

Contents

CVS Revision - 1	1
CVS Revision - 2	9
CVS Revision - 3	13
CVS Revision - 4	18
CVS Revision - 5	22
RS Revision - 1	28
RS Revision - 2	38
RS Revision - 3	49
Rheumatology Revision - 1	57
Rheumatology Revision - 2	66
Rheumatology Revision - 3	76
Rheumatology Revision - 4	80
Haematology Revision - 1	89
Haematology Revision - 2	95
Haematology Revision - 3	102
Haematology Revision - 4	110
Endocrinology Revision - 1	118
Endocrinology Revision - 2	127
Endocrinology Revision - 3	134
Endocrinology Revision - 4	145
CNS Revision - 1	157
CNS Revision - 2	161
CNS Revision - 3	165
CNS Revision - 4	170
CNS Revision - 5	176

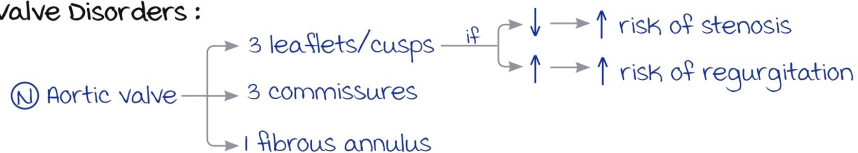
Nephrology Revision - 1	181
Nephrology Revision - 2	186
GIT Revision	191
Hepatology Revision	198

© Marrow | sahoosatyajeet000@gmail.com

CVS REVISION - 1

----- Active space -----

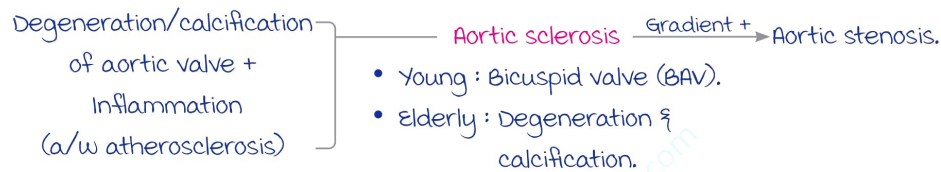
Aortic Valve Disorders :



Aortic Stenosis (AS)

00:04:37

Pathophysiology :



Features :

- BAV → Young patients :
 - NOTCH I defect.
 - Associated with aortopathies (mandatory CT aortogram).
- Tricuspid valve : > 60 y/o.

Note → Rheumatic etiology :

- Uncommon for AS.
- Rheumatic fever + valvulitis $\xrightarrow{15-20\text{ y}}$ RHD (MS + MR > MS + AR > AR + AS.)
(MR > MR + AR)

Hemodynamics :

- Aortic valve opens at the end of isovolumetric contraction.
- ① gradient b/w LV & aorta is zero (LV = 120 mmHg, Aorta = 120 mmHg).
- AS : valve does not open completely → Gradient (+) $\propto$ Severity of disease.

Note : Gradient = mean transvalvular pressure gradient (MTPG).

Severe AS : Given by 40/4/1 rule :

- MTPG > 40 mmHg (in sclerosis < 20 mmHg).
- Peak flow velocity > 4 m/s (Across valve).
- Surface area of valve < 1 cm² (Normal : 3 - 4).

Compensatory mechanism : To maintain cardiac output.

Concentric LV hypertrophy → ↑ LV mass + ↓ cavity size.



----- Active space -----

Clinical Features :

	Angina	Syncope	Dyspnea
Poor prognosis if untreated after	5 yrs	3 yrs	2 yrs

Angina :

- $\uparrow$ LV mass $\rightarrow \uparrow$ O_2 demand.
- $\downarrow$ capillary density (w.r.t. wall thickness).
- Tachycardia $\rightarrow \downarrow$ perfusion time.
- Atherosclerosis.

Syncope : D/t LV outflow obstruction $\rightarrow$ Fixed cardiac output state even when $\uparrow$ demand.

Dyspnea : D/t $\uparrow$ filling pressure (LVEDP).

$\uparrow$ LVEDP $\rightarrow \uparrow$ LAP $\rightarrow \uparrow$ PCWP $\rightarrow$ Fluid escapes into pulmonary interstitium.

