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Persistent Left Superior Vena Cava (PLSVC): Case Report

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Abstract: ***This clinical case captures the nuanced presentation of a rare vascular anomaly-Persistent Left Superior Vena Cava (PLSVC)-in a 35-year-old female who reported progressive breathlessness and chest discomfort. What initially appeared to be a straightforward cardiac complaint gradually unraveled into a more layered diagnosis through a series of well-integrated imaging findings. It is evident that the presence of a dilated coronary sinus, often an overlooked detail, served as a subtle clue pointing toward PLSVC. Interestingly, despite normal left ventricular function, signs of right-sided pressure overload-including a D-shaped left ventricle, moderate pulmonary hypertension, and a dilated pulmonary artery-revealed the deeper hemodynamic consequences of the underlying anomaly. The identification of a secundum atrial septal defect (ASD) with left-to-right shunting further complicated the picture, suggesting a congenital interplay that may have gone unnoticed without detailed echocardiographic and CT angiographic correlation. This raises an important consideration: in patients with unexplained right heart dilation and a conspicuously enlarged coronary sinus, the possibility of PLSVC should not be dismissed. Taking this further, the case highlights the diagnostic value of combining transthoracic and transesophageal echocardiography with cross-sectional imaging, not just to confirm vascular anomalies but to understand their functional impact on cardiac morphology and pressures. Ultimately, this report reinforces the teaching that seemingly incidental findings can serve as diagnostic turning points when interpreted in the right clinical context.***

Keywords: Persistent Left Superior Vena Cava, Atrial Septal Defect, Pulmonary Hypertension, Coronary Sinus Dilation, Right Heart Overload

35-year-old female

Presenting Complaints:
Breathlessness for the past 1 month
Chest pain for the past 1 month

Relevant Medical History:
No history of Diabetes Mellitus (DM)
No Systemic Hypertension
No Coronary Artery Disease (CAD)
No history suggestive of Connective Tissue Disorder
No history of Rheumatic Heart Disease (RHD)

Clinical Findings:
Electrocardiogram (ECG):
Heart rate: 90 beats per minute
Poor R-wave progression
T-wave inversion in leads V1 and V2

Transthoracic Echocardiogram (TTE):
Right Atrium (RA): Dilated
Right Ventricle (RV): Dilated
Left Ventricle (LV): D-shaped (indicative of RV pressure overload)
Atrial Septum: Secundum Atrial Septal Defect (ASD) with left-to-right shunt
Tricuspid Regurgitation: Mild (TR gradient = 42 mmHg)
Pulmonary Hypertension: Moderate
Main Pulmonary Artery (MPA): Dilated (measuring 28 mm)
TAPSE: 18 mm
Left Ventricular Ejection Fraction (LVEF): 60%
Atrial Septal Defect (ASD) Rim Measurements:
Aortic rim: 11 mm
Posteroinferior rim: 8 mm
Posteriosuperior rim: 8 mm
IVC rim: 6 mm

Transesophageal Echocardiogram (TEE):
Interatrial Septum (IAS): Intact
RA/RV: Not dilated on TEE
Coronary Sinus: Dilated (suggestive of abnormal venous return)

CT Pulmonary Angiogram Findings:
Presence of Persistent Left Superior Vena Cava (PLSVC)
Cardiomegaly noted
Associated Pulmonary Hypertension confirmed

Summary
This is a case of a 35-year-old female with Persistent Left Superior Vena Cava (PLSVC) diagnosed on CT pulmonary angiography. The patient presented with dyspnea and chest pain, and further evaluation revealed a secundum ASD, dilated coronary sinus, pulmonary hypertension, and moderate right heart dilation. Dilated coronary sinus on TEE raised suspicion of PLSVC, which was confirmed on imaging. The cardiac findings, including a D-shaped LV, moderate pulmonary hypertension, and dilated pulmonary artery, indicate chronic right-sided pressure overload.

Teaching Point:
PLSVC, although often asymptomatic, may be associated with congenital heart defects like ASD and can lead to right-sided heart overload. A dilated coronary sinus on echocardiogram should prompt evaluation for PLSVC,

especially in the presence of unexplained right heart changes.

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