hypoxic group had lower perfusion pressure? Were they in shock or vasodilated? Did hypoxemia had higher impact than the perfusion pressure? Please add status of preoperative shock, preoperative intubation, preoperative inotropic use, preoperative lactic acid level, and malperfusion syndrome by organ system to the analyses including the Table.
Reply 6: Thanks for the Reviewer's careful and significant question. In fact, hypoxic group had higher perfusion pressure and lower perfusion flow. The compressed true lumen of peripheral vessels or cannula size-weight mismatch can lead to the increase of perfusion pressure and limit the increase of perfusion flow (PF). Compared with normoxic group, these phenomenon (The compressed true lumen of peripheral vessels or cannula size-weight mismatch) might be more common, leading to higher perfusion pressure and lower perfusion flow in the hypoxic group. That's why DO_2 in the hypoxic group was lower compared with normoxic group according to the formula (DO_2 [ml/(min· m^2)]=PF[L/(min·m^2)] × {[HCT(%)/3 × 1.36 × SaO_2(%)] + [PaO_2(mmHg)× 0.003)]}× 10).
Both hypoxemia (HCT) and perfusion pressure (Higer perfusion pressure means lower perfusion flow) have impact on DO_2 according to the formula (DO_2 [ml/(min· m^2)]=PF[L/(min·m^2)] × {[HCT(%)/3 × 1.36 × SaO_2(%)] + [PaO_2(mmHg)× 0.003)]}× 10), however, which factors have more impact on DO_2 remains unclear.
In our present study, the incidence of preoperative shock, preoperative intubation, and preoperative inotropic use was 0 in both groups, and we have put these data in Result part (***Line 136-137, Page 6***). Preoperative lactic acid level was available in the **Table 1**. Moreover, preoperative abdominal organ malperfusion was excluded in the present study.