Chronic Rheumatic Heart Disease

ا د . نجوى على
استاذ طب الاطفال

The diagnosis of heart disease must be

* Etiological: → (Congenital - Rheumatic)
* Anatomical: → (VSD - TOF - MR - MS)
* Functional: → HF {decompensated}

OR

no HF {compensated}

* Complication: →

rheumatic activity - infective endocarditis - PH - arrhythmia - chest infection

RHEUMATIC HEART DISEASE

- Occurs in severe cardiac involvement during initial or recurrent attacks of ARF

- Left - sided heart valves are most often affected, (mitral followed by the aortic valves)

- Mitral regurge is the commonest lesion in children and adolescent with RHD

MITRAL REGURGE

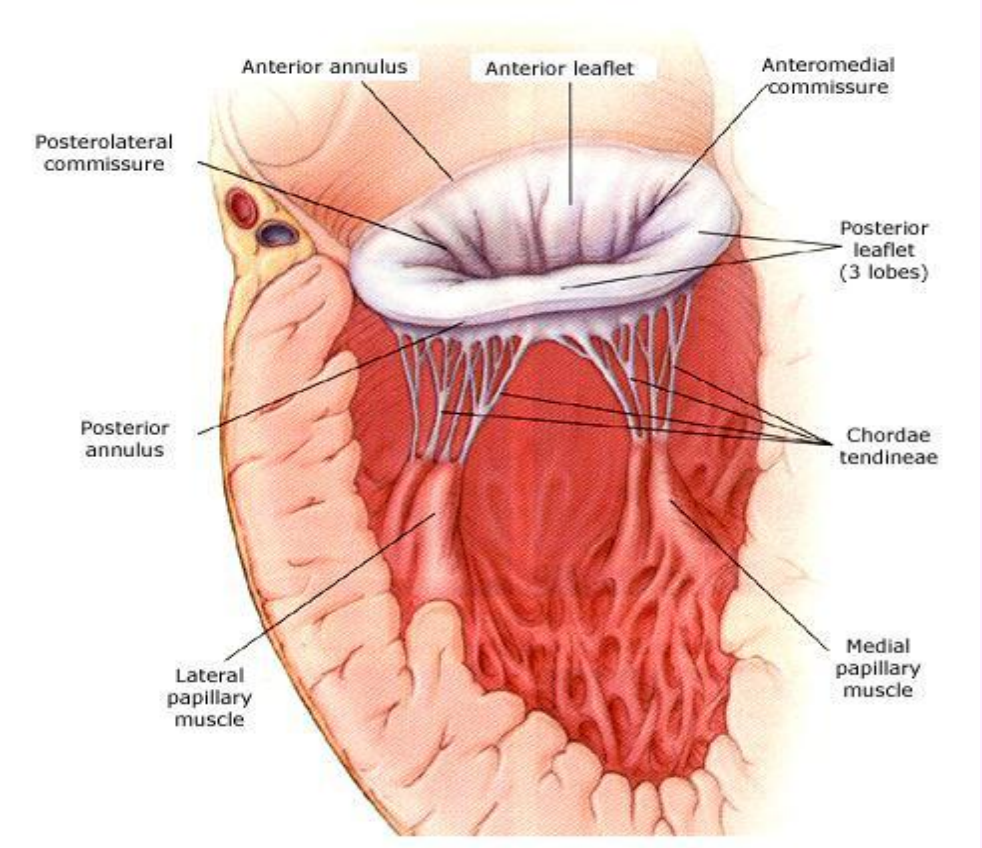
(MR, Insufficiency, Regurgitation, Incompetence)

The mitral valve consists of:

- an annulus
- 2 leaflets

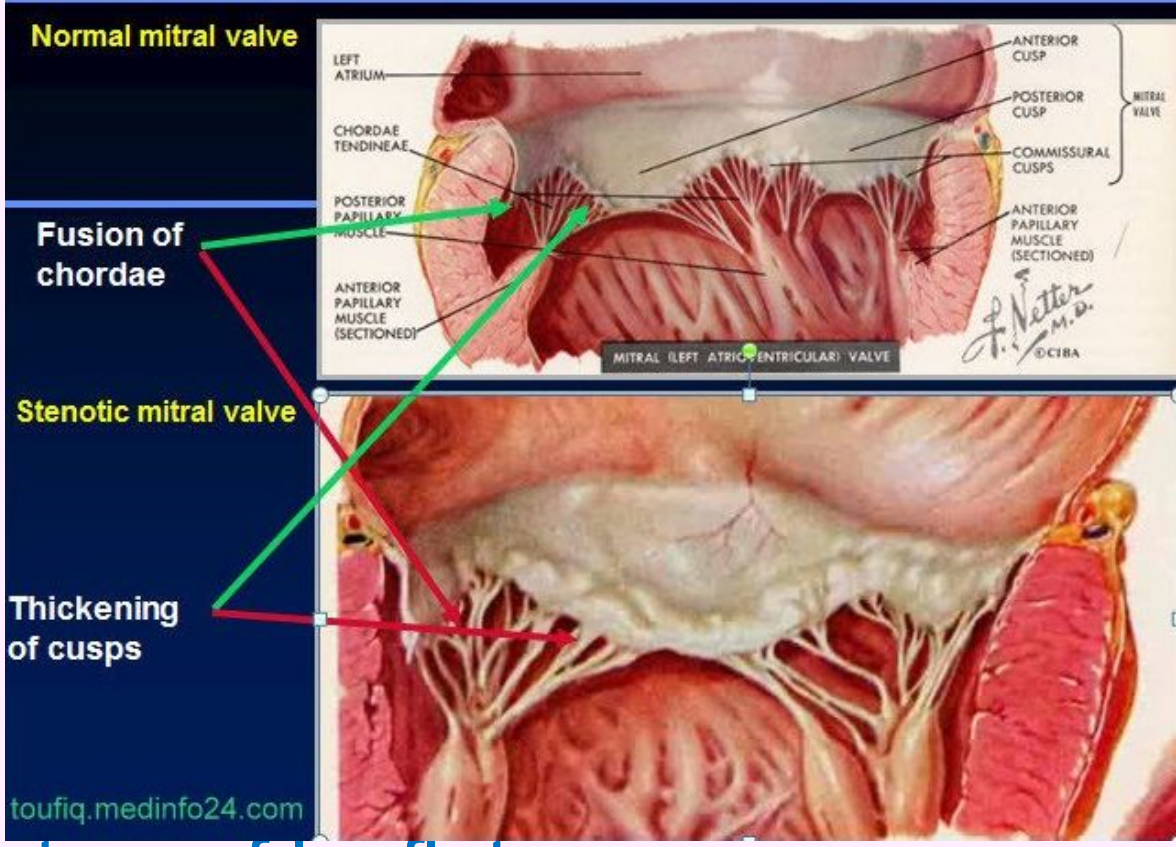
(anterior & posterior)

