

SUCCESSFUL REPAIR OF ANOMALOUS PULMONARY VENOUS CONNECTION BY CATHETER INTERVENTION

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HISTORY AND PHYSICAL

A 28 -year -old male presented to our cardiology clinic complaining of palpitation and dyspnea NYHA class I (The New York Heart Association Functional Classification). Palpitation was activity related and hindered his working capacity. He did not mention any past history of medical conditions or drug use. Physical examination findings were unremarkable.

Twelve lead ECG revealed sinus tachycardia with heart rate of about 110 beats/ minute, normal axis and right bundle branch block pattern without arrhythmias.

Chest X-ray findings were within normal limits. Exercise stress testing ordered to mimic patient's chief complaint of exercised induced palpitation and investigate for activity related arrhythmias was completely normal with the patient accomplishing the exercise protocol asymptotically and achieving the functional capacity of 11 METs.

IMAGING

Transthoracic echocardiography was performed showing normal left ventricular size and systolic function, mild right ventricular enlargement with preserved systolic function. There was no valvular abnormality and no atrial septal defects(ASD) or other intra-cardiac communications were detected. In the suprasternal view however an abnormal vessel parallel to proximal descending aorta with its color Doppler flow moving towards the transducer was detected in favor of a vertical vein raising the likelihood of an isolated left sided partial anomalous pulmonary venous drainage/connection (PAPVC).(Figure 1)

Transesophageal echocardiography depicted the presence of a left upper PAPVC draining in to a vertical vein and then innominate vein, superior vena cava (SVC) and right atrium(RA) respectively. No ASD or patent foramen ovale was present but during contrast injection all the four cardiac chambers were unexpectedly pacified. To further investigate the source of passage of contrast material to the left sided heart chambers, cardiac magnetic resonance imaging was performed and revealed the abnormal pulmonary vein had a dual connection both to left atrium and vertical vein (hence indirectly to the right atrium).No other associated abnormality was reported.

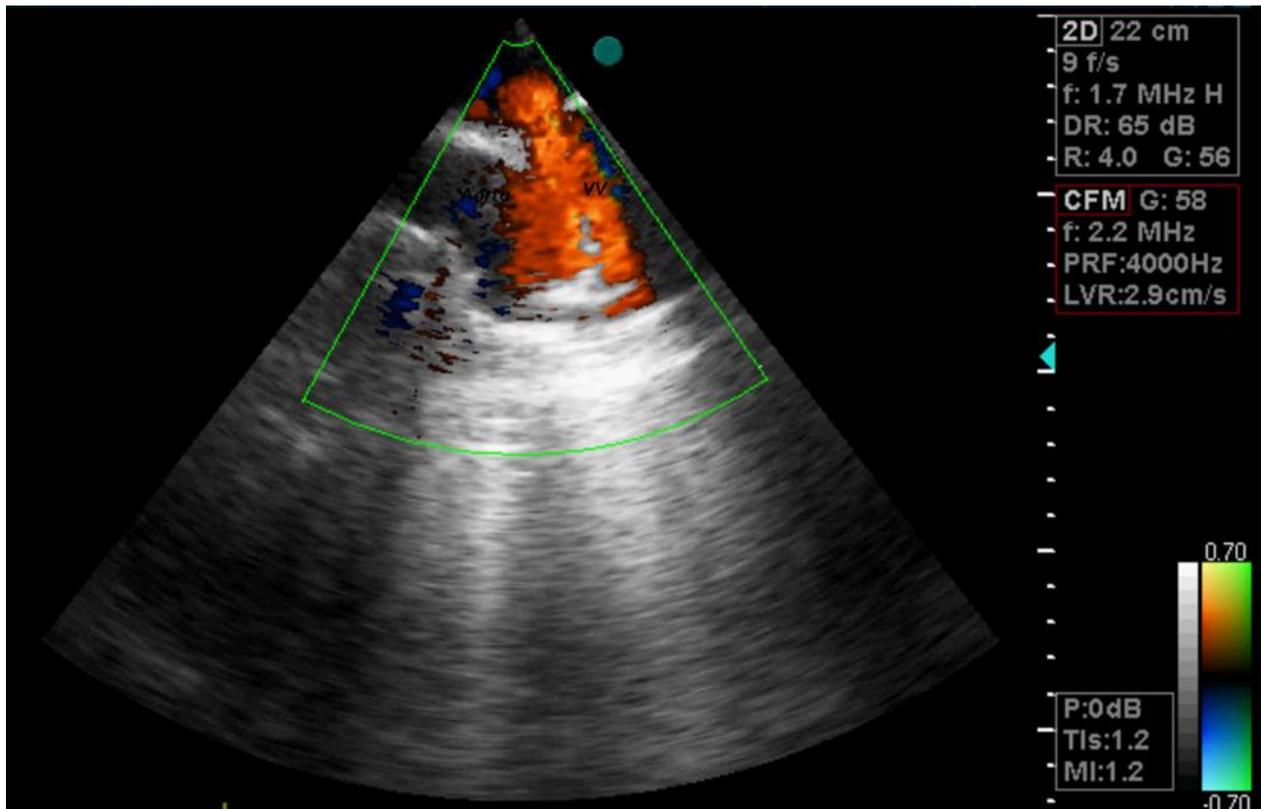


Figure1-Suprasternal echocardiographic view demonstrating left vertical vein(VV) with direction of flow towards transducer

INDICATION FOR INTERVENTION

The patient underwent cardiac catheterization that confirmed the connection of the vertical vein to both innominate vein and the left atrium via the left upper pulmonary vein. As the RV had become enlarged and the patient was symptomatic, it was decided to occlude the vertical vein percutaneously.