Exacerbating factors :

A - Fib :

- Contribution of atria to cardiac output $\uparrow$ (25 $\rightarrow$ 40%).
- Thus, A-fib is **fatal** in AS.

Systemic HTN :

- **masking of severe AS :**
 $\uparrow$ SBP $\rightarrow \uparrow$ Aortic pressure $\rightarrow \downarrow$ Gradient (Falsely low).
- Thus, strict BP control needed.

Diagnosis :

1. Transthoracic Echo : To look for 40/4/1 rule.
2. Angiogram : mandatory (To rule out atherosclerosis).
3. CT aortogram.
4. Dobutamine stress echo : To differentiate b/w

LV failure d/t AS $\textcircled{VS}$ mild AS with Pre - existing LV failure

Low flow low gradient.

Examination Findings :

Pulse : Slow rising pulse

- Severe AS : **Pulsus tardus**.
- Very severe AS : **Pulsus parvus et tardus**.

BP : D/t LVH $\rightarrow$ masks AS.

JVP : Only elevated in terminal patients (Not relevant).

Apex : Laterally displaced **Heaving apex** (High amplitude sustained apex).

Heart sounds :

- S1 : $\textcircled{N}$ (**ejection click** $\rightarrow$ mistaken for loud S1).
- S2 (A2) $\rightarrow$
 - $\rightarrow$ Loud : BAV (Young).
 - $\rightarrow$ Soft : Elderly (Calcified valve).
 - $\rightarrow$ Reverse/paradoxical split (P2 $\rightarrow$ A2) : Severe AS.

- management:

- ### Aortic Regurgitation (AR)

00:34:33

Etiology :

VS

- Syphilis
- Marfan's syndrome
- Ehler Danlos syndrome
- Takayasu arteritis
- Behcet's disease
- IgG4 related disease
- Coogan's syndrome

- Specific

- Pathophysiology :

- (N) diastolic gradient between LV (10 mmHg) & aorta (80 mmHg) : 70 mmHg → Favours regurgitation.
- No backleak d/t competent aortic valve.

----- Active space -----

Exacerbating factors :

- Nocturnal angina : **Bradycardia** at night $\rightarrow$ more filling $\rightarrow$ Prolonged diastole
 $\text{Angina} \leftarrow \downarrow \text{Blood to coronary circulation} \leftarrow \uparrow \text{Regurgitation}$
- Systemic HTN : $\uparrow$ Aortic pressure $\rightarrow \uparrow$ **Gradient** $\rightarrow \uparrow$ Regurgitation.

Relieving factor : **Exercise/NTG/Nitroprusside.**Vasodilatation $\rightarrow \downarrow$ Aortic pressure $\rightarrow \downarrow$ Gradient $\rightarrow \downarrow$ Regurgitation.

Compensatory mechanism : Eccentric hypertrophy with dilatation.

Clinical Features :

mild/moderate AR :

- Asymptomatic (Since ejection fraction is $\uparrow \uparrow$).
- Occasional palpitation.
- LVEDP & ESV (End systolic volume) is $\textcircled{N}$.

Severe AR :

- LV failure (Ejection fraction is $\textcircled{N}$ to low).
- LVEDP $\uparrow \uparrow$: Dyspnea.
- ESV $\uparrow \uparrow$: $S_3 \oplus$ ve.
- $\uparrow$ SBP & $\downarrow \downarrow$ DBP (Almost zero) $\rightarrow$ Wide pulse pressure $\rightarrow$ **Hill's sign** :
 Lower limb BP exceeds upper limb BP by 20 mmHg.

Examination Findings :

Pulse :

- Collapsing pulse** : High volume $\xrightarrow{\oplus}$ $\left\{ \begin{array}{l} \text{Rapid upstroke \& downstroke.} \\ \text{III - sustained peak.} \end{array} \right.$
- Bisferiens pulse $\rightarrow$ Two peaks in systole.
(AR/AR + mild AS/HCM)

Note : Pseudocollapsing pulse $\rightarrow \textcircled{N}$ volume + Rapid upstroke/downstroke
 (Seen in MR) + well sustained peak.