- chordae tendinea
- 2 papillary muscles



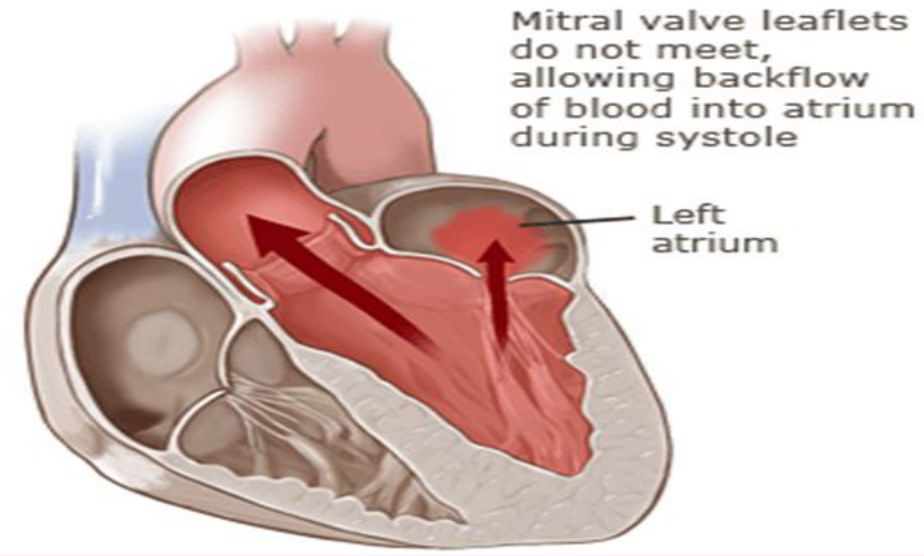
Pathophysiology

Healing of ARF results in



- Fibrosis & contracture of leaflets
- Shortening & thickening of chordea tendinea.
- Leaflets cannot coapt and separated
- LA and LV volume overload and enlargement.
- Pulmonary venous congestion, PH, RVH

Clinical Manifestations:

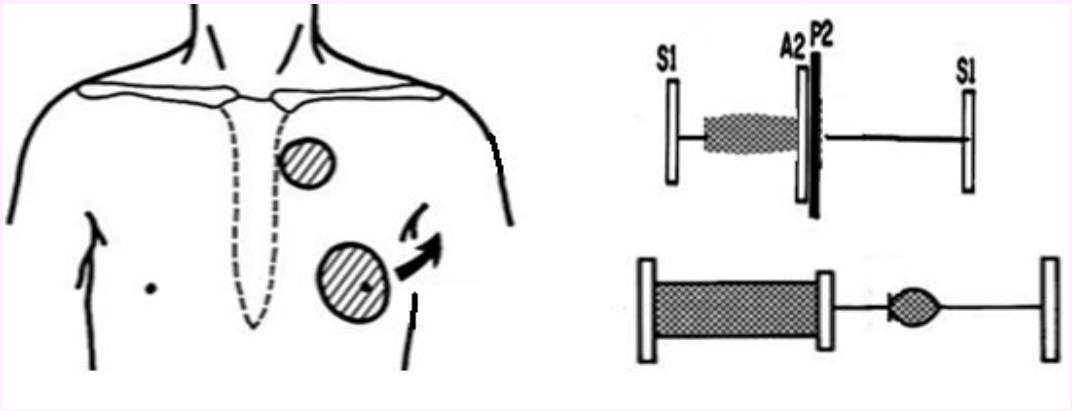


Symptoms

- Mild MR ⟶ no symptoms
- Severe MR ⟶ Symptoms of HF, pulmonary congestion, pulmonary edema

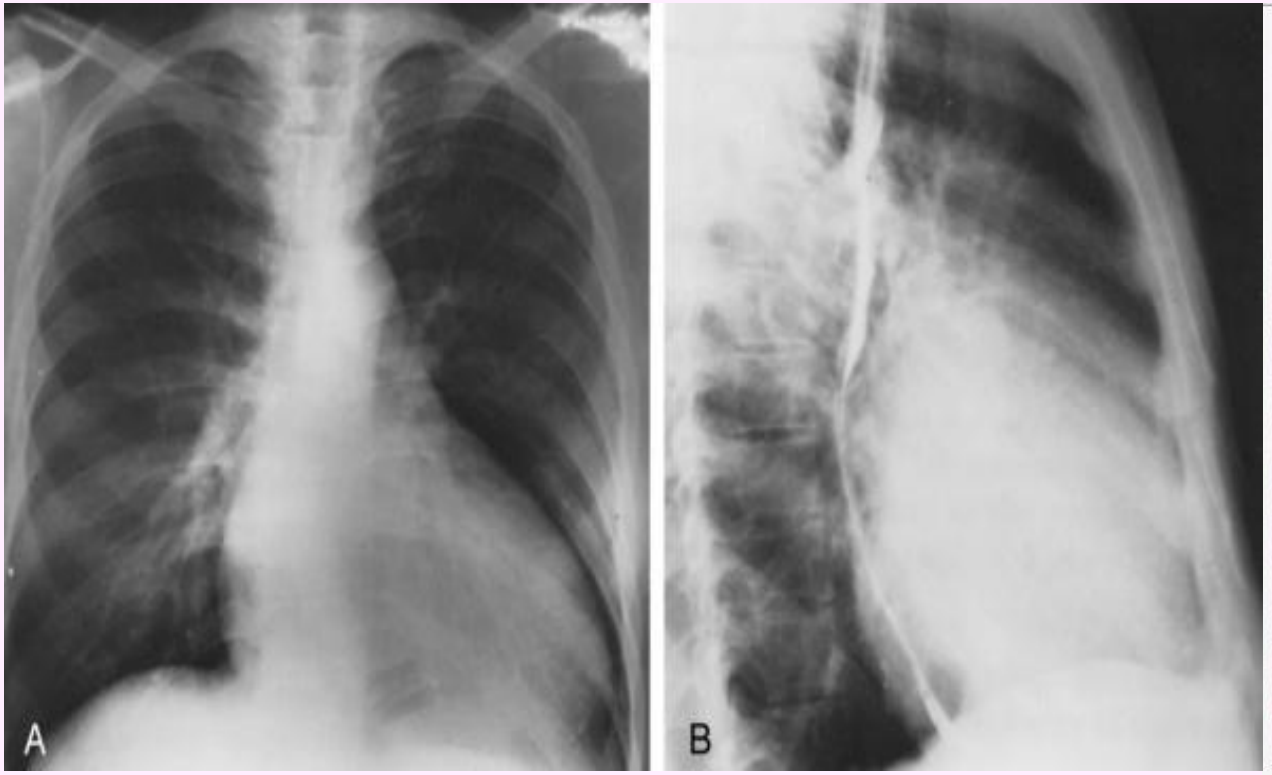
dyspnea - orthopnea - paroxysmal nocturnal dyspnea

Signs:

