Red colour venous flow in the suprasternal view: a red flag sign

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DESCRIPTION

A 3-day-old full-term neonate, born by normal vaginal delivery, was presented with respiratory distress and mild cyanosis. His room air saturation in all four limbs was 84%. The clinical examination was unremarkable. Chest X-ray showed cardiomegaly and increased pulmonary vascular markings. Transthoracic echocardiography revealed 8 mm ostium secundum atrial septal defect (ASD) with bidirectional shunt and dilated right atrium and right ventricle with absence of individual pulmonary veins (PV) draining into left atrium (LA). Suprasternal view showed vertical vein (VV) which was recognised as a vessel lateral to LA with red-coloured continuous flow on Doppler (figure 1). The PVs were draining into the venous confluence behind the LA which was draining into the VV. VV connects into the left innominate vein which finally forms the right superior vena cava (figure 1, video 1).

Clinical presentation of total anomalous pulmonary venous connection (TAPVC) varies from congestive heart failure at one end of spectrum to deep cyanosis at the other which in turn depends on the balance between the interatrial communication and pulmonary venous outflow obstruction.[1] Our case highlights the importance of recognising additional channel in relation to aorta in suprasternal view. Usually there is only one vessel visible except aortic arch, which is right pulmonary artery. The differential diagnosis of additional vessels can be aortopulmonary collaterals, patent ductus arteriosus (PDA) arising from aortic arch, VV in TAPVC and retroaortic innominate vein.[2] Meticulous echocardiography can be rewarding in differentiation of these structures. Aortopulmonary collaterals and PDA will show high-velocity continuous flow.

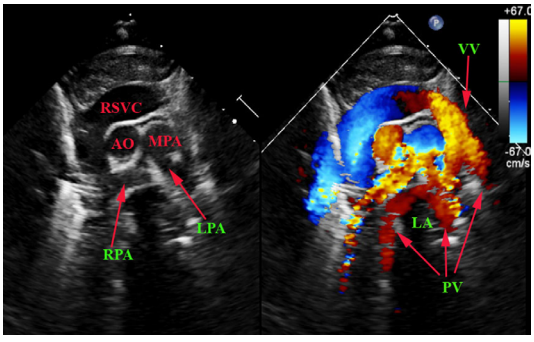
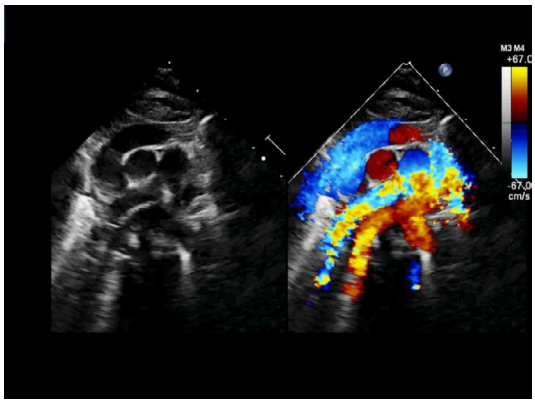


Figure 1 Suprasternal view demonstrating vertical vein. AO, aorta; LA, left atrium; LPA, left pulmonary artery; MPA, main pulmonary artery; PV, pulmonary vein; RPA, right pulmonary artery; RSVC, right superior vena cava; VV, vertical vein.



Video 1 Video demonstrating pulmonary venous drainage into a common chamber which finally drains into a vertical vein.

Retroaortic innominate vein will show low-velocity venous flow (blue flow) towards the heart while VV can be identified by low-velocity venous flow away from the heart (red flow). Our patient underwent successful rechanneling of PVs to the LA with ligation of VV and closure of ASD.

Learning points

- Supracardiac variety of total anomalous pulmonary venous connection (TAPVC) is the most common type of TAPVC.
- Transthoracic echocardiographic suprasternal view is the ideal view for anatomical delineation of pulmonary venous drainage.
- Demonstration of vertical vein is the cornerstone for diagnosis and meticulous echocardiography helps in differentiating it from other vascular structure.

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