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Images in Congenital Cardiac Disease

Echocardiographic diagnosis of dual connections to ascending and descending vertical veins in the setting of totally anomalous pulmonary venous connection

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Dual, or double, connections to a left vertical vein and to the coronary sinus have been described in the setting of totally anomalous pulmonary venous drainage, but to the best of our knowledge, simultaneous connections to ascending and descending vertical veins has thus far been suggested only as an embryological possibility.[1] Our patient was a female infant, born at term weighing 3.2 kilograms, who presented at birth with respiratory distress and cyanosis. Transthoracic cross-sectional echocardiography performed when the infant was aged 7 days old revealed, in the suprasternal coronal view (Fig. 1), that all the pulmonary veins (arrows) connected to a confluence, which then drained below the diaphragm (asterisk). Additional views with colour flow mapping (Fig. 2) showed that there was also a left vertical vein draining to the brachiocephalic vein. Further scanning from this projection showed both channels connecting to the confluence, revealing the relationship of the confluence to the left atrium (Fig. 3), and demonstrated increased flow through the hepatic and inferior caval veins (Fig. 4). These findings were confirmed during surgical repair carried out as an urgent procedure. Apart from needing nitric oxide to combat pulmonary hypertension, the patient made an uncomplicated recovery. Postoperative imaging confirmed unobstructed venous drainage to the left atrium, normalization of ventricular volumes, and an otherwise structurally and functionally normal heart.

Unlike mixed anomalous pulmonary venous connections, where different segments of the lungs drain to different sites, all the pulmonary veins in the setting of dual, or double, connections enter a confluence, which then connects to the systemic veins by two channels. In our patient, the unobstructed left vertical vein probably modified the clinical course by decompressing the obstructed infracardiac drainage. Had it not been demonstrated

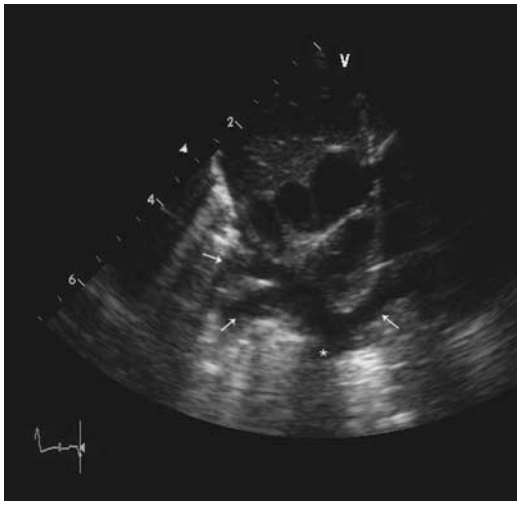

Figure 1.

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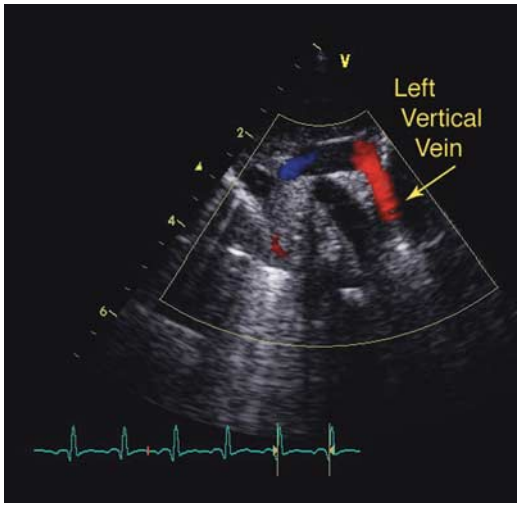

Figure 2.

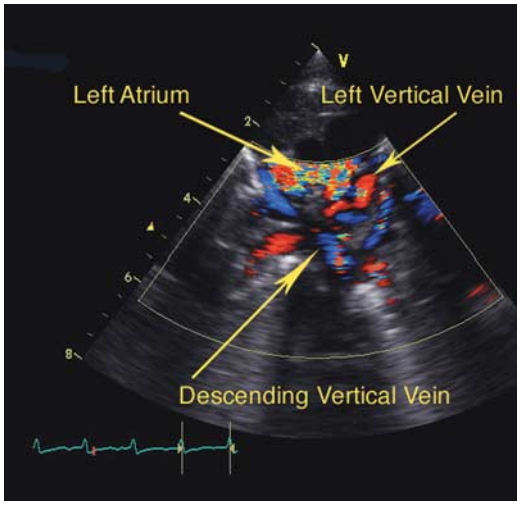

Figure 3.

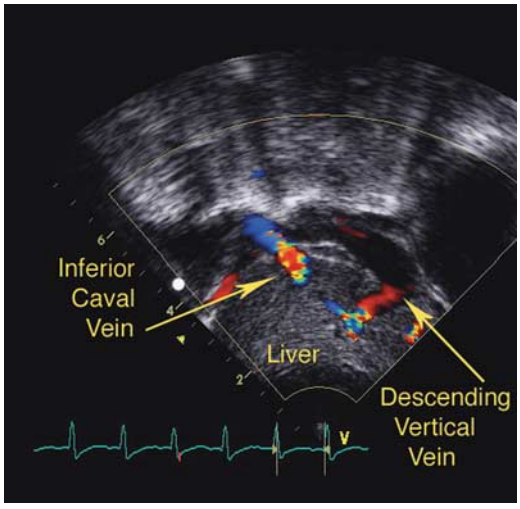

Figure 4.

preoperatively, the left vertical vein could easily have been overlooked at operation, leaving the patient with a residual left-to-right shunt.

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Reference

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