

Isolated persistent left superior vena cava: A rare and unexpected finding in a patient with COVID-19 and complete heart block

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Contained in this report is the case of a 90-year-old man with a loss of consciousness, fever and cough. The electrocardiogram showed third degree atrio-ventricular block with 30 bpm ventricular escape rhythm, with no reversible causes. A transvenous pacing was attempted and after positive SARS-CoV-2 PCR he was transferred to a referral hospital with a “COVID-Cardiology” unit. Transthoracic echocardiography (TTE) showed preserved left ventricular systolic function and dilated coronary sinus (CS). D-dimer was elevated and the computed tomography (CT) pulmonary angiogram showed subsegmental pulmonary emboli, without typical COVID-19 pneumonia.

The patient underwent pacemaker (PCM) implantation under high level protective measures. During the procedure, the course of vascular sheath introducer guidewires suggested the presence of persistent left superior vena cava (PLSVC), confirmed intra-procedurally by re-evaluation

of CT angiography (not included in the routine report) (Fig. 1, **Suppl. Video 1**). Unexpectedly, right superior vena cava (SVC) was not found — confirming isolated PLSVC with absent right SVC. Finally, dual chamber PCM was implanted without complications via PLSPV communicating with right atrium by humongous CS (30 mm). TTE with contrast use proved venous drainage from the right arm via left brachiocephalic bridging vein and PLSVC through the extremely dilated CS into the right atrium. The patient was discharged home in good condition.

This is the first report of isolated PLSVC in a patient undergoing PCM implantation during the highly demanding COVID-19 pandemic. PLSVC is observed in 0.3–0.5% of the population, but in > 90% the right homologue persists (“double SVC”). The present case highlights the importance of recognizing rare anatomical obstacles during PCM implantation and methods of dealing with them.

Conflict of interest: None declared

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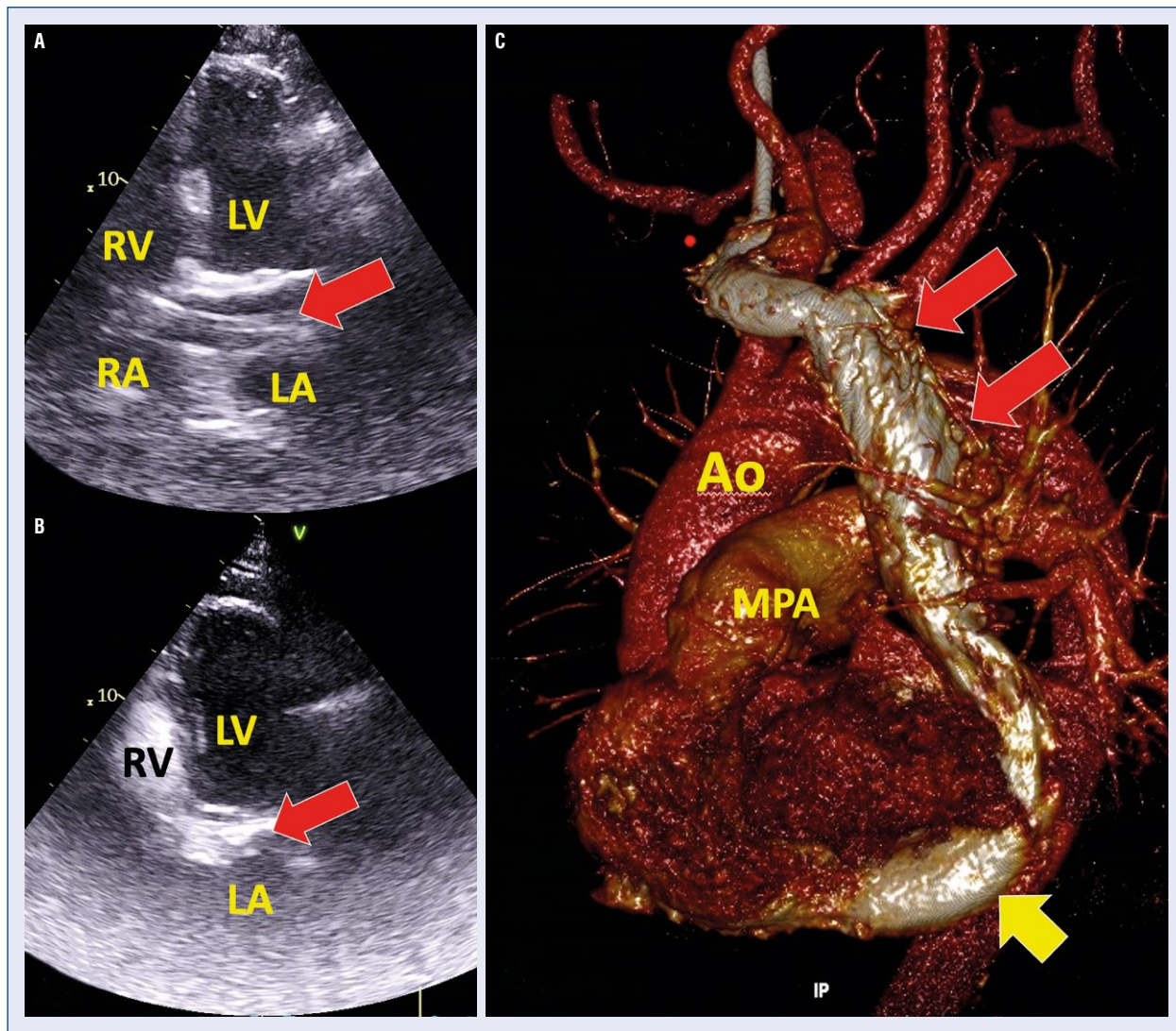


Figure 1. **A.** Transthoracic echocardiography (TTE), modified apical 4-chamber view showing the pacemaker leads (red arrow) entering via dilated coronary sinus into the right atrium (RA); **B.** An unenhanced image is on the top; after 2nd generation ultrasound enhancing agent injection via the right antecubital vein entire inflow into the RA occurs via dilated coronary sinus (CS) (right panel), suggestive for isolated persistent left superior vena cava (PLSVC); **C.** Computed tomography 3-dimensional angiogram (left anterior oblique view) showing the isolated PLSVC (double arrows), without right superior vena cava and drainage of the right subclavian vein via bridging vein through PLSVC (red arrows) into CS (yellow arrow); RV — right ventricle; LA — left atrium; LV — left ventricle; Ao — aorta; MPA — main pulmonary artery.