HEART & LUNG

Rare case of an unroofed coronary sinus

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ARTICLE INFO

Article history:
Received 1 September 2011
Revised 30 November 2011
Accepted 1 December 2011
Online 23 December 2011

Keywords:
Computed tomography
Congenital heart disease
Echocardiography
Unroofed coronary sinus

ABSTRACT

Unroofed coronary sinus (CS) is a rare congenital cardiac anomaly described by a communication between the CS and the left atrium due to the partial or complete absence of the CS roof. Echocardiography is the most widely used imaging modality for suspected unroofed CS, but it is limited in its ability to visualize the posterior cardiac structures. Multidetector computed tomography has allowed the visualization and accurate anatomic and morphologic evaluation of these structures. We report a rare case of unroofed CS found incidentally in a 41-year-old man who was studied by echocardiography and multidetector computed tomography.

The coronary sinus (CS) is a collection of veins joined together to form a large vessel that collects blood from the small, middle, great, and oblique cardiac veins; the left marginal vein; and the left posterior ventricular vein.[1-4] The CS delivers deoxygenated blood to the right atrium (RA) in conjunction with the superior and inferior vena cavae.[1-4] Unroofed CS is a rare congenital cardiac anomaly in which a communication occurs between the CS and the left atrium (LA) because of the partial or complete absence of the CS roof.[1-4] It is important to diagnose unroofed CS because cerebral embolism or brain abscess can result from the right-to-left shunt.[1,2] However, this entity is often difficult to diagnose because the clinical signs and symptoms are nonspecific.[1-3] Precise diagnosis with echocardiography can be difficult in adults because of the limited sonic window and contrast resolution.[3,4] Multidetector computed tomography (MDCT) has gained rapid acceptance as a diagnostic cardiac imaging modality, allowing the evaluation of unroofed CS with posterior cardiac structures.[3,4] We report a rare case of unroofed CS found incidentally in a 41-year-old man who was studied by echocardiography and MDCT.

Case Report

A 41-year-old man was referred to the Samsung Changwon Hospital for further evaluation and treatment of atrial septal defect (ASD) discovered

Financial Disclosure: The authors report no financial relationships or conflicts of interest regarding the content herein.

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doi:10.1016/j.hrtlng.2011.12.001

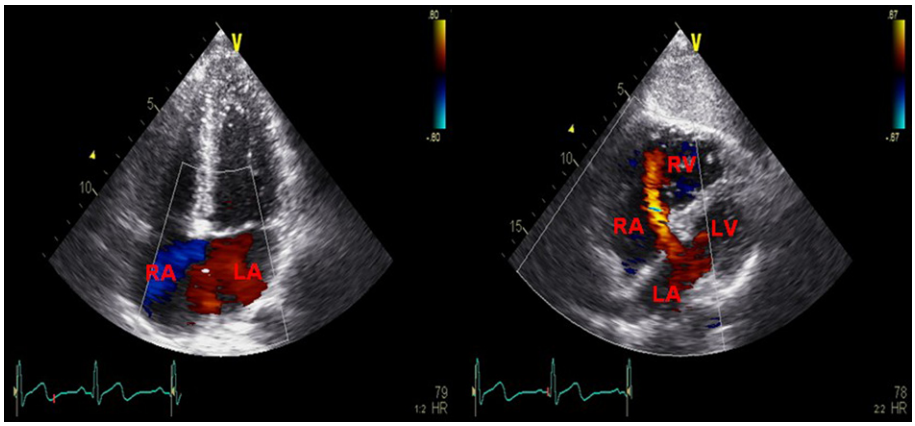

Figure 1 – TTE shows a defect in the atrial septum with left-to-right shunt. LA, left atrium; RA, right atrium; LV, left ventricle; RV, right ventricle.

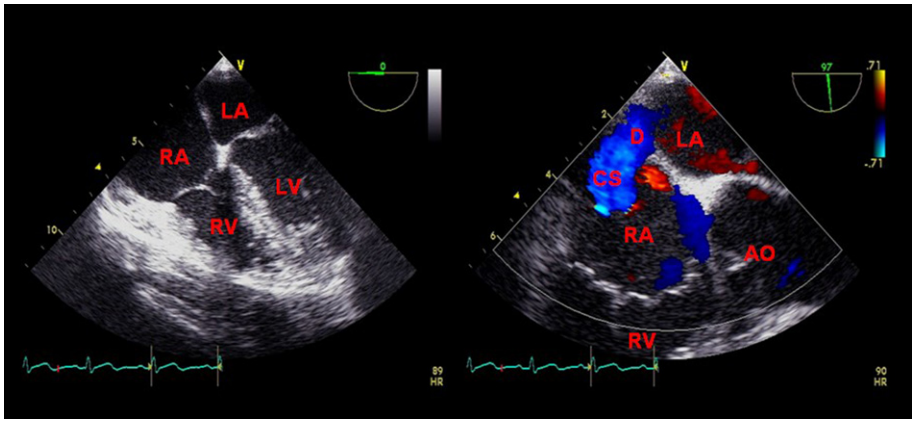

Figure 2 – TEE shows both atrial enlargement with intact interatrial septum (*left*) and a defect beyond the realm of the atrial septum with left-to-right shunt (*right*). CS, coronary sinus; D, coronary sinus defect; LA, left atrium; RA, right atrium; IVC, inferior vena cava; RV, right ventricle; AO, aorta.

incidentally on 2-dimensional transthoracic echocardiography (TTE) performed during a routine examination (Figure 1). The patient denied having any systemic disease in the past. He had no symptoms, and his physical examination results were normal. Initial electrocardiogram and chest roentgenogram revealed no pathology. Transesophageal echocardiography (TEE) showed both atrial enlargement and normal pulmonary venous return. An intact interatrial septum was found on 4-chamber view of the transverse plane (Figure 2, left). With further rotation of the transducer, a defect beyond the realm of the atrial septum was obtained, and a left-to-right shunt through this defect was simultaneously revealed by color Doppler flow imaging (Figure 2, right). Because unroofed CS could not be clearly discriminated from the associated ASD or congenital abnormalities on TEE, we performed electrocardiogram-gated 128-slice MDCT, which showed a dilated proximal CS with a direct connection with the LA, as noted by the contrast shunting from the LA into the CS and subsequently into the RA (Figure 3A–D). The 3-dimensional volume-rendering images demonstrated the dilated CS was unroofed and communicated with the LA (Figure 3C, D). The interatrial septum was intact. No other congenital anomalies, including persistent left superior vena cava (PLSVC), were identified by MDCT. The patient refused open cardiac surgery and has been followed up with outpatient clinic visits.

Discussion

The CS is a collection of veins joined together to form a large vessel that collects blood from the small,

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