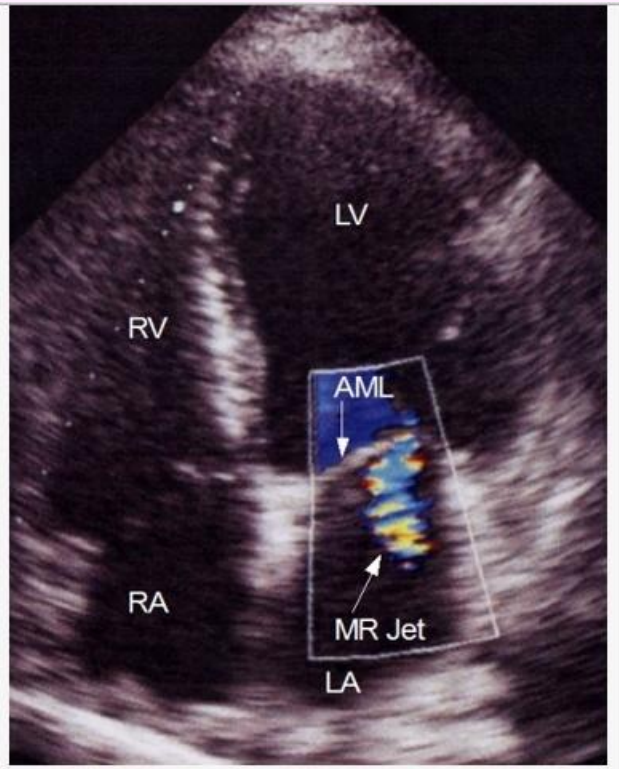


- **Apex** → (LV apex), shifted **downward,** localized, forcible, hyperdynamic (ill sustained) with **systolic thrill**.
- **S1** is usually **normal**
- **S2** is usually **normal** except in PH
- **Pansystolic murmur** maximal intensity at the apex, radiating to the axilla.
- **Short middiastolic murmur** over the apex may be heard (functional MS)
- **Ejection systolic murmur** on 2nd Lt ics (PH)

Mitral regurge CXR

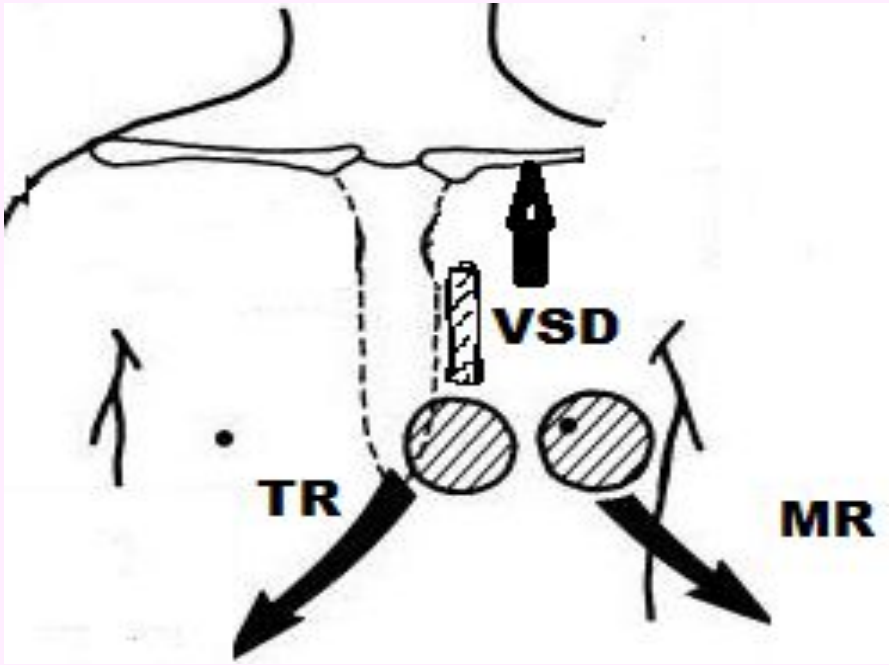


Mitral regurge Echocardiography



Mitral regurgitation jet by color Doppler echo

Differential Diagnosis of MR



1- **VSD:**

-maximal intensity over the 3rd & 4th left intercostal spaces

-propagated in fan manner

2- **Tricuspid regurge:**

- maximal intensity on lower left sternal border
- increases in intensity during inspiration.

3- **Mitral regurge of Carditis:**

- maximal intensity on the apex
- soft, musical, not associated with thrill, changeable

Management

- **Prophylaxis**

→ Against rheumatic recurrences **(LONG ACTING PENECILLIN)**

→ Against infective endocarditis

- **Medical treatment of**

- heart failure
- arrhythmia
- infective endocarditis
- Captoprile (After load reducing agent)

- **Surgical treatment** (Annuloplasty or valve replacement) is indicated in severe mitral regurge with:

- Recurrent heart failure
- cardiomegaly with pulmonary hypertension.

MITRAL STENOSIS (MS)

