

How to manage the patients with Atrial Fibrillation

Young-Hoon Kim, MD, PhD, FACC

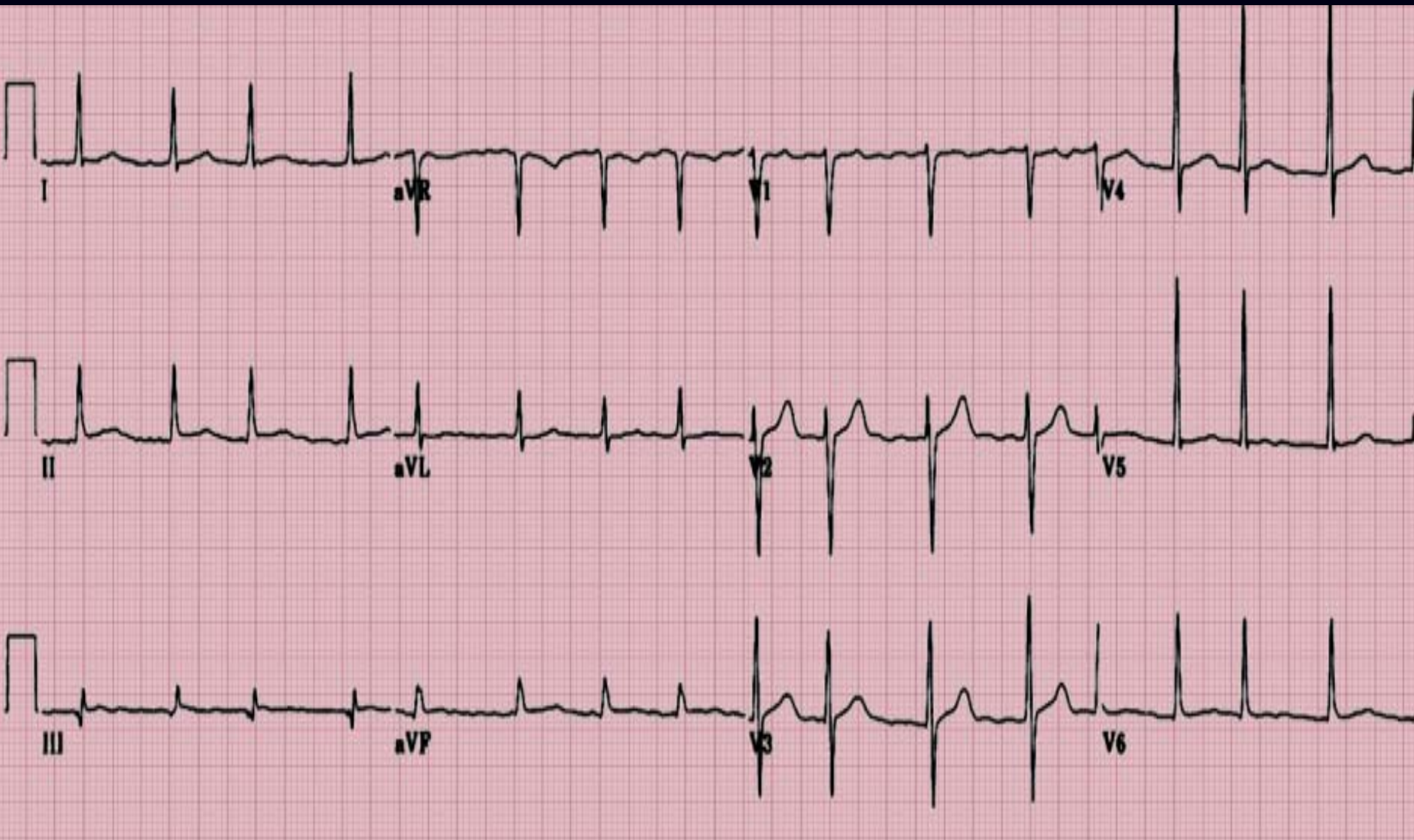
**Electrophysiology Laboratory
Cardiovascular Center
Korea University Medical College
Seoul, Korea**

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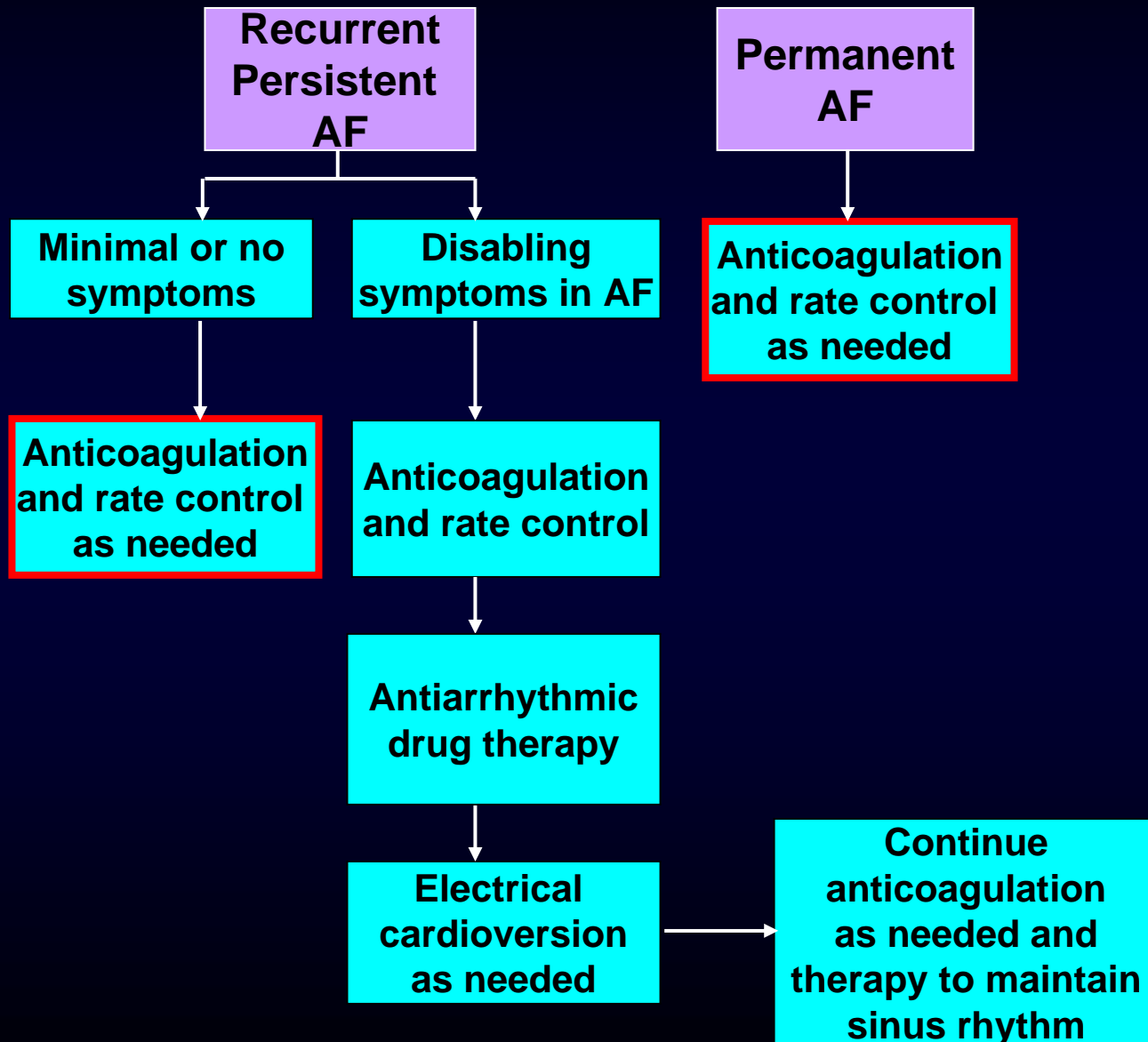
- 1) DC cardioversion for rhythm control
- 2) Start PO flecainide
- 3) Coumadin, maintain INR 2-3
- 4) Start PO digoxin with aspirin
- 5) Only observation
- 6) Catheter ablation for AF



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Pharmacological Management of Patients With Recurrent Persistent or Permanent AF



Risk Factors for Ischemic Stroke and Systemic Embolism In Patients with Nonvalvular AF

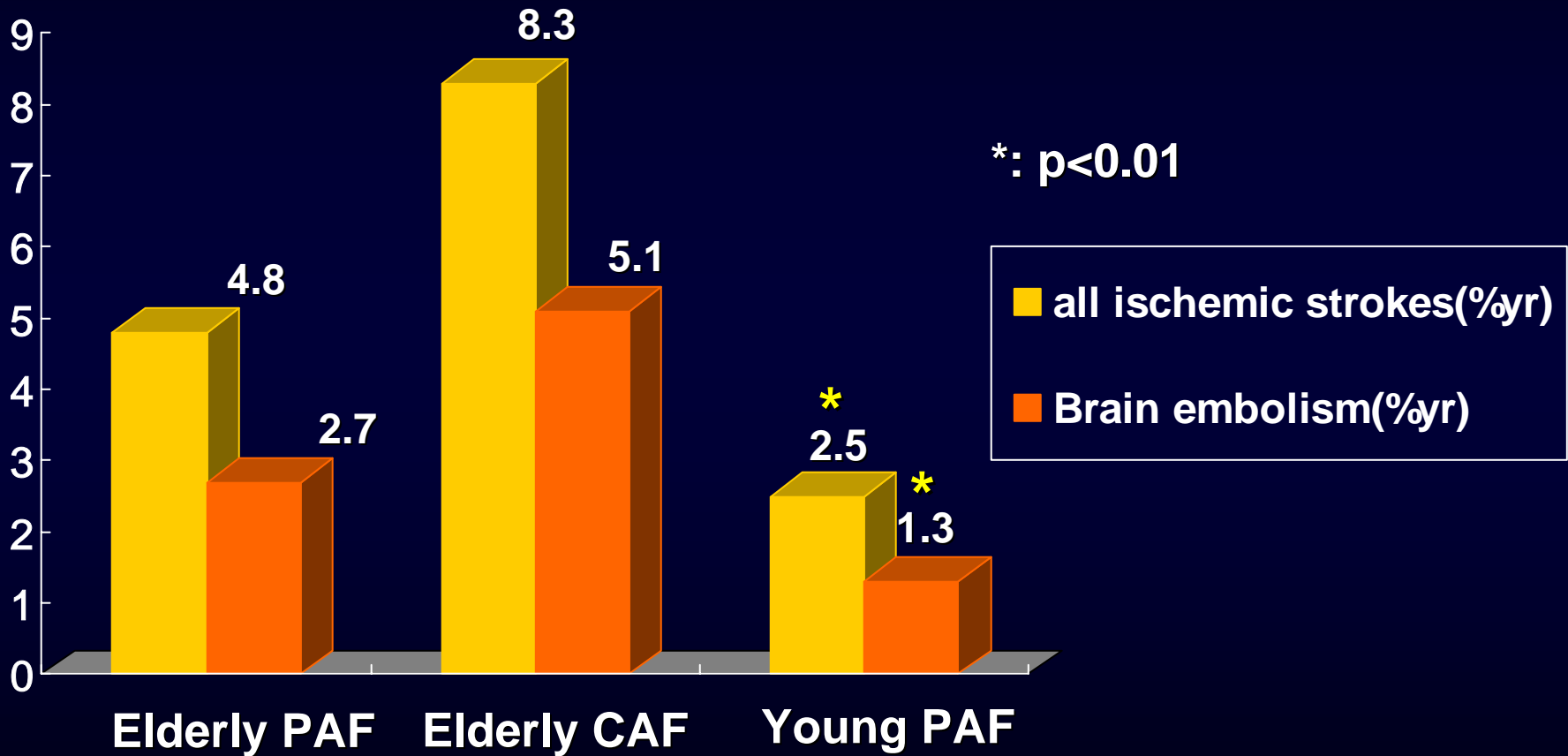
Risk Factors (vs. Control Groups)	Relative Risk
Previous stroke or TIA	2.5
History of hypertension	1.6
Congestive heart failure	1.4
Advanced age (continuous, per decade)	1.4
Diabetes mellitus	1.7
Coronary artery disease	1.5

CHADS₂

- Congestive Heart Failure – 1 point
- Hypertension – 1 point
- Age – 1 point
- Diabetes – 1 point
- Stroke or TIA – 2 points

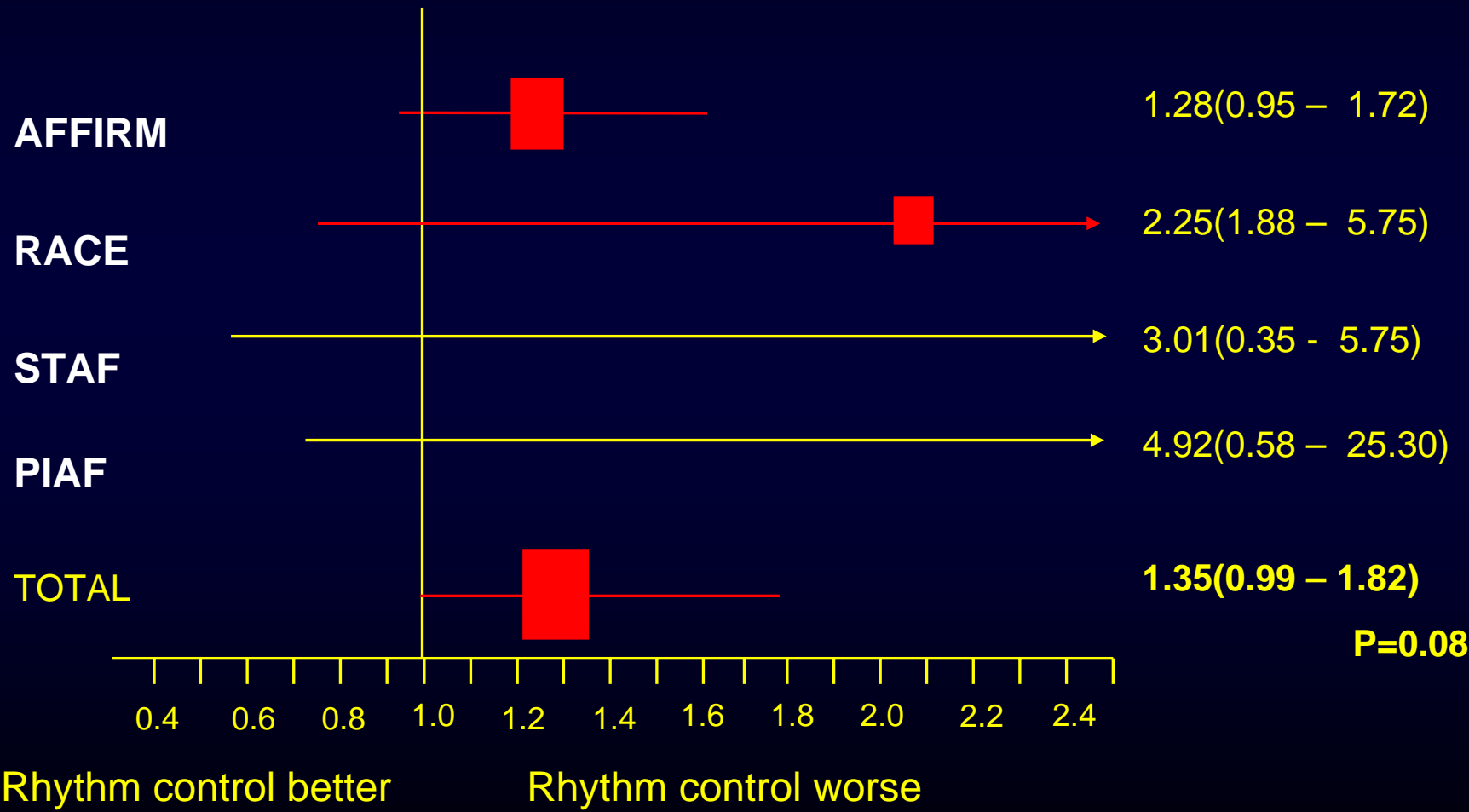
Score ≥ 3 identifies high risk (≥ 4 per 100 patient-years) of stroke: The rest are moderate (>1 to 2.9) or low (<1) risk.

Incidence of Thromboembolism in AF



A Main Finding of Rate Vs. Rhythm Trials

Incidence of Ischemic Stroke



A Main Finding of Rate vs. Rhythm Trials

**Unless contraindications exist,
all patients with AF and risk factors
for embolic complications
should be anticoagulated.**

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- 1) DC cardioversion for rhythm control
- 2) Start PO flecainide
- 3) Coumadin, maintain INR 2-3
- 4) Start PO digoxin with aspirin
- 5) Only observation
- 6) Catheter ablation for AF



52 2 , 5 2 2 (CCB)
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Case #2, 52

ECG at ER



2

digoxin 0.25 mg, verapamil 5 mg

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- 1) Maintain PO Propafenone PO daily
- 2) Change CCB to Beta-blocker PO
- 3) Catheter ablation for atrial fibrillation
- 4) Anticoagulation with warfarin PO
- 5) Flecainide PO a single oral dose (“pill-in-the-pocket”)



Outpatient Treatment of Recent-Onset Atrial Fibrillation With the “Pill-in-the-Pocket” Approach

Alboni P, et al.

