Clinical vignette

Persistent left superior vena cava. Use of an innominate vein between left and right superior caval veins for the placement of a right ventricular lead during ICD/CRT implantation

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This patient with congestive heart failure, atrial fibrillation, mild renal impairment, chronic lung disease, and diabetes mellitus underwent CABG 2 weeks prior to the implantation of a combined implantable cardioverter defibrillator/cardiac resynchronization therapy (ICD/CRT) device with access via the left subclavian vein. During the procedure, we found that the patient had a persistent left superior vena cava. The prevalence of this condition in patients without congenital heart disease is estimated to be 0.3–3.0%. Some of these patients also have an innominate vein connecting the two superior venous drainage systems. In our patient, we directed the 'left ventricular lead' to a left cardiac vein employing the persistent left superior vena cava draining into the coronary sinus. However, the ICD lead could not be easily placed in the right ventricle using this pathway. Fortunately, our patient had an innominate vein connecting the two superior drainage systems, allowing the advancement of the ICD lead from the left to the right caval system and further on into the right ventricle. A right atrial lead was not needed due to chronic atrial fibrillation.

In patients with a persistent left superior vena cava, one would usually switch to a right subclavian approach. Our case demonstrates the convenience of using a left subclavian approach for placing an ICD/CRT device provided that the right ventricular/atrial leads can be placed via an innominate vein.

Image: Three different X-ray images in the LAO projection were amalgamated to show the whole CRT/ICD system. The ICD lead can be identified with the proximal coil in the right superior vena cava and the distal coil in the right ventricle (left). The left ventricular lead can be identified running from the left superior vena cava via the coronary sinus and to a left posterior, lateral cardiac vein (right).

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