

Element 28.00

Pellerin



Atrio-Ventricular Dyssynchrony

AV conduction block
Long PR interval

Atrial arrhythmias
Atrial fibrillation

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- The diagram illustrates the pathophysiology of atrio-ventricular dyssynchrony. It shows two categories of conditions: AV conduction block (Long PR interval) and Atrial arrhythmias (Atrial fibrillation). Two orange arrows point from these categories to a central list of consequences: Loss of (synchronous) atrial contraction, Short LV filling time, and Diastolic mitral regurgitation. A note below the list specifies that these consequences are associated with a Long PR interval and high LVEDP.
- **Loss of (synchronous) atrial contraction**
 - **Short LV filling time**
 - **Diastolic mitral regurgitation**

(Long PR interval and high LVEDP)

Loss of atrial contraction

- **Atrial contraction:**
 - 20-30% of the normal resting SV
 - up to 90% in HF patients
 - increases with age (E/A ratio)
- **AF occurs in 20% of pts with HF**

Atrial Fibrillation: Clinical issues

■ Thromboembolism

Most thrombi in LAA

Old thrombus migration or new after conversion

16% annual risk of stroke

20% annual risk of stroke if LA

Diameter >2.5 cm/m²

Atrial Fibrillation: Clinical issues

- **Hemodynamic decompensation**

Excessive ventricular rate with decreased LVFT

- **Palpitations**

Tachycardia-induced cardiomyopathy with rapid ventricular rate

- **Likely increased mortality**

Management of AF

- Ventricular rate control – anticoagulation
– treat pulmonary congestion
- Attempt at cardioversion made for all initial non-valvular AF
- Maintaining SR after cardioversion
 - LA size < 6.0cm*
 - Duration of AF < 1 year*
 - Etiology valvular or non valvular*
- Depressed LV systolic function is strong predictor of thromboembolism

Management of AF (1)

**LA size increases
with duration of AF**



**AF promotes further
LA enlargement**

AF in Heart Failure

Therapeutic anticoagulation

Cardioversion candidate (Amiodarone)

Warfarin 3 wks

TEE

No thrombus

Thrombus detected

Cardioversion

Warfarin 3 wks

Warfarin long term

Manning WJ et al. JACC 1995 Klein AL et al. NEJM 2001

Chest Wall Echo in AF/CHF

- LV size and systolic function

 - Estimation of LVEDP and CO*

 - Mitral regurgitation*

 - RV size and function*

 - Pulmonary artery pressure, RAP*

 - Ventricular dyssynchrony*

- LA dimension in M mode

- LA volume in 2D

 - Ellipsoid method (Ap 4ch, PLAX and SAX)*

 - Simpson's rule*

Chest Wall Echo in AF/CHF

■ LA enlargement

Decreases the likelihood of maintaining SR

Predictor of subsequent development of non valvular AF in patients with a history of AF