NEJM 2004;351:2384-91

- ❖ Flecainide PO (300 mg or 200 mg, if BW > or < 70kg)
- ❖ Propafenone PO (600 mg or 450 mg)

Outpatient Treatment of Recent-Onset Atrial Fibrillation With the “Pill-in-the-Pocket” Approach

Alboni P, et al. NEJM 2004;351:2384-91

- ❖ Successful in 94% within 113 ± 84 minutes.
- ❖ Adverse effects: 7%
 - atrial flutter, AF with RVR
 - non-cardiac effects: nausea, asthenia, and vertigo
- ❖ Monthly visits to ER and hospitalization were significantly lower during F/U.

Outpatient Treatment of Recent-Onset Atrial Fibrillation With the “Pill-in-the-Pocket” Approach

Alboni P, et al. NEJM 2004;351:2384-91

❖ Inclusion criteria:

- 1) 18-75 yrs old
- 2) Recent onset of AF: <48 hours
- 3) Hemodynamically tolerable
- 4) Mean HR > 70 bpm
- 5) SBP > 100 mmHg
- 6) 1-12 episodes/previous yr

Outpatient Treatment of Recent-Onset Atrial Fibrillation With the “Pill-in-the-Pocket” Approach

Alboni P, et al. NEJM 2004;351:2384-91

Exclusion criteria:

- ❖ Pre-excitation or BBB
- ❖ Hx of AF lasting > 1 week
- ❖ HF, CMP, VHD
- ❖ Brady-tachy syndrome
- ❖ Previous Hx of stroke
- ❖ Long QT interval
- ❖ Brugada syndrome

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bid
300 mg bid

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Flecainide 100 mg
Propafenone

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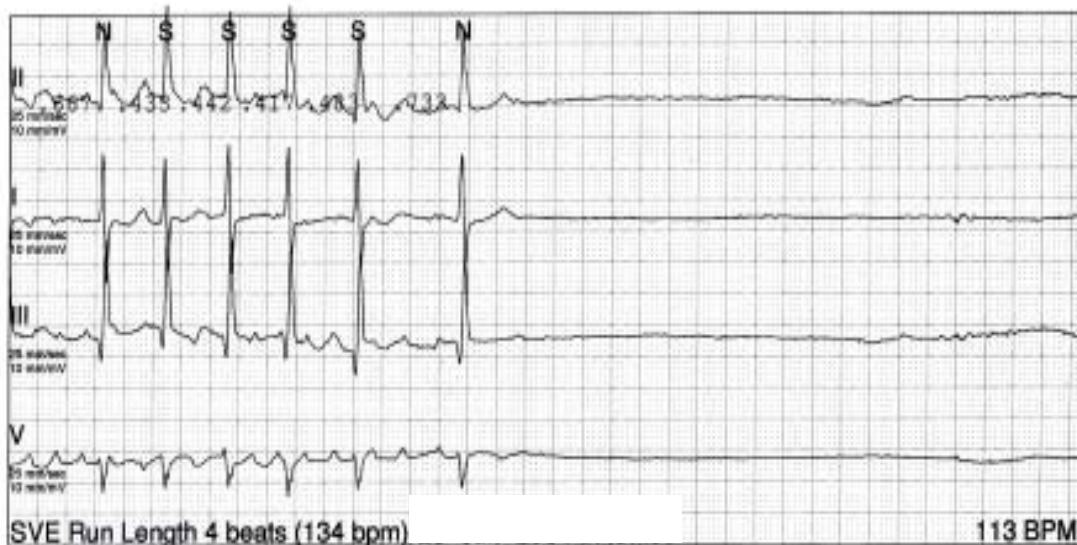
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- 1) Quinidine PO
- 2) Catheter ablation for AF
- 3) Amiodarone PO
- 4) Pacemaker implantation (Dynamic atrial overdrive) + Amiodarone PO
- 5) Anticoagulation with warfarin PO



Case #3, M/51

R-R pause(5900ms)

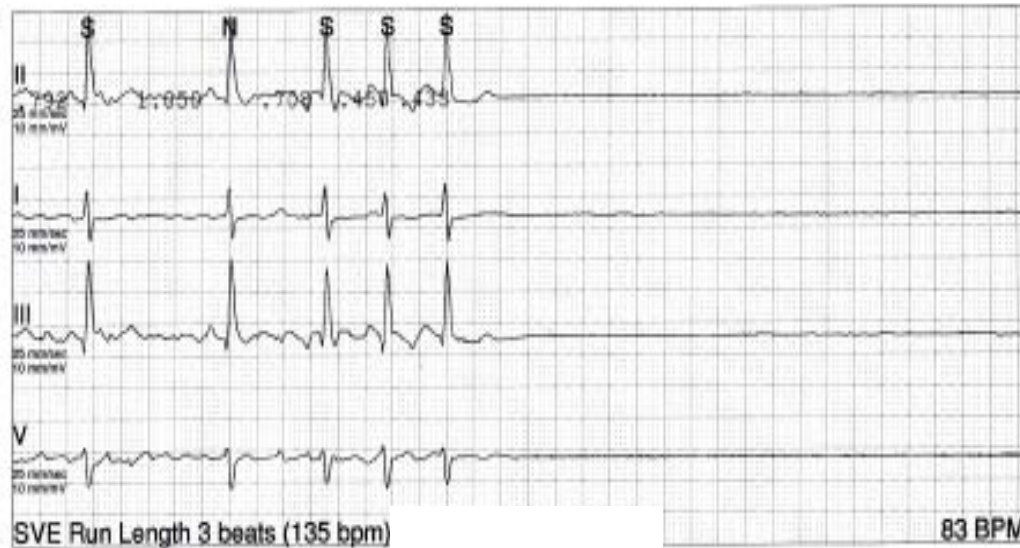


R-R pause(6560ms)

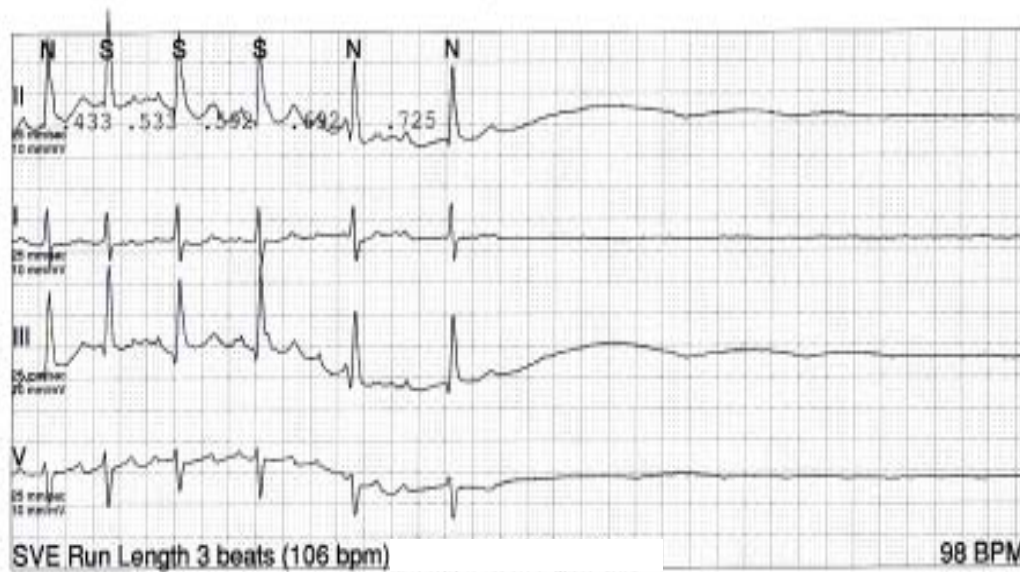


Case #3, M/51

R-R pause(6640ms)

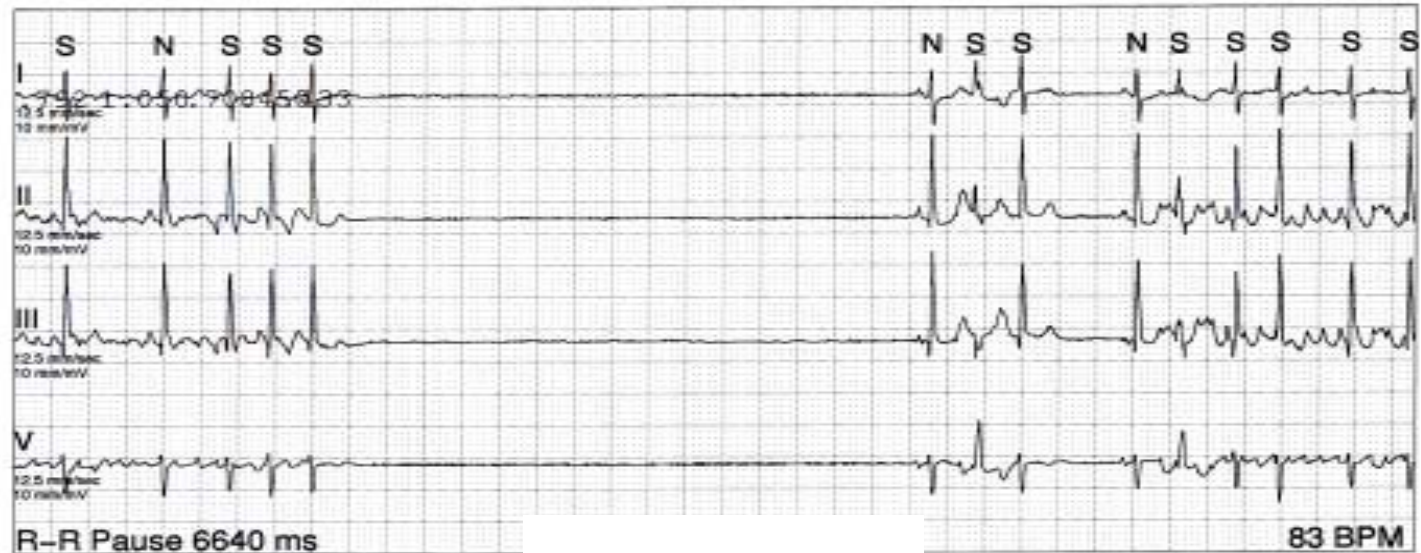


Max.R-R pause(7840ms)

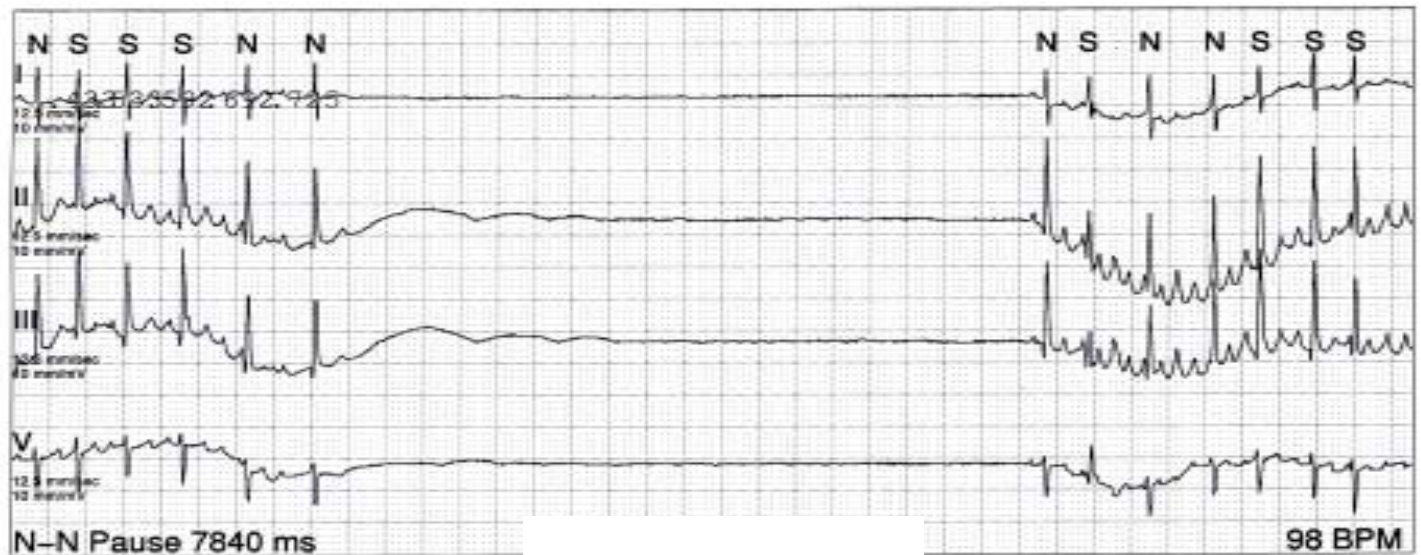


Case #3, M/51

R-R pause(6640ms)



Max.R-R pause(7840ms)



Diagnosis:

Tachycardia-Bradycardia Syndrome

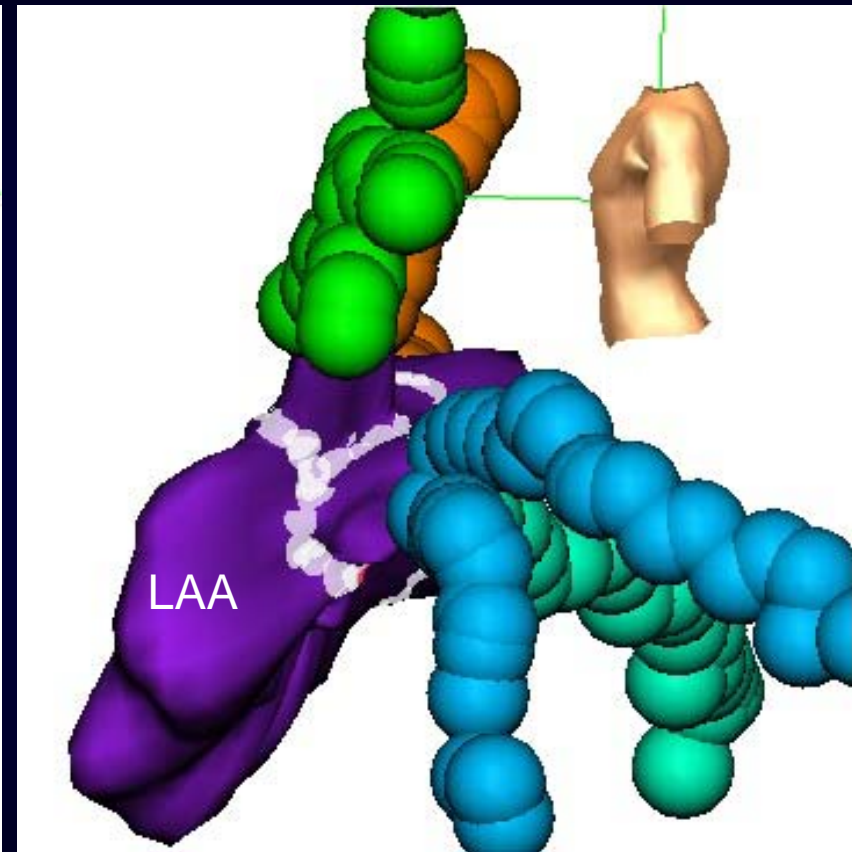
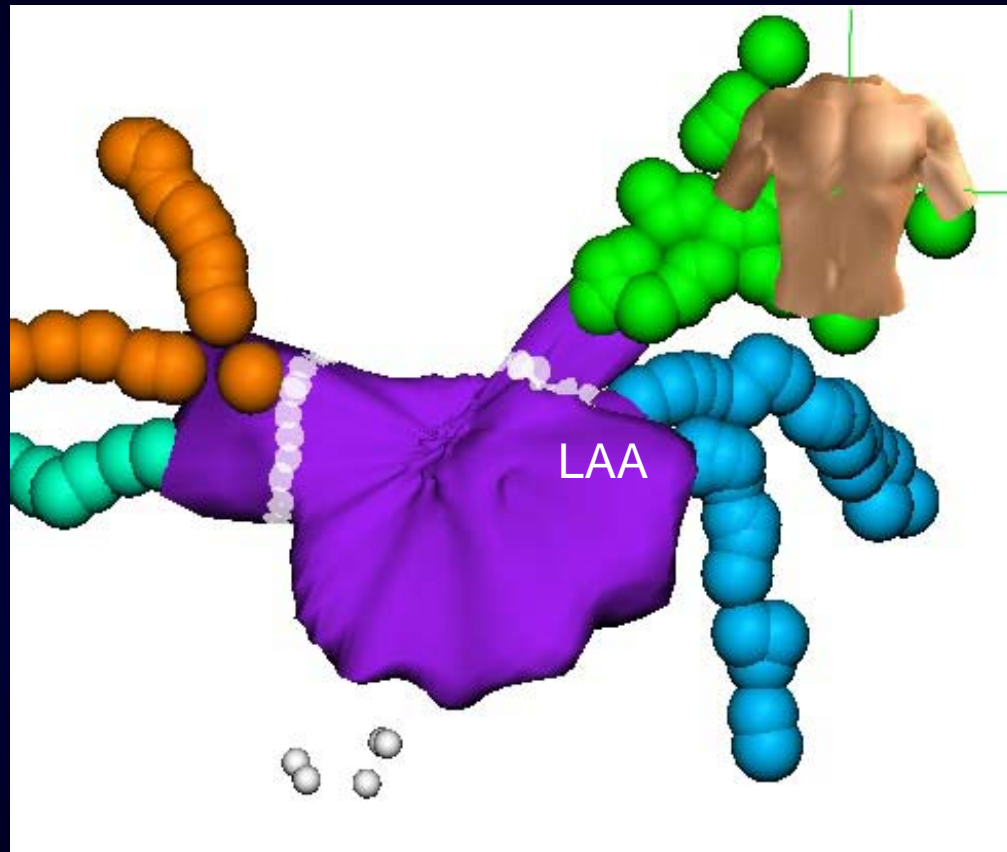
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a. Pacemaker Implantation +