Pathophysiology

-Thickening of valve leaflets

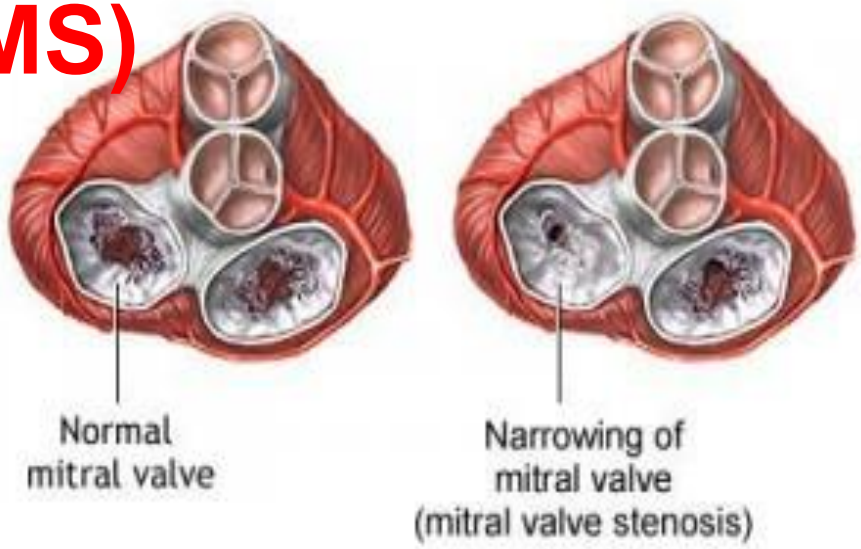
- Fusion of commissures

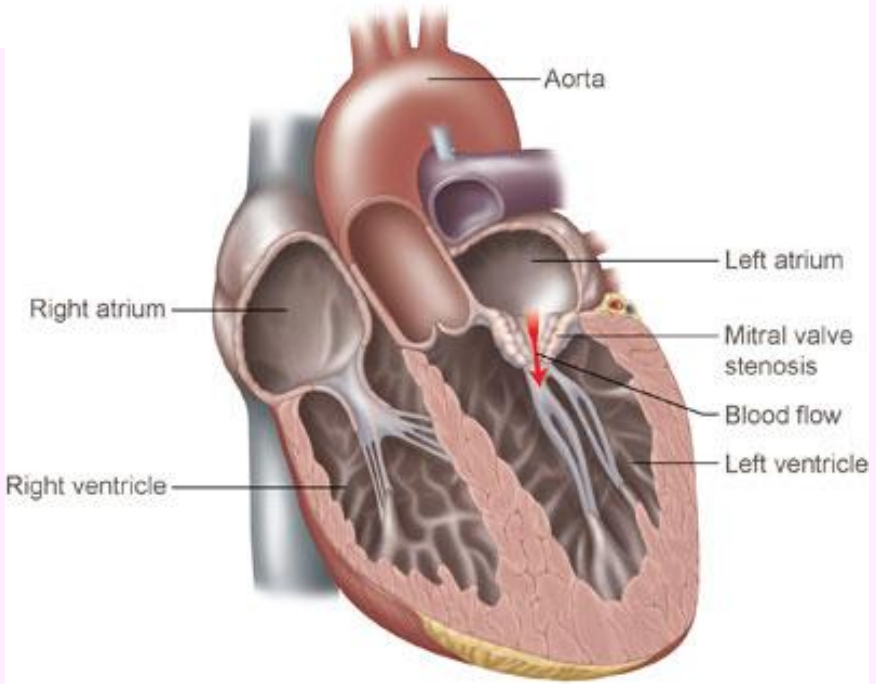
- Shortening & thickening of chordae tendineae.

- Funnel shaped valve apparatus → marked obstruction to blood flow from LA to LV

- LA enlargement **(Not LV)**, pulmonary venous congestion, PH, RV & RA dilation

- Right side HF





Clinical manifestations:

The clinical course depends on the severity of MS.

Symptoms:

- Dyspnea on exertion.
- Orthopnea & paroxysmal nocturnal dyspnea.
- Poor growth and development.
- Tachycardia and atrial fibrillation.
- Congestive heart failure may be present.

Signs

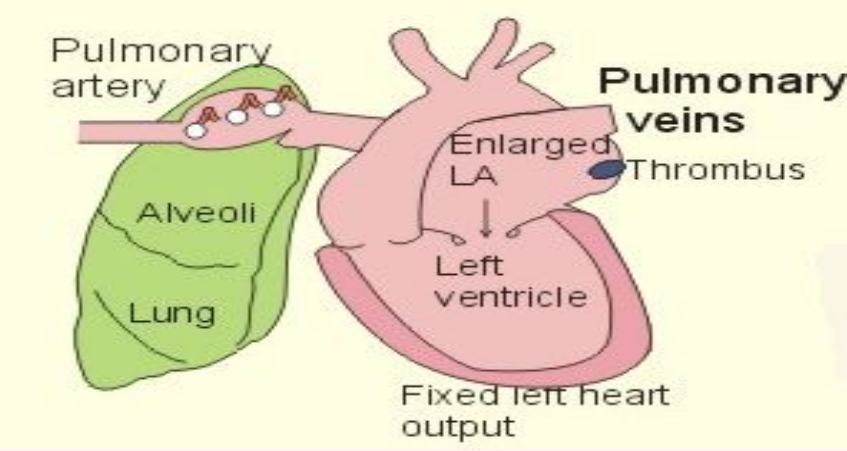
- Signs of RV hypertrophy:

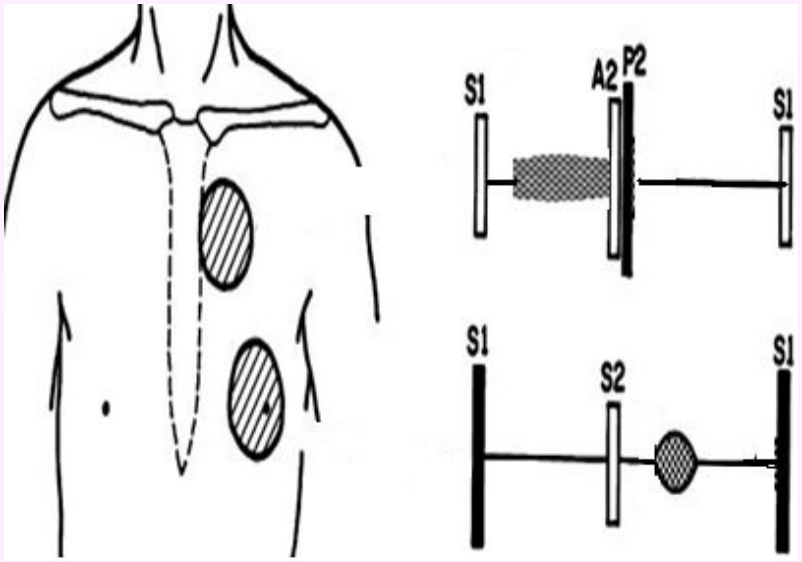
a- <u>The apex</u> is diffuse and shifted outward (RV apex), diastolic thrill

b- Left parasternal pulsations

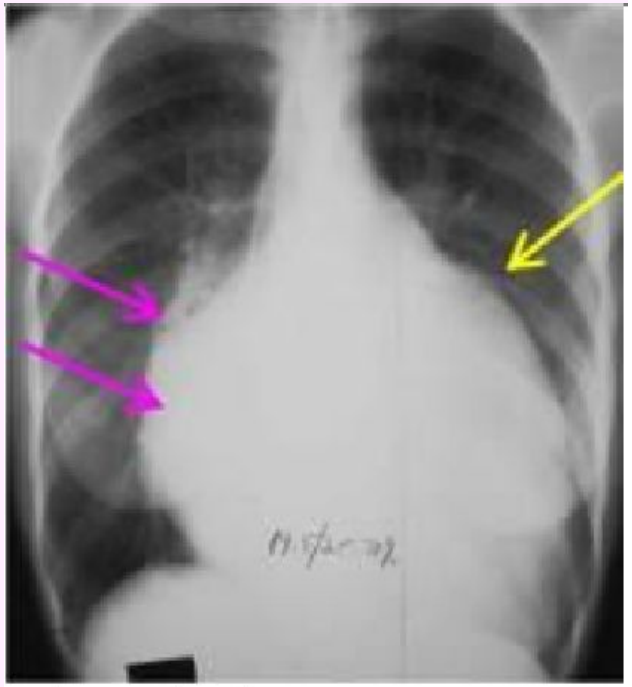
c- Epigastric pulsations

- loud S1
- Apical, rumbling mid-diastolic murmur.

