CLINICAL VIGNETTE

Atresia of the coronary sinus ostium on cardiac computed tomography

Shu Yoshihara[1], Taku Yaegashi[2], Masaki Matsunaga[3], Masaaki Naito[1]

1 Department of Diagnostic Radiology, Iwata City Hospital, Iwata, Japan
2 Department of Radiological Technology, Iwata City Hospital, Iwata, Japan
3 Department of Cardiology, Iwata City Hospital, Iwata, Japan

A 52-year-old man with atrial tachyarrhythmia scheduled for electrophysiology was referred for cardiac computed tomography. It showed an enlarged coronary sinus (CS) with atresia of the right atrial ostium, which communicated with a persistent left superior vena cava (PLSVC) (FIGURE 1A–1C). An anomalous vein arose from the CS (FIGURE 1A and 1C) with a branched tortuous tubular connection to the right atrium (RA) (FIGURE 1B and 1C), and finally ended at the left atrium. Atresia of the CS ostium with a PLSVC was diagnosed.

The CS is the largest cardiac venous structure, lying posteriorly in the atrioventricular groove and draining into the RA. The CS is a commonly used gateway to the left atrial and left ventricular epicardium in patients undergoing electrophysiology studies, catheter ablation of arrhythmias, and implantation of resynchronization therapy devices. Atresia of the CS ostium with a PLSVC is a rare abnormality, which is sometimes overlooked because it usually occurs without clinical symptoms or a significant cardiac dysfunction. The diagnosis of this abnormality is usually incidental at autopsy, surgery, or failure of cannula insertion into the CS from the RA. However, this abnormality has important clinical implications, especially in the field

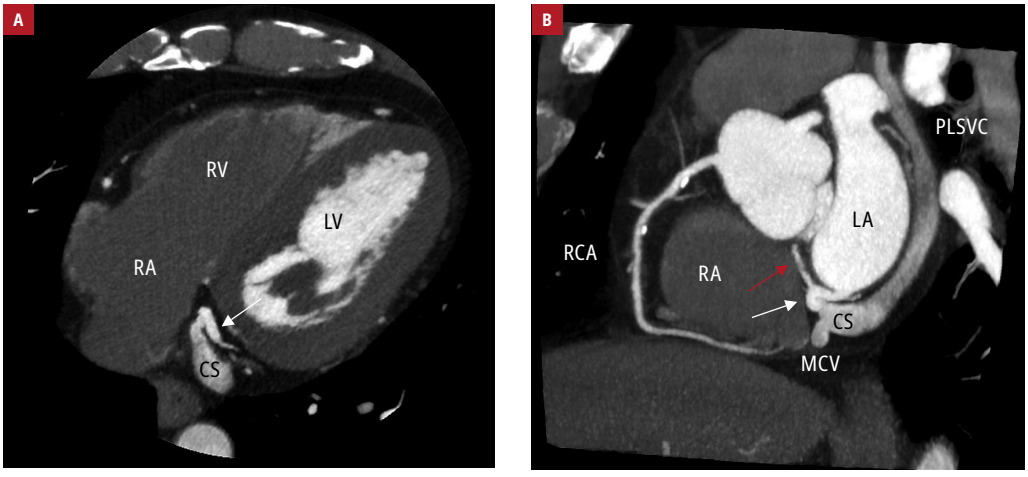

FIGURE 1 **A** – multiplanar reconstruction axial image of cardiac computed tomography (CT) showing an enlarged coronary sinus (CS) with atresia of the right atrial ostium. Arrow indicates an anomalous vein arising from the CS toward the left atrium (LA). **B** – multiplanar reconstruction short-axis image of cardiac CT showing atresia of the CS ostium communicating with persistent left superior vena cava (PLSVC). White arrow indicates an anomalous vein arising from the CS toward the LA. Red arrow indicates a side branch of the anomalous vein, which finally ended at the right atrium (RA).
Abbreviations: LV, left ventricle; MCV, middle cardiac vein;