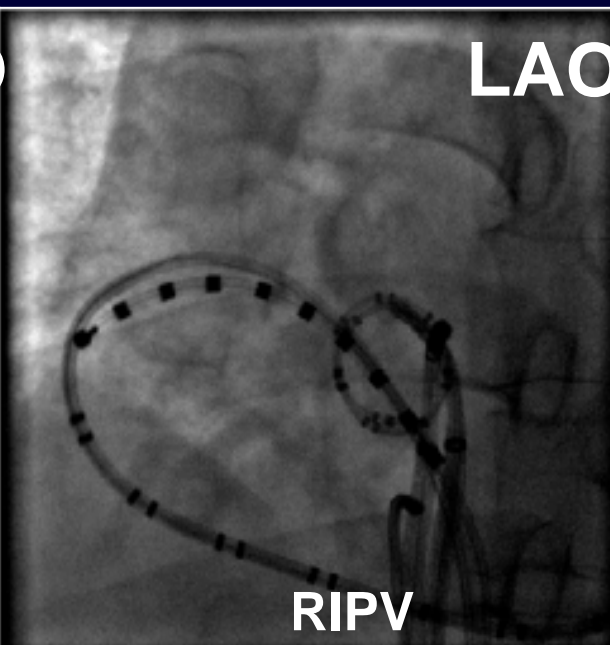
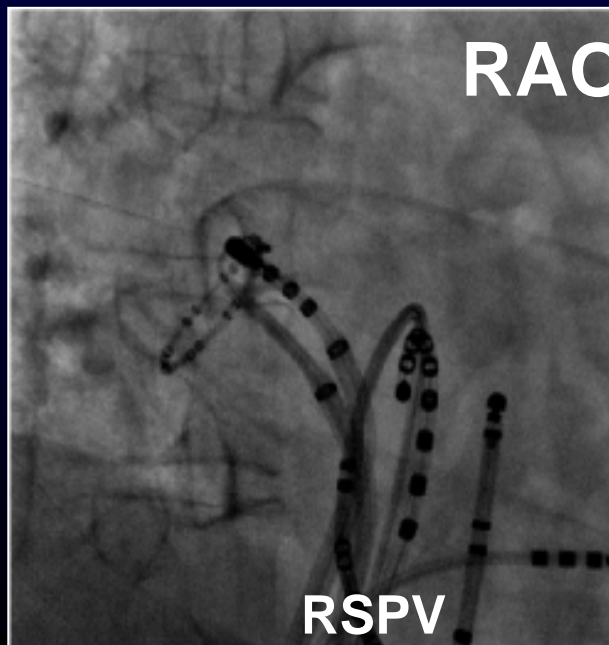
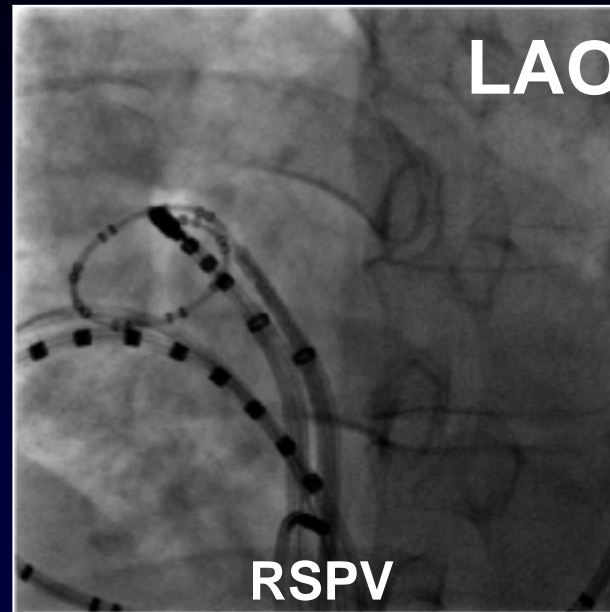
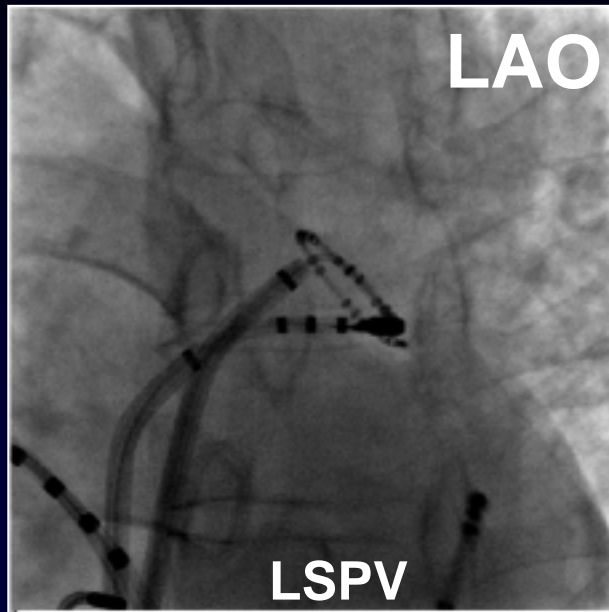
b. Catheter ablation for AF

Circumferential PVs Ablation



Case #3,
M/51

4 PVs Isolation Confirmed by Elimination of PVPs

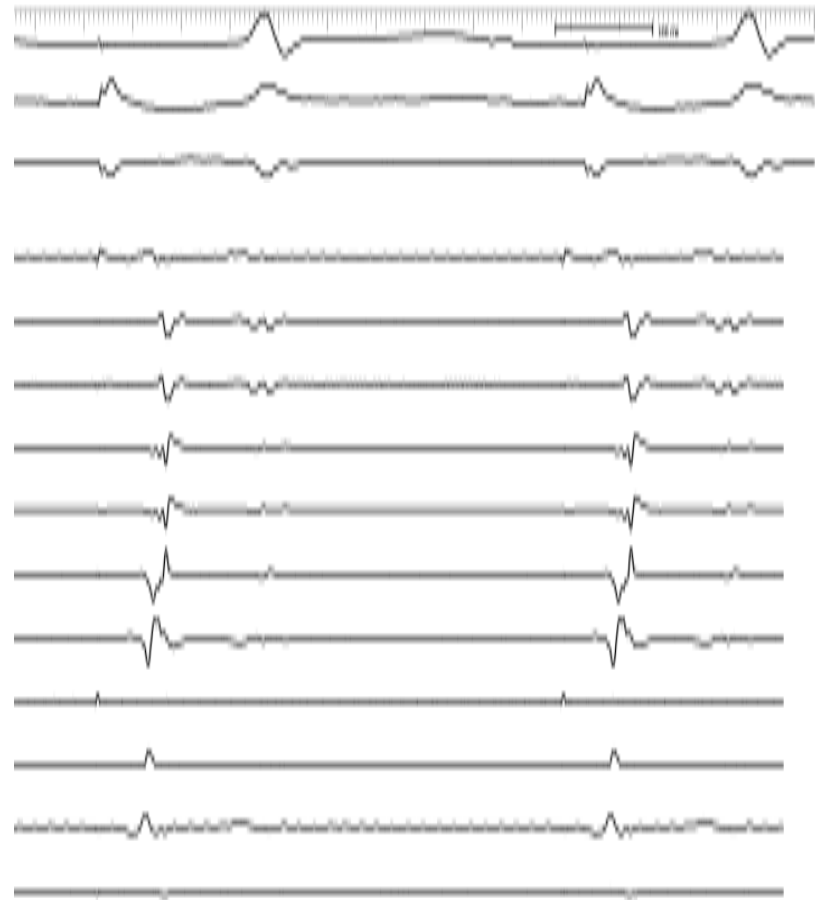
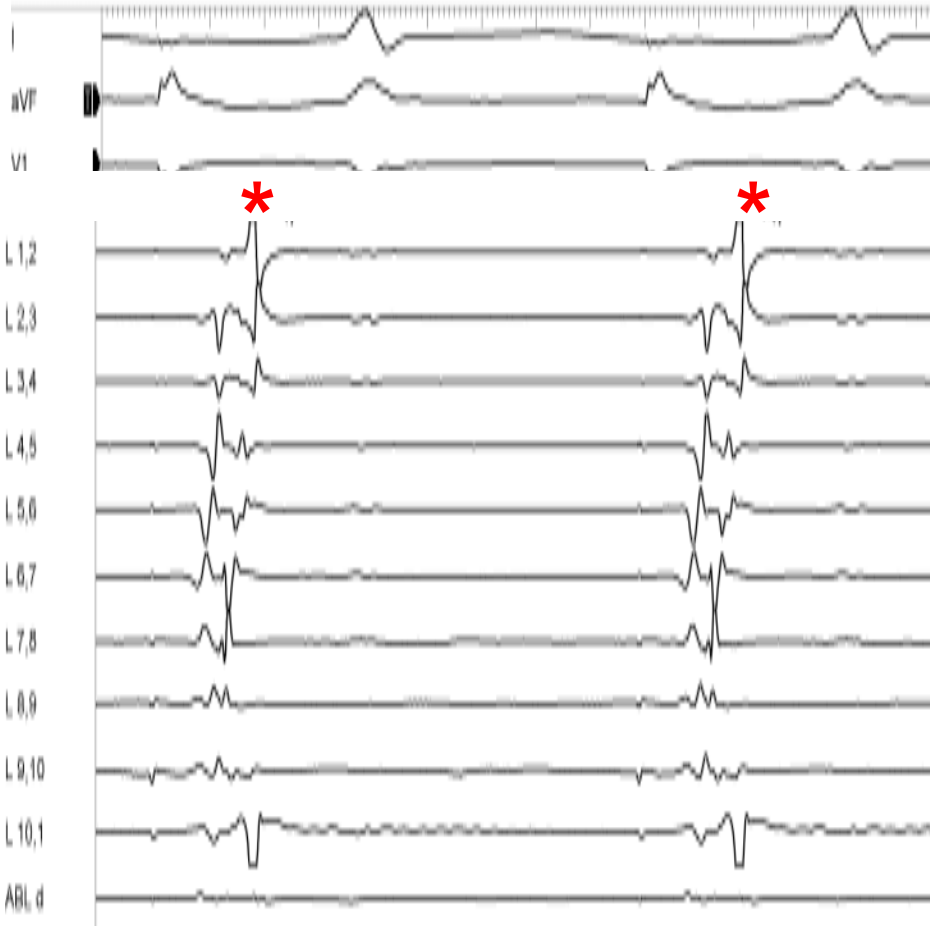


Case #3, M/51

4 PVs Isolation Confirmed by Elimination of PVPs

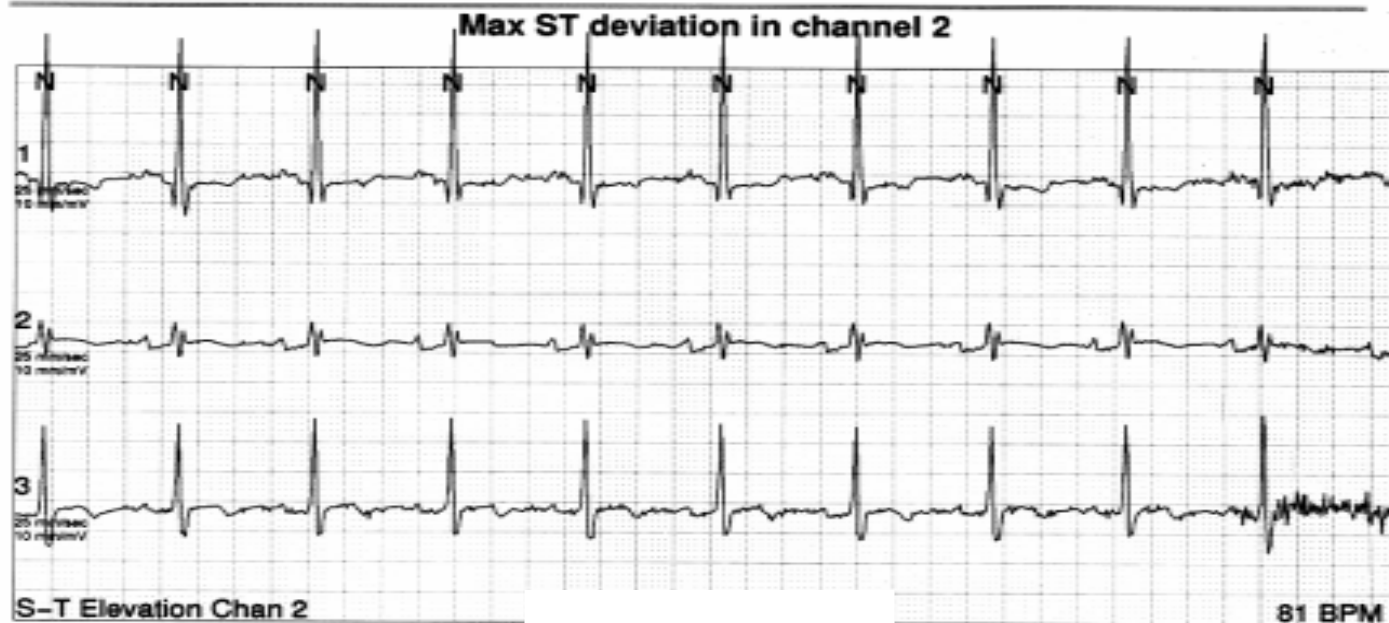
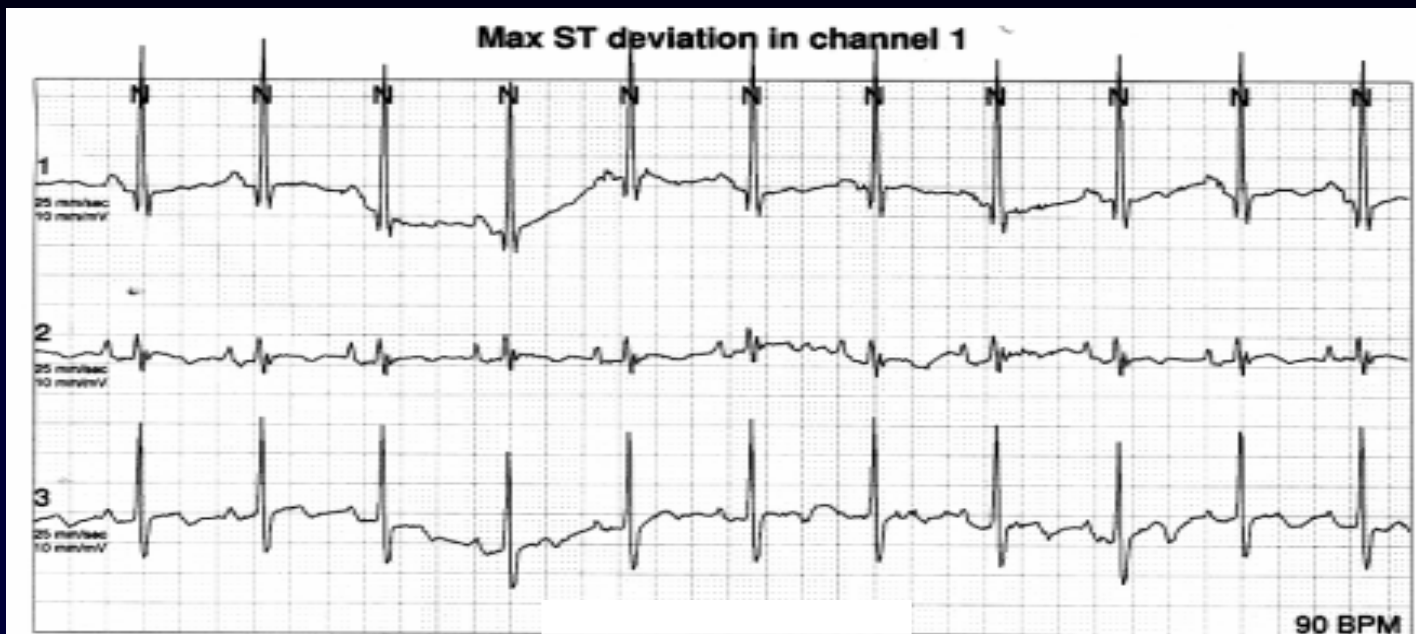
Before

After



Case #3, M/51

Holter After Catheter Ablation-post 12 months



Reverse remodeling of sinus node function after catheter ablation of AF in patients with prolonged sinus pauses.

Hocini M, Haissaguerre M. *Circulation*. 2003 9;108(10):1172-5

N=20, PAF and prolonged sinus pauses (≥ 3 s) on termination of AF.

After AF ablation, there was a significant improvement of sinus node function.

The CSNRT decreased in all patients (P=0.019).

At 26.0 \pm 17.6 Ms, 18 patients (85%) had no recurrence of AF, with **no symptoms attributable to sinus pauses on ambulatory monitoring**. Two patients had infrequent episodes of AF, 1 requiring PM implantation.

