

VALVULAR HEART DISEASE



AORTIC STENOSIS

ETIOLOGY



OBSTRUCTION TO LV OUTFLOW

- **HYPERTROPHIC CARDIOMYOPATHY**
- **SUPRAVALVULAR**
- **SUBVALVULAR**
- **CONGENITAL**
- **ACQUIRED**

Etiology



CONGENITAL AORTIC STENOSIS

– UNICUSPID

- SEVERE AND DEADLY IN INFANCY

– BICUSPID

- MANIFESTED LATER IN LIFE
- MOST COMMON CONGENITAL CARDIAC ANOMALY IN LIVE BIRTHS (1%)

– TRICUSPID

- CUSPS OF UNEQUAL SIZE

ETIOLOGY



ACQUIRED AORTIC STENOSIS

- RHEUMATIC HEART DISEASE
- DEGENERATIVE
- RHEUMATOID

ETIOLOGY



DEGENERATIVE AORTIC STENOSIS

- PRIMARY CAUSE OF ADULT AORTIC STENOSIS
- YEARS OF MECHANICAL STRESS
- DEPOSITION OF CALCIUM AT BASE
- PRESERVED COMMISSURES
- RISK FACTORS
 - DIABETES AND HYPERLIPIDEMIA

ETIOLOGY



RHEUMATIC AORTIC STENOSIS

- FUSION OF COMMISSURES AND CUSPS
- RETRACTION OF CUSPAL BORDERS
- REDUCE ORIFICE TO TRIANGULAR OPENING
- ASSOCIATED WITH AORTIC INSUFFICIENCY
- MITRAL DISEASE COMMON
- ISOLATED AORTIC STENOSIS RARE

HISTORY



- **ANGINA**

- i MEDIAN SURVIVAL 5 YEARS

- **SYNCOPE**

- i MEDIAN SURVIVAL 3 YEARS

- **CONGESTIVE HEART FAILURE**

- i MEDIAN SURVIVAL 2 YEARS

PHYSICAL EXAMINATION



- **PULSUS PARVUS AND TARDUS**
 - **IN CAROTID PULSE**
- **REDUCED PULSE PRESSURE**
- **SUSTAINED CARDIAC IMPULSE**
- **DELAYED A2 OR DIMINISHED**
- **HARSH SYSTOLIC EJECTION MURMUR**

PATHOPHYSIOLOGY



- **GRADUAL DEVELOPMENT OF OBSTRUCTION TO LV OUTFLOW**
- **LV OUTPUT MAINTAINED BY LV HYPERTROPHY**
- **LV HYPERTROPHY MAY SUSTAIN A LARGE PRESSURE GRADIENT FROM THE LV TO AORTA OVER YEARS**
- **ATRIAL CONTRACTION IMPORTANT**
 - ! **ATRIAL FIBRILLATION MAY CAUSE ABRUPT AND SEVERE SYMPTOMS**

PATHOPHYSIOLOGY



- **INCREASE IN AFTERLOAD**
- **INCREASED LV WALL STRESS COMPENSATED BY THE INCREASED LV HYPERTROPHY**
- **ULTIMATELY LOSS IN CONTRACTILITY OF LV MASS AND DEVELOPMENT OF HEART FAILURE**

LABORATORY



– ECG

- i LEFT VENTRICULAR HYPERTROPHY

– CHEST XRAY

- i MAY BE ENTIRELY NORMAL BECAUSE THE HYPERTROPHY OF LV IS CONCENTRIC (CENTRAL) NOT ECCENTRIC LIKE MR OR AORTIC INSUFFICIENCY
- i CALCIFICATION OF AORTIC VALVE MAY BE SEEN

ECHOCARDIOGRAPHY



- **CALCIFIED VALVE WITH THICKENED LEAFLETS OR COMMISSURES**
- **DECREASED OPENING OF AORTIC VALVE SEEN**
- **LEFT VENTRICULAR HYPERTROPHY**
- **DOPPLER**
 - i **VALVE PRESSURE GRADIENT CALCULATED**
 - i **VALVE AREA FROM THIS MEASUREMENT**

