

eLearning
by  **Dr. M.G.R.** EDUCATIONAL AND RESEARCH INSTITUTE



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(Deemed to be University with Graded Autonomy Status)

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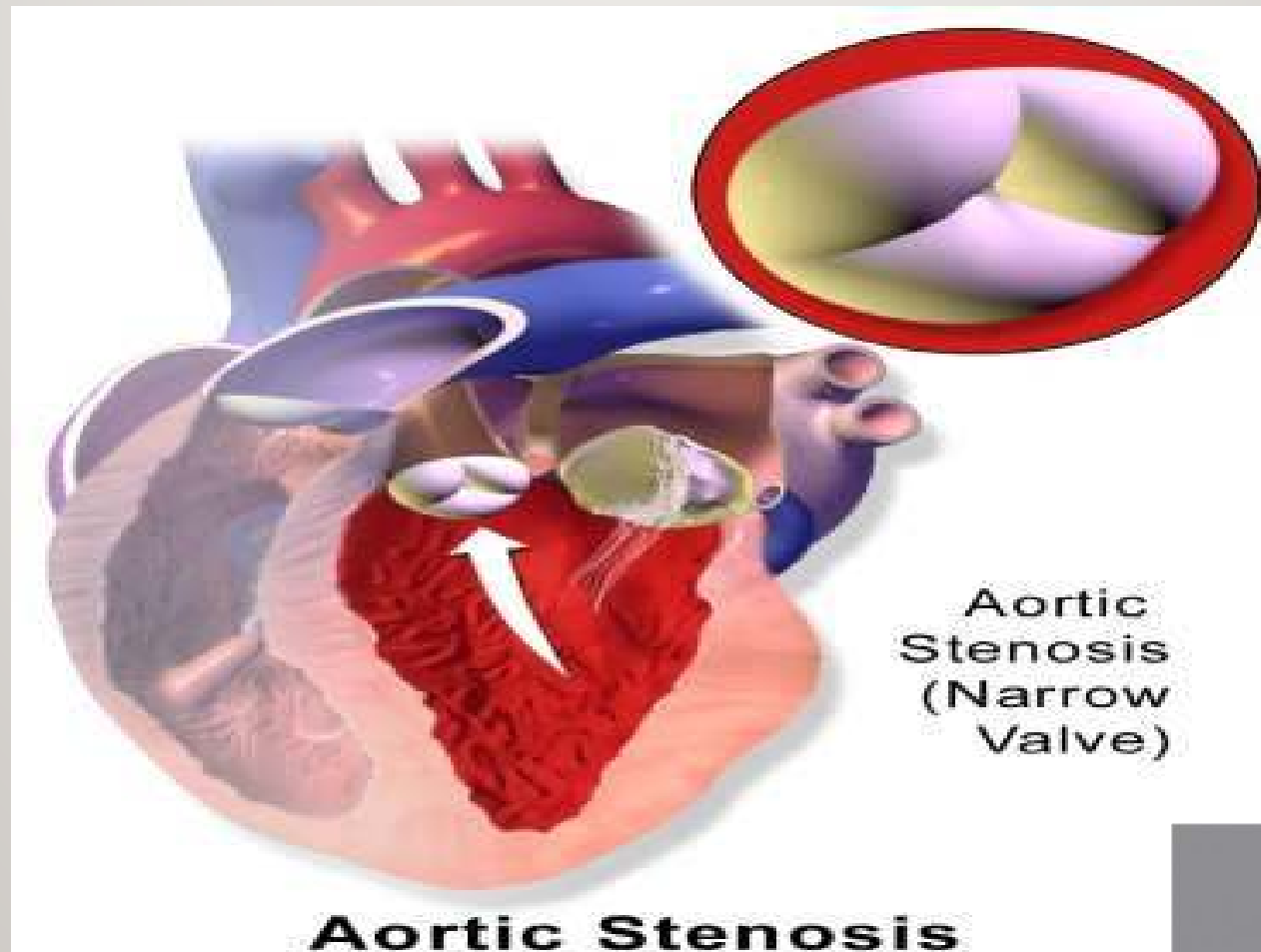
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AORTIC VALVE: AORTIC STENOSIS



AORTIC STENOSIS

- Aortic stenosis (AS) is **narrowing of the aortic valve** resulting in **obstruction of blood flow** from the **left ventricle** to the **ascending aorta** during **systole**.



