Echo Aids Diagnosis of Constrictive Pericarditis

BY BRUCE JANCIN
Denver Bureau

SNOWMASS, COLO. — Demonstration of enhanced ventricular interaction upon hemodynamic cardiac catheterization is a novel diagnostic criterion for constrictive pericarditis, with far greater predictive accuracy than that of the classic hemodynamic criteria, Dr. Rick A. Nishimura reported at a conference sponsored by the Society for Cardiovascular Angiography and Interventions.

This concept of enhanced ventricular interaction provides the most reliable means of solving a difficult diagnostic dilemma: how to differentiate constrictive pericarditis from restrictive cardiomyopathy, said Dr. Nishimura, professor of medicine at the Mayo Clinic, Rochester, Minn.

It is a key distinction to make in a timely fashion because constrictive pericarditis is treatable with complete removal of the pericardium via open heart surgery—but the operative risk is severalfold greater, and 5-year survival substantially lower, when pericardiectomy is performed after progression to class III or IV heart failure, he said at the meeting, cosponsored by the American College of Cardiology.

Enhanced ventricular interaction is unique to constrictive pericarditis.

DR. NISHIMURA

In 70%-75% of cases, diagnosis of constrictive pericarditis can be made on the basis of a clinical examination and two-dimensional and Doppler echocardiography, with no need for invasive hemodynamic studies. But in about one-quarter of cases, constrictive pericarditis can not be differentiated from restrictive cardiomyopathy with noninvasive diagnostic methods, especially in patients who present with right heart failure and a history of cardiac surgery or radiation therapy for breast cancer, Hodgkin's disease, or non-Hodgkin's lymphoma. In this setting, the best way to determine if the heart failure is a result of pericarditis or a noncompliant ventricle is to quantify ventricular interaction during respiration. Enhanced ventricular interaction is unique to constrictive pericarditis, Dr. Nishimura stressed.

Indeed, in his recent series of 100 consecutive patients who underwent hemodynamic catheterization for diagnosis of constrictive pericarditis versus restrictive myocardial disease, of whom 59 were subsequently found to have surgically proven constrictive pericarditis, enhanced ventricular interaction had a 97% sensitivity and 100% positive predictive accuracy for the diagnosis of constrictive pericarditis.

In contrast, the positive predictive accuracy of the conventional hemodynamic criteria, such as early rapid filling, equalization of end-diastolic pressures in all four chambers, or a pulmonary artery systolic pressure less than 55 mm Hg, was 58%-73%.

Enhanced ventricular interaction is an expression of dissociation between intrathoracic and intracardiac pressures resulting in decreased filling of the left ventricle during inspiration in patients with constrictive pericarditis. The rigid, constrictive pericardium also encourages increased filling of the right ventricle during inspiration. It can be identified by measuring the area under the ventricular pressure curves during respiration. This yields the systolic area index—that is, the ratio of the right ventricular to left ventricular systolic pressure-time area during inspiration compared with expiration. A systolic area index greater than 1.1 constitutes enhanced ventricular interaction—and makes the diagnosis of constrictive pericarditis, the cardiologist explained.

Dr. Nishimura urged constrictive pericarditis as a diagnostic consideration in any patient presenting with symptoms of right-sided heart failure and elevated jugular venous pressure with rapid x and y descents in the presence of echocardiographic evidence of normal valvular and left ventricular function. If upon 2-D echo the patient displays the classic septal inspiratory bounce along with Doppler echo findings of restrictive mitral inflow velocity, a normal or increased early diastolic mitral annular tissue velocity, and good hepatic vein flow with inspiration but little flow in expiration, that patient has constrictive pericarditis. Hemodynamic catheterization is not needed, he said. ■

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