Peer Review File

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Reviewer Comments (Round 1)

Reviewer A

Comment 1: This is an interesting case series highlighting the potential for late complications after surgical repair of aortic coarctation. The importance of lifelong surveillance with yearly imaging intervals for these patients are recommended by the authors which is more than the current ESC guidelines of 3-5 years. This may be appropriate given the aortopathy and hypertension associated with aortic coarctation.

Reply 1: Thank you. We appreciate our recommendation for more frequent imaging might only be applicable to the adult population, we have clarified this in the text following a comment from your colleagues.

Changes in the text: Lines 47 and 273-275.

Comment 2: The aortic complications are often difficult to manage and the authors should be commended for the successful surgical management of these complications with low morbidity with standardised perioperative management. The authors did not mention whether any of these complications could have been treated with endovascular therapy. Is this an option in their institution and are these patients discussed with endovascular specialists in a multi-disciplinary meeting?

Reply 2: Thank you. We do routinely discuss complex aortovascular patients on a bi-weekly Aortovascular MDT, attended by endovascular specialists and GUCH Cardiologist. In the event of an emergency this might not be possible, however we tend to do ad-hoc MDTs for borderline indications. In these particular cases, endovascular treatment was not offered either due to lack of proximal landing zone or in equipoise of treatment due to the young age of the patients preferring a more definitive result with lower reintervention rate.

Changes in the text: Lines 71-73 and 256-260.

Comment 3: The discussion should briefly discuss the incidence and outcome in the literature of the endovascular outcomes in the treatment of complications of coarctation repair.

Reply 3: Agree, added and referenced in the results.

Changes in the text: We have added that in lines 244-247 and 256-260.

Comment 4: There are 2 minor errors

Line 183

"presented with as pseudoaneurysm" should be "presented with a pseudoaneurysm"

surveillance in our institution (n=4). Another patient, who presented with as pseudoaneurysm and impeding rupture was under 3-year imaging surveillance

Line 242

Omit the first "be"

could represent a selection bias, as those cases would be likely be treated by endovascular specialists rather than open aortic surgeons.

Reply 4: amended, thanks.

Changes in text: lines 173 and 231.

Reviewer B

As the authors state, CoA is not only a simple defect but can be seen as general aortopathy. I think that this case series is important reminder of this and should be published. However, I have several comments.

Comment 5: In general, the authors should differentiate more between children and adults as well as early treatment and late treatment. Today, most CoAs are diagnosed and treated in neonatal period. These infants are prone to re-stenosis, which occurs commonly soon after (usually 1-5 months) primary operation and can usually be treated by balloon angioplasty. This is stated in the discussion but should also be added to the introduction. Also the fact that late diagnosis and treatment is a risk factor for hypertension and may affect to the risk of late complications.

Reply 5: Thanks. We have added this to the introduction as suggested.

Changes in text: lines 66-69.

Comment 6: In the abstract, percentages and numbers are presented in confusing manner. I suggest that the authors use only numbers, since the series is so small.

Reply 6: We have removed the percentages from the abstract and the results. Please note there is a patient that underwent repair of the CoA twice, hence why the total number is 10 and not 9.

Changes in text: lines 19-22 and 156-161.

Comment 7: In the highlight box and discussion: There are follow-up recommendations (ESC Guch 2020, AHA), but these recommendations are not followed, or the patients are lost in the follow-up. There is also Clinical Practice Algorithm For the Follow-up of repaired Coarctation of the aorta (ACC 2023, Majd Makhoul). In these recommendations imaging is recommended in an interval of 3-5 years. The authors advocate yearly imaging. In my opinion, the authors cannot generalize this to the all CoA-treated patients and should state more clearly that from which age on and in which group of patients yearly imaging is recommended. As seen in the Table, the age when complications occurred was from 22 y. It is not necessary or even possible for example for small children since they need anesthesia for MRA and get radiation from CT. In addition, aortic arch can be visualized usually quite well by echo. Is it possible that some of the patients are at higher risk of aneurysms (for example hypertensive) and need more frequent imaging, this should be discussed.

Reply 7: Thanks, this is a very valid point. We were implying those recommendations for the adult population – we have now modified and rephrased the suggestion, so it is clear we are referring to patients who had their CoA repair during the adult life.

Changes in text: Lines 47 and 274.

Comment 8: In the introduction, line 56, I would leave out the words "is a defect of the great vessels that", CoA does not need a classification like that. "Coarctation of the aorta (CoA) accounts for 5-7% of congenital heart defects with an incidence of 0.3/1000 births".

Reply 8: Removed, thanks

Changes in text: Line 56

Comment 9: From line 63 Introduction: Surgery can be performed from the left thoracotomy or sternotomy and can be closed or open. Suggest adding this in the parenthesis. I disagree (and this can be also seen in the results), that interposition graft is one of the most preferred technique today. It can be performed if there is not much growth to be expected. Arch augmentation, for example with homograft, is still a common technique if the arch needs to be augmented.

