

Quick Fact Sheet: Mitral Regurgitation

Mitral regurgitation (aka mitral insufficiency) is defined as the abnormal flow of blood through the mitral valve from the left ventricle to the left atrium during systole.

Etiologies

- 1) **Organic MR** - defect originates in valve leaflets and/or supporting structures (i.e. chordae or annulus)
 - Myxomatous changes (Mitral valve prolapse or Barlow Syndrome)
 - Rheumatic Heart Disease
 - Infective endocarditis
 - Spontaneous chordal rupture
 - Collagen vascular diseases
 - Mitral annular calcification (MAC)
 - Trauma
 - Coronary artery disease with papillary muscle dysfunction
- 2) **Functional MR** - defect in left atrial or left ventricular function with INTACT mitral valve apparatus
 - Coronary artery disease
 - Hypertrophic Obstructive Cardiomyopathy (HOCM)
 - Dilated cardiomyopathy
 - Left atrial enlargement

Signs/Symptoms

- 1) **Acute MR**
 - Acute pulmonary edema/CHF signs and symptoms
 - Angina
- 2) **Chronic MR**
 - Slowly progressive CHF signs and symptoms

Physical examination

- 1) **Acute MR**
 - Soft/absent murmur due to increased LA pressure reducing pressure gradient between the LA and LV
 - If murmur present, it is often early systolic (since pressure gradient equals out early in systole). This means in severe acute MR, the murmur will be absent.
 - Murmur responds to dynamic auscultation like chronic MR as described below.
 - CHF signs and symptoms almost always present
- 2) **Chronic MR**
 - High pitched holosystolic murmur at apex radiating to axilla
 - If anterior leaflet defect present, regurgitant jet is directed posteriorly and murmur radiates to the back
 - If posterior leaflet defect, regurgitant jet is directed anteriorly and is heard best at the aortic listening post
 - S3 present due to increased return of volume to the left ventricle
 - Carotid pulse is brief and low in amplitude (but not late i.e. tardus, as in severe AS)

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- Pulse pressure is narrow (not wide as compared to severe AI)
- Handgrip or transient arterial occlusion with BP cuff increases SVR/afterload thus causing worsening of the MR, thus increasing the intensity of the murmur. This helps distinguish the murmur from that of AS which does not change with increased afterload.
- Varying cardiac cycle lengths (in patients with atrial fibrillation or frequent PVCs/PACs) also helps to distinguish the murmur of AS from that of MR. A longer cycle length increases the murmur of AS but does not change the intensity of the murmur of MR.
- Laterally displaced PMI due to eccentric LVH
- CHF signs and symptoms may be present

Diagnosis

- 1) EKG - Non-specific although LVH and left atrial enlargement often present
- 2) Chest X-ray - Mitral annular calcification, left atrial enlargement, cardiomegaly
- 3) Echocardiography - Dopplar can identify the presence of MR (critical in acute MR since PE unreliable)
 - Severity determined by:
 - 1) Depth of penetration of regurgitant jet into the left atrium
 - < 1 cm is mild
 - 2-3 CM is moderate
 - > 4 cm is severe
 - 2) Various other methods
- 4) Cardiac catheterization
 - PCWP tracing will show prominent V waves (similar to RA tracing in TR)
 - Severity determined by LV-gram when dye enters LA
 - 1+ MR (mild)
 - 2+ MR (moderate)
 - 3+ MR (moderate-severe)
 - 4+ MR (severe) = Dye enters into pulmonary veins

Treatment

- 1) Acute MR
 - Diuretics, afterload reducers, intraaortic baloon cunterpulsation
 - Emergent mitral valve repair/replacement
- 2) Chronic MR
 - ACEI or hydralazine
 - Mitral valve repair/replacement before ventricular dysfunction occurs