MEDICAL HISTORY



- EDUCATION IN SYMPTOMS AND REPORTING
- OPERATE FOR SYMPTOMS WHEN VALVE IS SEVERLY NARROWED
 - i <1CM² IN AREA
- DO NOT OPERATE ON SEVERE NARROWING IF ASYMPTOMATIC
- ENDOCARDITIS PROPHYLAXIS

SURGICAL MANAGEMENT RESULTS



- 5 YEAR ACTUARIAL SURVIVAL 85%**
- REDUCTION IN LV MASS**
- IF PATIENTS HAVE CONGESTIVE HEART FAILURE THEN VALVE REPLACEMENT HAS 10-25% MORTALITY**
- NORMAL 3-5% MORTALITY IN OR**
- PORCINE VALVE FOR AGE > 70**

SURGICAL MANAGEMENT



— ASYMPTOMATIC PATIENTS

- i MORTALITY WITHOUT OPERATION IS <5% PER YEAR
- i FOLLOW EVERY 6 MONTHS IN OFFICE
- i COUNSEL ON DEVELOPMENT OF SYMPTOMS OF ANGINA, CHF, SYNCOPE

AORTIC STENOSIS IN THE ELDERLY



– OPERATIVE MORTALITY IN THE ELDERLY

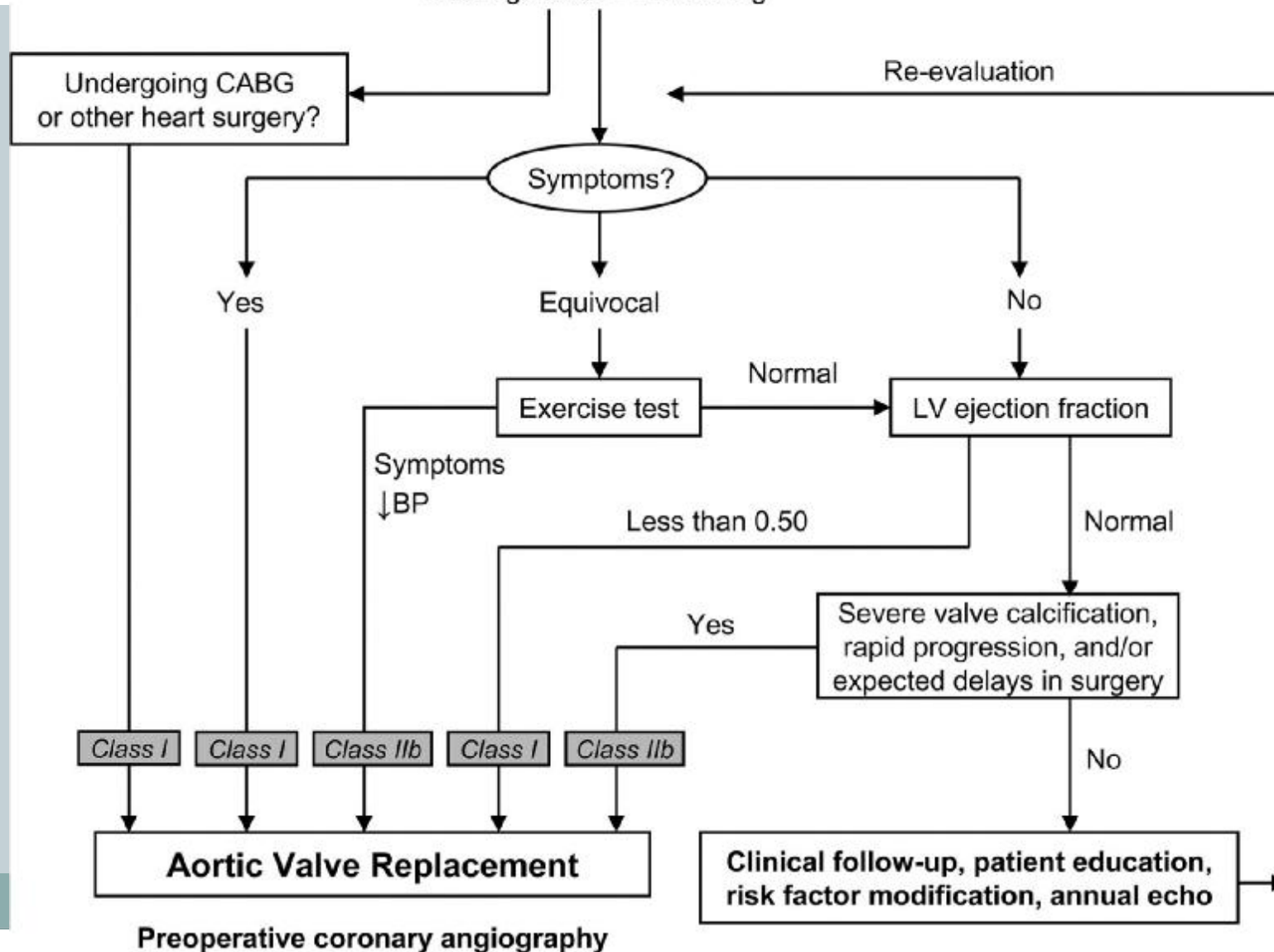
- i 1.8% AGE < 50
- i 5.1% AGE 50 - 60
- i 7.1% AGE 60 – 70