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(NYHA III)

Holter

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sinus

arrest가

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- 1) Propafenone PO
- 2) Warfarin PO
- 3) Catheter ablation for AT/AF
- 4) Pacemaker implantation
- 5) Aminophylline PO

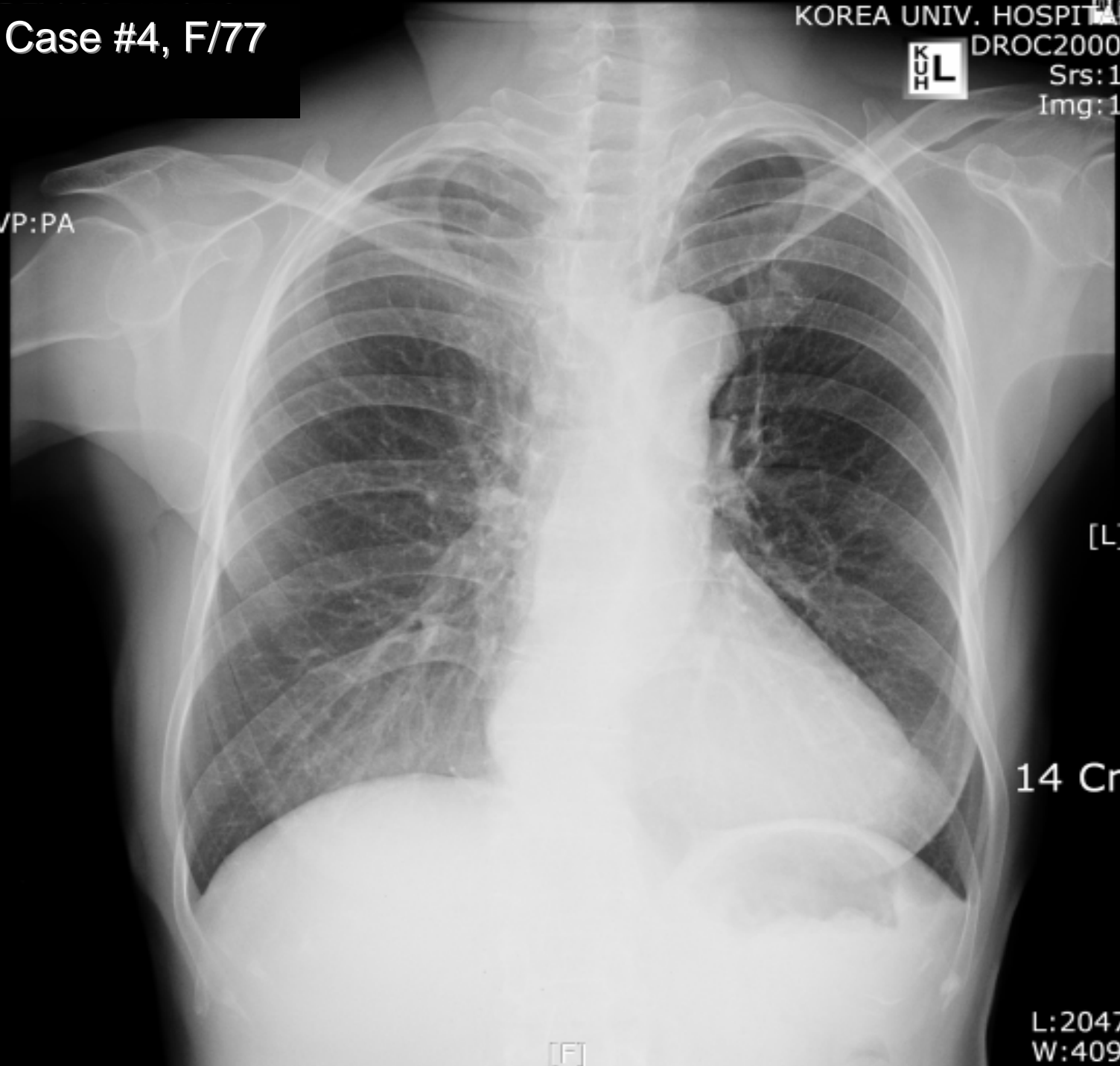


Case #4, F/77

KOREA UNIV. HOSPITAL
DROC2000I
Srs: 1
Img: 1



VP:PA



[L]

14 Cm

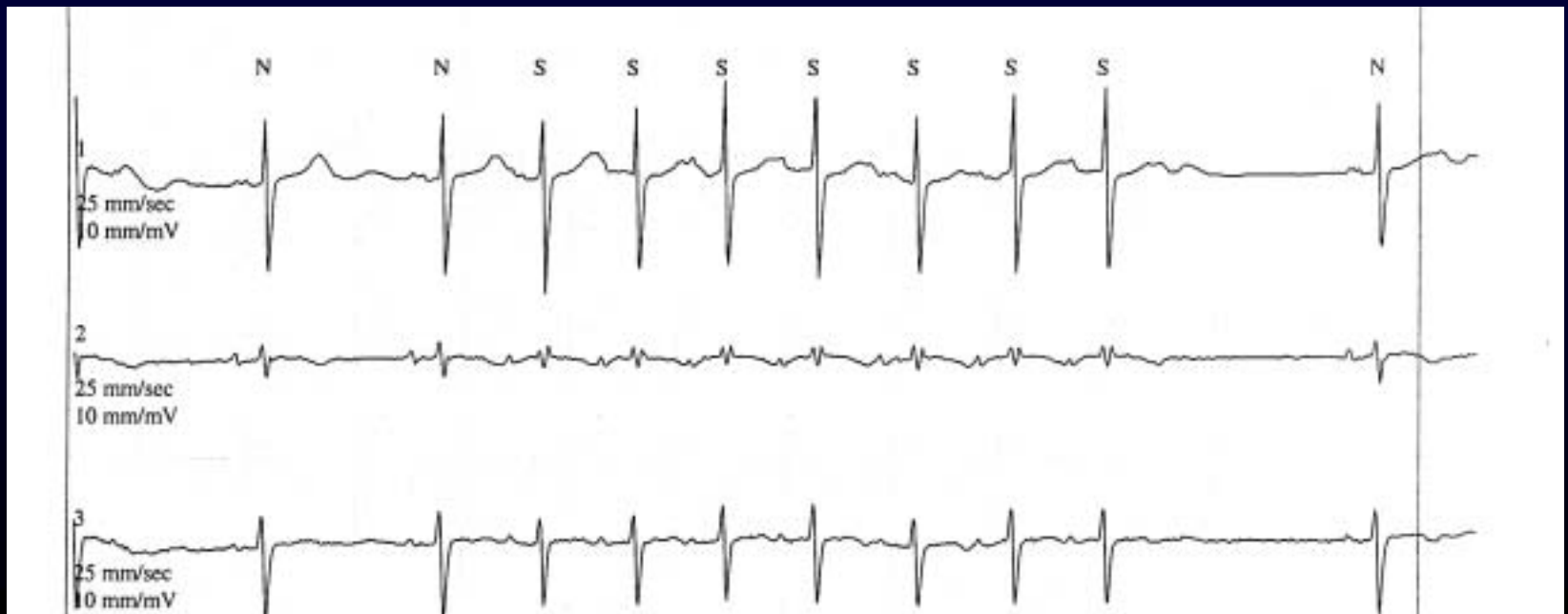
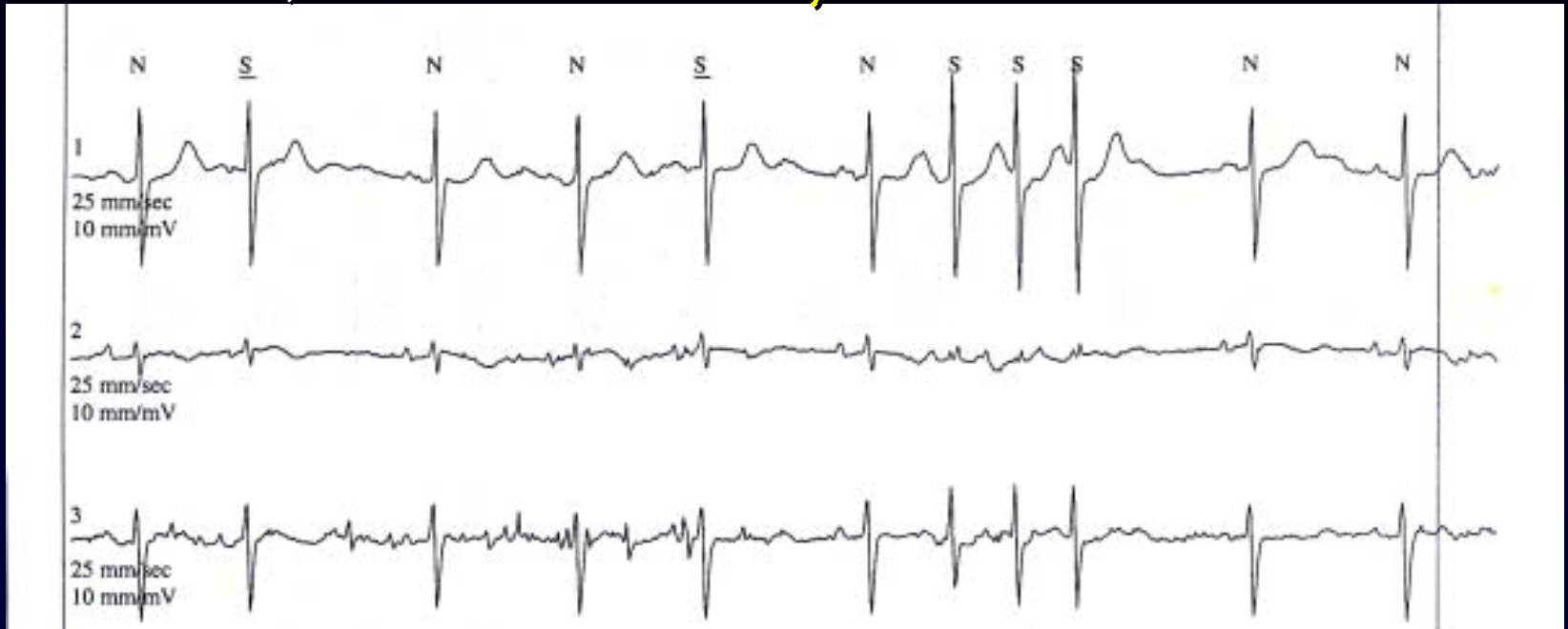
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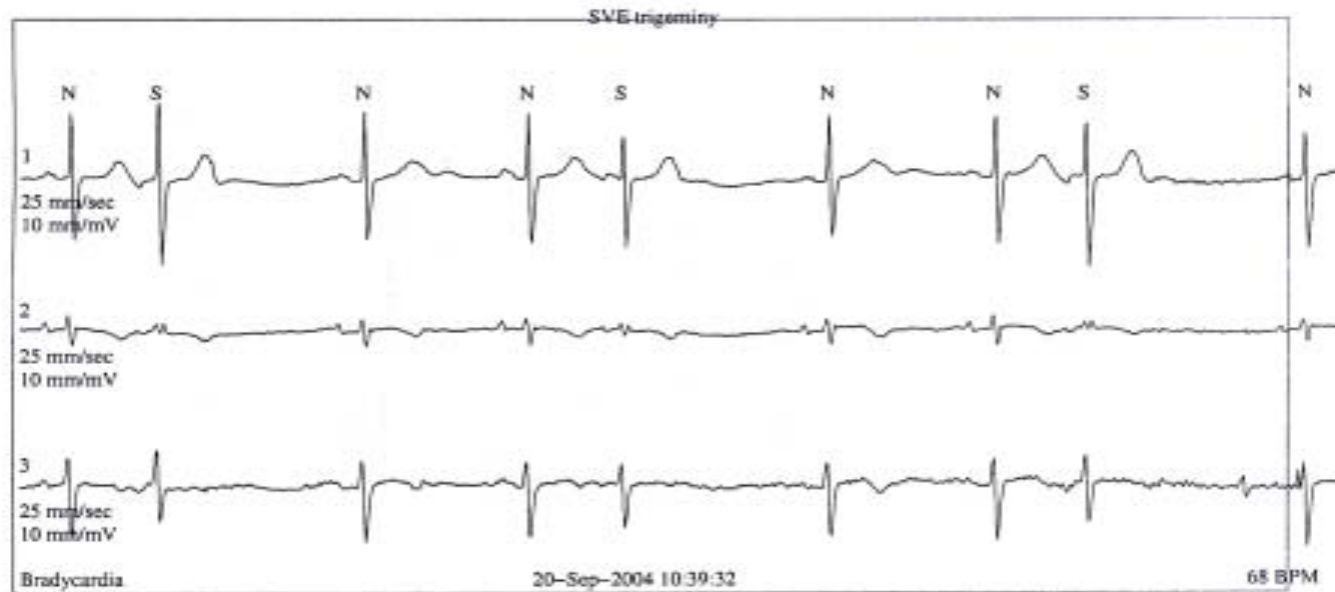
Case #4 F/77