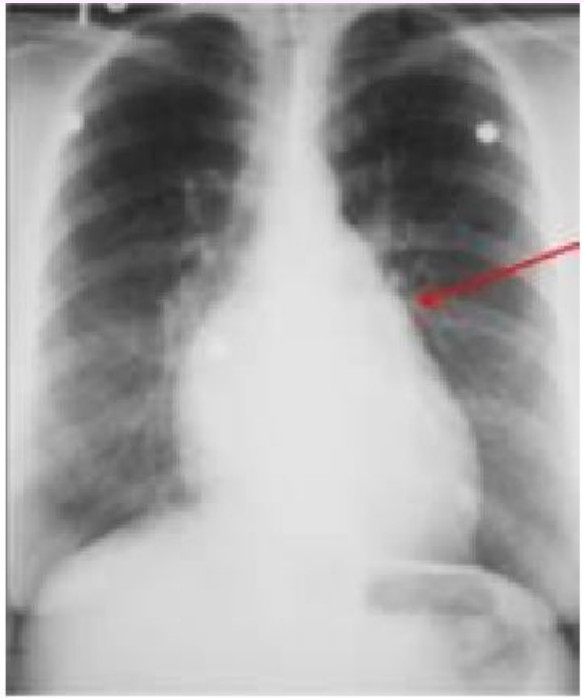




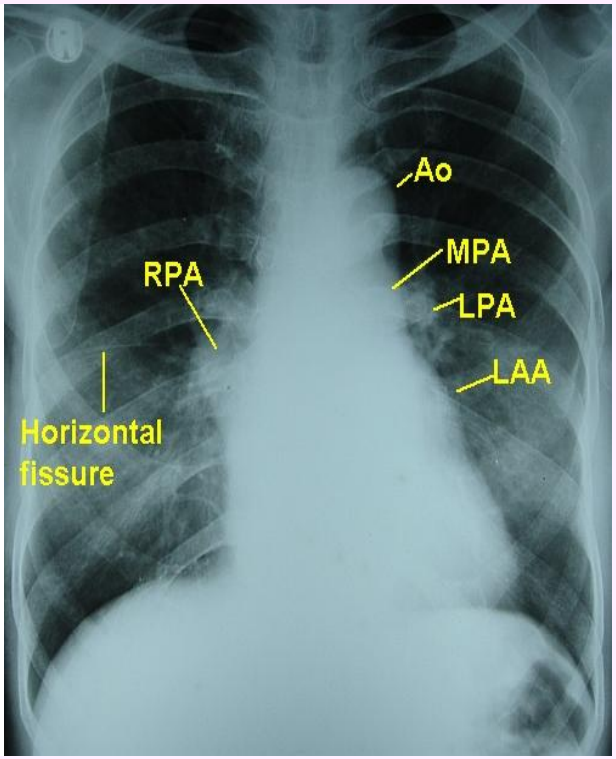
Mitral stenosis CXR



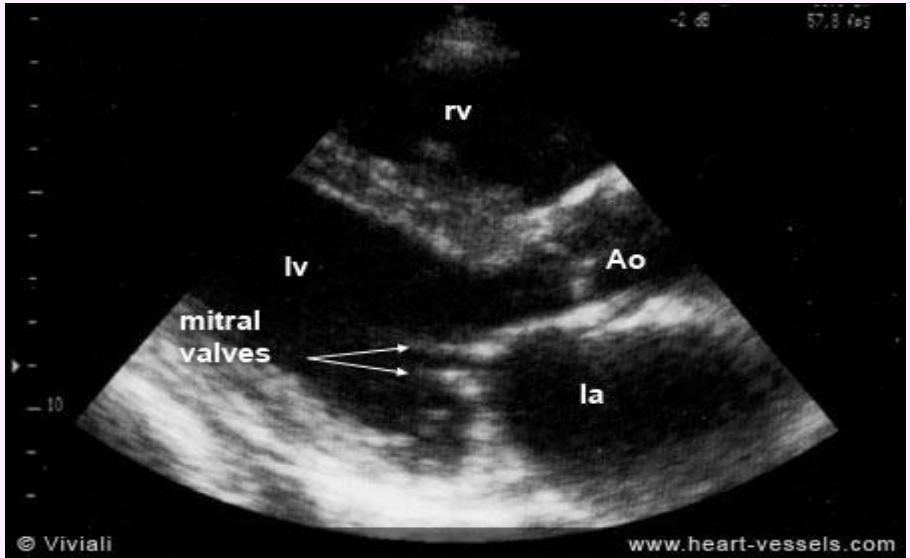
Right atrial enlargement
(from tricuspid regurgitation)
Enlarged left atrial appendage
(from mitral stenosis)



Straightening of left heart border



Mitral stenosis echo



Differential Diagnosis of MS

- **Mitral flow murmur (functional MS)**

associated with large VSD, PDA, MR, AR **(Austin flint** murmur**)**

- Normal S1
- No presysolic accentuation or opening snap
- Original lesion

- **Carditis** (**Carey Coombs murmur).**

- Soft , low pitched
- Changeable
- Not associated with thrill.
- Normal or muffled S1

Management:

- **Prophylaxis**

→ Against rheumatic recurrences (LONG ACTING PENECILLIN)

→ Against infective endocarditis

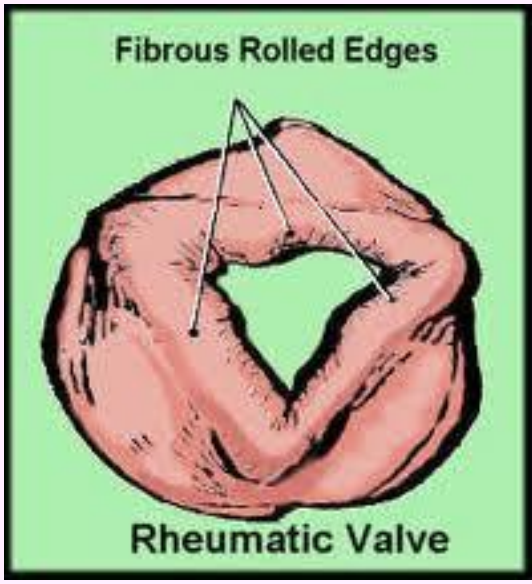
- **Medical treatment:**

Heart failure and atrial fibrillation (AF).

- **Surgical or baloon trans-catheter** valvotomy

.

Combined MS and MR



- Dilatation, scaring and narrowing → stenosis & leakage
- Obstruction and leakage of mitral valve → LA , RV & LV hypertrophy
- LV enlargement is going with MR and against pure MS
- RV enlargement is going with MS and unusual with MR

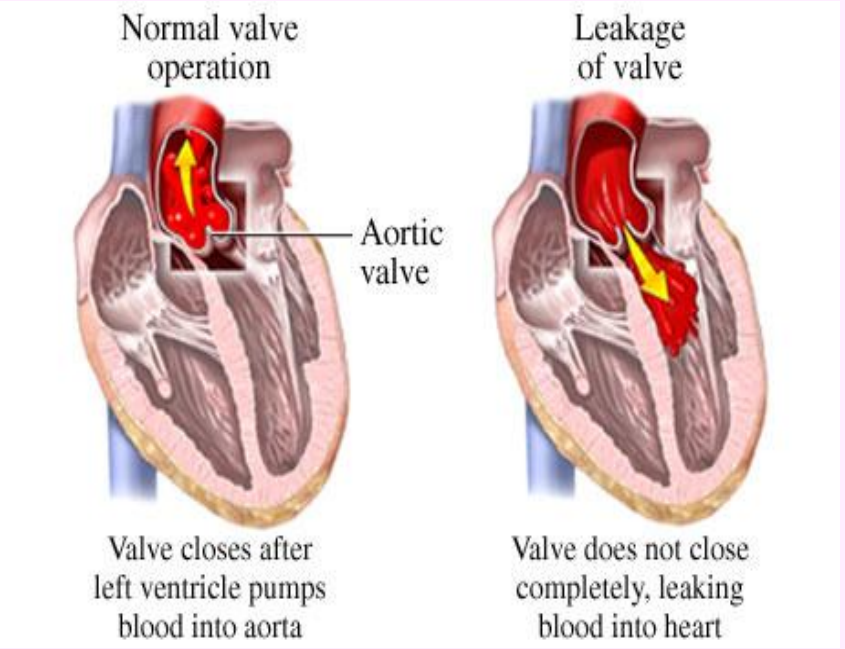
Which of the following pathological change occur in rheumatic mitral stenosis ?