– ISOLATED AV REPLACEMENT IN PTS AGE 80 TO 89

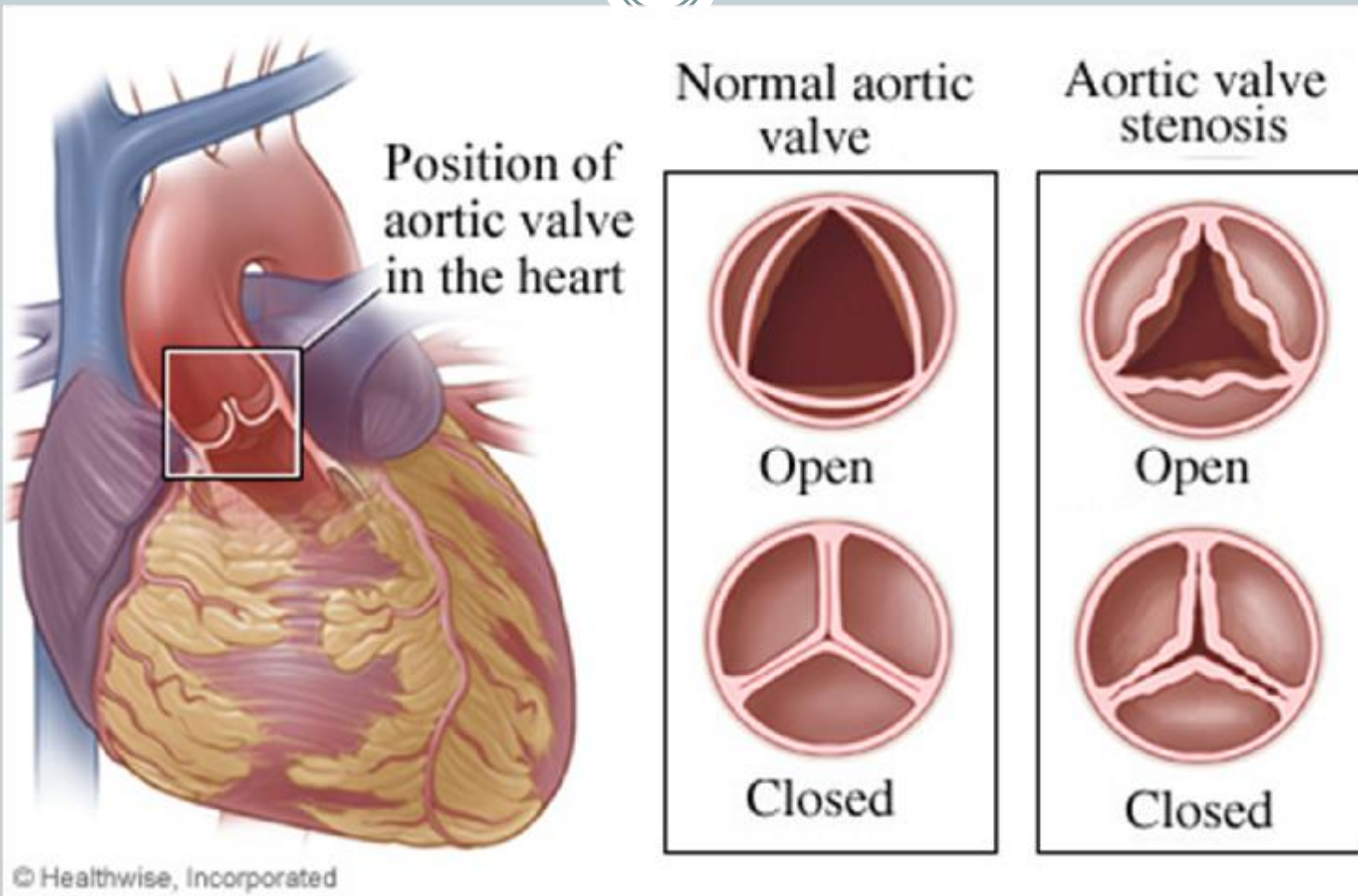
- i 94% HAD GOOD RESULTS
- i APPROPRIATE SELECTION

