Case Report: Intraoperative diagnosis of a clinically significant vascular ring by the anesthesia team

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Background
- We present the case of a clinically significant vascular ring diagnosed by the anesthesia team intraoperatively after placement of the transesophageal echocardiogram (TEE) probe.

Patient History
- 18-month-old female born at 36 weeks by NSVD with a known ASD and right aortic arch diagnosed by fetal echocardiogram
- Multiple respiratory infections, chronic cough and congestion
- Chest X-ray and a cardiology consult with transthoracic echocardiogram (TTE)
- Chest X-ray displayed significant consolidation with air bronchograms
- TTE demonstrated an ASD, right heart dilation and a right aortic arch
- The ASD was determined to be unamenable to non-invasive device closure secondary to its position and the risk of vascular injury
- Due to her chronic infections, congestion and dilated right ventricle, it was determined that surgical ASD closure was necessary

Case Description
- Uneventful mask induction, nasal intubation and left radial arterial line
- TEE probe placed followed by loss of arterial blood pressure tracing along with a drop in tidal volumes on the ventilator
- A non-invasive blood pressure on the right arm was recorded which displayed a normal blood pressure of 88/42
- Given her history, a vascular ring was suspected by the anesthesia team
- A flexible bronchoscopy was performed by the anesthesiologist demonstrating a significant narrowing of the trachea above the carina
- DLB was then performed by ENT confirming the presence of a significant narrowing of the trachea just proximal to the carina (Figures 1 and 2)
- A diagnosis of a vascular ring was made and the surgical course was then changed
- The patient underwent a patch closure of her ASD and ligation of the ligamentum arteriosum releasing the vascular ring. She had an uneventful post-operative course and was discharged to home on day three

Discussion
- Symptoms include reflux, dysphagia, chronic cough, recurrent upper respiratory infections, and noisy breathing
- Chest X-ray can display lung consolidation
- A barium swallow test can be performed
- A chest CT or MRI scan can also confirm the anatomic location and variation of the vessels, trachea and esophagus
- Bronchoscopy will demonstrate a narrowing of the trachea
- Echocardiogram is unreliable for the diagnosis of a vascular ring and should not be used to exclude its presence
- The gold standard for the diagnosis of a vascular ring is by angiography

References