(1) Increased left atrial pressure
(2) Left atrium dilatation
(3) Left ventricular hypertrophy
(4) Left ventricular hypertrophy
(5) Embolization of clots

AORTIC REGURGE

(AR, Insufficiency, Regurgitation, Incompetence)

- Rheumatic AR is the result of fibrosis and contracture of the aortic valve structure

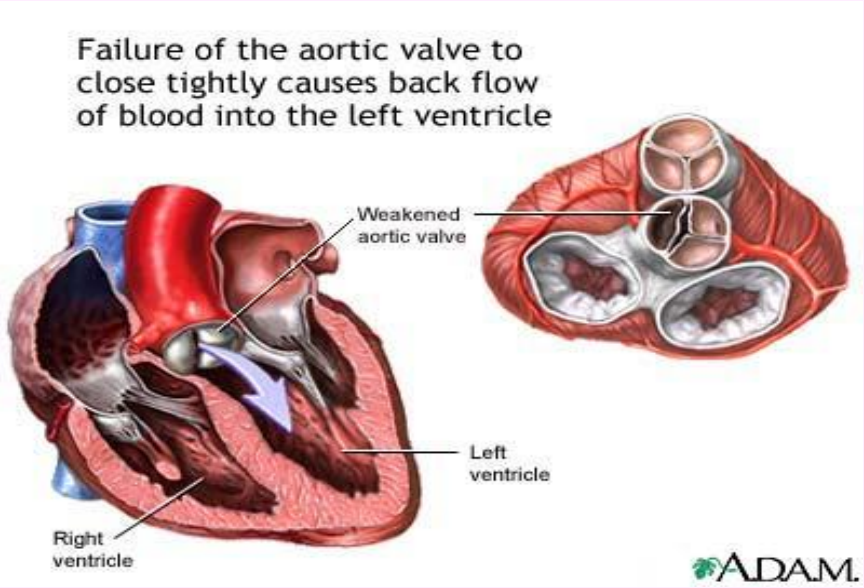


- Hemodynamically
  AR → LV volume overload

- Rheumatic AR is almost always associated with mitral valve disease.

Clinical manifestations:

Symptoms



Depend on the severity.

<u>In moderate and severe cases:</u>

- Effort intolerance, palpitation, dyspnea, orthopnea & paroxysmal nocturnal dyspnea, excessive sweating.

- Manifestations of pulmonary congestion and edema.

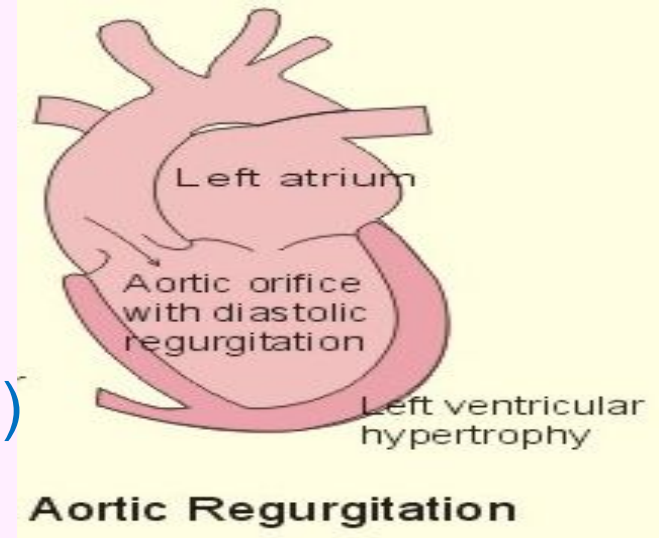
Signs

The rapid run off of the blood from aorta during diastole causes the signs of hyperdynamic circulation:

- The pulse is collapsing (water hammer)
- BP: wide pulse pressure (high systolic & low diastole)
- Corrigan's sign prominent carotid pulsation in the neck.
- Capillary pulsation is visible (alternative systolic flushing and diastolic blanching as pressure is applied to finger nails)
- Pistol shots heard over the femoral arteries due opening of collapsed arteries during systole
- Duroziez's murmur: a systolic and diastolic murmur detected by applying mild pressure by the stethoscope over the femoral artery.
- Musset's sign: Head movement in time with heart beat.

* Manifestations of **LV enlargement**.

- The apex is shifted downword, forcible, localized and hyperdynamic (ill sustained)
- The S1 & S2 are normal