BP : wide pulse pressure.

JVP : Changes only in terminal disease.

Apex : Hyperdynamic apex, down & out.

Heart Sounds :

- S1 : Soft S1 (Premature closure).
- S2 : $\left\{ \begin{array}{l} \text{Delayed A2} \\ \uparrow \text{Blood in LV } \oplus \end{array} \right. \rightarrow \left\{ \begin{array}{l} \text{Root issue : Loud S2.} \\ \text{Leaflet issue : Soft S2.} \end{array} \right.$
- S3 : Heard in failure.

For S1 :

- Premature : Soft closure.
- Delayed : Loud closure.

- S4 : Not heard.
- murmur : EDM (End diastolic murmur).
 - High pitched, soft blowing.
 - Decrescendo.
 - Austin - Flint murmur : Low pitched d/t displacement of anterior mitral leaflet.

----- Active space -----

↓
Cole Cecil murmur : Radiates to axilla.

management :

AVR :

- Done in symptomatic severe AR.
- Asymptomatic patient with 55/50 rule —→
 - Ejection fraction $\leq 55\%$.
 - LV end systolic diameter > 50 mm.

ACUTE REGURGITATION

Presentations :

Acute pulmonary edema (D/t sudden $\uparrow$ LVEDP $\rightarrow$ $\uparrow$ PCWP) $\pm$ Cardiogenic shock.

Causes :

- Infective endocarditis.
- Aortic dissection : Acute AR + chest pain.
- Rupture of sinus of Valsalva : Acute AR + Right heart failure symptoms.
 - Immediate mx : NTG/Nitroprusside.
 - Definitive mx : AVR.

Mitral Stenosis (MS)

00:52:28

mitral valve :

- 3D structure.
- Surface area : $4 - 6 \text{ cm}^2$.
- Parts :
 - Annulus.
 - Papillary muscles.
 - Leaflets with commissures.
 - Adjacent LV myocardium.
 - Chordae.

Types of MS :

1. Progressive MS : $> 1.5 \text{ cm}^2$
2. Severe MS : $< 1.5 \text{ cm}^2$ —→
 - Asymptomatic
 - Symptomatic
3. Very severe MS : $< 1 \text{ cm}^2$

Etiopathogenesis :

main etiology : Rheumatic origin.

main pathology : Commissural fusion $\rightarrow$ Fish mouth abnormality.

ARF $\xrightarrow{(15 - 20 \text{ yrs})}$ RHD —→

- MS + MR (m/c).
- MS + AR.

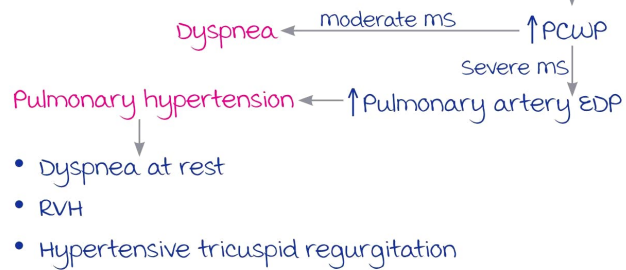
----- Active space -----

Hemodynamics & compensation :

- Normal : Ventricular filling is passive > active & occurs across an open valve.
- In MS :
 - $\uparrow$ LAP at rest for ventricular filling.
 - On exertion $\longrightarrow \downarrow$ diastole time $\longrightarrow \uparrow \uparrow$ LAP for ventricular filling.
 - very severe MS : **LV failure**.

First symptom of :

- AS : Angina
- AR : Palpitation
- **MS : Dyspnea on exertion**



Clinical Features :

- Pulmonary hypertension related symptoms.
- Pulmonary edema (in tachycardia).
- A - fib.
- Hemoptysis : D/t pulmonary capillary apoplexy.
- Ortner's syndrome : D/t compression of RLN.
- Hoarseness of voice.
- Dysphagia : D/t compression of esophagus.

Examination Findings :

Pulse : Normal.

JVP : Elevated (D/t RVH).

BP : Normal.

Apex : **Tapping apex** (Loud, ill-sustained SI).