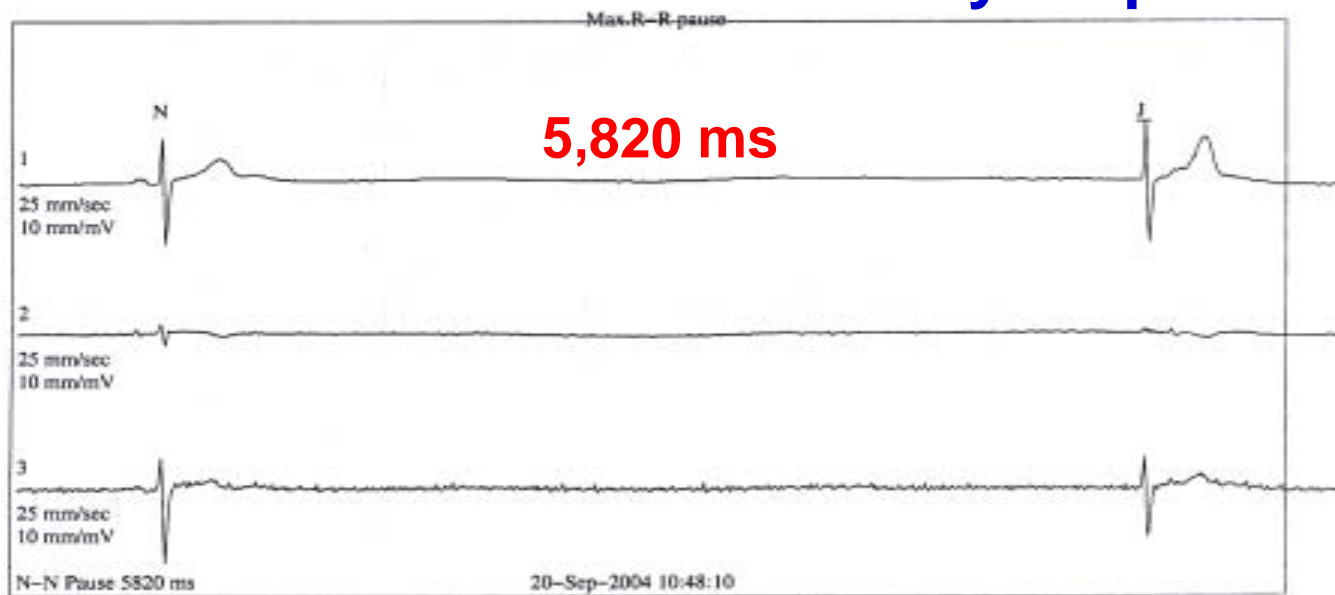
Case #4, F/77 **Holter, no Sxs**



Case #4 F/77

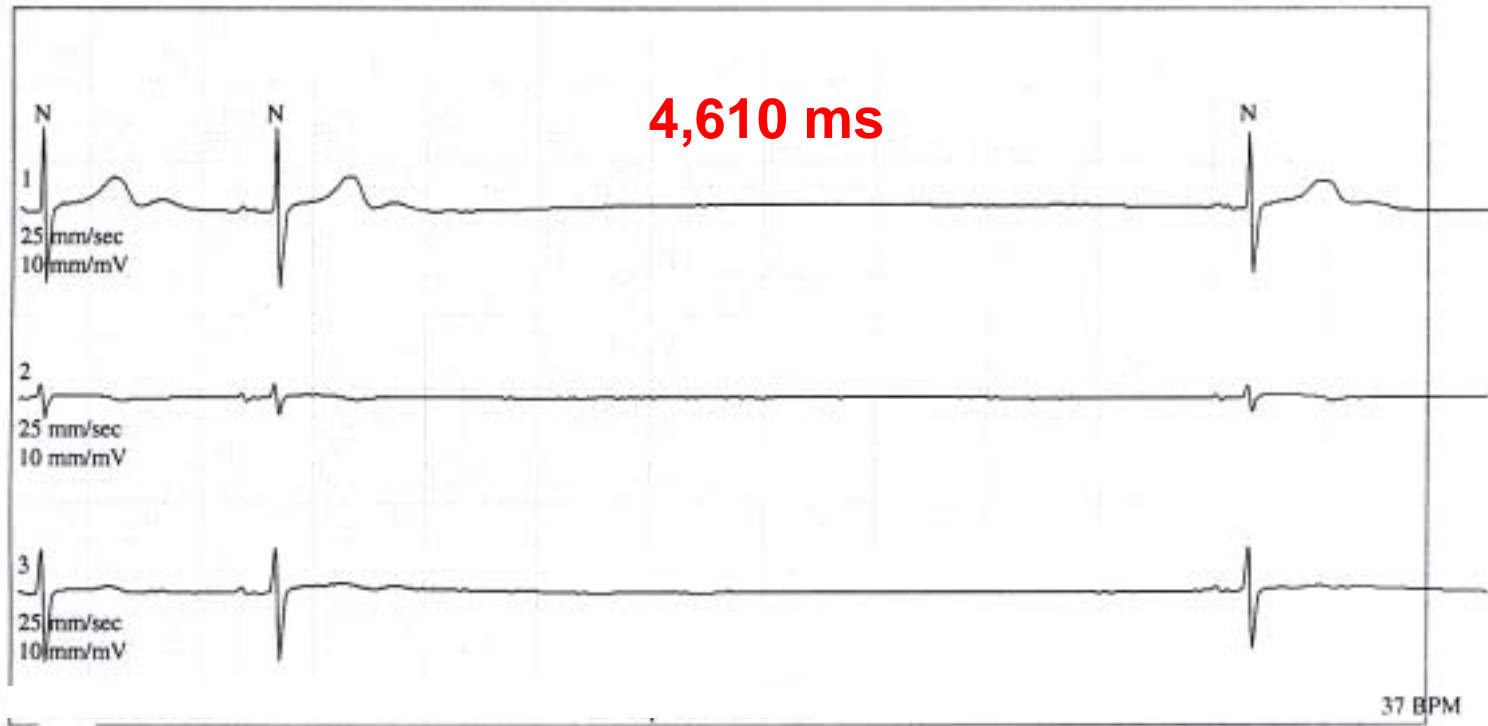


Chest discomfort and Pre-syncope



Case #4, F/77

Holter, Dizziness



Case #4, F/77 **SNRT: 4508 ms**



Case #4, F/77

**Intermittent AF (lasting 48 hrs) and AT,
Sinus pause (> 3 s) was
not preceded by AF or AT**

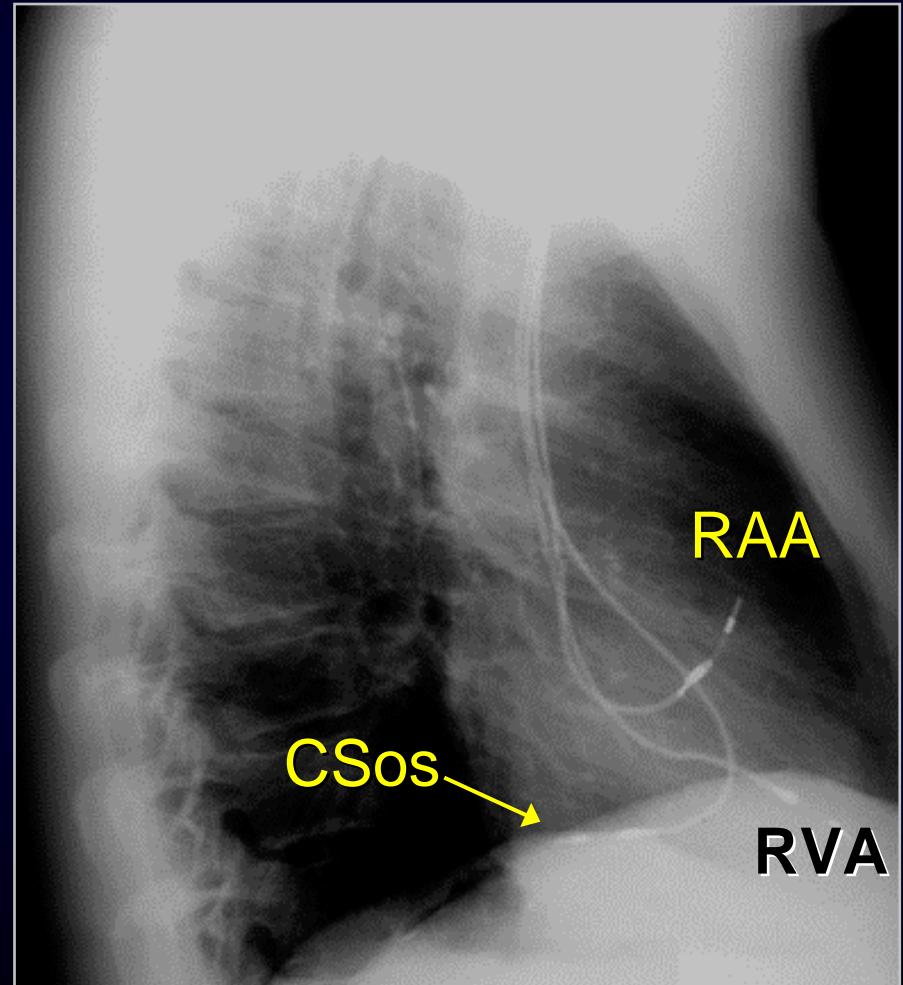
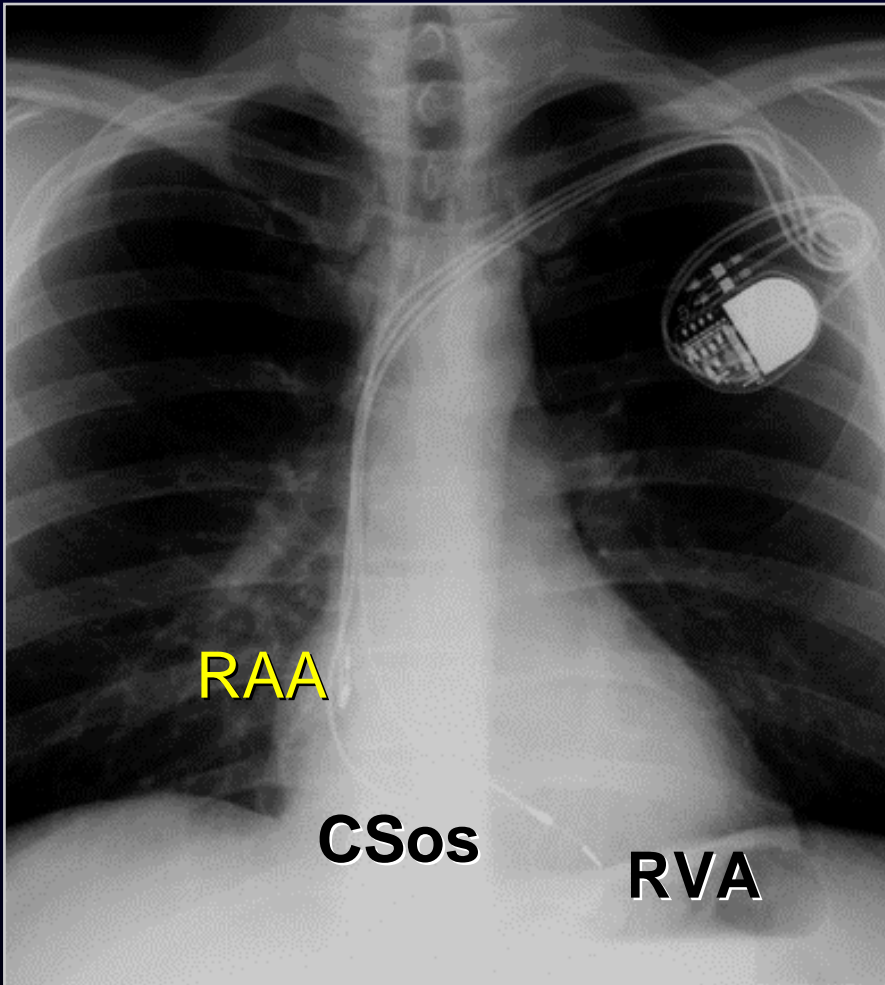
**“Class I indication” of
pacemaker**

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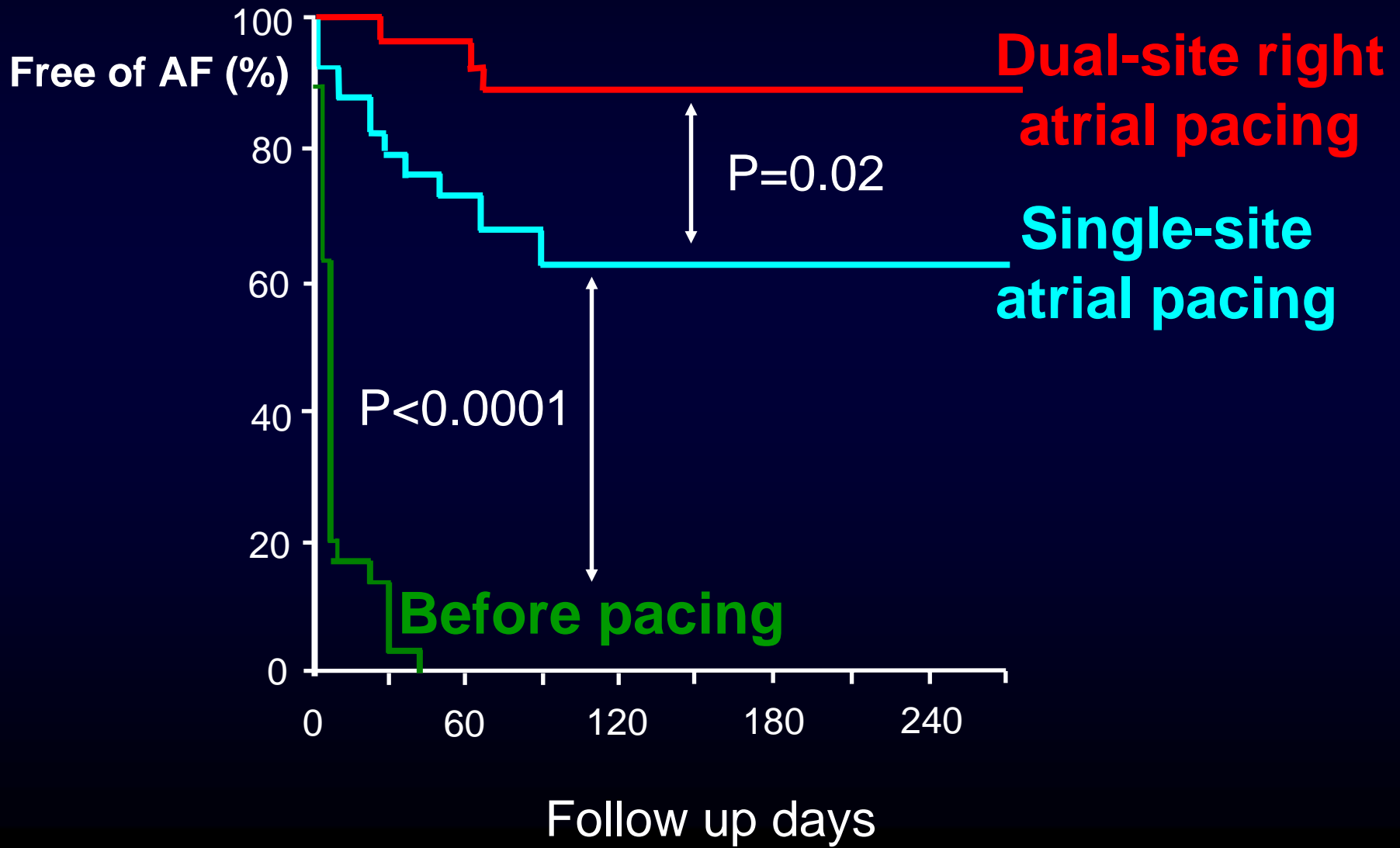
- 1) Propafenone PO
- 2) Warfarin PO
- 3) Catheter ablation for AT/AF
- 4) Pacemaker implantation
- 5) Aminophylline PO



Pacemaker with Dual-Site Atrial Pacing



Pacemaker with Dual-Site Atrial Pacing

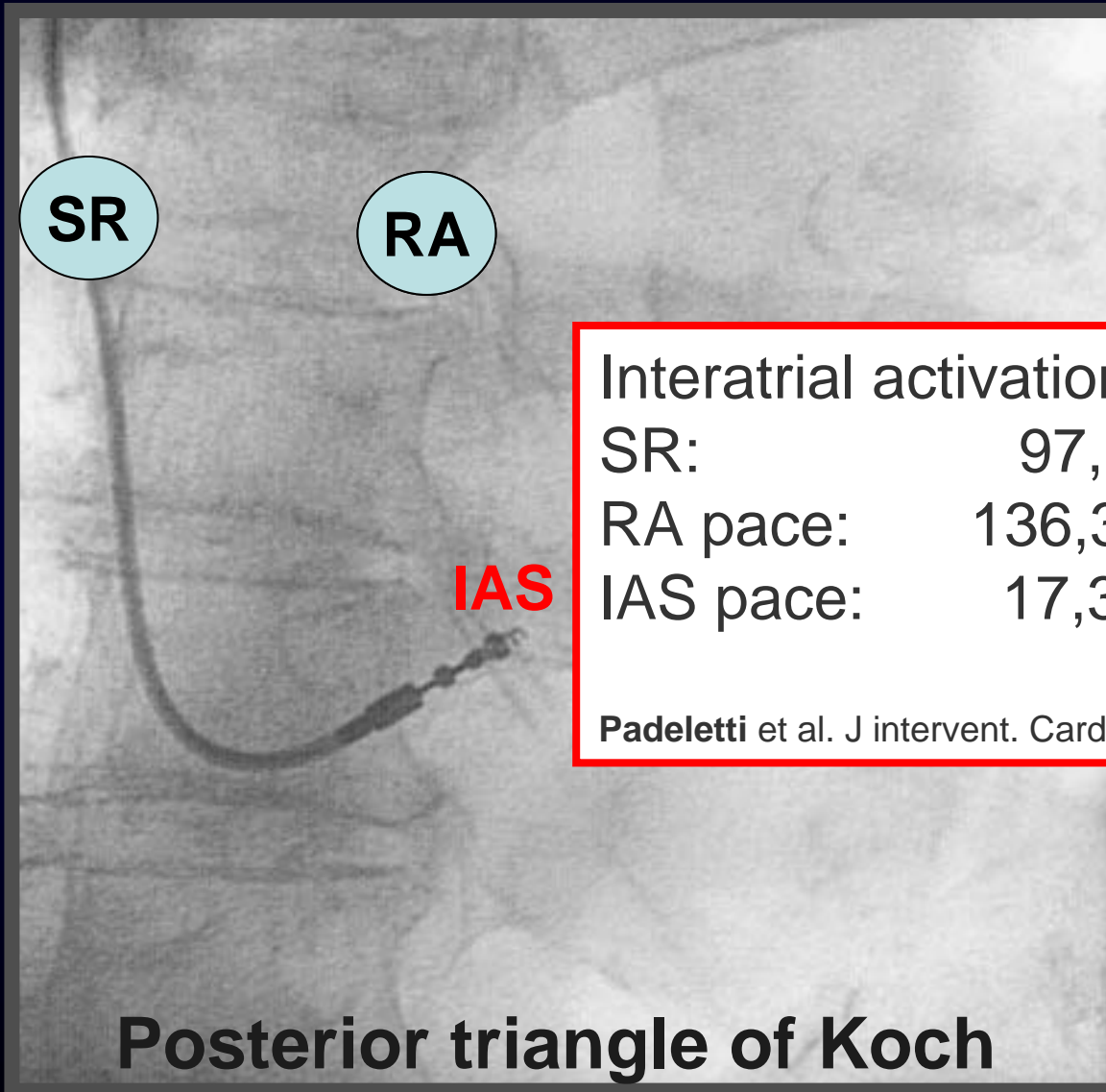


**Is Low Atrial Septal Pacing
Effective For Prevention of AF ?**

**Prevention of Atrial
Fibrillation by Overdrive
Atrial Septum Stimulation**

OASES

Rationale **OASES** Study

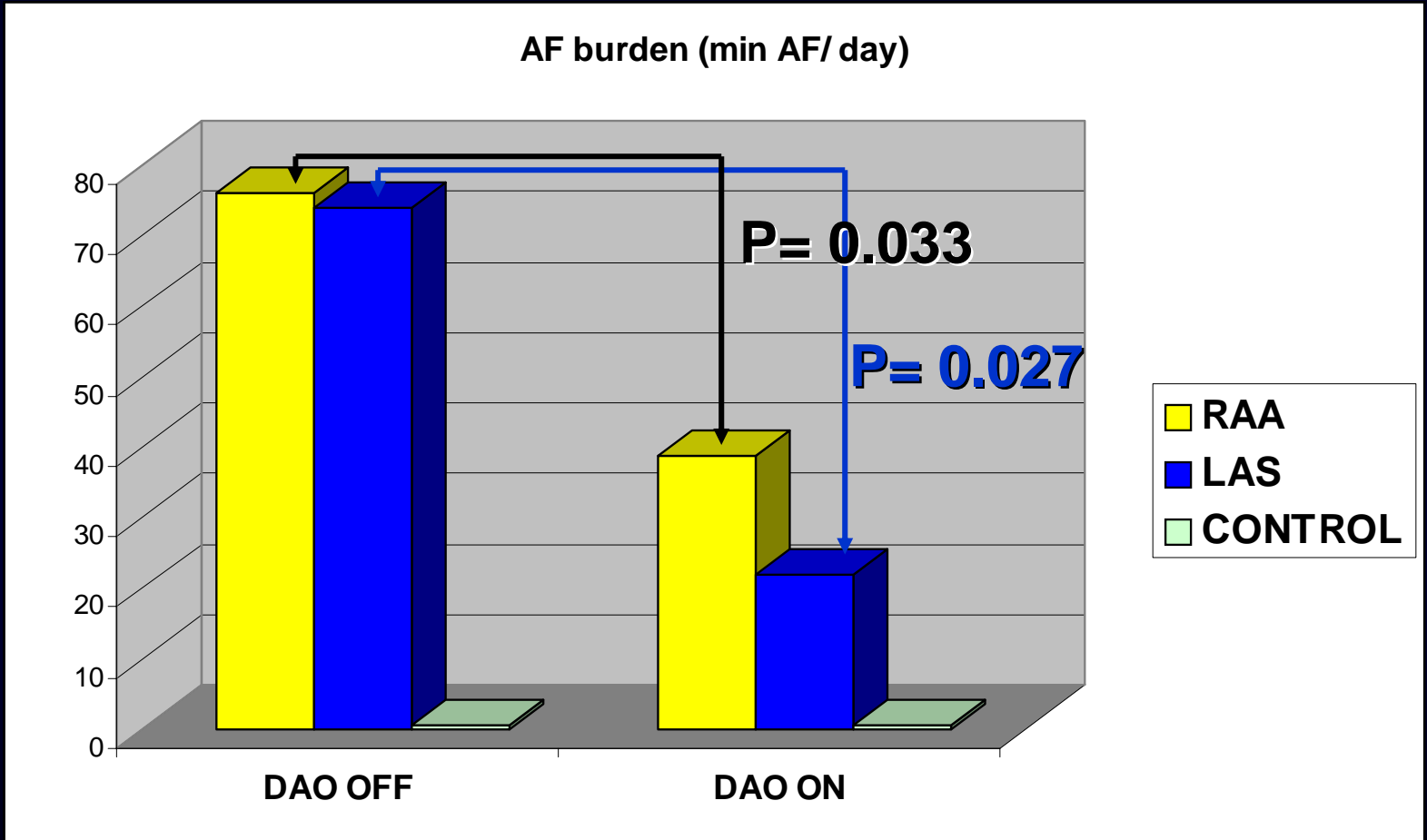


Interatrial activation time	
SR:	97,7 ± 26,5 msec.
RA pace:	136,3 ± 34,8 msec.
IAS pace:	17,3 ± 13,3 msec.

