Mitral Valve Disease- Assessment and Management

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Mitral Valve Disease

- Mitral Valve Regurgitation
- Mitral Valve Stenosis
- Mitral Valve Prolapse

Mitral Regurgitation

- Typical Causes-Chronic
  - Myxomatous degeneration of mitral leaflets
  - Mitral valve prolapse
  - Mitral annular enlargement
- Typical Causes- Acute
  - Infective Endocarditis
  - Ischemic Papillary muscle dysfunction/rupture
  - Acute Rheumatic fever
  - Acute dilatation of LV (MI, myocarditis)

Mitral Regurgitation- Presentation

- No pathognomonic symptoms
- Dyspnea on exertion
- Orthopnea
- Paroxysmal nocturnal dyspnea
- Lower limb edema
- Palpitations
- Fatigue
- Diaphoresis
- Physical: Holosystolic, blowing murmur at apex
  - May radiate to axilla
  - Chronic MR also has diminished S1, laterally displaced apex beat

Mitral Regurgitation

- Diagnosis and severity are established by symptoms and findings on echocardiogram
- Echo:
  - Measure flow
  - Pulmonary flow- in severe MR, diastolic flow velocity> systolic flow velocity

Mitral Regurgitation- Diagnosis

- Diagnostic criteria:
  - Flow convergence method or proximal isovelocity surface area
  - Regurgitant orifice area:
    - >0.4 cm^2 =severe
    - <0.2 cm = mild
  - Regurgitant volume:
    - <30 mL = mild
    - >60 mL = severe
  - Regurgitant fraction:
    - <30% = mild
    - >50% = severe
- Severity of Symptoms- NYHA

NYHA Classification

Class	Functional Capacity: How a patient with cardiac disease feels during physical activity
I	Patients with cardiac disease but resulting in no limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.
II	Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain.
III	Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea or anginal pain.
IV	Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort increases.

MR- Treatment

- Acute MR:
  - 1st line- emergency surgery
    - + pre-op diuretics- afterload reduction. Usually furosemide
    - + intra-aortic balloon counterpulsation
      - If severe MR with hypotension
      - Cylindrical balloon sits in aorta, deflated in systole, inflates in diastole (inc. blood flow to coronary arteries)

MR- Treatment

- Chronic MR
  - Asymptomatic
    - Left Ventricular End Diastolic Function >60%
      - ACE inhibitors (Captopril 25-50 mg PO x3 or Enalapril 5-40 mg PO x1)
      - Beta blockers (Metoprolol 50-200 mg PO x1)
    - LVEDF <60% or LVE systolic diameter >45mm
      - Repair valve leaflet (preferred)
      - Replace valve (+ anticoagulant)
      - Prosthetic ring

MR- Treatment

- Chronic MR
  - Symptomatic (class II, III, IV)
    - LVEF > 30%
      - Surgery + medication (ACE inhibitors and Beta blockers)
    - LVEF <30%
      - Medication + intra-aortic balloon

Mitral Stenosis

- More common in women (2/3)
- Acute insult→ multiple inflammatory foci (Aschoff bodies) in endocardium, myocardium
- Common causes
  - ** Rheumatic fever- grp A ß-strep
  - Congenital, malignant carcinoid disease, SLE, RA, Whipple disease, mucopolysaccharidoses
  - Lutembacher syndrome= ASD + rheumatic mitral stenosis

Mitral Stenosis- Symptoms

- Symptoms begin when valve area is ~2.5 cm^2 or less
  - LA pressure increases→
    - transudate fluid,
    - dyspnea,
    - Hemoptysis (if bronchial veins rupture)
  - LA dilatation→
    - Increased risk of Atrial Fibrillation
    - Compression of left recurrent laryngeal nerve– hoarse voice
    - Pulmonary hypertension

Mitral Stenosis- Signs

- Jugular vein distention
- Laterally displaced apical impulse
- Heart sounds:
  - Loud S1
  - Opening snap
  - Diastolic rumble