ETIOLOGY

Infants, children, adolescents

Congenital aortic stenosis

Congenital subvalvular aortic stenosis

Congenital supra-ventricular aortic stenosis

Young adults to middle-aged

Calcification and fibrosis of congenitally bicuspid AV

Rheumatic aortic stenosis

Middle-aged to elderly

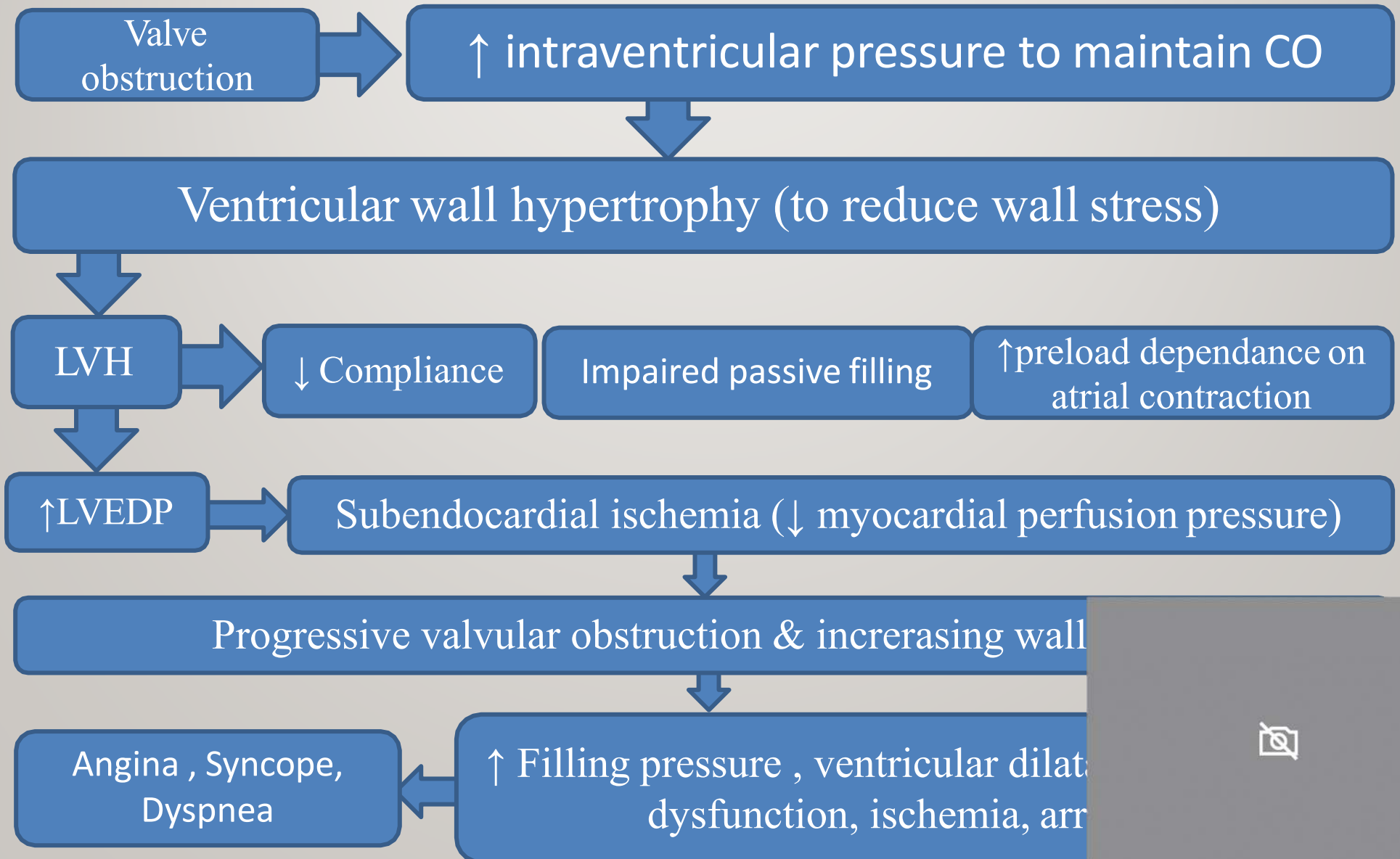
Senile degenerative aortic stenosis

Calcification of bicuspid valve

Rheumatic aortic stenosis



PATHOPHYSIOLOGY: AS



- Left ventricular and aortic pressure tracings demonstrate a pressure gradient between the left ventricle and aorta, suggesting aortic stenosis.
- The left ventricle generates higher pressures than what is transmitted to the aorta.
- The aortic valve normally consists of three leaflets (trileaflets). When the left ventricle (LV) contracts, it forces blood through the valve to the aorta and then to the rest of the body.
- When the LV expands again, the aortic valve prevents the blood from returning to the ventricle.

- When the opening of the aortic valve becomes narrowed or constricted (stenotic), the blood can't be pumped adequately and the pressure in the left ventricle increases.
- Initially, the LV compensates by thickening its walls (myocardial hypertrophy) in order to maintain adequate pumping pressure.
- The type of hypertrophy most commonly seen in AS is concentric hypertrophy, in which the walls of the LV are (approximately) equally thickened.
- In the later stages, the left ventricle dilates, the wall thins, and the systolic function deteriorates.

SYMPTOMS

- The classic symptoms due to AS are heart failure (HF), syncope, and angina. However, these “classic” symptoms reflect end-stage disease.
- The most common presenting symptoms are:
 1. Dyspnea on exertion or decreased exercise tolerance
 2. Exertional dizziness
 3. Exertional angina



INSPECTION: CAROTID PULSE

- Best appreciated in the **carotid artery** where the pulse is **reduced in amplitude and delayed in occurrence.**
- There may be :an associated carotid artery thrill or coarse vibration ("shuddering") due to the marked turbulence of blood flow across the stenotic valve.
- a slow and/or sustained upstroke of the arterial pulse, and the pulse may be of low volume sometimes referred to as pulsus parvus e