Heart Sounds :

- **S1 : Loud S1**
 - $\longrightarrow \uparrow$ velocity of valve closure.
 - $\longrightarrow$ Downward position of leaflets (D/t inadequate LV filling).
 - $\longrightarrow$ Delayed closure.
- **S2 :**
 - **Loud, palpable P2** d/t Pulmonary HTN.
 - A2 - P2 widening : Pulmonary HTN with RV failure.
- **Opening snap (OS) :**
 - Seen in organic MS.
 - D/t $\uparrow$ LAP.
 - Severity of MS $\longrightarrow$ Long duration of murmur.
 - $\longrightarrow$ Short S2 - OS gap.
- **S3, S4 : Not seen.**
- **Murmur :**
 - Low pitched, **mid diastolic** (MDM).
 - **Presystolic accentuation** (Absent in A - fib).

management :

1. Pulmonary edema → Control heart rate → β - blockers
Verapamil/Diltiazem
2. Anticoagulation : Oral vitamin K antagonists
3. Surgery : **Percutaneous mitral balloon valvotomy** / commissurotomy
upon failure : mitral valve replacement.
(1st line for : Calcific MS +/- mod/severe MR/LA clot)
Dx : Trans esophageal echo

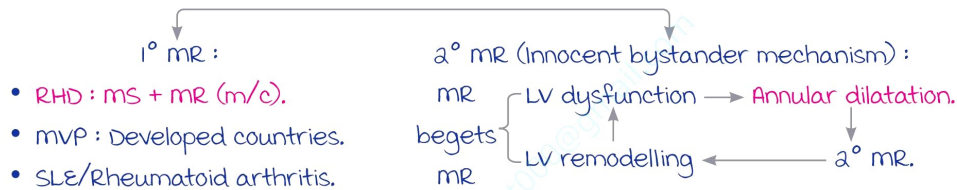
----- Active space -----

Mitral Regurgitation (MR)

01:10:38

Acute MR :

- D/t posteromedial papillary muscle rupture.
- Seen in inferior wall MI (RCA involvement).

Chronic MR :**Pathogenesis :**

Hemodynamics : Reduction in afterload.

LV - LA gradient >>> LV - Aorta gradient.
(LA = 10mmHg; LV = 120mmHg; Aorta = 120mmHg).

Regurgitation into LA.

Worsens with **hypertension** (↑ aortic pressure).
Relieved by **Nitrates** : vasodilation (↓ pressure).

LVEDP (N) / LV ESV (N) / Ejection fraction (N).

Compensation : Eccentric hypertrophy with dilatation of LV.

Clinical Features :

- mild/moderate MR : Palpitation/Asymptomatic.
- Severe MR : LV failure → Ejection fraction (N) / ↓ ↓ + LVEDP/LVESV ↑ ↑.

Examinations Findings :Pulse : **Pseudocollapsing** pulse.

BP : Normal.

JVP : Normal.

Apex : **Hyperdynamic** apex; displaced down & out.

Heart sounds :

- S1 : Soft S1 $\xrightarrow{d/t}$ Poor coaptation of leaflet.
↓ ↓ dp/dt of isovolumetric contraction.
- S2 : Early A2 + Normal P2 → **wide split S2.**

Pulse in LV failure :

- Pulsus alternans
- Pulsus dicroticus

----- Active space -----

- S3 : **Heard (Even without failure).**
- S4 : Not heard.
- murmurs : **Pansystolic murmur.**
 - High pitched.
 - Soft blowing.
 - Seen in the apex.
 - Radiates to axilla.

Myxomatous Degeneration :

MVP ± MR.

MVP

Click & murmurs : **Non ejection click**

- Dynamic auscultation (Valsalva & standing).
- ↓↓ LV cavity size → ↓↓ chordae stretch → ↑↑ Prolapse
↓
Click moves closer to S1 :
Long duration murmur.
- All murmurs ↓ on dynamic auscultation **except** :
 - **HCM** : ↑ intensity.
 - **MVP** : ↑ duration.

Management :

- Symptomatic : Surgery (Repair fails → Replacement).
- Asymptomatic with **60/40 rule** :
 - Ejection fraction ≤ 60%.
 - LV End Systolic diameter ≥ 40mm.