Peer Review File
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Review Comments

Reviewer A

Comment 1: In line 131. platelet function test showed approximately 40% platelet function. please specify the used test and used strategy (thrombocyte transfusion)
Response 1: Thank you for making this point and identifying that we had provided insufficient detail.
Changes 1: We have updated the manuscript with the technology used to perform platelet mapping and how our strategy altered as a result of these findings.

Comment 2: In line 161 it is stated that no cell saver is used perioperatively, while this is generally used in cardiac surgery. In the literature, the cell saver is sometimes considered safe for SCT patients. Please discuss.
Response 2: Thank you for making this point. Given our limited experience in this scenario, and the time sensitive nature of the presentation, we opted to follow the advice given in the guidance received from another centre with regards to not utilising cell saver. Additionally, cell salvaged blood is exposed to fat globules, diathermy smoke, static and acidotic environment which all increases the risk of sickling crisis.
Changes 2: We have updated the manuscript to include an explanation as to why we did not use cell salvage.

Comment 3: Please discuss why you used DHCA with selective integrate cerebral perfusion instead of MHCA (24-26 degree C). Moderate to mild hypothermia strategies are associated with decreased operative mortality and the risk of postoperative stroke. As mentioned, hypothermia is a risk factor for a sickle cell crisis.
Response 3: Thank you for raising this important point. Whilst we recognise that some evidence points towards better outcomes with MHCA, it is an approach that is never used in our centre. We therefore felt that given there were already a number of complex and unfamiliar aspects of the case, that utilising an HCA strategy never before used in our centre would potentially be unsafe. Moreover, the dissection in the carotid meant that the ability to deliver ACP, which is mandatory with MHCA but not with DHCA, was not assured.
Changes 3: This information has been added to the manuscript.

Reviewer B

Comment 1: The authors need to spend some mild additional time to further edit their manuscript to an easier to read manuscript. There are exceedingly long paragraphs that need mild editing in order to improve their legibility.
Response 1: Thank you for making this point.
Changes 1: We have restructured and shortened many of the paragraphs in the manuscript.

Reviewer C

Comment 1: Line 44: probably one "space" too much after dissection flap
Response 1: Noted
Changes 1: Additional space removed.

Comment 2: Line 44-45: The authors conclude that "The extent of the dissection meant that the operation required the patient to be cooled to 18°C". Do the authors utilize DHCA with 18°C in every patient presenting with preoperative cerebral malperfusion and/or stroke in acute type A Aortic dissection? I believe this conclusion comes from the fact of preoperative cerebral malperfusion with corresponding stroke and preoperative neurological deficits. However, current evidence does not show that lower grades of hypothermia may lead to a reduction of postoperative stroke and cerebral injury in surgery for acute type A aortic dissection. Furthermore, stroke was 5 days past and neurological status was stable, making it discussable if deeper degrees of hypothermia would give extra protection in terms of further neurological injury due to cerebral ischemia. I suggest reading and potentially including "Cerebral Protection Strategies and Stroke in Surgery for Acute Type A Aortic Dissection" J Clin Med. 2023 Mar 15;12(6):2271. doi:

10.3390/jcm12062271
Response 2: Thank you for raising this important point. Whilst we recognise that some evidence points towards better outcomes with MHCA, it is an approach that is never used in our centre. We therefore felt that given there were already a number of complex and unfamiliar aspects of the case, that utilising an HCA strategy never before used in our centre would potentially be unsafe. Moreover, the dissection in the carotid meant that the ability to deliver ACP, which is mandatory with MHCA but not with DHCA, was not assured.
Changes 2: We have updated both the case presentation and discussion to reflect our thinking on HCA strategy.

Comment 3: Line 104: probably one "space" too much after blood.(3)
Response 3: Noted
Changes 3: Additional space removed.

Comment 4: Line 235-239: The authors conclude that "A first presentation with intra-operative sickle cell crisis during a period of DHCA would be catastrophic and centres who regularly carry out aortic surgery under DHCA could consider screening for the presence of HbS in all patients undergoing elective aortic surgery under hypothermia either routinely or selectively for patients deemed to be at higher risk of carrying the gene for SCT." How do the authors define the higher risk of carrying the gene of SCT? Under which circumstances screening should be performed, when it should not? I suggest adding an additional clarifying sentence.
Changes 4: Thanks for making this point. Screening programmes tell us that patients who identify as black and patients with African heritage are at the highest risk. It would therefore make reasonable sense to label patients who fall into either of these categories as high risk and screen them accordingly.
Response 4: The discussion and conclusion have been updated to reflect this additional detail.