INTERVENTION

A 0.035 guide wire and a multipurpose catheter was passed from the femoral vein through inferior vena cava(IVC), RA, SVC , innominate vein ,vertical vein and the left upper pulmonary vein. Then the guide wire was exchanged for an extra-stiff guide wire over which a long 14-F delivery sheath was placed. To achieve complete obstruction with minimal risk for residual shunting a 12mm symmetric muscular ventricular septal occluder device (Cera occluder , Lifetech Scientific, China).was chosen, loaded on the cable and advanced in the delivery sheath. After confirming the appropriate position, the device was released at the end of the vertical vein. Control contrast injection confirmed successful positioning of the device with no residual leakage. .(Figure 2) Follow up echocardiography 24 hours after the procedure showed eliminated flow of the vertical vein and proper position of the device with no compressive effect on adjacent structures and no clot. The patient was discharged on aspirin 80 mg and clopidogrel 75mg daily. In one month clinic visit the patient stated that the palpitation had disappeared and functional capacity improved. Repeat transthoracic echocardiography confirmed a successful interventional procedure with reduction in right ventricle end diastolic diameter and good device position.

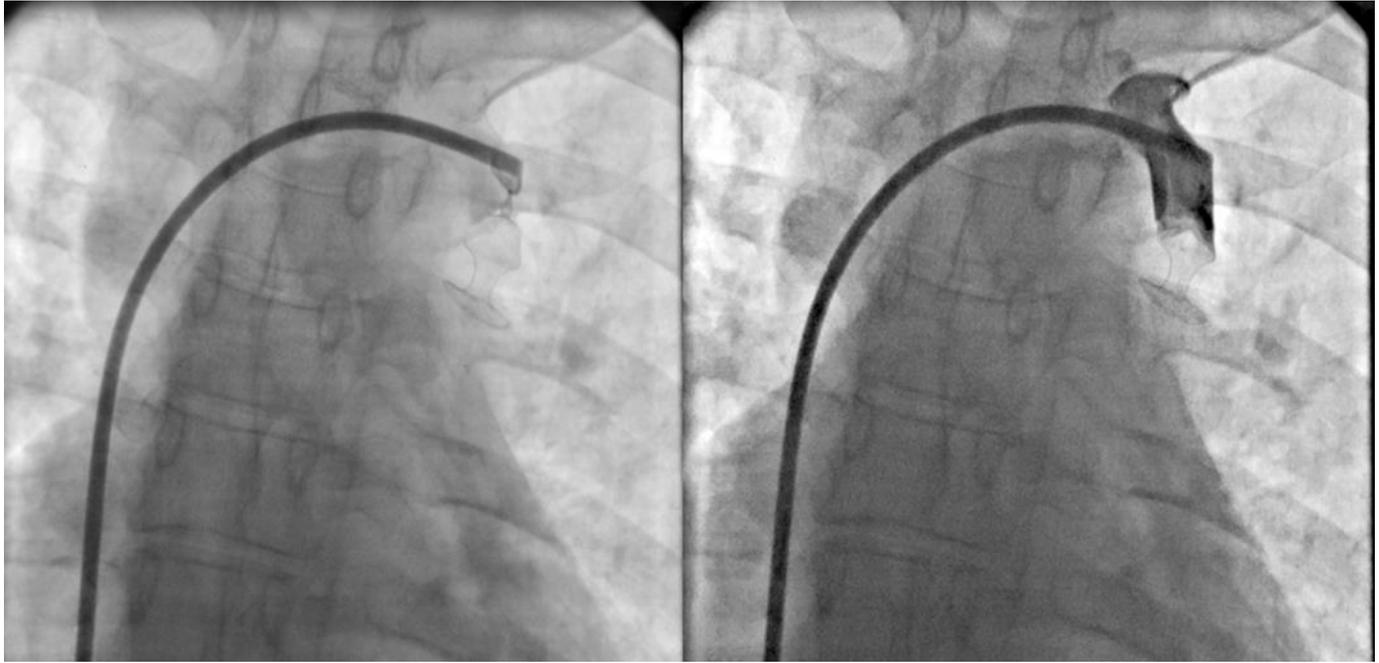


Figure 2-VSD occluder device positioned in the duct with contrast injection showing no residue

LEARNING POINTS OF THE PROCEDURE

Comprehensive evaluation of every individual with congenital heart disease is necessary to determine the optimal management strategy. Dual supply vertical vein involving left upper pulmonary vein is a rarely reported congenital anomaly and must be kept in mind while assessing patients with a abnormal pulmonary venous connections. The anomaly could be amenable to catheter intervention thus obviating the need for surgical correction.