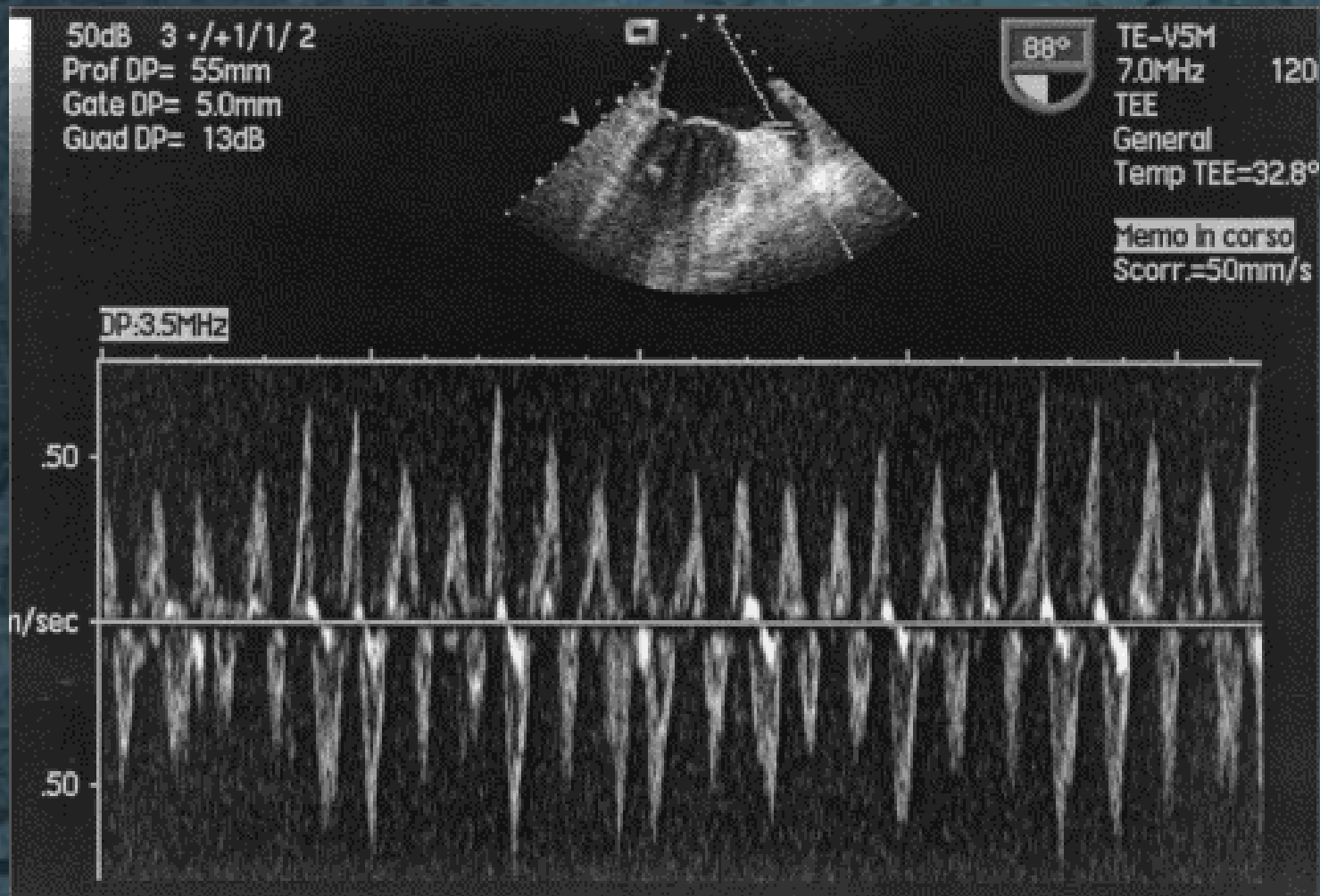
Not predictive of LA thrombus

Increases with duration of AF

Estimation of LVEDP when not on treatment and in SR

TEE in pts with AF and HF

- **Intra cardiac thrombus (LAA)**
- **Spontaneous echo contrast**
- **Peak LAA ejection velocity (4 types)**
- **Aortic debris**