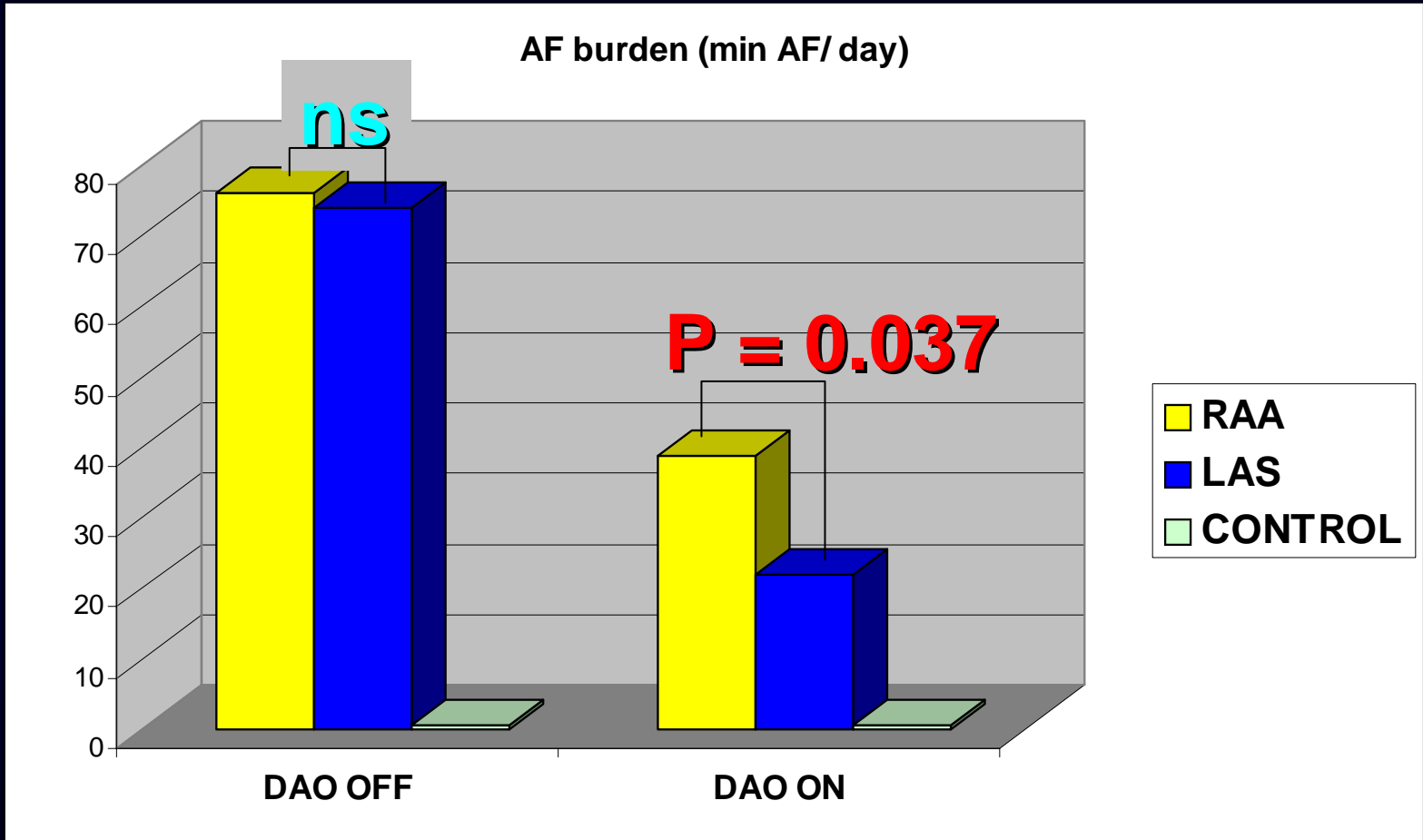
Padeletti et al. J intervent. Card. Electrophysiology 1999

Posterior triangle of Koch

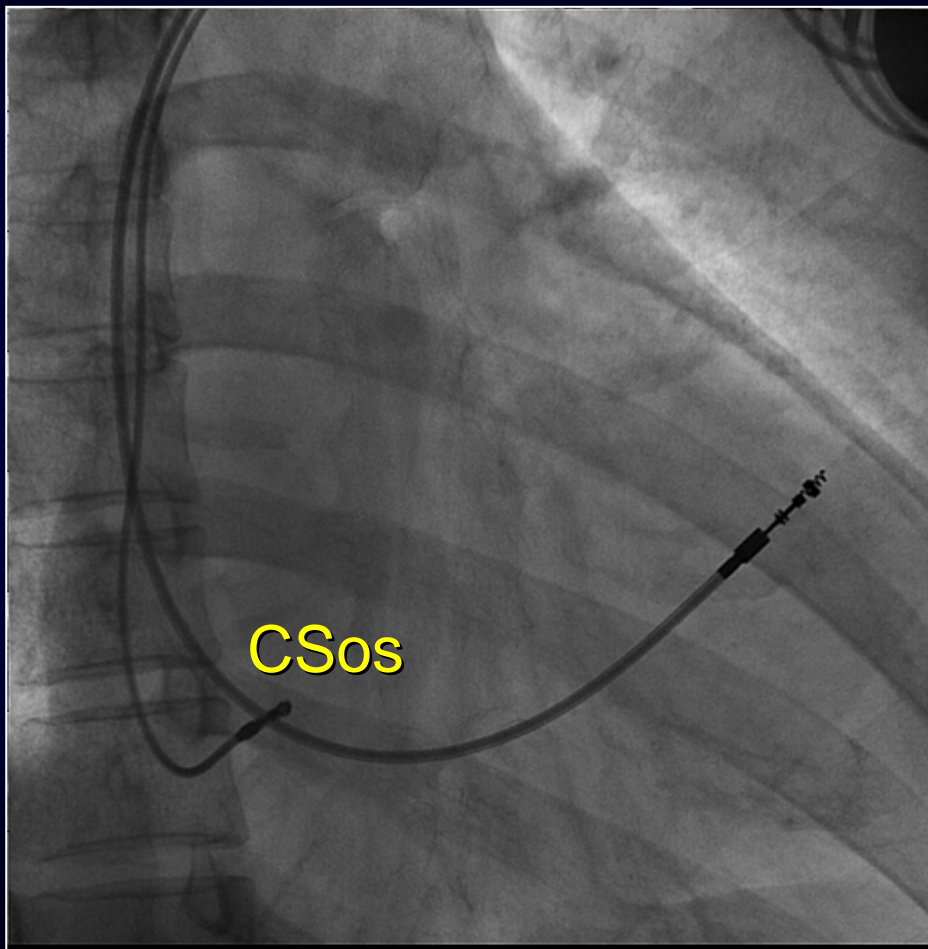
OASES AF Burden results



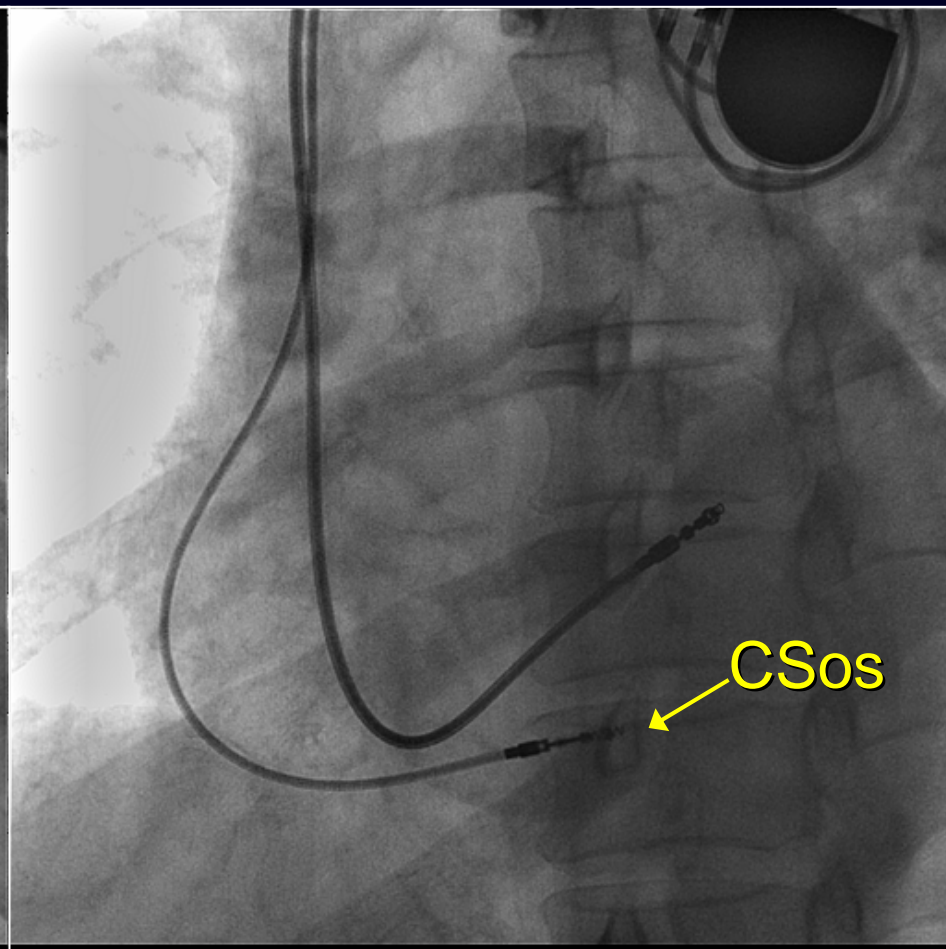
OASES AF Burden results



DDDR (Low Atrial Septal Pacing with RV High Septal Pacing)



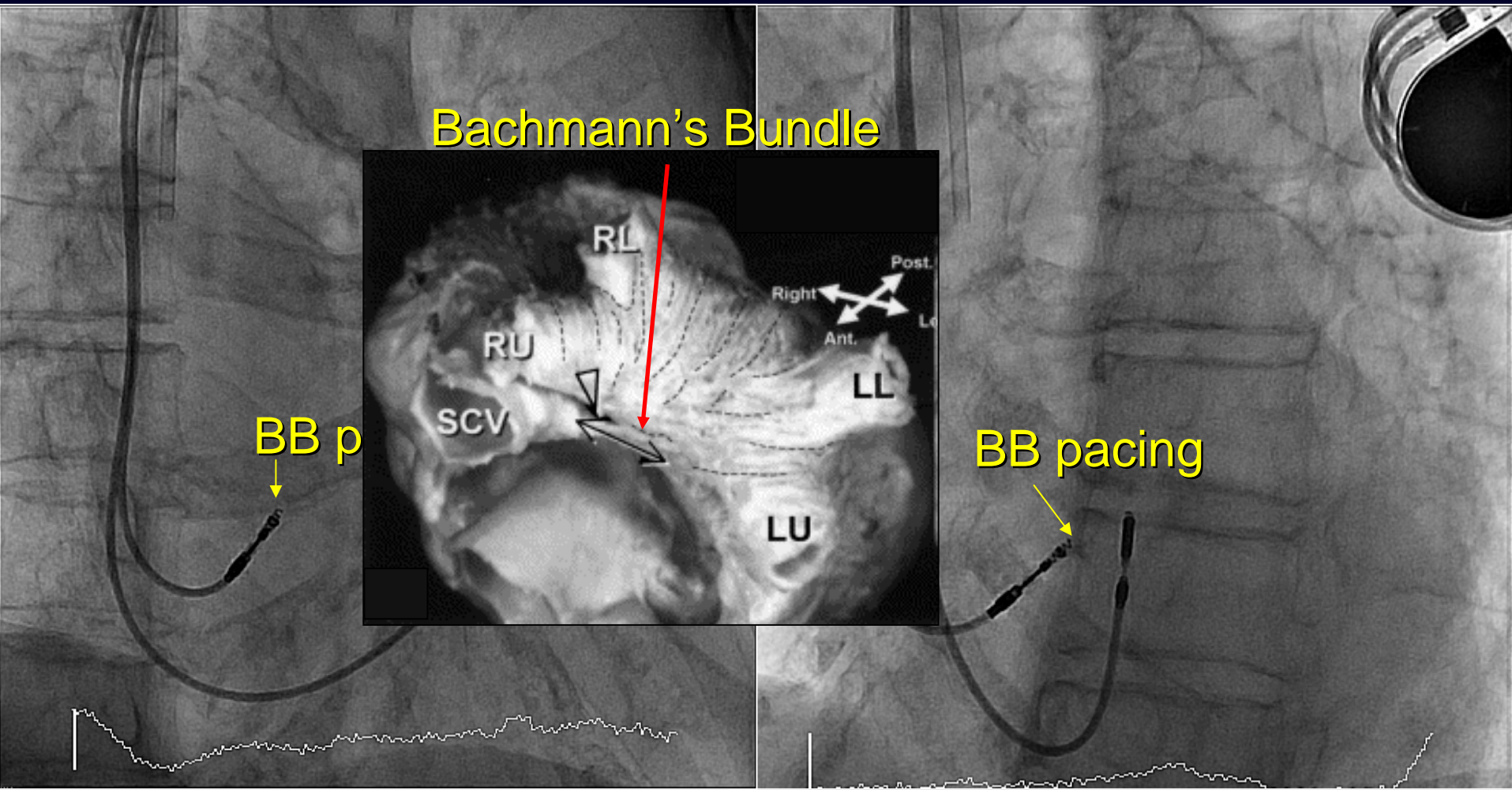
RAO30



LAO30

Bachmann's Bundle Pacing is Effective for Prevention of AF

Paced "P" wave shortening



RAO30

LAO30

75

Patients group	Risk factor	Estimated risk	Recommendation
Age < 65	Present	High	Warfarin
	Absent	Low	Aspirin or nothing
Age 65-75	Present	High	Warfarin
	Absent	Low	Warfarin or aspirin
Age >75	Present	High	Warfarin
	Absent	Low	Warfarin

Recommendations: Anticoagulation for AF

Clinical Background

- Rheumatic heart disease, age < 75 yr.
- “Lone” atrial fibrillation, age < 65 yr.
- High risk, age < 75 yr.
- High risk, age > 75 yr.
- Patients with major contraindications to warfarin:

Treatment

- Warfarin (INR 2.0 - 3.0)
- ASA 325 mg/day
- Warfarin (INR 2.0 - 3.0)
- Warfarin (INR 1.5 - 2.5)
- ASA 325 mg/day

