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Reviewer A

The authors have written a nice manuscript on their experience in 9 children with innominate artery compression syndrome and a repair through partial median sternotomy. the paper is well- written and illustrated, and the surgeical technical detail quite informative. however, the approach, surgery and results are not new and extensively published in the literature. a few comments/questions:

Thank you for stating that our paper is well-written, well-illustrated, and informative. We have incorporated your comments and feel they have improved the quality of the paper.

1. page 4, lines 97-98: which prophylactic antibiotics and for how long?

We now state:

“Prophylactic cefazolin was administered prior to the operation and continued for 24 hours post-operation.”

2. pages 4 and 5: even for a practicing congenital heart surgeon with experience doing this surgery, i find the detail extremely redundant; you can shorten this passage extensively.

We have streamlined these sections following your feedback.

3. bottom of page 6 and top of page 7: the fact that some patients still had symptoms, despite what is defined as a technical success, is also well known, and in your case, probably due to the relatively shorter follow-up time. perhaps you may wish to comment on this? for those surgeons and pediatricians following-up on these patients, it may be important to stress that longer standing airway compression prior to surgical relief needs time for the alleviation of airway symptoms, often requires reassurance for the parents and caregivers alike, and usually improves with time.

Thank you for the suggestion. We now state:

“One patient had a 20% residual stenosis with mild stridor but no further episodes of ATLE at 6-month follow-up. Mild stridor often improves overtime and requires patience and reassurance to both caregivers and family members.”

4. page 8, lines 244-245: the role of complete thymectomy in the success rate of your series is conjecture and not supported by many published reports. i do this through a mini right anterior thoracotomy in the second intercostal space (Chamberlain incision), have never done a thymectomy, not even partial, and have had excellent results. i'm not sure you should sell this to the general public as a rule; i'm happy it worked for your patients, but you don't know if the same good results could have been achieved without touching the thymus.

We have updated the language to state:

“In our experience, a complete thymectomy is central to the operation’s success...”

In addition, following your feedback we cite a paper by Weber et. al., that included 4 patients with innominate artery compression syndrome and now say:

“It is worth noting, that successful AAs for IAS have been reported without a thymectomy including via an anterior inframammary incision.”

In summary, it's a nice manuscript on a well known/published problem and technique, which could interest a broader readership such as that of TP. It needs to be tightened up a little, and I will leave it to the discretion of the Editor-in-Chief, if the originality attains priority for publication.

Thank you for the kind words. Incorporating your feedback, we believe the revised manuscript is better and worth publishing. In addition to being of interest to the broader readership of TP, we hope that the success of our technique would encourage surgeons to consider a partial median sternotomy with a complete thymectomy for their patients with IAS.

Reviewer B

There should be a waiver from IRB at least.

IRB waiver was obtained for this study.

How do you measure the degree of tracheal narrowing? Is it eyeballing or something else? Do you also calculate the length of the malacia? Aortopexy seems a good first option for short segments.

Yes, the degree of tracheal narrowing is subjective and is determined by the provider at bronchoscopy by visual inspection. The length of the malacia is also as visualized on bronchoscopy.

Resolution of apnoeic spells and infection is normally the best outcome parameter. In the manuscript it appears that 5/9 patients were successful. How were the symptoms in the children with a remaining narrowing > 20%?

Apologies for the confusion, we updated the results in the abstract to state:

“Technical success (defined as $\leq 20\%$ residual stenosis) was achieved in 78% (7/9) of the patients. The two patients with unsuccessful AAs, required either a tracheal resection or an innominate artery reimplantation. Both achieved full symptom resolution. Overall, 78% (7/9) patients experienced full symptom resolution. Of the two patients without full symptom resolution, one had mild stridor at 6-months post-operation. The other patient without full resolution is awaiting further vocal cord surgery for an associated glottic pathology potentially contributing to the patient’s residual mild stridor.”

The child with cartilaginous problem which was operated a second time, what was the cartilago problem and why was this not picked up before the first surgery?

Following your feedback, we added the following details:

“The patient was missing a single tracheal ring 0.5cm above the carina resulting in an entirely membranous section of trachea. The missing ring was not diagnosed preoperatively as repeat flexible bronchoscopy could easily pass the stenosis suggesting an extramural pathology and CT scans, taken while the patient was intubated, showed the innominate artery proximal to the anterior trachea.”

Line 222: reflex apnea is commonly mentioned as brief resolved unexplained events (old term) and apparent life threatening event (ALTE - new term). It would be good to mention this.

Thank you for the feedback. We have updated the terminology from reflex apnea to the new term of ALTE.

In the discussion, you mention that stridor alone is not an indication for surgery, in your series, one child was operated because of stridor alone.

That patient also had a >70% luminal reduction, which is an indication for surgery. To clarify we now state that the indication for surgery was “severe stridor with >70% luminal reduction”.

Could you add a video of the surgery?

Unfortunately, the operations were not recorded.

Discussion could be elaborated by other surgical possibilities in tracheomalacia.

Thank you for the suggestion, we added the following to the discussion:

“Historically, a left anterior thoracotomy has been the preferred approach utilized in ~70% of AAs for tracheomalacia. In an analysis of 100 patients undergoing aortopexy, no differences in outcomes (e.g., mortality, length of ICU stay) was found between a median sternotomy (n=89) and a thoracotomy/thoracic approach (n=11). Wine et. al., report a case series including 17 patients with a right median transverse incision. Wine et. al., report a complete response in 13 of 21 patients (62%) with the remaining (38%) experiencing a partial response. In cases of tracheal compression by the innominate artery at/above the thoracic outlet, a cervical approach can also be utilized. When utilizing a suprasternal incision for an aortopexy, Haveliwala et. al., report 41% of patients with complete symptom resolution, 32% with improved symptoms, and 27% with no improvement (N=22). Specifically for IAS, Grimmer et. al., report a case series of 22 patients treated with an off-pump innominate artery reimplantation utilizing a median sternotomy approach. 19 of the 22 patients (86%) experienced complete symptom resolution, 2 experienced partial resolution, and one patient experienced no improvement and continued to suffer attacks of severe stridor.”

“It is worth noting, that successful AAs for IAS have been reported without a thymectomy including via an anterior inframammary incision. In addition, Isik et. al., report a cases series utilizing an upper partial sternotomy and only removing the left part of the thymus gland.”