Preoperative visualization of a muscular ventricular septal defect by 64-slice cardiac computed tomography

Anumeha Tandon, MD, Robert B. Allison, MD, Paul A. Grayburn, MD, Baron L. Hamman, MD, and Jeffrey M. Schussler, MD

A 21-year-old man presented to a primary care physician for a general evaluation. He had a past medical history of a "heart murmur" present since childhood. His only complaint was mild increased fatigability with exertion; he had no dyspnea at rest. Physical examination was remarkable for a 2/6 systolic ejection murmur heard throughout the precordium. A transthoracic echocardiogram showed a muscular ventricular septal defect (VSD) with a mildly dilated right ventricle and an elevated right ventricular systolic pressure of 80 mm Hg. The patient was evaluated for an elective repair of the VSD. Preoperative assessment included a cardiac computed tomography (CT) angiogram (Lightspeed VCT, GE Healthcare) to rule out coronary disease. The CT scan clearly demonstrated the muscular VSD (*Figure*) and showed normal coronary arteries.

We have previously described the utilization of 64-slice coronary CT to effectively rule out coronary atherosclerosis in low-probability patients who were receiving cardiac surgery (1, 2). In this case, we were able to evaluate the patient's coronary anatomy without invasive catheterization, ruling out the need for coronary bypass. At the same time, we were able to visualize the septal defect, definitively identifying the location and course of the defect through the ventricular septum. In the future, coronary CT may facilitate preoperative planning by helping the surgeon identify the exact location and extent of different types of congenital abnormalities prior to surgical correction.

Figure. Echocardiographic (a–c) and computed tomographic (d–f) images of a muscular ventricular septal defect (*arrows*). (a, b) Doppler interrogation demonstrates flow from the left through to the right ventricle. The defect is clearly seen on axial (d) as well as sagittal (e) views of the heart by 64-slice cardiac CT. A "navigator view" (f) demonstrates the location of the orifice of the ventricular septal defect (*arrow*) as seen from inside the left ventricle, looking up towards the valvular structures. AoV indicates aortic valve; MV, mitral valve; RV, right ventricle; LV, left ventricle.

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2. Gibbs WN, Hamman BL, Roberts WC, Schussler JM. Diagnosis of congenital unicuspid aortic valve by 64-slice cardiac computed tomography. *Proc (Bayl Univ Med Cent)* 2008;21(2):139.

From the Department of Internal Medicine (Tandon, Allison), Division of Cardiology (Grayburn, Schussler), and Department of Cardiothoracic Surgery (Hamman), Baylor University Medical Center, Dallas, Texas.

Corresponding author: Jeffrey M. Schussler, MD, 621 North Hall Street, Suite 500, Dallas, Texas 75226 (e-mail: JSchussler@heartplace.com).