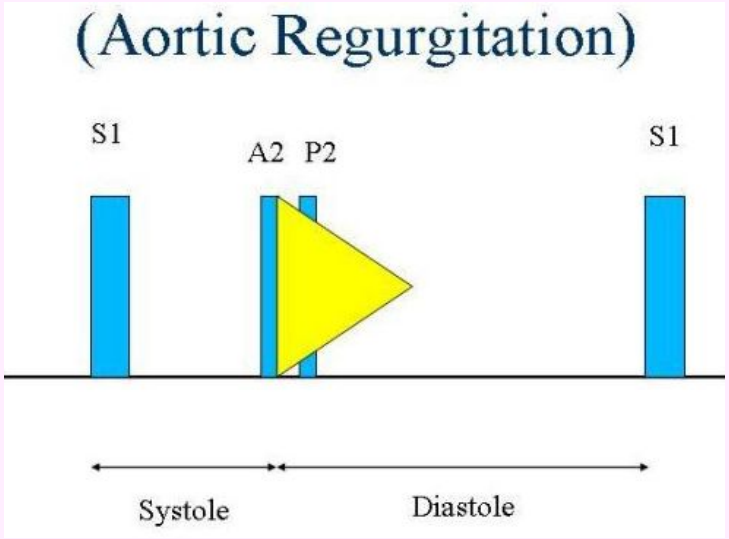


* **Early diastolic murmur**

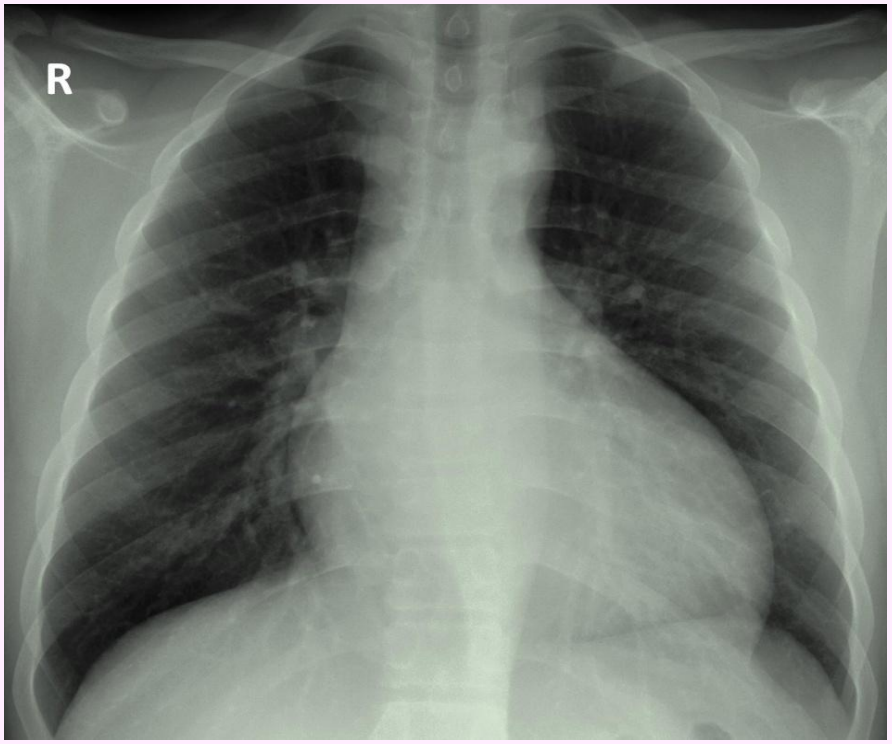
begins immediately after the S2. maximum intensity at the 2nd aortic area, the patient sitting and leaning forward & the breath held in expiration.

* **Austin flint murmur**

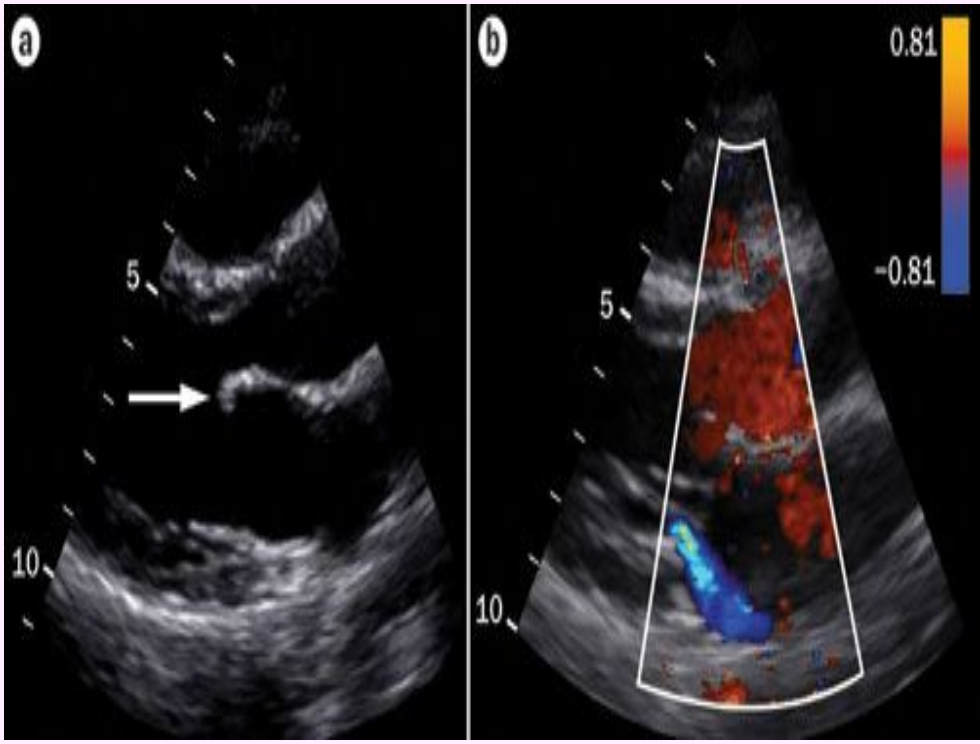
Apical (mid diastolic), rumbling in Character (functional mitral stenosis)



Aortic regurge CXR



Aortic regurge Echocardiography



Management

- **Prophylaxis**

→ Against rheumatic recurrences (LONG ACTING PENECILLIN)

→ Against infective endocarditis

- **Surgery:**

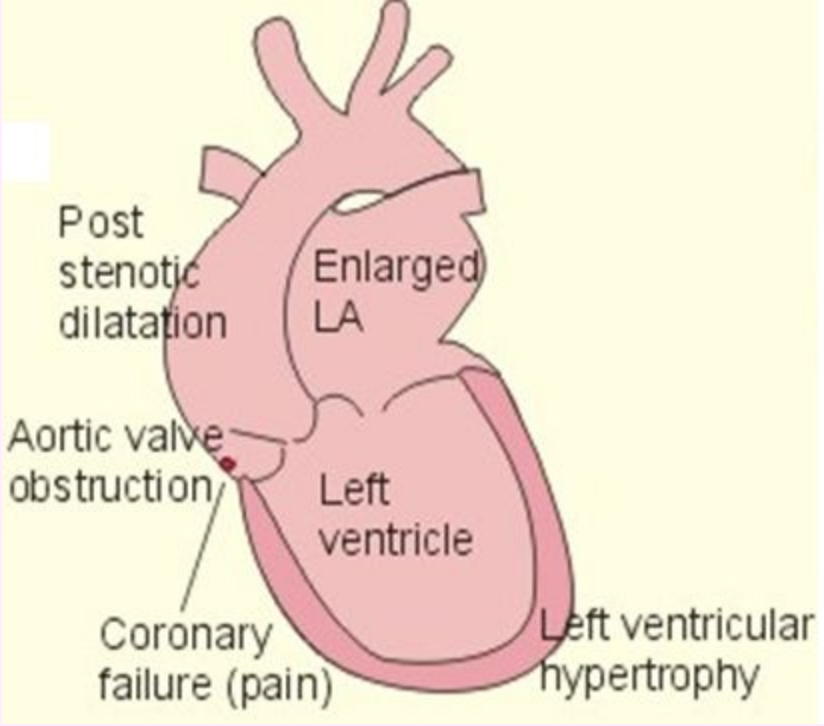
Aortic valve replacement. It could be recommended at earlier stages of the disease.

AORTIC STENOSIS

- Commissural adhesions occur slowly and progressive → narrowing and calcification of the orifice leads to significant aortic stenosis.

- Obstruction of LV emptying results in LV hypertrophy.

