

Valvular Heart Disease

Aortic Regurgitation

Aortic Regurgitation

- Etiology
- Physical Examination
- Assessing Severity
- Natural History
- Prognosis
- Timing of Surgery

Aortic Regurgitation: Etiology

- Any conditions resulting in incompetent aortic leaflets
- Congenital
 - Bicuspid valve
- Aortopathy
 - Cystic medial necrosis
 - Collagen disorders (e.g. Marfan's)
 - Ehler-Danlos
 - Osteogenesis imperfecta
 - Pseudoxanthoma elasticum
- Acquired
 - Rheumatic heart disease
 - Dilated aorta (e.g. hypertension..)
 - Degenerative
 - Connective tissue disorders
 - E.g. ankylosing spondylitis, rheumatoid arthritis, Reiter's syndrome, Giant-cell arteritis)
 - Syphilis (chronic aortitis)
- Acute AI: aortic dissection, infective endocarditis, trauma

Aortic Regurgitation: Symptoms

- Dyspnea, orthopnea, PND
- Chest pain.
 - Nocturnal angina >> exertional angina
 - (↓ diastolic aortic pressure and increased LVEDP thus ↓ coronary artery diastolic flow)
- With extreme reductions in diastolic pressures (e.g. < 40) may see angina

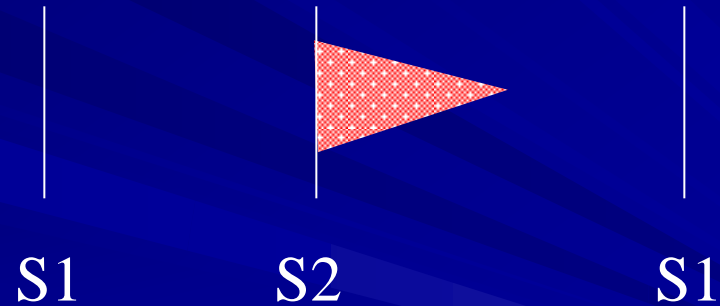
Peripheral Signs of Severe Aortic Regurgitation

- Quincke's sign: capillary pulsation
- Corrigan's sign: water hammer pulse
- Bisferiens pulse (AS/AR > AR)
- De Musset's sign: systolic head bobbing
- Mueller's sign: systolic pulsation of uvula
- Durosier's sign: femoral retrograde bruits
- Traube's sign: pistol shot femorals
- Hill's sign: BP Lower extremity > BP Upper extremity by
 - > 20 mm Hg - mild AR
 - > 40 mm Hg – mod AR
 - > 60 mm Hg – severe AR



Aortic Regurgitation: Physical Exam

- Widened pulse pressure
 - Systolic – diastolic = pulse pressure
- High pitched, blowing, decrescendo diastolic murmur at LSB
- Best heard at end-expiration & leaning forward
- Hands & Knee position



Wave Sound

Central Signs of Severe Aortic Regurgitation

■ Apex:

- Enlarged
- Displaced
- Hyper-dynamic
- Palpable S3
- Austin-Flint murmur

■ Aortic diastolic murmur

- length correlates with severity (chronic AR)
- in acute AR murmur shortens as $\text{Aortic DP} = \text{LVEDP}$
- in acute AR - mitral pre-closure

Assessing Severity of AR

- Assess severity by impact on peripheral signs and LV
 - \uparrow peripheral signs = \uparrow severity
 - \uparrow LV = \uparrow severity
 - S3
 - Austin -Flint
 - LVH
 - radiological cardiomegaly