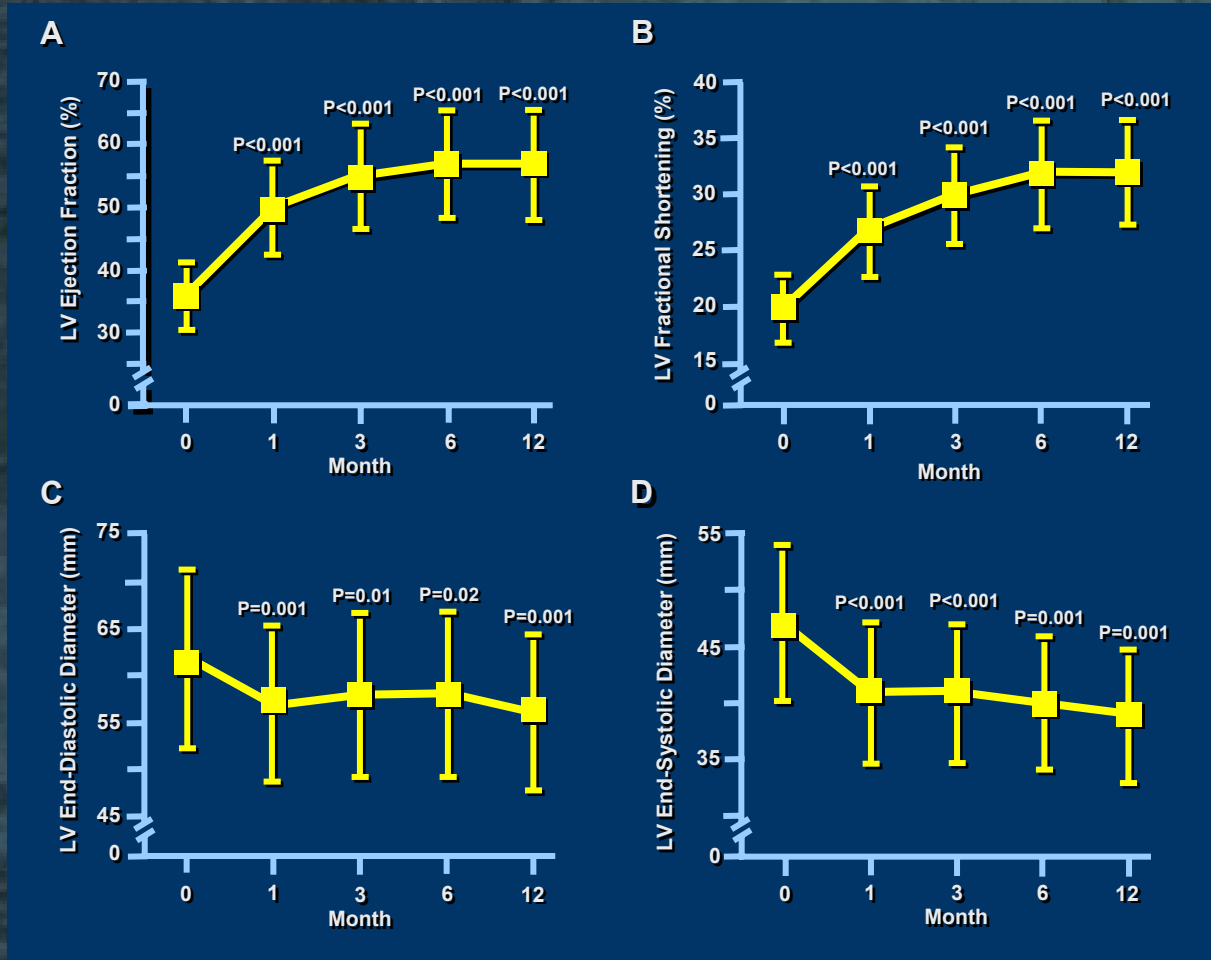


Antonielli E et al. JACC 2002

Management of AF (2)

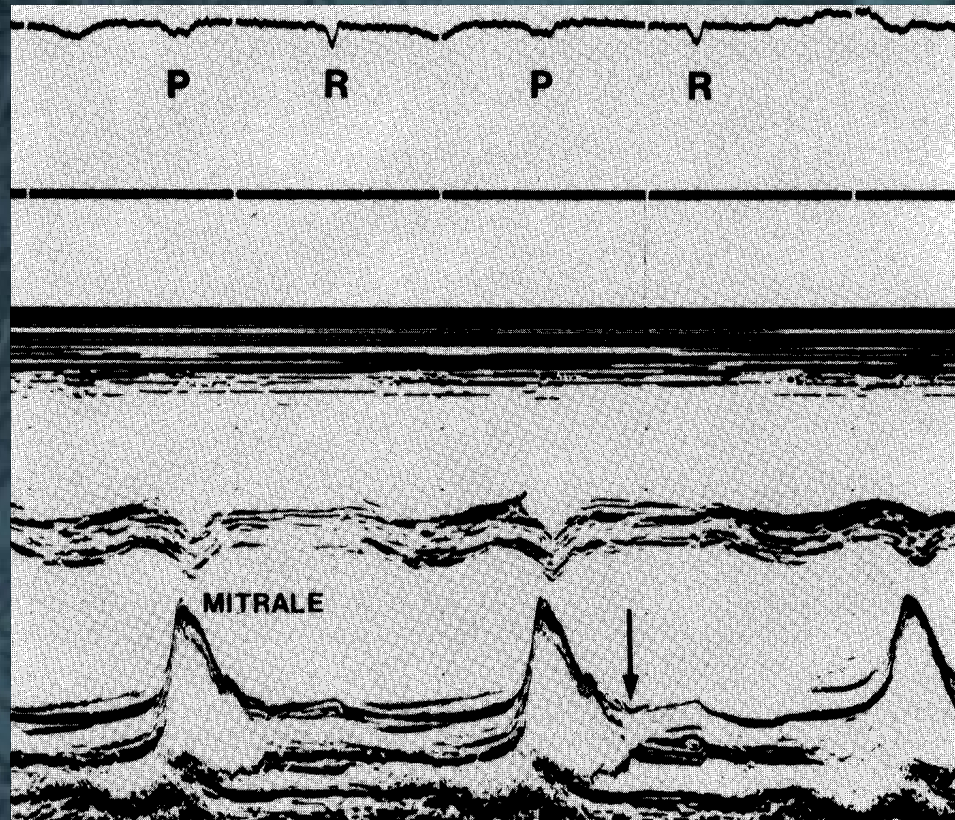
- **AV nodal ablation and BiV / LV pacing (rare)**
- **Catheter ablation for atrial fibrillation**
 - Before ablation: *Thrombus (LAA), spontaneous echo contrast, peak LAA ejection velocity and aortic debris, 4 Pulmonary veins (origin, diameter, color flow guided)*
 - During ablation: *Guidance of transseptal*
 - After ablation: *Pericardial effusion, atrial contraction, LV size and function*

Catheter Ablation for Atrial Fibrillation in CHF



Hsu LF et al. NEJM 2004

First degree AV block



Premature closure of the mitral valve before QRS onset

Perrenoud JJ 1989

