Peer Review File

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Reviewer A

I congratulate on your work. I would like to make some comments in order to help you improve the quality of your manuscript:

1. Your Figures 1 and 2 are Kaplan-Meier Curves. I miss 2 elements there:
A. Number at risk over the follow-up
B. Log-rank test to verify if the groups are statistically different
C. Consider applying a Cox model to quantify effect size (HR and 95%CI) - I suggest, for example, that the group with "Ascending only" be the reference group (simple they are supposed to have the lowest risk in comparison with the other groups).

Reply:
Answer: Thank you for your comment:

1. Figure 2 and 3 are Kaplan-Meier Curves.
    A. The statistical software we utilized to elaborate the graph ("ggsurvplot", R Studio) depicts at the bottom of the figure the exact number of the censored patients (from which the number at risk can be promptly derived, being its reciprocal). This graph offers the advantage of depicting the censored patients not only by year, but across each single year. For instance, the number of censored patients at "time 0" was 4 in Figure 2 (survival according to aortic segment replaced) and 3 in Figure 3 (survival across status classes). Both graphs present the number of censored patients up to the end of follow up (16th year).
    B. The log-rank test was performed, and the statistical significance (p-value) for both survival analyses was reported in Table 4. No statistical significance ($p = 0.56$) was reached for the survival analysis according to aortic segment repaired (graphed in Figure 2). There was statistical significance ($p < 0.01$) for the survival analysis according to urgency status at presentation (graphed in Figure 3).
    C. The results of Cox regression analysis were reported in Table 5b, which provides the predictors of follow-up mortality (i.e. the reciprocal of survival).

2. I saw that most of your dissections with root replacement had a Bentall procedure. We live in a time where there is enormous enthusiasm for valve-sparing aortic root replacement (VSARR), however, the evidence shows that, while VSARR seems to be better for aneurysms (in comparison with Bentall), the same VSARR is worse than Bentall in the context of dissections. Please discuss this aspect (and find below references for this discussion).
References:
*VSARR vs Bentall in aneurysms - Sá MP, Tasoudis P, Jacquemyn X, Van den Eynde J, Rad AA, Weymann A, Ruhparwar A, Caranasos TG, Ikonomidis JS, Chu D, Serna-Gallegos D,

Sultan I. Long-term outcomes of valve-sparing root versus composite valve graft replacement for acute type A aortic dissection: Meta-analysis of reconstructed time-to-event data. Int J Cardiol. 2023;382:12-19.
*VSARR vs Bentall in dissection - Sá MP, Jacquemyn X, Van den Eynde J, Chu D, Serna-Gallegos D, Coselli JS, Sultan I. Long-term outcomes of valve-sparing aortic root versus composite aortic valve graft replacement for aortic root aneurysm: Meta-analysis of reconstructed time-to-event data. Am J Surg. 2023 Jul 5:S0002-9610(23)00318-5.

Reply 2: The Authors agree with the above. The modified Bentall procedure with a mechanical or bioprosthetic valve, was considered the gold standard intervention for TAAAD in the participating centers. The first objective is to save the patient's life in the context of emergent and life-threatening scenarios. In our study a valve-sparing aortic root replacement with reimplantation technique (David procedure) or remodeling technique (Yacoub procedure) was rare and performed for younger patients by a surgeon who had large experience with valve-sparing aortic root replacement.

Changes in the text: In the centers participating in the study, a modified Bentall procedure with a mechanical or bioprosthetic valve, was considered the gold standard intervention for TAAAD when the aortic root aortic root replacement needed replacement for dilatation (larger than 4.5 cm), contains the intimal tear, or if the patient suffers by aortic valvulopathy or connective tissue disorder. The rare cases of valve-sparing aortic root replacement with reimplantation technique (David procedure) or remodeling technique (Yacoub procedure) were performed for younger patients by a surgeon with large experience with valve-sparing aortic root replacement. A recent meta-analysis compared long-term outcomes of valve-sparing aortic root replacement (VSARR) versus composite aortic valve graft replacement (CAVGR) shows well that VSARR has not any difference in terms of in-hospital mortality and long-term survival, but presents a higher risk of reoperation and in the older population a higher risk of all-cause death[x].

X: Sá MP, Tasoudis P, Jacquemyn X, Van den Eynde J, Rad AA, Weymann A, Ruhparwar A, Caranasos TG, Ikonomidis JS, Chu D, Serna-Gallegos D, Sultan I. Long-term outcomes of valve-sparing root versus composite valve graft replacement for acute type A aortic dissection: Meta-analysis of reconstructed time-to-event data. Int J Cardiol. 2023 Jul 1;382:12-19.

Reviewer B

I would like to congratulate dr Nappi and colleagues with this extensive work.
A comprehensive description of data in 3 centers, with clinical results of acute type A aortic dissections (ATAAD).

Although this paper describes outcome in these centers, I have some concerns with regard to the inferences.

1) The 3 centers have a mean ATAAD cases of 15 per year per center, which is not a high

volume, more likely an average center. Nevertheless, the mortality was relatively high for the ascending replacement only group (23%). This could be due to relatively large number of severely hemodynamic impaired patients, with almost half of patients were emergent of salvage cases. Can you elaborate on this and the case selection procedure. With other words, what proportion of patients is operated and what not?

Reply: The authors thank the reviewer for his/her suggestion. As tertiary referral centers, we offered surgery to every referral who survived transfer to the units. However, the proportion of patients who were not transferred or referred would not be available for analysis which perhaps represents a as yet undefined/unexplored group.

2) comparing a more conservative approach to a more aggressive one has some difficulties. The reason for more extensive operation in the arch should (in most patients) be the presence of an entry or re-entry tear. If in ascending only there are entry tears in the arch, than one should expect worse outcome during FUP.

Reply: This would be true but the conservative approach was primarily used in older patients who have more co-morbidities, thus the primary aim would be to re-establish flow to the true lumen proximally in the acute setting. Longer-term follow up would perhaps identify more patients with longer term complications for re-entry.

3) Authors in their conclusions, that neurological events occur more often in the arch replacement group, despite younger age. I think that in those patients there is just more severe and extended dissection regarding the carotid arteries, which is of more clinical impact than age alone.

Reply: This is also probably true alongside poorly managed risk factors like hypertension and diabetes.

4) It should be interesting to identify patients with similar characteristics in different groups (Arch and asc only) to compare their survival and other complication rates. Does the data allow for such analysis (of subgroups). Taking into account the severity of disease, ie. extension of the dissection
Reply: A subgroup analysis was performed but the reviewer is perhaps suggesting a propensity-matched study for which our numbers would be too small to provide any meaningful comparisons.

5) more generally, the manuscript comprises very long text. If data is available in tables or figures, than please remove from text for the readability.

Reply: Many thanks for your comments. We will truncate some of the discussion for improved readability.