I

aVR

V1

V4

II

aVL

V2

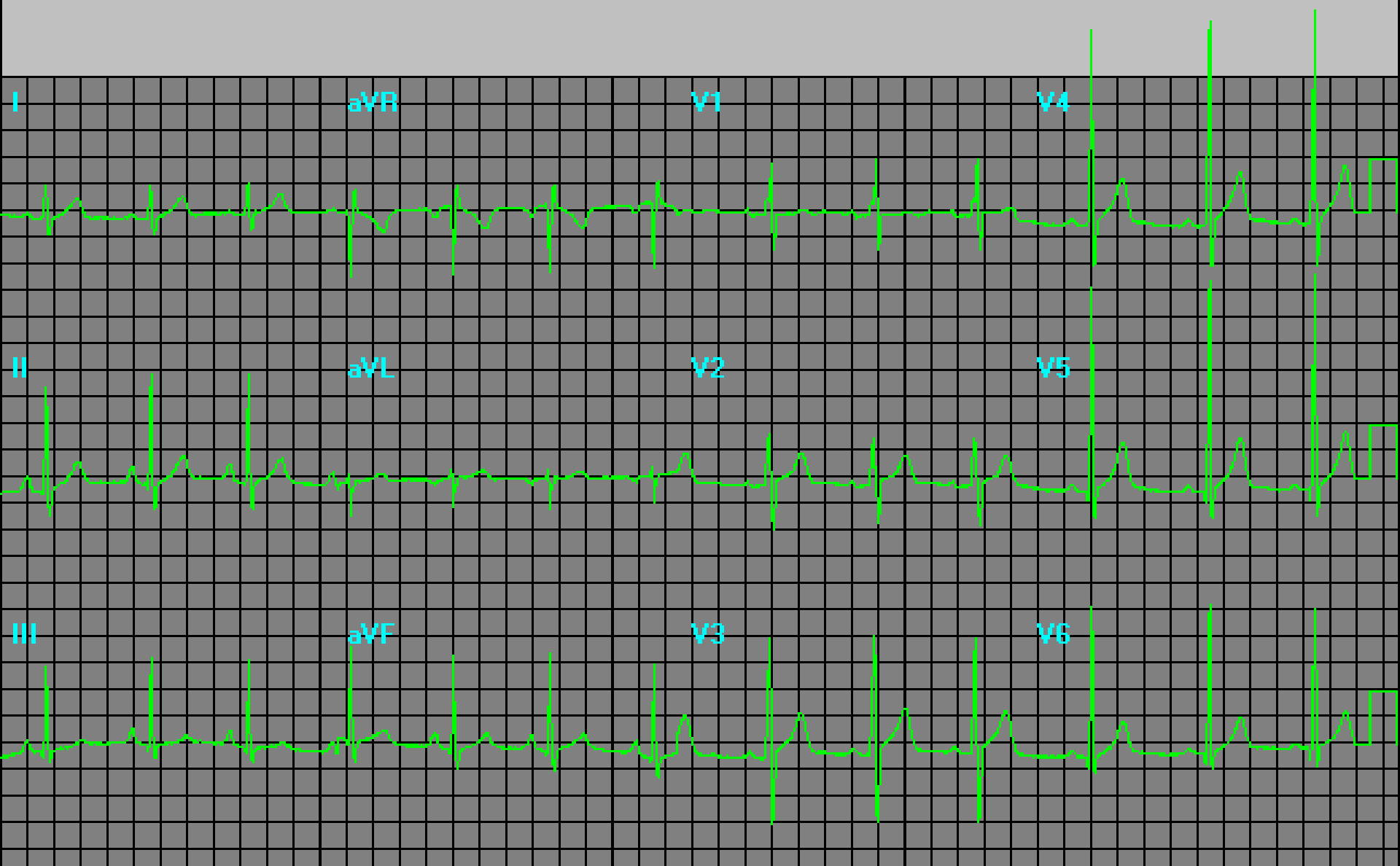
V5

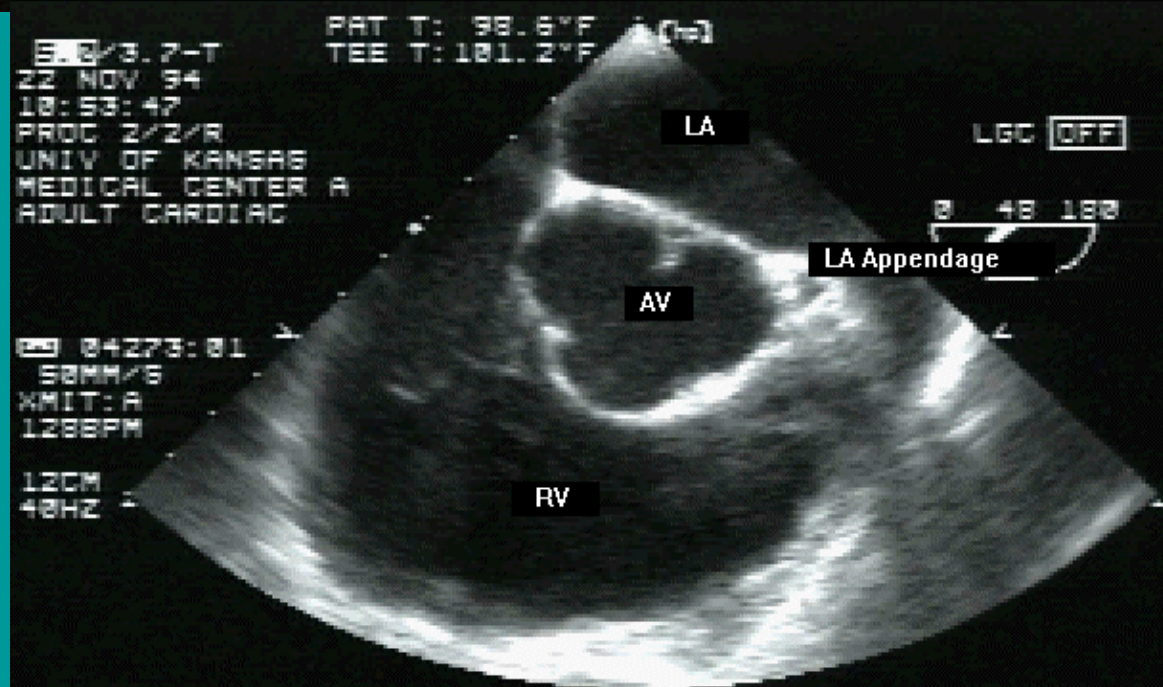
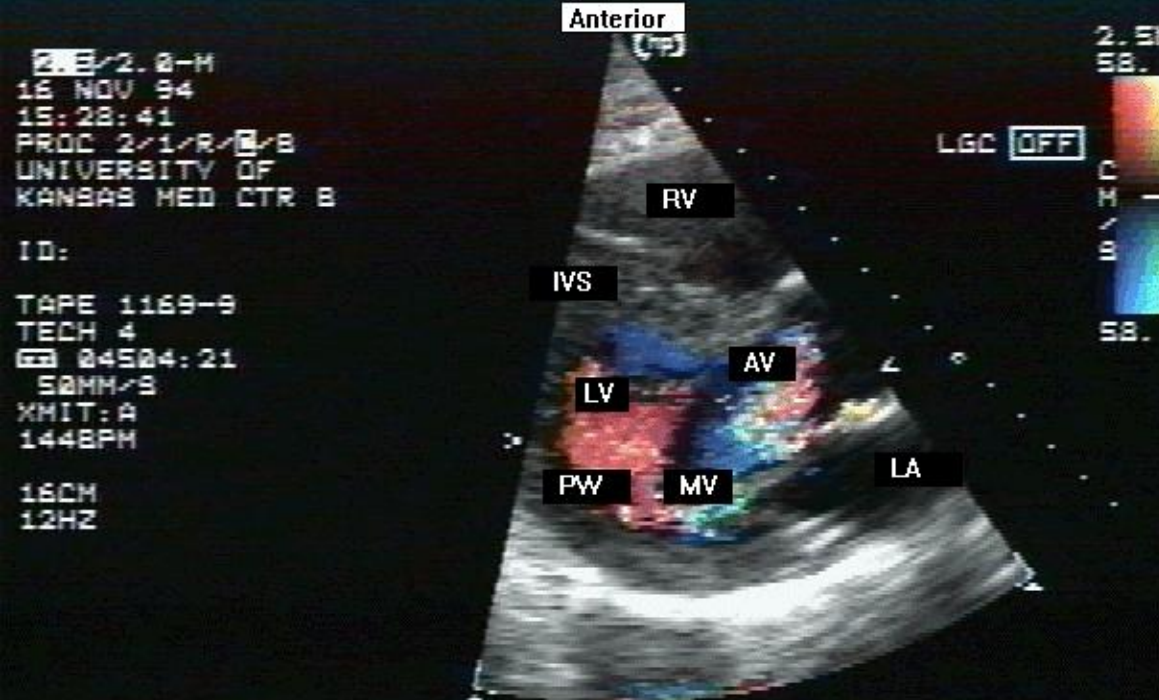
III

aVF

V3

V6





Aortic Regurgitation: Natural History

Asymptomatic

%/Y

■ Normal LV function (~good prognosis)

- Progression to symptoms or LV dysfunction < 6
- Progression to asymptomatic LV dysfunction < 3.5
- 75% 5-year survival
- Sudden death < 0.2

■ Abnormal LV function

- Progression to cardiac symptoms 25

■ Symptomatic (Poor prognosis)

- Mortality > 10

Echo Indications for Valve Replacement in Asymptomatic AR & MR

Type of Regurgitation	LVEDD mm	EF %	FS
Aortic	> 55	< 55	<0.27
Mitral	> 45	< 60	< 0.32

Indication for Valve Replacement in Aortic Regurgitation

■ ACC/AHA Class I

- Symptomatic patients with preserved LVF (LVEF >50%)
- Asymptomatic patients with mild to moderate LV dysfunction (EF 25-49%)
- Patients undergoing CABG, aortic or other valvular surgery

■ ACC/AHA Class II a

- Asymptomatic patients with preserved LVEF but severe LV dilatation (EDD > 75 mm or ESD > 55mm)

Indication for Valve Replacement in Aortic Regurgitation

■ ACC/AHA Class II b

- Patients with severe LV dysfunction ($EF < 25\%$)
- Asymptomatic patients with normal systolic function at rest ($EF > 0.50$) and progressive LV dilatation when the degree of dilatation is moderately severe (EDD 70 to 75 mm, ESD 50 to 55 mm).

■ ACC/AHA Class III

- Asymptomatic patients with normal systolic function at rest ($EF > 0.50$) and LV dilatation when the degree of dilatation is not severe (EDD < 70 mm, ESD < 50 mm).