Editorial

Constrictive Pericarditis, A Diagnostic Challenge

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Mayow in 1674 may have been the first to recognize constrictive pericarditis at necropsy, and he seemed to realize that the fibrotic and calcified pericardium interfered with ventricular filling. Although Chevers in 1842 and Wilks in 1871 preceded him,[1] Friedel Pick in 1896 described hepatomegaly and ascites in young patients with constrictive pericarditis,[2] and this syndrome bears his name.[1] (Friedel Pick also described progressive circumscribed cerebral atrophy, ie, Pick's Disease, which at times is also called Pick's Syndrome.) Antemortem diagnosis of constrictive pericarditis awaited Volhard and Schmieden in 1923.[3,4]

Constrictive pericarditis can mimic or be mimicked by many conditions such as cor pulmonale and cirrhosis with ascites, but the most difficult differentiation has usually been between constriction and restrictive cardiomyopathy. In this issue of the *Journal*, Kleinecke, Wagner, and O'Meallie describe the diagnosis of constrictive pericarditis in an elderly man who also had aortic stenosis and coronary arterial disease.[5] Their diagnosis was aided by finding extensive pericardial calcium deposits by chest radiograph, echocardiogram, and computed tomogram. Such heavy deposits currently are seen less frequently than in the past. Their diagnosis was confirmed at operation, and pericardiectomy relieved the patient's symptoms and signs of constriction.

After the paper of Kleinecke et al was received, a landmark study of constrictive pericarditis appeared.[6] The authors reviewed 100 consecutive patients undergoing cardiac catheterization at the Mayo Clinic between 1997 and 2004 for differentiation of constrictive pericarditis from restrictive cardiomyopathy. Of the 100 patients, 59 had constrictive pericarditis, all confirmed by operation, and the commonest etiologies were prior cardiac surgery (28 patients), idiopathic (15 patients), and radiation therapy (9 patients).[6] In contrast to the first half of the twentieth century when infection, especially tuberculosis, was the most common etiology,[3] only 4 of the 59 patients had a history of infective pericarditis.[6]

The Mayo group went on to review the hemodynamic parameters obtained by echocardiography and cardiac catheterization that traditionally have been used to differentiate constrictive pericarditis from restrictive cardiomyopathy[6] and that were used by Kleinecke et al to diagnose their patient.[5] Although there were statistically significant differences between the patients with constrictive pericarditis and those with restrictive cardiomyopathy for most of these parameters, there was a large overlap of the two groups for each parameter.[6]

In contrast, the Mayo investigators found that a new parameter, the systolic area index, which assesses the change in ventricular pressure area during inspiration and expiration, had a 97% sensitivity and a 100% predictive accuracy for identifying patients with constrictive pericarditis.[6] The new parameter makes sense because the constricting pericardium keeps the total diastolic volume of the two ventricles constant. With inspiration the right ventricle fills more at the expense of the left ventricle, and on the ensuing systole the area of the right ventricular pressure curve is larger than during expiration, while the area of the left ventricular pressure curve is smaller than during expiration. With expiration the left ventricle fills more at the expense of the right ventricle, and on the ensuing systole the area of the left ventricular pressure curve is larger than during inspiration, while the area of the right ventricular pressure curve is smaller than during inspiration. In contrast, this pattern is not seen in patients with restrictive cardiomyopathy, and in the example illustrated, the area of the right ventricular pressure curve is smaller with inspiration compared to expiration, while the area of the left ventricular pressure curve is the same during inspiration and expiration.[6]

The Mayo study is exciting, but there are two caveats. First, another group needs to confirm the high sensitivity and specificity of the systolic area index for diagnosing constrictive pericarditis. Second, the new index requires the simultaneous recording and subsequent measurement of high-fidelity right and left ventricular pressure tracings, obtained using micromanometer-tipped catheters, at peak inspiration and peak expiration during exaggerated respirations.[6] This is not always an easy task. Thus, constrictive pericarditis can be diagnosed, but doing so remains a challenge.

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