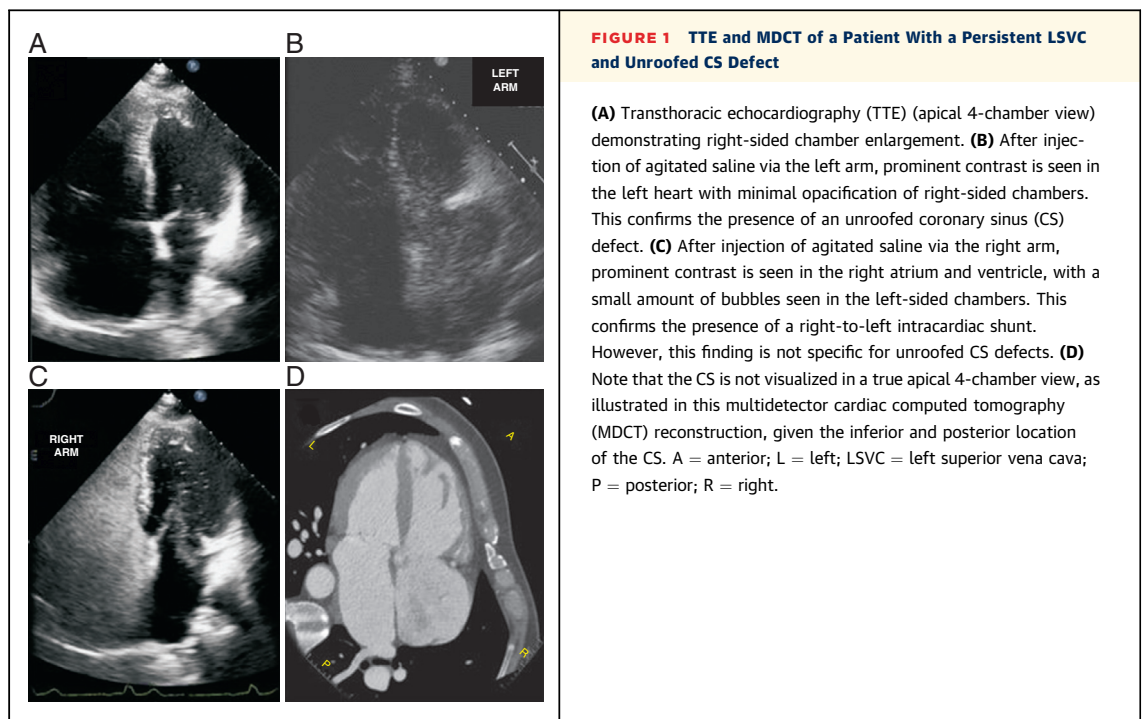


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 IMAGING VIGNETTE

Multimodality Cardiovascular Imaging of Unroofed Coronary Sinus Defects

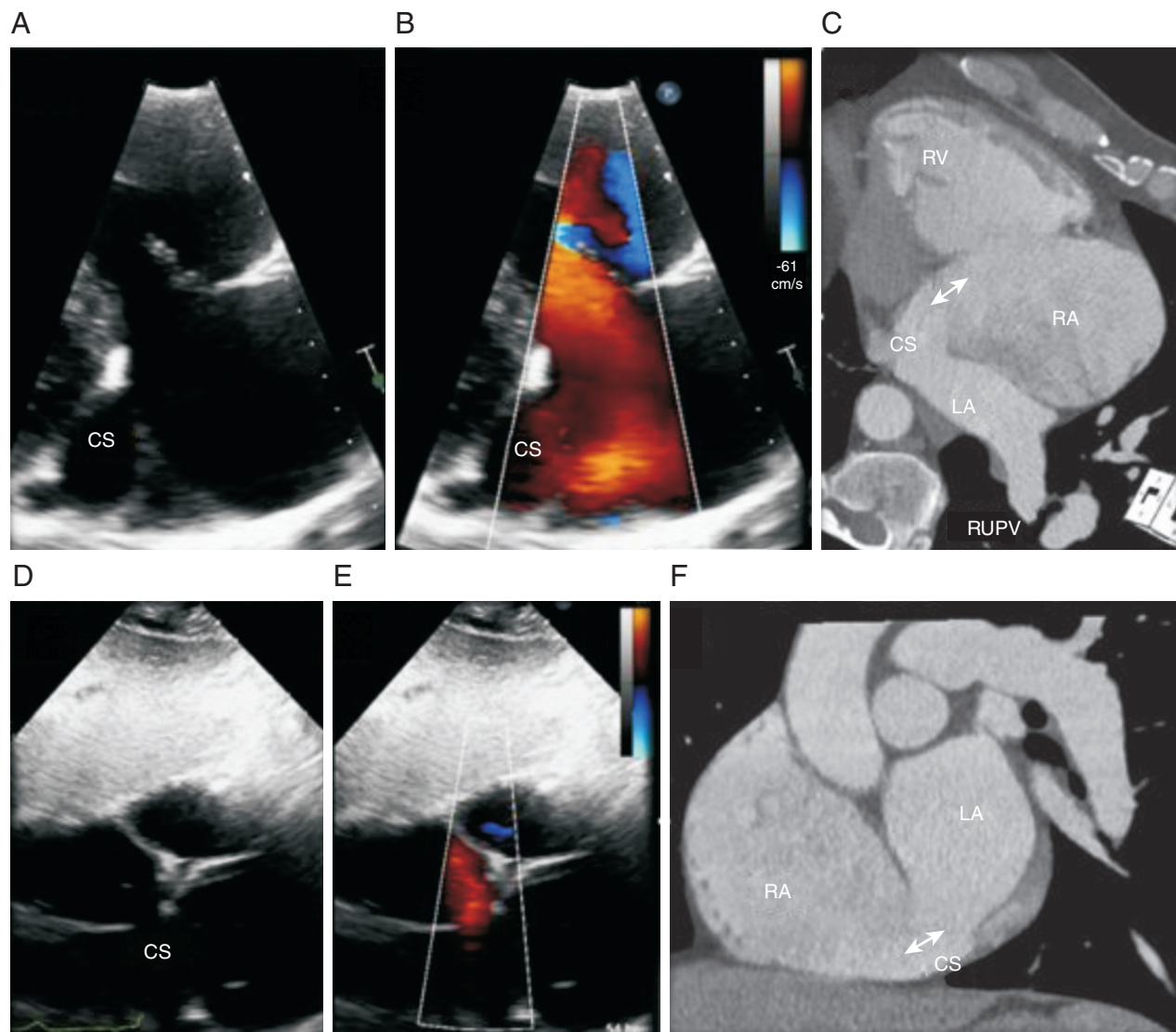
Bo Xu, MBBS (HONS),^a Jorge Betancor, MD,^a Paul C. Cremer, MD,^a Rahul Renapurkar, MD,^b Gosta B. Pettersson, MD,^c Craig R. Asher, MD,^d L. Leonardo Rodriguez, MD^a

