

✉ **Valvular Heart disease**

HVD

✉ **By**

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✉ **VHD- Objectives**

✉ ***By the end of this session, the student should be able to:***

- Define and classify valvular heart disease.
- Enlist the causes of acquired heart valve diseases.

- Identify the clinical consequences of valve dysfunction and complications.
- Describe different morphological features of valve dysfunction.

✉ **Valvular Heart Disease(HVD)**

✉ **Function of normal Valves –**

- ✉ Unidirectional blood flow, one-way flow of blood from the atria to the ventricles to the arteries.

✉ **Name of heart valves –**

- ✉ 1. Two atrioventricular valves:
 - ❖ **Mitral valve:** Left heart - “Bicuspid valve” .

❖ **Tricuspid valve:** Right heart -
“tricuspid”

☒ 2. Two semilunar valves:

❖ **Aortic valve:** Left heart .

❖ **Pulmonary valve:** Right heart.

☒ **Valve competency**

depends on –

☒ 1. Annulus, 2. Leaflets, 3.
Cords, 4. Papillary muscles,
5. Ventricular wall layers



The aortic valve

☒ **Define HVD, and explain why its draw the clinical attention?**

✉ HVD is groups of critical clinical conditions involve heart valves, leading to different pattern of dysfunction.

✉ HVD come to clinical attention – because impose:

- **Hemodynamic instability.**
- **Increase susceptibility to infection** (infective endocarditis).

✉ Why **hemodynamic** burden precipitated?

✉ **Abnormal Valve Function**

✉ **1. Valve Stenosis**

- **Obstruction to valve flow.**

✉ **2. Valve Regurgitation, Insufficiency, Incompetence**

- **Inadequate valve closure---→ back leakage.**

✉ **3. A single valve can be both stenotic and regurgitant; but both lesions cannot be severe!!**

✉ **4. Combinations of valve lesions can coexist**

- **Single disease process**
- **Different disease processes**

- One valve lesion may cause another

Abnormal valve function

Definition of Valvular stenosis ?

- Stenosis is the failure of a valve to open completely, which obstructing forward flow.
- **Etiology**
- Almost caused by chronic primary cuspal abnormalities-
(1)Calcification or (2)Valve scarring.
- Stenosis of the mitral valve is a common complication of rheumatic fever.

✉ **Definition of Valvular Regurgitation ?**

- Insufficiency results from failure of a valve to close completely, thereby allowing reversed flow.
- **Etiology**
- **(1) Intrinsic disease of the valve cusps= destruction.**
- **(2) Distortion of supporting structure (papillary M, cords,etc.)**

✉ **Classification**

✉ **Based on etiology can be classified into:**

- ❖ **1. Congenital heart disease**
- ❖ **2. Acquired heart disease.**

✉ Heart Valvular Disease- Etiology

1. Congenital heart valve disease -
e.g. Septal defect, Atresia, mal-
position.

*to be
discussed in separate session.*

2. Acquired heart valve disease :-
(most frequent)

- Endocarditis– (MR & AR) most common is mitral valve.
- Post-inflammatory healed scar (Rheumatic heart disease)

MS+MR & AS+AR

- **Senile calcific aortic stenosis- AS**
- **Myxomatous - Mitral valve Prolapse- MR**
- Abnormalities of Leaflets and Commissures
- Abnormalities of Tensor Apparatus.
- Abnormalities of Left Ventricular Cavity and/or Annulus-

 **Valvular Heart Disease-
Clinical consequences**

The clinical consequences depend on

:

- **Type of valve involve.**
- **Degree of impairment.**
- **How fast it develops. (Acute form and chronic form)**
- **Rate of compensatory mechanism.**

Clinical Outcomes:

- ✉ **1) Stenosis leads to pressure overload of the heart.**
- ✉ **2) Insufficiency leads to volume overload of the heart.**

✉ **VALVULAR STENOSIS**

Pressure in upstream chamber IS HIGHER than Pressure in downstream chamber *during time of flow* (when valve is normally open).

**Hemodynamic abnormality =
"PRESSURE GRADIENT"**

✉ **VALVULAR REGURGITATION**

✉ Assessment for Valve Dysfunction

- Murmurs
- General malaise
- Dyspnea on exertion
- Dizziness
- Chest pain or discomfort
- Prior history of rheumatic heart disease
- Orthopnea
- Dyspnea, rales
- Pink-tinged sputum

Complications:

- Hemodynamic instability
- Heart failure

- Angina
- Syncope
- Death

Diagnosis:

- ✉ ECG
- ✉ Chest x-ray
- ✉ Cardiac cath
- ✉ Echocardiogram

✉ Heart Valvular Disease- Clinical Outcomes

- ✉ Example:
- ✉ (1) Mitral stenosis: (comments type)

- ✉ Complication of Rheumatic heart disease → fibrotic\scarring
- ✉ Chronic - Well tolerated over years.

✉ **Calcific aortic disease**

- ✉ Most common **acquired** aortic stenosis in **elderly**.
- ✉ Consequence of age-associated “**wear and tear**” → **degeneration , fibrosis and calcification.**
- ✉ **Occasions:** (1) Normal valves. (2) Congenitally bicuspid valves

- ✉ **Pathological processes for calcification** →
(1) Disorder of elderly (2)
Unknown.

- ✉ **The major clinical features of Stenosis :**

- ✉ (1) Left ventricular hypertrophy and (CHF) failure...
- ✉ (2) Angina.
- ✉ (3) Syncope (abrupt episodes of faintness) (hypoperfusion)



- ✉ **Calcified aortic valve of old age**



MITRAL VALVE PROLAPSE (MPV)

Definition:

- **Mitral valve leaflets (one or both)** are “floppy” and **Prolapse**, or balloon back, into the left atrium during systole.
- The histologic change in the tissue is called **myxomatous degeneration**.
- **MVP**-Uncommon, affects approximately 3% of adults in USA.
- Women 7times more frequently > Male
- **Pathogenesis of MVP:**

- (1)Unknown,
- (2) MVP is associated with heritable disorders of CT diseases **Marfan syndrome (fibrillin-1 mutation)**, where there is intrinsic defect of CT either in its **Synthesis or Remodeling**.

✉ **MPV-MORPHOLOGY**

✉ **Macroscopic appearance**

- **The Leaflets:** Enlarged, redundant, thick, rubbery, Ballooning .
- **The Tendinous :** cords may be elongated, thinned, or even ruptured.
- The **annulus:** may be dilated.
- The tricuspid, aortic, or pulmonary valves may also be affected.

✉ **Mitral valve**

**Pronounced hooding of MV
with thrombotic plaques**

❖ **Microscopy:**

* **Thinning** fibrosa layer of the valve.

* **Marked expansion** of the spongiosa layer with deposition of mucoid (myxomatous) material.



Valvular Heart Disease

The end

?

1. Stenosis is the failure of a valve to close completely.

(T) OR (F)

2. Insufficiency is the failure of a valve to close completely.

(T) OR (F)