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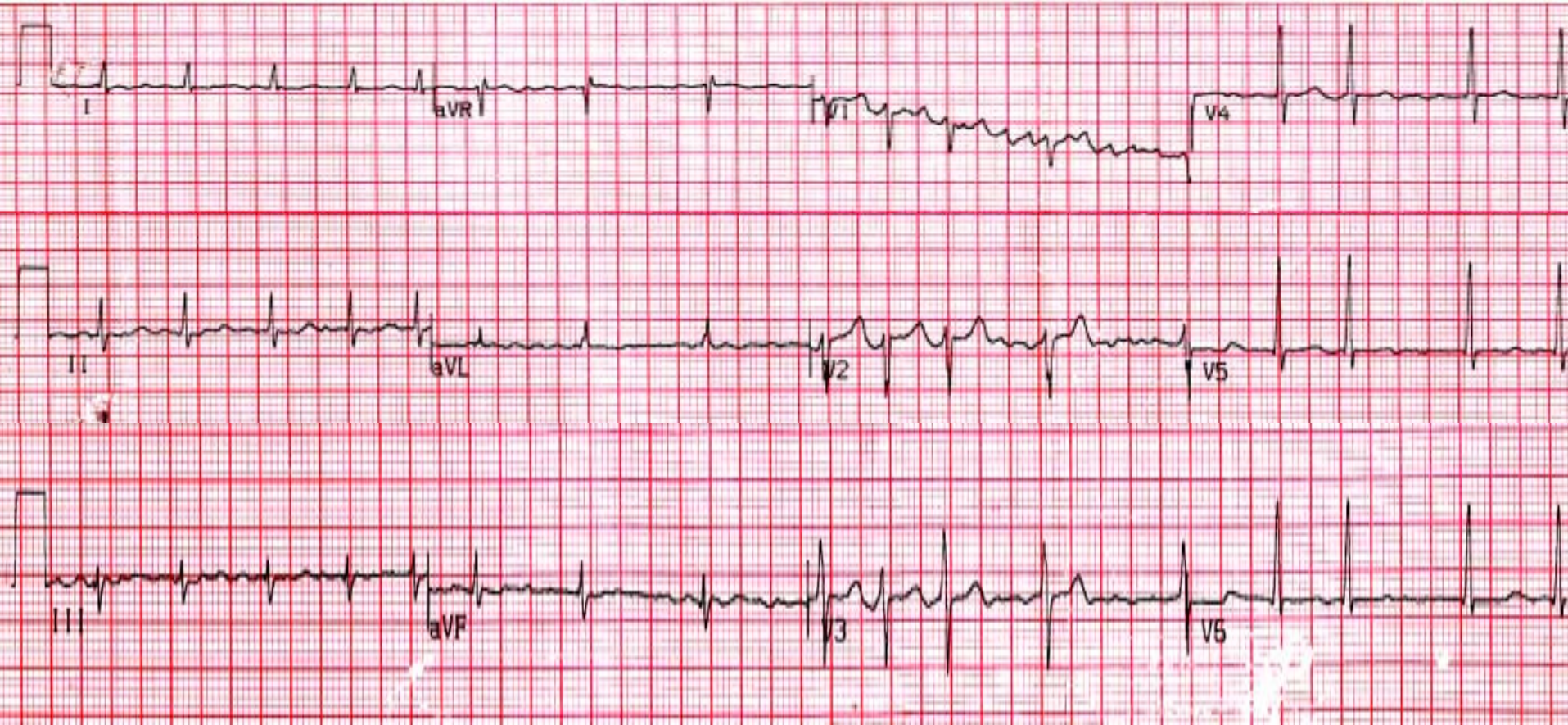
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Case #5, M/38

Baseline ECG



Case #5, M/38

2-D Echocardiography



25%

72

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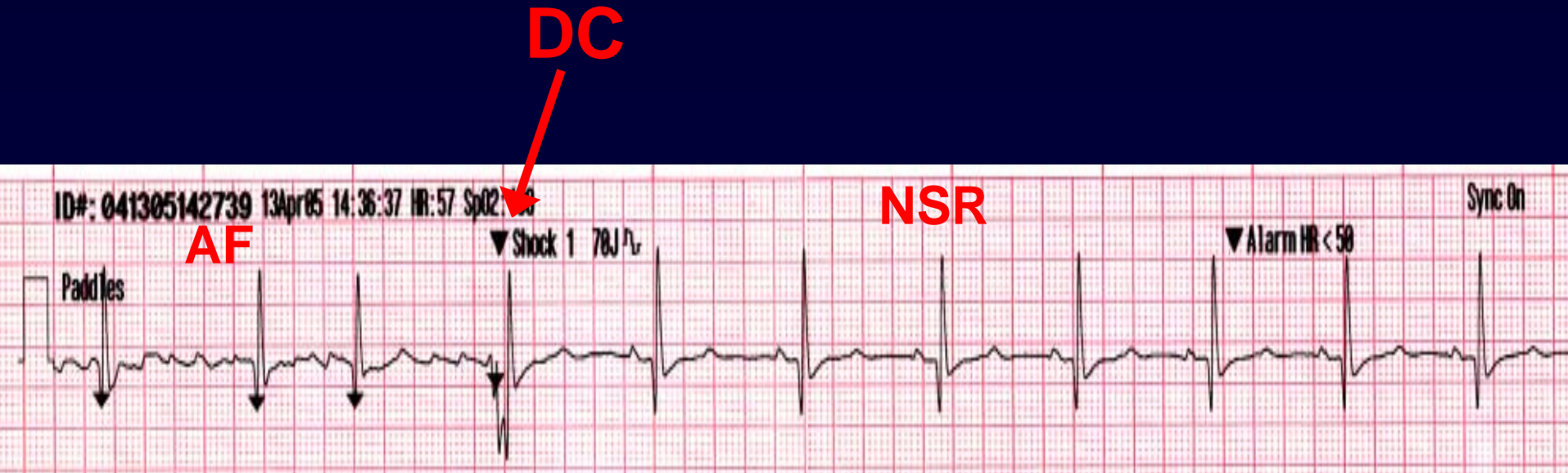
- 1) ACEI or ARB + Aldosterone antagonist + Warfarin PO
- 2) Propafenone PO + Warfarin PO
- 3) Pacemaker Implantation with His ablation
- 4) Catheter ablation for AF
- 5) Digoxin + Diuretics + Aspirin PO
- 6) DC cardioversion + Amiodarone + Warfarin PO
- 7) ARB only for BP control



5, M/38

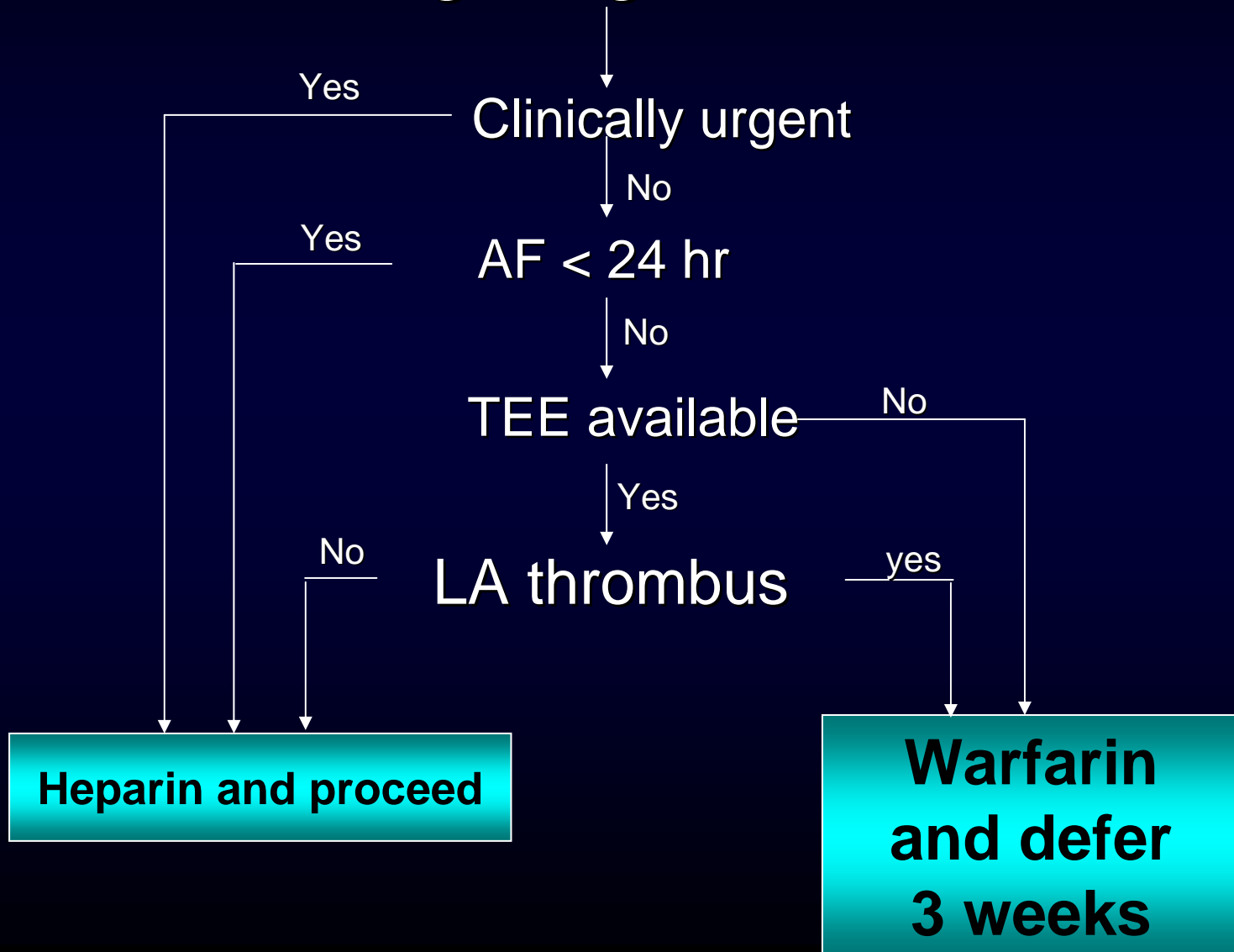
ACEI + Aldosterone antagonist + Warfarin PO for 6 weeks
DC cardioversion after TEE

No LA thrombi/SEC on TEE, PT: INR 2.4



Anticoagulation During Cardioversion

AF requiring cardioversion



Assessment of Cardioversion Using Transesophageal Echocardiography

TEE: 619, non-TEE: 603

Embolism 5 (0.8%) vs. 3 (0.5%)

Hemorrhage

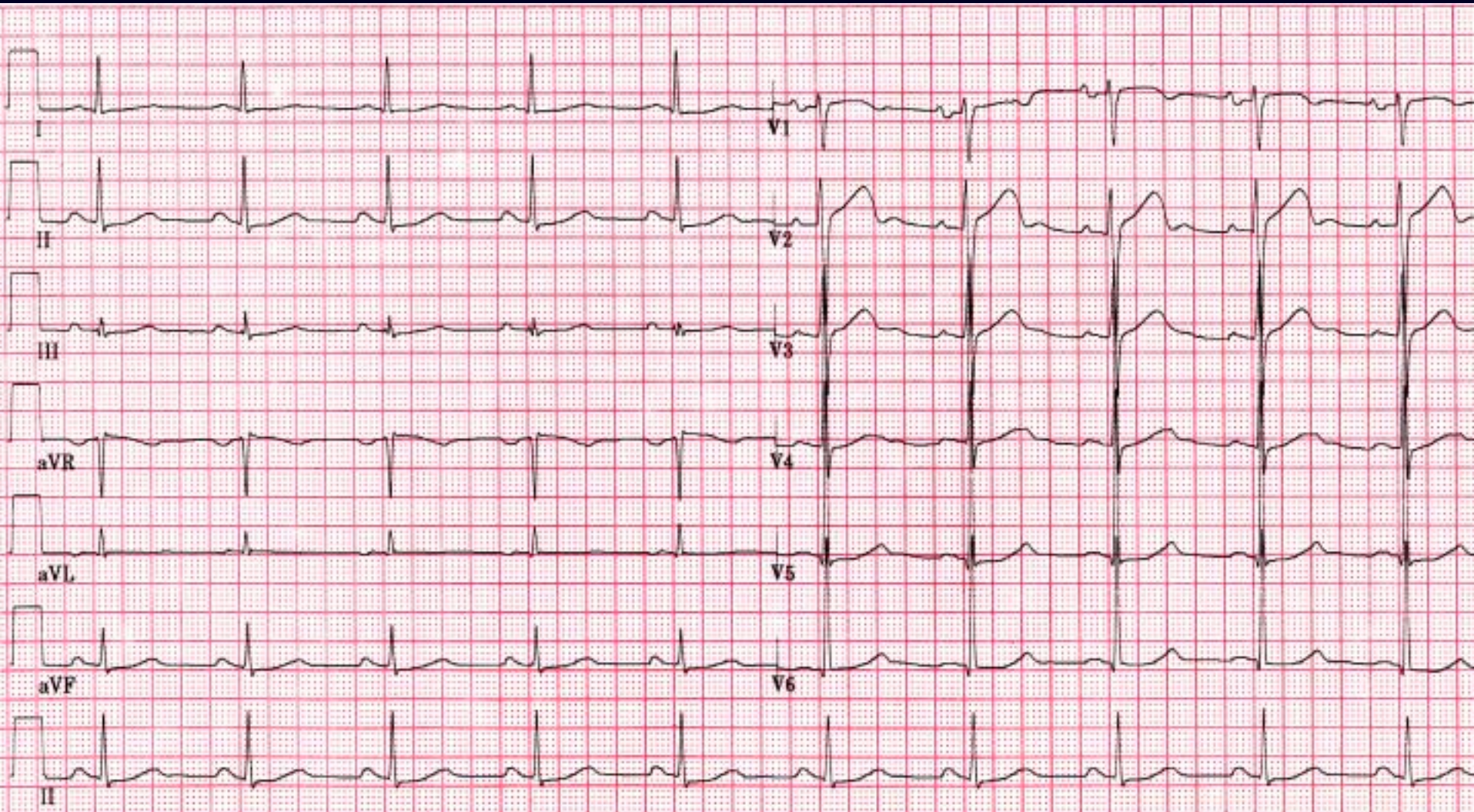
18 (2.9 %) vs. 33 (5.5 %) $P=0.03$

Successful restoration of SR

440 (71.1%) vs. 393 (65.2%) $P=0.03$

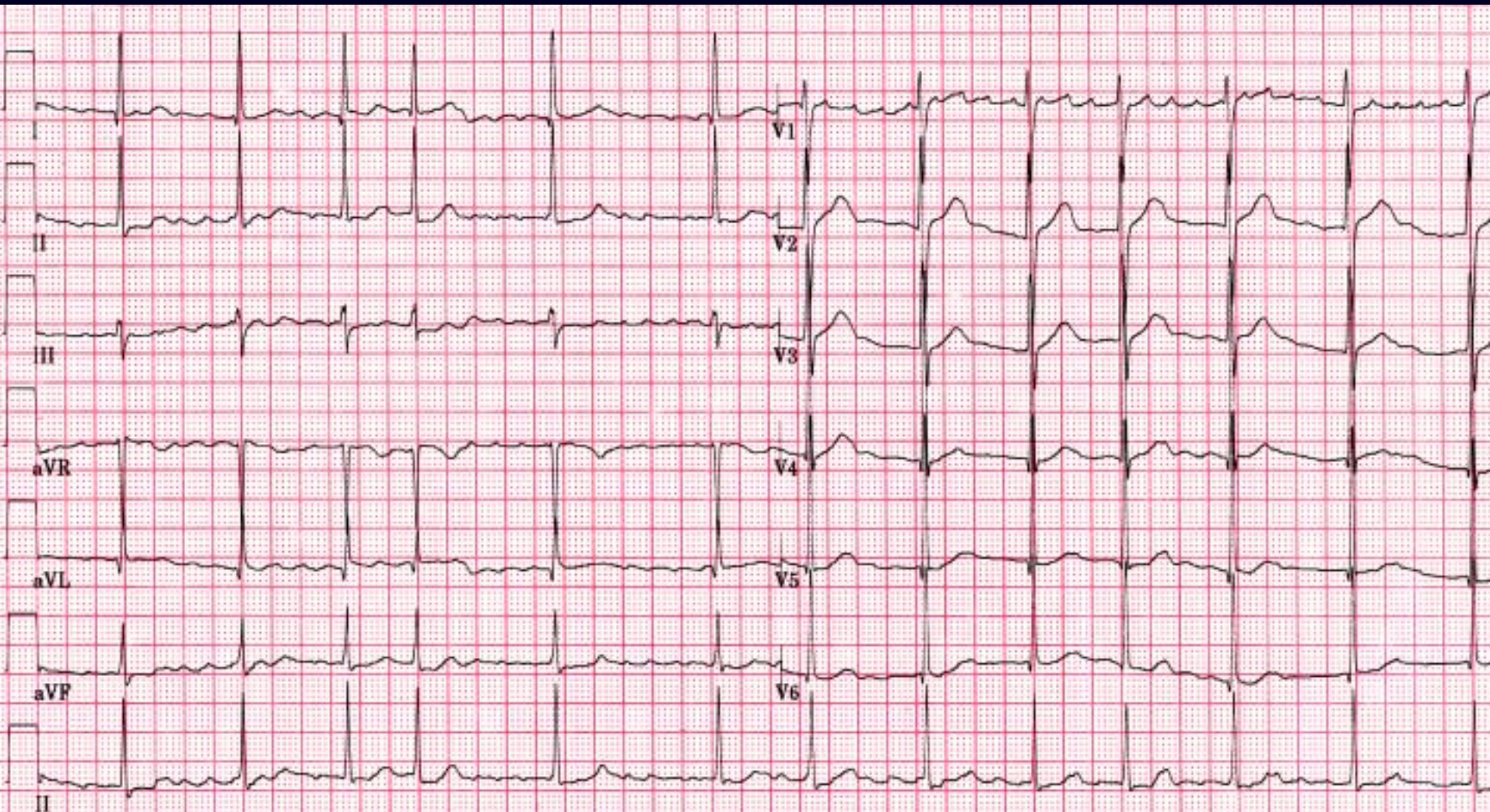
5, M/38

Post-CV Maintain PO Amiodarone • Post-CV 4 weeks, EF 48%



5, M/38

Recurred AF post-CV 4 months, Amiodarone + Warfarin PO accompanied by chest fluttering & SOB



M/38,

- 1) Recurred Persistent AF post-CV 4 months
- 2) Symptomatic
- 3) LV dysfunction (EF:30%)
- 4) Amiodarone + ACEI+ Warfarin (INR:2.2)

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- 1) Amiodarone dose ↑
- 2) Change to class Ic agents
- 3) Rate control with digoxin and/or verapamil
- 4) DC Cardioversion
- 5) Catheter ablation for AF

Is **Rhythm Control**
really better than
Rate Control
for relief of symptoms
with fewer adverse
effects and improved
survival ?