Reply 9: Added and modified as suggested.

Changes in text: Lines 61 and 65

Comment 10: Results: How many native CoAs were treated by surgery and intervention from April 2015 to January 2022? This information should be added to the first section of the introduction.

Reply 10: there were 4 native repairs in our unit. Of note, we do not have pediatric cardiac surgery in our centre and endovascular services had been also separate for the majority of the study period, although we have them now onsite. This could represent a bias as we have stated elsewhere in the manuscript.

Changes in text: lines 152-155.

Comment 11: Results and Table: Is it possible to get the information how many of the patients had hypertension? I suggest adding this to the Table.

Reply 11: 4 patients had hypertension, as stated on the text. This has now been added to the table as requested.

Changes in text: Table 1

Comment 12: Line 229 Discussion: "Indication for intervention is systemic hypertension with an upper to lower body pressure difference of >20mmHg [1-2]". I suggest that the authors add the indications also for children: In children, if there is >20 mmHg gradient, hypertension is not required and if the CoA is duct-depended, hypertension/pressure difference are not required for the indication. In systemic hypertension, the pressure difference of > 20 mmHg is not a requirement if there is at least 50% narrowing relative to the aortic diameter (ESC IIa).

Reply 12: thank you for providing the indication for children; added now to the text.

Changes in text: lines 218-221.

Comment 13: Figures: The figures are mainly very demonstrative, and the findings are obvious. I still, suggest that the findings are shown with arrows, and this should be added also to the figure legends.

Reply 13: Arrows, labels and marks added to the figures.

Changes in text: Figures and figure legends.

Reviewer Comments (Round 2)

Reviewer B

Thank You for the corrected article, it has improved a lot. I still have a few comments:

Comment 1: Abstract: The sentence "A variety of surgical techniques can be used to repair coarctation in children, whilst in adults, endovascular therapy can also be employed" is not correct since endovascular therapy is applied in children as well. Suggest to change: "A variety of surgical and endovascular techniques can be used to repair coarctation"

Reply 1: Changed as suggested, thanks.

Changes in the text: Line 11

Comment 1: Abstract: The one patient treated with end-to-end anastomosis (patient number 7) was initially treated with end-to-end-anastomosis, not balloon angioplasty. Balloon angioplasty was not an initial treatment, rather, it was treatment of re-CoA at age 1. So, if I understand correctly, You do not need to mention balloon angioplasty in the abstract. Of course, it should be reported in the text (see below) because angioplasty is probably the reason for pseudoaneurysm.

Reply 2: Removed from the abstract, thanks.

Changes in the text: Line 20

Comment 3: Abstract, methods and results: I suggest using median and range in parenthesis to report age in years and time in years. It is very confusing to report means, standard deviations and ranges. These (age and time) are continuous variables, mean can be used if the variables are normally distributed, I suspect that the age and time variables in this series are not. In the methods the sentence "Categorical variables are expressed as mean (range) +/- standard deviation" is not correct since age and time are continuous variables. I suggest changing this: "Age- and time-variables are expressed as medians and ranges".

Reply 3: The age at presentation follows a normal distribution as indicated by the Saphiro-Wilk test, hence why we reported them using means and STD.

Changes in the text: We have amended categorical variables for continuous variables as it was clearly and error.

Comment 4: Abstract: This case series contains patients with SURGICAL treatment of native CoA (except 1 with balloon angioplasty at age 1). I suggest adding this to the sentence: "The aim of this series is to describe late complications following coarctation repair and the outcomes of their surgery".

Reply 4: Modified as suggested, thanks.

Changes in the text: Line 14

Comment 5: The patient number 7 had native CoA treated surgically and reCoA treated with balloon angioplasty? This patient had late pseudoaneurysm treated (possibly caused by balloon angioplasty). I suggest adding pseudoaneurysm and aneurysm to the discussion where complications of endovascular CoA treatment are listed, line 281.

Reply 5: The endovascular treatment mentioned in the discussion refers to stents rather than balloon angioplasty. We do not think the complications of balloon angioplasty and endovascular treatments should be merged. Pseudoaneurysm or false aneurysm formation is mentioned in line 244 as known complication of of CoA repair.

Changes in the text: None

Comment 6: Discussion: “We advocate for a more frequent follow-up with annual imaging surveillance of the whole aorta with MRA to patients with previous CoA repair during their adult life, replicating the postoperative surveillance recommended for other aortic pathologies in the adult.” This is still a bit unclear recommendation since 5/9 of these patients were treated in childhood. I still suggest rephrasing the sentence. It is important that all CoA treated patients are followed up and imaging is performed regularly, and in certain risk groups even yearly imaging in adulthood may be necessary.

Reply 6: Modified as per your suggestion. This was modified based on your previous revision.

Perhaps advocate was too much of a strong word, when the message we were trying to convey is that replicating our local policy for other aortic pathologies of annual imaging, some of this complications could have been prevented or treated electively rather than on an emergency situation.

Changes in the text: Lines 291-293