Demonstration of a persistent left superior vena cava by transthoracic echocardiography using agitated saline injection

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A 72-year-old man underwent transthoracic echocardiography (TTE) for evaluation of a holosystolic murmur heard best at the apex. TTE revealed an enlarged coronary sinus (28 mm × 24 mm), a mild degree of aortic stenosis and regurgitation, as well as pulmonary hypertension. Because of the enlarged coronary sinus, we performed contrast echocardiography to determine whether there was an associated persistent left superior vena cava (PLSVC). Injection of agitated saline into the right antecubital vein resulted in contrast entering into the right atrium through the normal superior vena cava (Figure 1). However, injection through the left antecubital vein resulted in opacification of the dilated coronary sinus and

subsequently the right atrium (Figure 2). TTE performed with agitated saline injection may easily demonstrate PLSVC, which is a rare coronary sinus anomaly. Although it usually requires no treatment, the majority of patients with PLSVC are at risk of paradoxical embolism because of accompanying lesions such as atrial septal defect, unroofed coronary sinus and direct communication of the vein to the left atrium. In daily practice, PLSVC may be responsible for difficulties in central venous catheterization and pacemaker electrode placement. Therefore, its diagnosis with the aid of a simple and easy technique, such as TTE with agitated saline injection, may be extremely helpful for physicians who perform device implantation.

Figure 1) Injection of agitated saline into the right antecubital vein resulting in contrast entering into the right atrium through the normal superior vena cava. CS Coronary sinus; LV Left ventricle; RA Right atrium; RV Right ventricle

Figure 2) Injection through the left antecubital vein resulting in opacification of a dilated coronary sinus (CS) before reaching the right atrium (RA). LA Left atrium, LV Left ventricle; RV Right ventricle

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