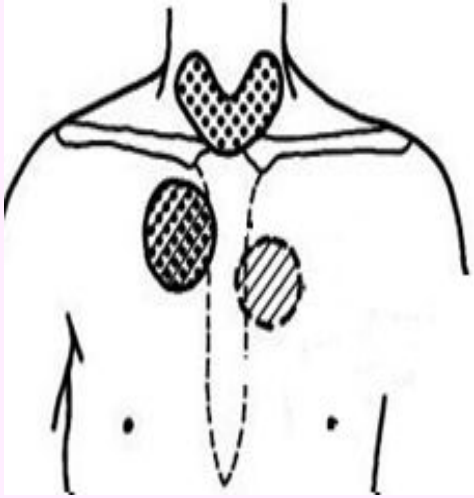
Clinical manifestations:
Symptoms:

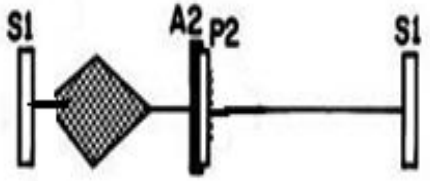


In cases with severe stenosis:

Chest pain, exercise intolerance, dyspnea, syncope.

Signs



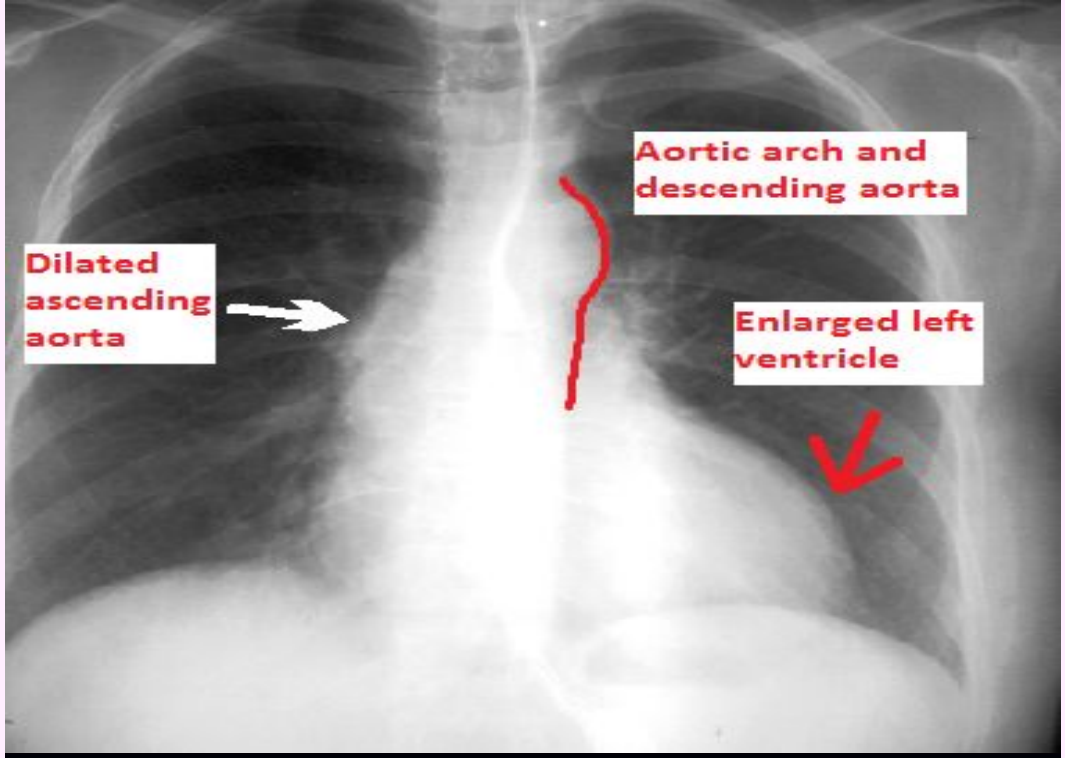


- **The apex:** Localized, forceful & sustained (pressure overload).
- Systolic **thrill** is common on Rt sternal border radiates to the neck.
- Normal S1
- Normal or single S2

Beyond childhood, scarring & calcification decrease mobility of the valve and thus the intensity of aortic component decreases (single)

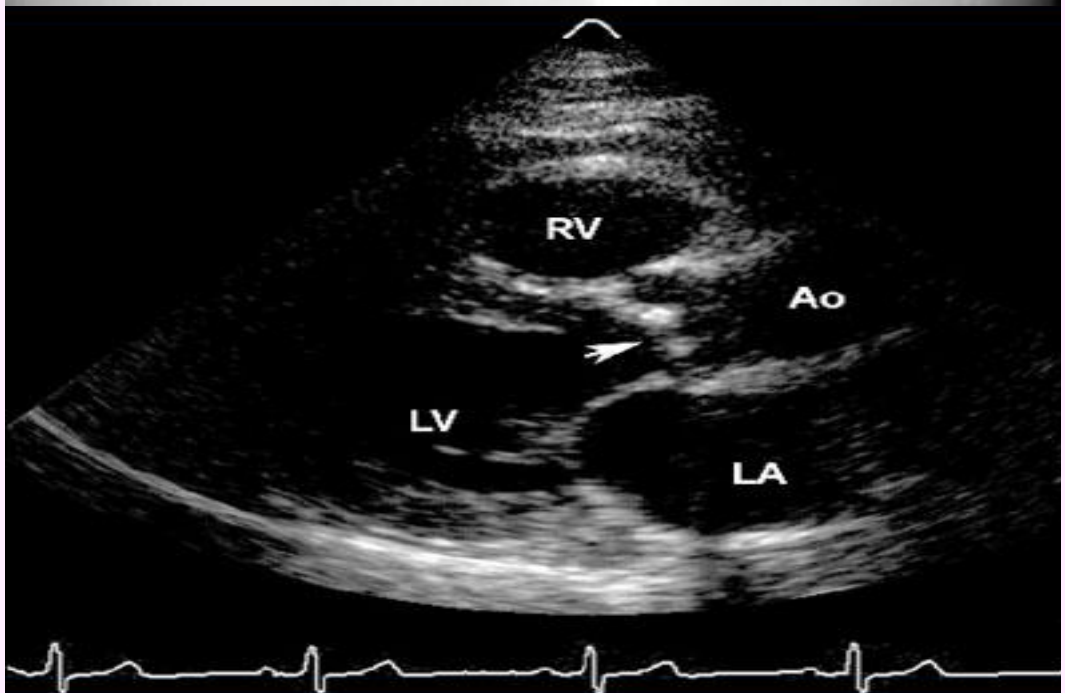
- **Ejection systolic murmur** maximally on 2nd Rt or 3rd Lt ics radiates to the neck.

Aortic stenosis CXR



Aortic stenosis Echocardiography

shows morphology of the valve and degree of stenosis.



Management

→ Against rheumatic recurrences (LONG ACTING PENECILLIN)

→ Against infective endocarditis

- Surgical intervention by valve replacement.

- Trans-catheter balloon dilatation is considered in some cases.

A case with dilated left ventricle and normal size of the other chamber. The most likely diagnosis is :

(1) mitral stenosis
(2) mitral regurgitation
(3) aortic stenosis
(4) aortic regurgitation

8 year old child with history of rheumatic fever and pansystolic murmur of mitral regurge. What is your management

(1) prophylaxis against infective endocarditis when indicated
(2) long acting penicillin every 3 weeks
(3) salicylates 70 mg/kg for 6 weeks
(4) Both 1 and 2
(5) All 1, 2 and 3


THANK
YOU!
meredo.com