Severe Aortic Stenosis

V_{max} greater than 4 m/s
AVA less than 1.0 cm²
Mean gradient > 40 mm Hg



Preoperative coronary angiography





Normal Valve



Stenotic Valve

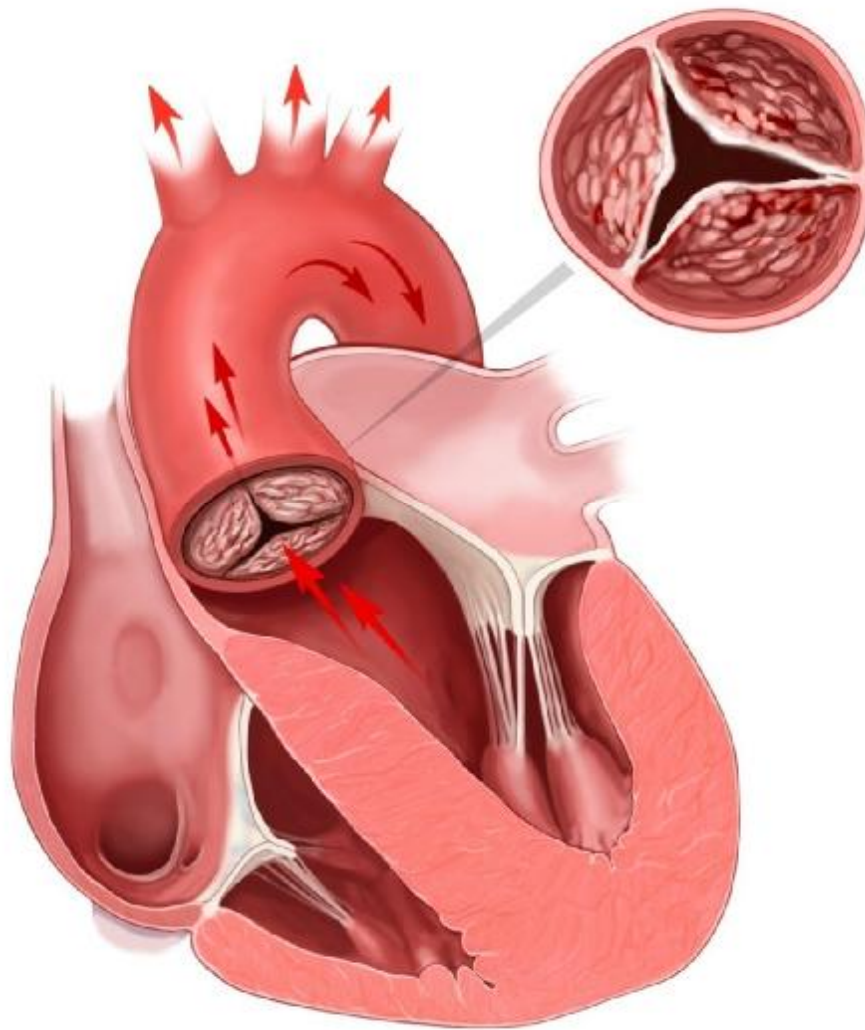
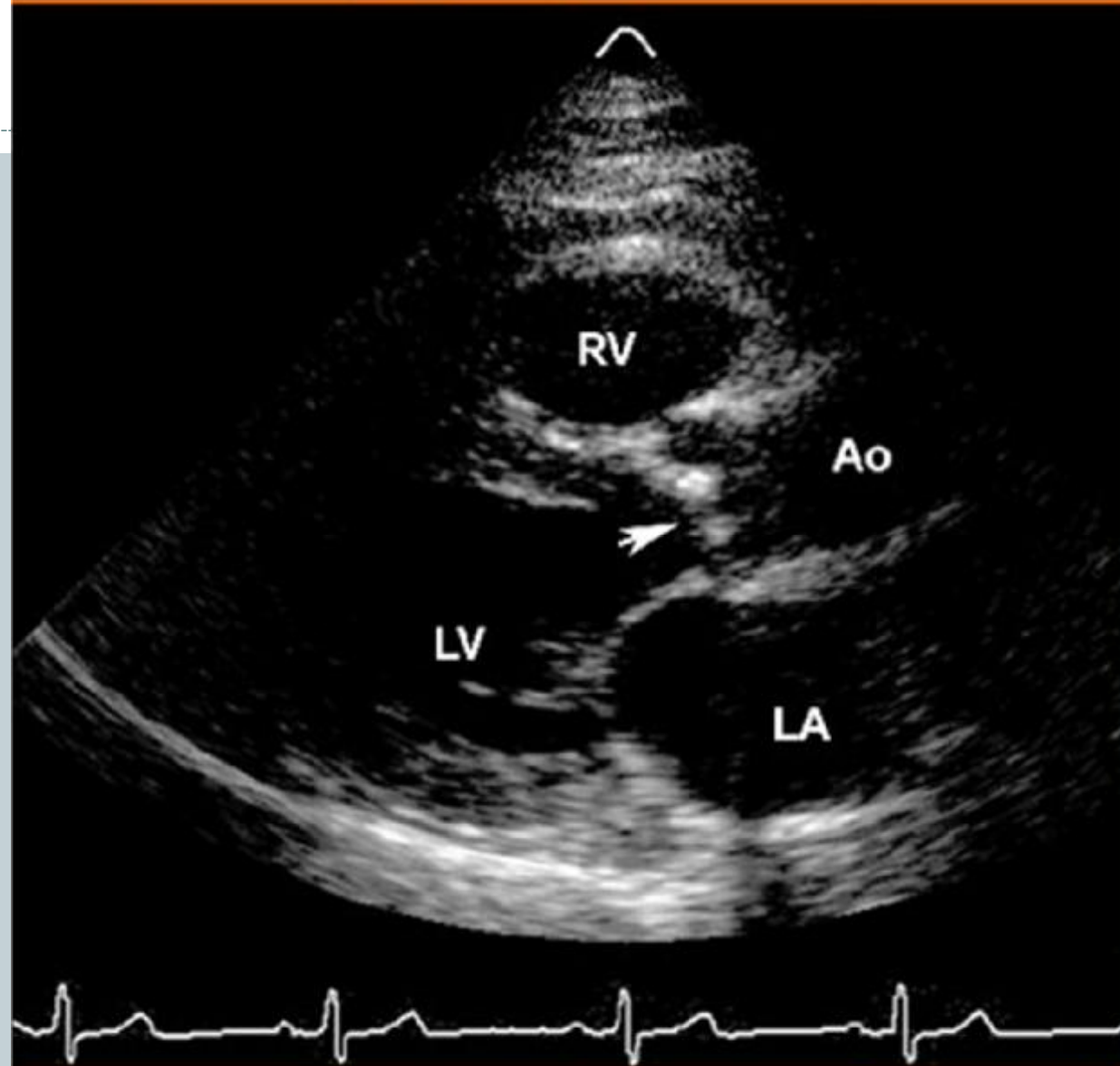


