Diastolic Mitral Regurgitation Secondary to Acute Aortic Regurgitation

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Introduction: We present a case of diastolic mitral regurgitation (MR) secondary to acute aortic insufficiency (AI) diagnosed using transesophageal echocardiography (TEE). Transmitral two dimensional color flow Doppler (CFD), continuous wave Doppler, and color flow Doppler (CFD) M-mode were used for diagnosis of diastolic MR (1).

Case Presentation: A 53 year old man with severe, acute AI associated with dehiscence of his previous bioprosthetic valve presented for aortic valve replacement. He had a history of endocarditis and three previous aortic valve replacements. Preoperative transthoracic echo showed an aortic root abscess, severe AI, mild to moderate MR, and an ejection fraction of 60%. Cardiac catheterization demonstrated severe AI and no significant coronary artery disease. ECG showed a normal sinus rhythm.

Aortic valve replacement with possible mitral valve replacement or repair was planned. Intraoperative precardiopulmonary bypass TEE confirmed the diagnosis of severe AI. On evaluation of the mitral valve with CFD, systolic and diastolic MR jets were noted. This was confirmed by transmitral continuous wave Doppler and CFD M-mode.

The decision was made to replace the aortic valve with a mechanical aortic valve. Post-bypass TEE showed a non-obstructive aortic valve prosthesis with no AI. The degree of systolic MR decreased from severe to mild. There was complete resolution of the diastolic MR as documented by transmitral continuous wave Doppler and CFD M-mode. (See figures 1 and 2)

Discussion: When left ventricular diastolic pressure increases rapidly, it exceeds left atrial pressure in late diastole (2). This results in a presystolic closure of the mitral valve prior to atrial or ventricular contraction. Coordinated atrial and ventricular contraction is required for proper coaptation of the mitral valve leaflets (3). In severe AI, left ventricular diastolic pressure rises over the left atrial pressure causing diastolic MR. This is reflected in continuous wave Doppler of transmitral flow, which can be used for diagnosis (1). Temporal analysis of transmitral flow is aided by the addition of CFD M-mode. The differential diagnosis for the etiology of diastolic MR includes atrial fibrillation, bradycardia, atrioventricular block, atrial and ventricular extrasystoles, or intrinsic mitral valve disease (3).

CFD, CWD, and CFD M-mode can be utilized to diagnose diastolic MR.

References:
(1) Circulation 1999;99:e13
(2) J Am Coll Cardiol 1986;7:768-74
(3) Am Heart J 1989; 117:1106-1112