CARDIAC AUSCULTATION :HEART SOUNDS

- S2 may become paradoxically split when the stenosis is severe and associated with LV dysfunction .
- The presence of a normal split S2 is the most reliable finding to exclude severe AS in adults.
- The S1 is usually N. However, an aortic ejection click, which is more commonly heard with a congenital bicuspid valve, may be heard after S1
- Vigorous LA contraction can lead to a S4.



AS: MURMUR

- The hallmark finding is a crescendo-decrescendo ejection murmur, heard best with the diaphragm of the stethoscope at the right upper sternal border when a patient is sitting upright leaning forward.
- The more severe the stenosis, the longer the duration of the murmur and the more likely it peaks at late systole.



COMPLICATIONS

- Endocarditis
- Ventricular arrhythmias
- Congestive cardiac failure



DIAGNOSIS

- Clinical Findings
- ECG-Features of LVH, conduction disturbances.
- Echo- To assess the gradients across the valve, valve area, severity of stenosis, LV function and integrity of other valves.
- Chest X-ray-can also assist in the diagnosis, showing calcific aortic valve, and long standing cases dilatation of LA and LV.
- Cardiac Catheterization-measure the pressure on both sides of the aortic valve. It is indicated in symptomatic patients before surgery



MANAGEMENT

- Treatment is generally not necessary in people without symptoms.
- Patients with symptomatic severe AS should have prompt AV replacement- Mechanical or Bio prosthetic valve.
- Old age is not a contraindication to valve replacement.
- Percutaneous(Transcatheter)Aortic Replacement-When selecting the optimal individual patients, the percutaneous (tra approach can be done.

Valve



Balloon valvuloplasty

- For infants and children, balloon valvuloplasty, where a balloon is inflated to stretch the valve and allow greater flow, may also be effective.
- Aortic balloon valvuloplasty is useful in congenital aortic stenosis but is of no value in older patients with calcific aortic stenosis.
- Anticoagulants are only required in patients who have Afib or those who have had a valve replaced with a mechanical prosthesis





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