CORRESPONDENCE

Echocardiography Aided by Computed Tomography to Diagnose Obstructive Masses in Patients with Prosthetic Heart Valves

To the Editor:

We appreciate Kealhofer and colleagues' report on their beneficial use of cardiac computed tomography (CT) for evaluating prosthetic aortic valve dysfunction.[1] We want to contribute further by drawing attention to the role of cardiac CT in differentiating periprosthetic masses in patients who have prosthetic heart valves (PHVs).

Transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), cinefluoroscopy, and cardiac CT are noninvasive imaging methods for evaluating suspected PHV dysfunction.[2] Because acoustic shadowing and low resolution caused by prosthetic material usually preclude differentiating obstructive masses and their causes by TTE, abnormalities thus detected should be investigated further by using TEE or cardiac CT. Real-time 3-dimensional TEE provides better views of the atrial and ventricular sides of mitral prostheses, clarifies relationships between cardiac structures, and helps to discriminate pannus from thrombus.[3] However, this method is less adequate for evaluating aortic PHVs because of the distance between the esophagus and aortic valve. In such cases, cardiac CT complements TEE, and indeed it has emerged as a diagnostic tool in evaluating mechanical PHVs.[4] Attenuation values of abnormal masses adjacent to the PHVs may provide quantitative data for differentiating pannus from thrombus.[5] Because of histopathologic differences, the radiographic attenuation of pannus may be markedly higher than that of thrombus.

We have reported a quantitative approach to distinguish pannus from thrombus with use of cardiac CT. With high sensitivity and specificity, periprosthetic masses with attenuation values ≥145 Hounsfield units (HU) were associated with the presence of pannus formation, and lower values, with thrombus formation. Furthermore, masses with values <90 HU were almost always completely lysable by means of thrombolytic therapy.[5] Kealhofer and colleagues[1] successfully delineated subclinical aortic bioprosthetic valve thrombosis with the complementary use of cardiac CT and prescribed the patient anticoagulation for 3 months. Quantitative analysis with cardiac CT may similarly differentiate PHV thrombosis from pannus, which resists anticoagulation or thrombolytic therapy.[6]

Despite the limitations of streak artifacts and volume averaging, cardiac CT has incremental value in identifying and characterizing periprosthetic masses, and it can guide the treatment of patients who have PHV dysfunction.

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