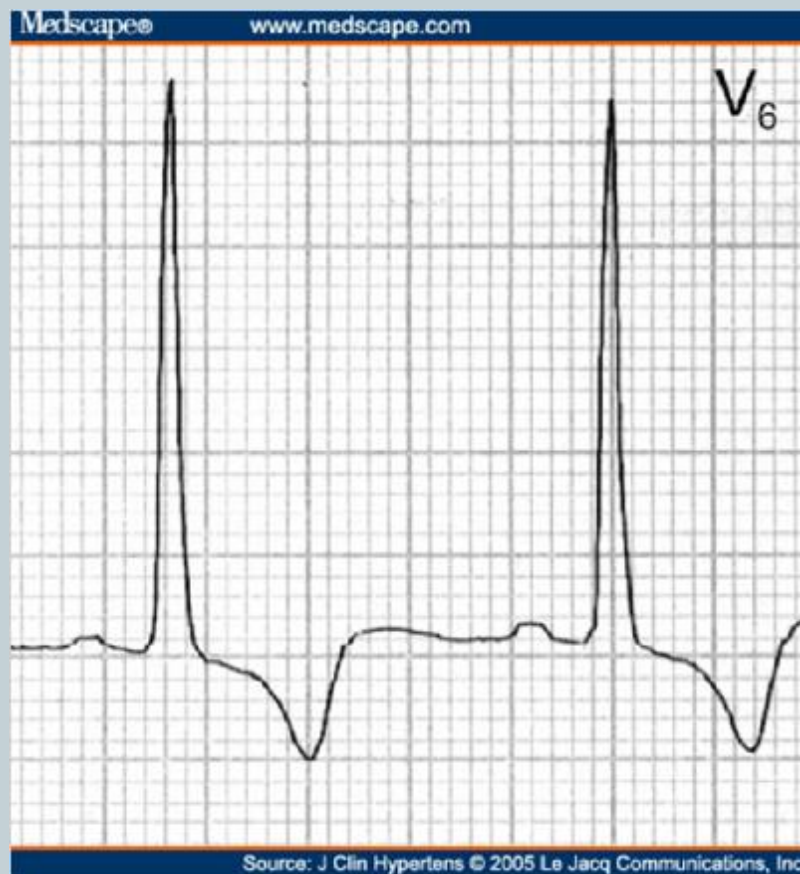


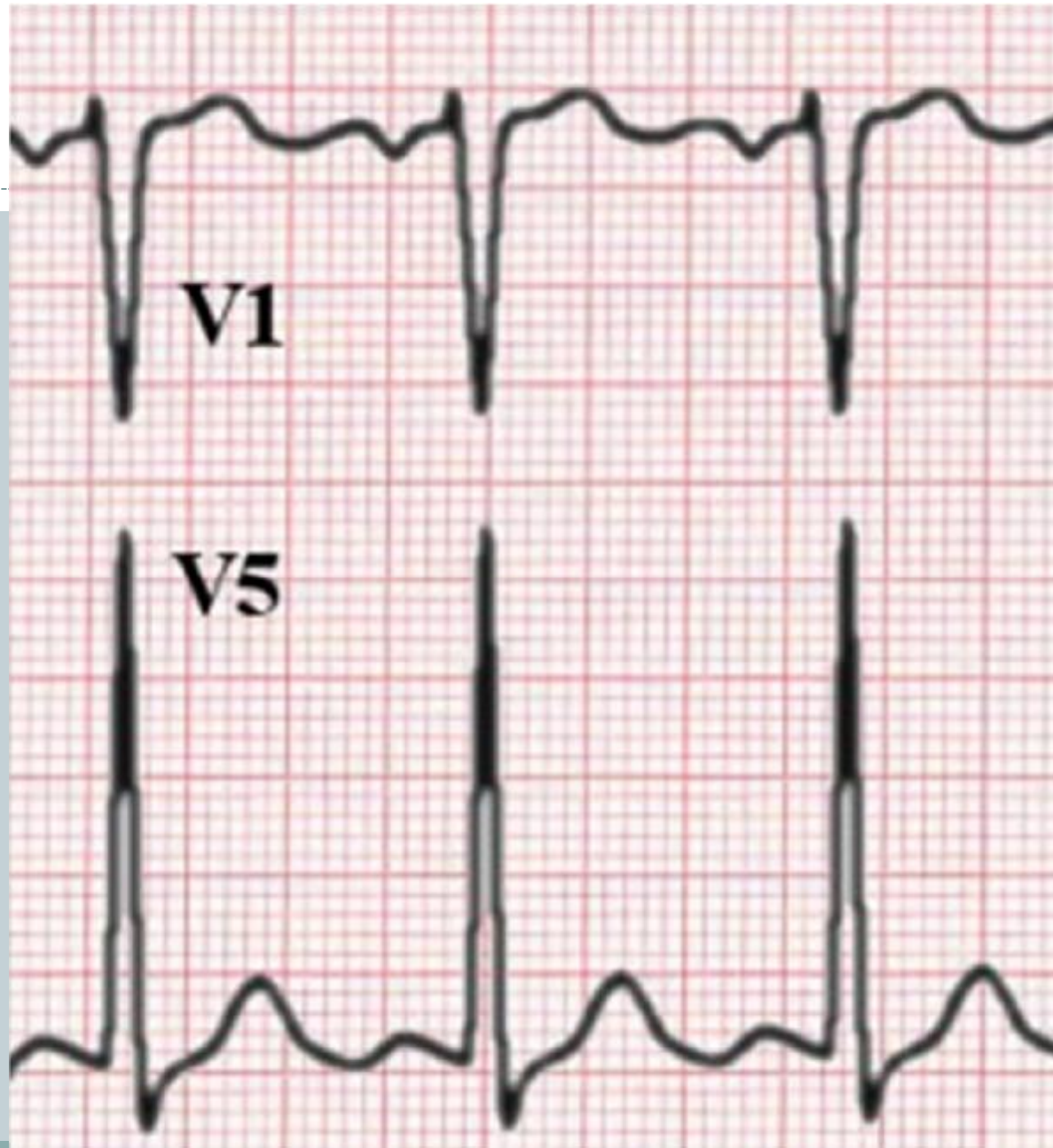


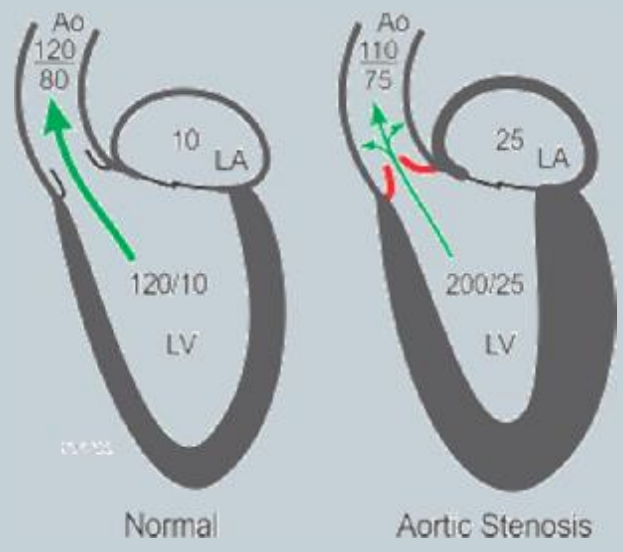


Figure 1. The image of transthoracic echocardiography.













VALVULAR HEART DISEASE

AORTIC INSUFFICIENCY

ETIOLOGY



- **$\frac{3}{4}$ OF PATIENTS WITH PURE AI ARE MALES**
- **$\frac{2}{3}$ OF PATIENTS FROM RHEUMATIC FEVER**
- **INFECTIVE ENDOCARDITIS**

ETIOLOGY



- **Rhuematic**
- **PROLAPSE OF AN AORTIC CUSP**
- **CONGENITAL FENESTRATIONS OF CUSP**
- **TRAUMATIC RUPTURE**
- **ASCENDING THORACIC AORTA DISSECTION**
- **MARKED AORTIC ROOT DILATATION**
- **SYPHILIS, ANKYLOSING SPONDYLITIS**

PATHOPHYSIOLOGY



