Case report of aortopulmonary window with undiagnosed interrupted aortic arch: Role of transesophageal echocardiography

The Editor,

A 6-month-old child weighing 3.2 kg with complaints of recurrent chest infections, breathlessness, and failure to thrive since birth was admitted with stable vitals and all peripheral pulses were felt without radio femoral delay. Preoperative transthoracic echocardiography (TTE) showed an 11 mm echo drop out between aorta and pulmonary artery and a 3 mm patent ductus arteriosus (PDA) with L-R shunt, and it was confirmed by the computerized tomography angiogram (CTA).

Balanced anesthesia was given with fentanyl, sevoflurane, and rocuronium in oxygen/air mixture. Right femoral artery was cannulated with 22 g arterial catheter and right internal jugular vein with 4.5 Fr triple lumen catheter under ultrasonographic guidance. ST-3 pediatric transesophageal echocardiography (TEE) probe was inserted using a laryngoscope. Upper esophageal short axis view (SAX) view showed aortopulmonary (AP) window defect (1.08 cm). The AP window was repaired using a Gore-Tex patch and PDA was also closed. During weaning from bypass, femoral arterial pressure trace did not appear even though there was adequate root pressure. The integrity of femoral arterial catheter was checked and confirmed. Immediately, we suspected interrupted aortic arch (IAA) and the flow of descending thoracic aorta (DTA) were checked with TEE in situ. There was no pulsatile flow in the DTA which was reconfirmed with cardiologist [Figure 1a]. It was found that the distal end of PDA was continuing as DTA. Integrity of aorta was re-established by anastomosing the DTA to left subclavian artery (end to side). Subsequently, femoral arterial trace reappeared; TEE also showed the returning of pulsatile DTA flow [Figure 1b]. The patient was weaned from the cardiopulmonary bypass (CPB) successfully and he had an uneventful postoperative course.[1]

Fifty percent of these cases have associated cardiovascular anomalies, so it is important to look for these associated anomalies of heart and great vessels.[2] Preoperative imaging such as TTE, Doppler studies, and hemodynamic catheterization should be carried out to rule out these coexisting anomalies.[3‑5] In our case, preoperative evaluation of TTE and CTA failed to diagnose IAA,[3,4] probably due to the continuous flow of DTA through PDA and also a possibility of human error.[2]

Prebypass TEE failed to detect IAA, since our upper esophageal TEE views were unclear. We recommend that it is ideal to put a femoral arterial line in AP window patients and check for the integrity of femoral arterial trace by temporarily clamping the PDA before initiating the CPB. As a routine TEE examination in AP window patients, it is wise to look for DTA flow while coming off bypass. Missing the diagnosis may lead to death due to heart failure and failure to wean off from CPB in a child, who could undergo a successful surgery.

To conclude, thorough knowledge about the patient and good understanding of the embryology and pathogenesis of congenital cardiac lesions are needed to proceed for corrective repair. In our case with high index of
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Figure 1: (a) Mid esophageal-descending thoracic aorta long axis view. Pulse wave Doppler showing no flow in descending thoracic aorta. (b) Return of flow in descending thoracic aorta.

suspicion, femoral arterial cannulation and appropriate use of TEE uncovered and confirmed the missing diagnosis and changed the course of surgery.

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Conflicts of interest
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