Mitral Stenosis -workup

- **CXR**:
  - **LA enlargement** (double shadow in cardiac silhouette, straightening of left cardiac border, upward displacement of mainstem bronchi)
  - **Prominent pulmonary vessels**
  - **Mitral valve calcification**
  - **Interstitial edema** (Kerley A, B lines)
- **Echocardiogram:** best diagnostic tool
  - **Measure :** mitral valve orifice, transvalvar gradient, pulmonary arterial pressure
- **Cardiac catheterization:** now replaced by echo, but used in severe lung disease, pulmonary hypertension
- **ECG:** AF, P wave >0.12 in lead II

Mitral Stenosis- Treatment

- Non-pregnant:
  - **Mild Disease** (gradient < 5mmHg, Valve area >1.5 cm^2)
    - **Diuretics** (relieves LA pressure):
      - Furosemide 40 mg PO x1 and titrate up to 600 mg
      - Bumatenide 0.5 mg PO x1, max 10 mg/ day
  - **Moderate Disease** (5-10 mmHg gradient, valve 1.0-1.5 cm^2)
    - **1st line- diuretics**
    - **+ balloon valvotomy-** for patients with more severe symptoms
      - **If pulmonary capillary wedge pressure >25mmHg or pulmonary arterial pressure > 60 mmHg when exercising, then can consider balloon valvotomy if good valve anatomy**

Mitral Stenosis- Treatment

- Severe Disease (gradient >10, area <1.0 cm^2)
  - Diuretics + balloon valvotomy (if anatomy is suitable)
  - Grade on severity (1-4)
    - Valve mobility
    - Calcification
    - Leaflet thickening
    - Sub-valvular apparatus distortion
  - If <9 , balloon valvotomy
  - If >9, open valve commisurotomy or valve replacement

Mitral Valve Prolapse

- Most common valvular disease in the US, prevalence of 2.4%, equally common in men and women
- **Systolic prolapse or billowing of one or both mitral valve leaflets into the left atrium**
- Diagnosis on Echo= **prolapse of leaflet(s) by 2 mm or greater above the level of the annulus during systole**
- Classic MVP= leaflet thickening > 5mm during diastasis. Caused by myxomatous degeneration, frequently seen in connective tissue disorders
- Can also be caused by rheumatic fever, chordae rupture

Mitral Valve Prolapse

- Heart sounds:
  - Late systolic crescendo with mid-systolic click.
  - Loud S2.
  - Enhanced by valsalva maneuver
- Can predispose to infective endocarditis

Mitral Valve Prolapse- treatment

- Asymptomatic: Reassurance. Look for mild mitral regurgitation
  - Aspirin: in patients with
    - 1. Atrial Fibrillation, <65 years, no MR/HTN/CHF
    - 2. MVP + history of TIA
    - 3. MVP + ischemic stroke (no MR, AF, thrombus or abnormal leaflet)
  - Warfarin: in patients with
    - 1. previous stroke + MR/AF/thrombus
    - 2. MVP + AF + >65 yrs/ MR/HTN/CHF
    - 3. MVP + recurrent TIA despite therapy
    - 4. MVP + previous stroke + leaflet thickening

Mitral Valve Prolapse- Treatment

- Asymptomatic + severe MR: Mitral valve repair + post-op aspirin/ warfarin.
  - If LVEF <60%, Pulmonary HTN, A- fib → Surgery

- Symptomatic (i.e. palpitations, syncope, chest pain, anxiety)
  - Urgent evaluation + lifestyle change
    - Avoid stimulants/ caffeine/ nicotine, reduce alcohol intake, promote regular exercise, restrict competitive sports
  - + beta-blocker
  - Can add aspirin or warfarin (see previous slide)
  - If severe MR- see above

Thank You

- BMJ best practice
- Medscape