- **DILATATION OF LEFT VENTRICLE**

- TO MAINTAIN ADEQUATE FORWARD CARDIAC OUTPUT

**REVERSE PRESSURE GRADIENT FROM AORTA TO
LV IN DIASTOLE CAUSES BACK FLOW**

- **ACUTE VS CHRONIC INSUFFICIENCY**

HISTORY



- **FAMILY HISTORY WITH MARFAN SYNDROME**
- **INFECTIVE ENDOCARDITIS**
- **SYPHYLIS**
- **AWARENESS OF HEARTBEAT**
- **ORTHOPNEA, DOE LATE OR IN ACUTE**
- **ANGINA**
- **EDEMA**

PHYSICAL FINDINGS



— INSPECTION

- i BOBBING HEAD OR JARRING OF BODY

— PALPATION

- i ARTERIAL JACK HAMMER PULSE
- i CAPILLARY PULSATIONS
- i VARIOUS SIGNS
- i WIDENED PULSE PRESSURE

PHYSICAL FINDINGS



— MURMURS

- i DIASTOLIC HIGH PITCHED BLOW
- i LOUD SYSTOLIC AORTIC EJECTION FLOW MURMUR
- i DIASTOLIC RUMBLE **AUSTIN FLINT MURMUR**
 - ÷ MISTAKEN FOR MITRAL STENOSIS

LABORATORY



- **ECG**
 - i **LEFT VENTRICULAR HYPERTROPHY**
 - ÷ **WITH STRAIN**
 - i **ECHOCARDIOGRAM**
 - ÷ **FLOW INTO LV FROM AORTIC VALVE**
 - ÷ **LV SIZE**
 - ÷ **FLUTTERING OF MITRAL LEAFLET**
 - i **BLOOD CULTURES IN ENDOCARDITIS**

TREATMENT



— SURGERY

- i SYMPTOMATIC PATIENTS SHOULD BE OPERATED UPON
- i ASYMPTOMATIC PATIENTS FOLLOWED FOR LEFT VENTRICULAR ENLARGEMENT AND SYSTOLIC DIMENSIONS ON ECHOCARDIOGRAM
- i YEARLY ECHOCARDIOLOGY
- i MORTALITY <5% IF GOOD LV
- i MORTALITY 5-10% IF POOR LV FUNCTION