UNROOFED CORONARY SINUS (CS) DEFECTS ARE RARE ANOMALIES THAT RESULT FROM EMBRYOLOGIC developmental abnormalities, leading to partial or complete absence of the common wall between the CS and the left atrium. They account for less than 1% of atrial septal defects, having a strong association with a persistent left superior vena cava, and are often difficult to diagnose. Delayed diagnosis may lead to right ventricular enlargement and failure, and pulmonary hypertension. Here, we present the multimodality cardiovascular imaging findings of unroofed CS defects (Figures 1 to 5). For simplicity, unroofed CS defects are classified as types I, II, and III, referring to complete unroofing, partial unroofing of the mid-portion, and



From the ^aSection of Cardiovascular Imaging, Heart and Vascular Institute, Cleveland Clinic, Cleveland, Ohio; ^bDepartment of Diagnostic Radiology, Imaging Institute, Cleveland Clinic, Cleveland, Ohio; ^cDepartment of Thoracic and Cardiovascular Surgery, Heart and Vascular Institute, Cleveland Clinic, Cleveland, Ohio; and the ^dDepartment of Cardiovascular Medicine, Heart and Vascular Institute, Cleveland Clinic Florida, Weston, Florida. The authors have reported that they have no relationships relevant to the contents of this paper to disclose. Drs. Xu and Betancor contributed equally to this work and are joint first authors.

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FIGURE 2 TTE and MDCT of a Patient With a Persistent LSVC and Unroofed CS Defect

(A) TTE (parasternal right ventricular [RV] inflow view), showing a dilated CS draining into the right atrium (RA). (B) TTE (parasternal RV inflow view) with color Doppler imaging, showing flow from the dilated CS reaching the RA. (C) MDCT reconstruction of the RV inflow view. Note the dilated CS draining into the RA, without a wall separating it from the left atrium (LA). Note the right upper pulmonary vein (RUPV) draining into the LA, which communicates freely with the CS. (D) TTE (subcostal 4-chamber view) showing the communication between the atria. Note how inferior the imaging plane must be in order to identify the defect in a 4-chamber view. (E) TTE (subcostal 4-chamber view with color Doppler imaging) demonstrating communication between the atria. At the time of TTE imaging, a subcostal sweep in coronal and sagittal planes will help delineate the anatomy of the unroofed CS defect. (F) MDCT reconstruction of the subcostal short-axis view at the atrial/CS level, emphasizing the inferior and posterior location of unroofed CS defects. This illustrates how easily unroofed CS defects can be missed by TTE if dedicated off-axis imaging planes are not acquired. It is important to note that unroofed CS defects are located posteriorly to the entrance of the inferior vena cava into the RA, differentiating them from inferior sinus venosus atrial septal defects, on MDCT reconstruction. The **double-headed arrow** highlights the unroofed coronary sinus, and the potential for interatrial shunting (either left-to-right, or right-to-left, depending on pressure differences between the left atrium and right atrium). Abbreviations as [Figure 1](#).

partial unroofing of the terminal portion, respectively. Echocardiography is the first-line imaging modality, whereas multidetector cardiac computed tomography provides detailed anatomical information, when echocardiography is not diagnostic. Cardiac magnetic resonance imaging is useful as an adjunct, particularly when quantification of intracardiac shunting is required ([Figure 6](#)).

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