A 47-year-old man presented with a three-month history of atypical chest pain. The patient’s medical history included a strong family history of coronary artery disease, dyslipidemia, and smoking. His left foot had been disabled in a traffic accident five years previously. The patient’s blood pressure was 120/80 mmHg, and his pulse was 72 beats/min and rhythmic. Physical examination findings were normal. ECG showed normal sinus rhythm. Transthoracic echocardiography showed normal left and right ventricular systolic functions (EF 64%). ECG-gated coronary CT angiography was performed. The patient’s coronary CT angiography showed normal coronary arteries; however, blood flow through the great cardiac vein was abnormal. The vein was not in the atrioventricular groove, and blood was instead bypassing the coronary sinus and draining into the superior vena cava (Figures A-C). The coronary sinus was formed by the posterior marginal vein, the middle cardiac vein, and the lateral marginal vein and drained into the right atrium. Subtle myocardial bridges were also observed on the coronary arteries, potentially explaining the patient’s chest pain. With optimal medical therapy, the patient’s symptoms were resolved. The patient is on a regular follow-up schedule. The great cardiac vein is the longest venous vessel of the heart. It originates from the lower part of the anterior interventricular sulcus and travels through the coronary sulcus. The great cardiac vein forms the coronary sinus together with the middle cardiac veins at the apex of the heart. Anomalous coronary venous anatomy has rarely been studied and few cases have been reported. Without multi-detector CT cardiac angiography to evaluate the cardiac structures around the vessels in DSA, similar venous coursing anomalies cannot be recognized.