Correspondence to:
Shu Yoshihara, MD, Department of Diagnostic Radiology, Iwata City Hospital, 512–3 Ookubo, Iwata, 438–8550, Japan, phone: +81 538 38 5000, email: shuy@hospital.iwata.shizuoka.jp
Received: May 14, 2020.
Revision accepted: May 29, 2020.
Published online: June 5, 2020.
Kardiol Pol. 2020; 78 (9): 926-927
doi:10.33963/KP.15421

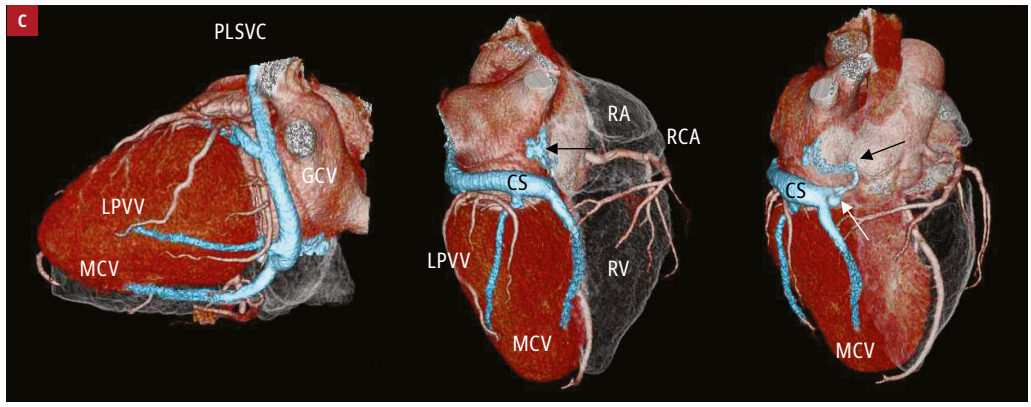

FIGURE 1 **C** – 3-dimensional volume-rendered reconstruction images of cardiac computed tomography showing atresia of the coronary sinus (CS) ostium with persistent left superior vena cava (PLSVC) (left, left posterior oblique view; middle, caudal view; right, right oblique caudal view). The right atrium (RA) and right ventricle (RV) are shown in outline for clarity. White arrow indicates an anomalous vein arising from the CS toward the left atrium. Black arrows indicate a side branch of the anomalous vein, which finally ended at the RA.
Abbreviations: GCV, great cardiac vein; LPVV, left posterior ventricular vein; MCV, middle cardiac vein; RCA, right coronary artery

of electrophysiology. It has been reported that CS cannulation is unsuccessful in 5% to 10% of patients undergoing invasive cardiac procedures, and that CS anomaly may explain many of these problems.[1] Special care should be taken during surgical repair of associated cardiac defects because PLSVC division or ligation could potentially disrupt the CS venous return, leading to myocardial edema, ischemia, and necrosis.[2,3] Cardiac computed tomography can provide clinically valuable information on the cardiac venous anatomy before electrophysiologic and interventional procedures.[4,5]

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

HOW TO CITE Yoshihara S, Yaegashi T, Matsunaga M, Naito M. Atresia of the coronary sinus ostium on cardiac computed tomography. Kardiol Pol. 2020; 78: 926-927. doi:10.33963/KP.15421

REFERENCES

1 Mak GS, Hill AJ, Moisiuc F, Krishnan SC. Variations in Thebesian valve anatomy and coronary sinus ostium: implications for invasive electrophysiology procedures. Europace. 2009; 11: 1188-1192.

2 Jha NK, Gogna A, Tan TH, et al. Atresia of coronary sinus ostium with retrograde drainage via persistent left superior vena cava. Ann Thorac Surg. 2003; 76: 2091-2092.

3 Calcagni G, Ou P, Marini D, et al. Atresia of coronary sinus ostium: surgical implications. Int J Cardiol. 2007; 116: e92-e94.

4 Mlynarski R, Mlynarska A, Tendera M, Sosnowski M. Coronary sinus ostium: the key structure in the heart's anatomy from the electrophysiologist's point of view. Heart Vessels. 2011; 26: 449-456.

5 Mlynarski R, Mlynarska A, Golba KS, Sosnowski M. Three-dimensional visualization of coronary sinus ostium from the inside right atrium perspective. Kardiol Pol. 2018; 76: 536-541.