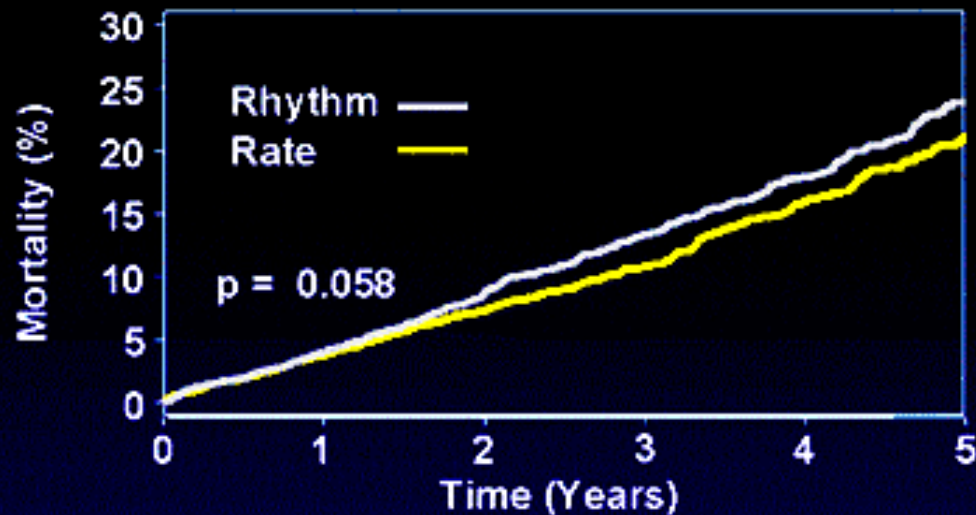
Trial of Rate vs. Rhythm Control

	N	age	AF	F/U
PIAF	252	60	Persistent <1 yr	1.0 yr
RACE	522	68	Persistent	2.3 yr
AFFIRM	4,060	69.7	Persistent (First onset AF 35.5%)	3.5 yr
STAF	200	66	Persistent < 2 yr	19.6 M

AFFIRM

Atrial Fibrillation Follow-up Investigation of Rhythm Management

Primary Endpoint: All-Cause Mortality



Rhythm N:	2033	1932	1807	1316	780	255
Rate N:	2027	1925	1825	1328	774	236

N Engl J Med 2002;347:1825-33

AFFIRM

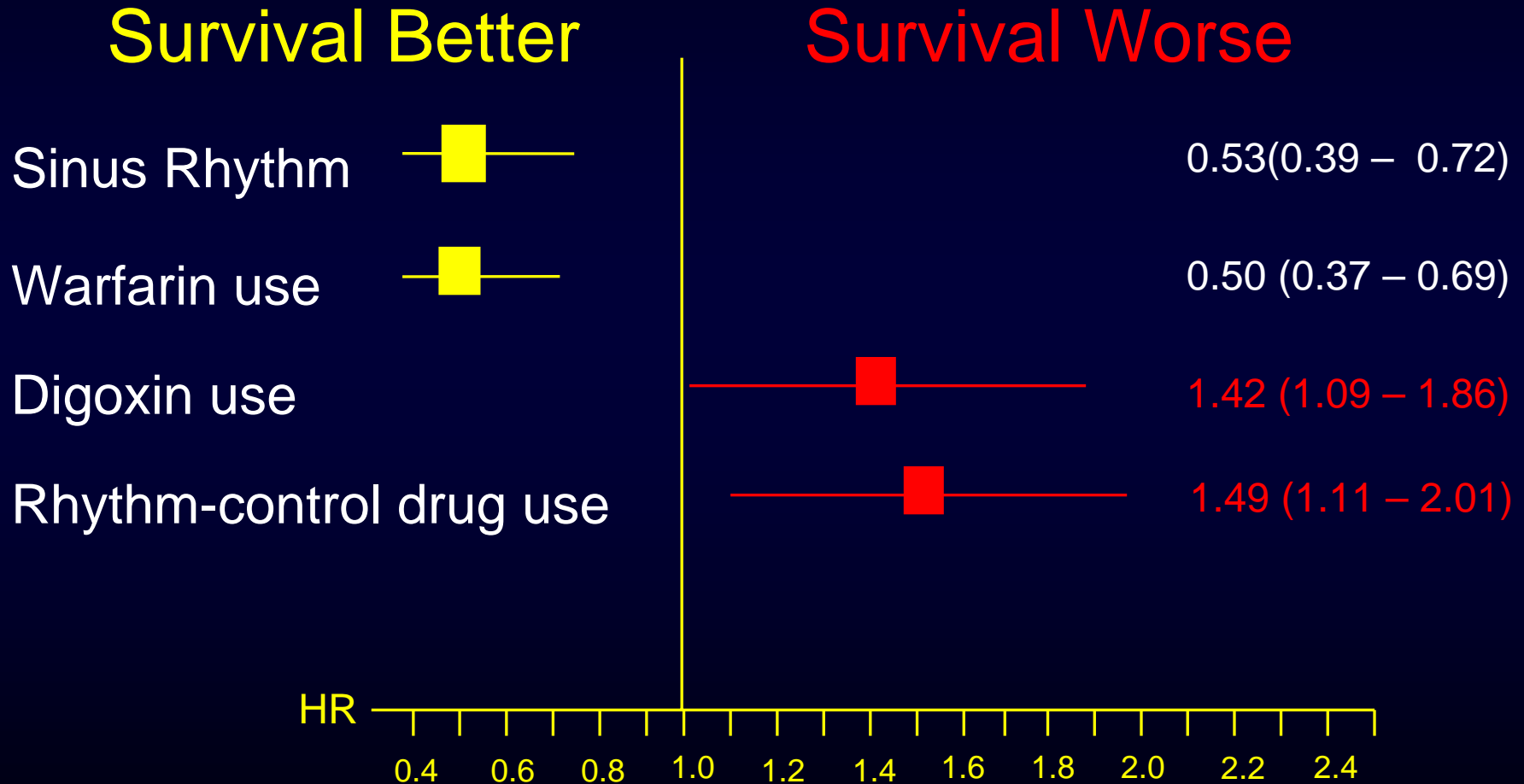
Rhythm-control strategy offered no survival advantage over the **rate-control** and that there were potential advantages, such as lower risk of adverse drug effects, with the **rate-control** approach.

AFFIRM

Does **sinus rhythm** offer no survival advantage over the **atrial fibrillation** ?

AFFIRM

On-treatment analysis



Association of Sinus Rhythm but not AADs with improved survival

**currently available AADs are
neither highly efficacious nor
completely safe.**

Non-Pharmacologic Therapy in AFFIRM

Rate Control

Catheter AVN ablation: **5.2%** (n=105)

Rhythm Control

Catheter ablation: **0.7%**(n=14)

Maze procedure: **0.2%**(n=4)

Negative aspects of rhythm control

Include

- 1) the poor efficacy of the AADs
- 2) the potential to cause adverse effects
- 3) low incidence of non-pharmacologic therapy

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ESTABLISHED IN 1812

DECEMBER 2, 2004

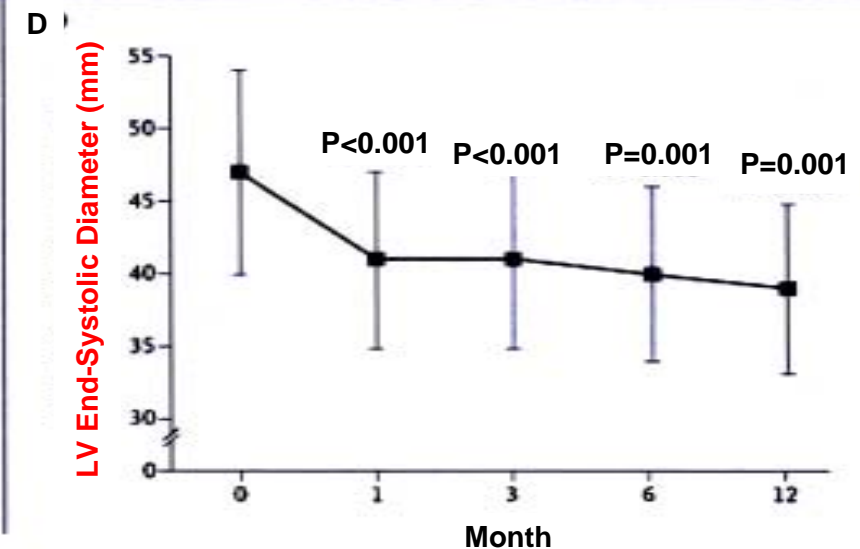
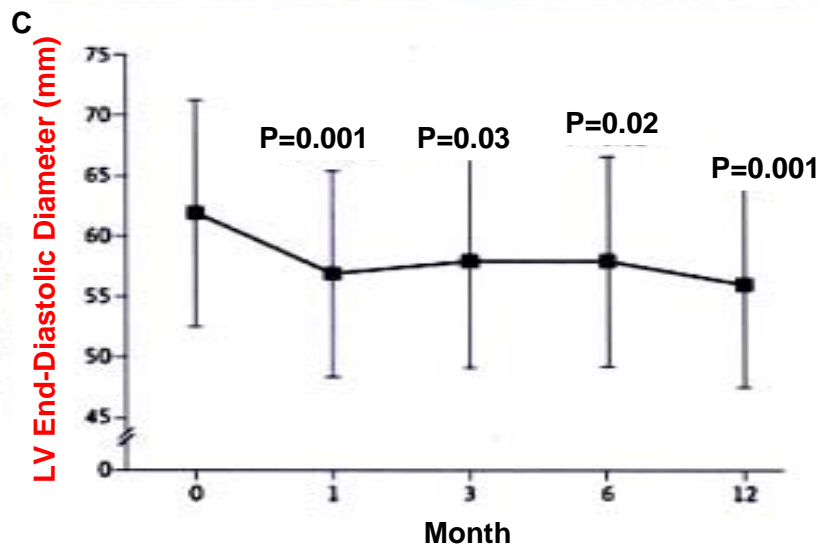
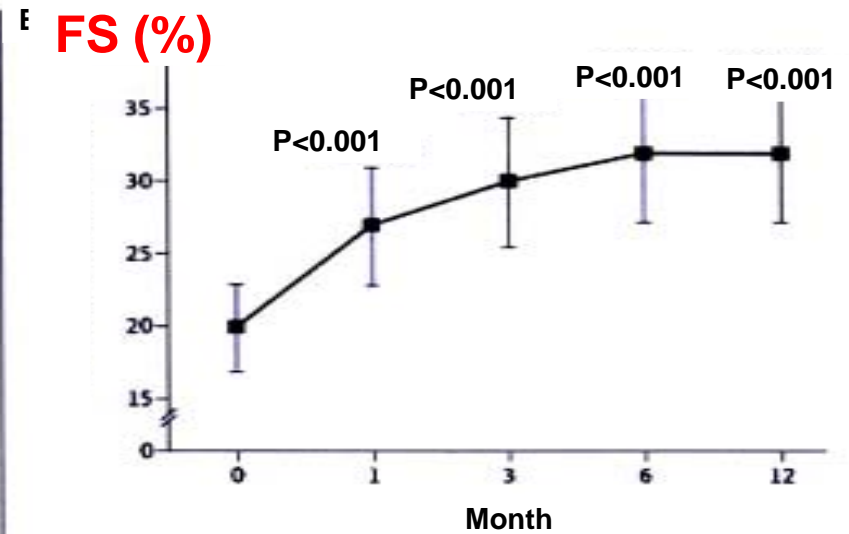
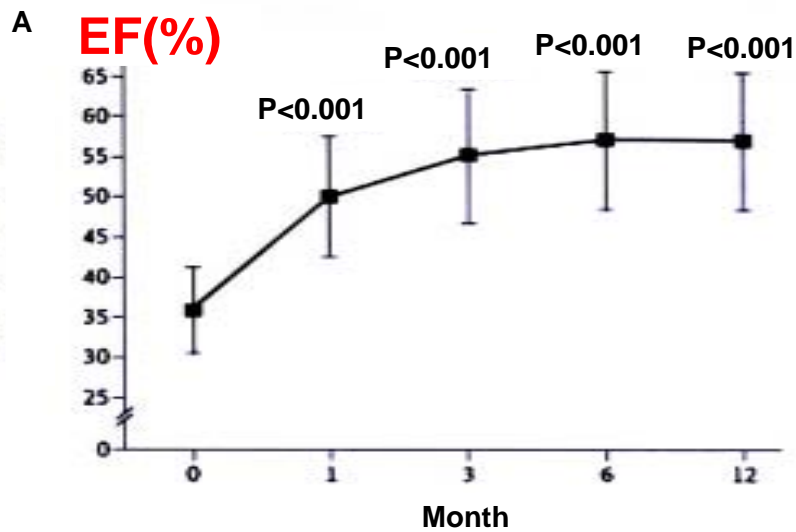
VOL. 351 NO. 23

Catheter Ablation for Atrial Fibrillation in Congestive Heart Failure

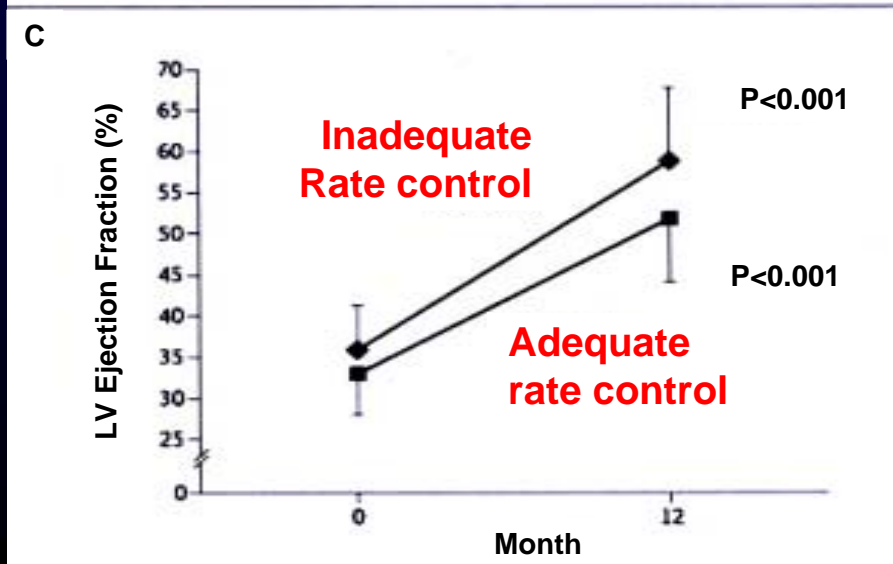
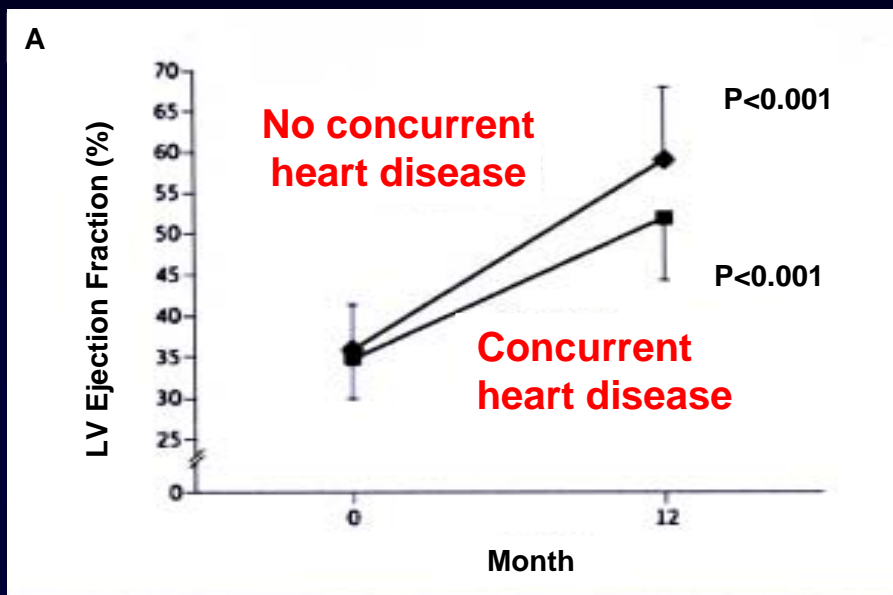
Li-Fern Hsu, M.B., B.S., Pierre Jaïs, M.D., Prashanthan Sanders, M.B., B.S., Ph.D., Stéphane Garrigue, M.D., Ph.D.,
Mélèze Hocini, M.D., Frédéric Sacher, M.D., Yoshihide Takahashi, M.D., Martin Rotter, M.D.,
Jean-Luc Pasquié, M.D., Ph.D., Christophe Scavée, M.D., Pierre Bordachar, M.D., Jacques Clémenty, M.D.,
and Michel Haïssaguerre, M.D.

- ❖ 58 with CHF and a LVEF <45 % undergoing ablation for AF
- ❖ 58 patients without CHF undergoing ablation for AF:control

Improvement in LV Function and Dimensions After Ablation in Patients with CHF



Effect of Concurrent Structural Heart Disease and Rate Control before Ablation on LV Function after Ablation among Patients with CHF



Catheter Ablation for AF in CHF

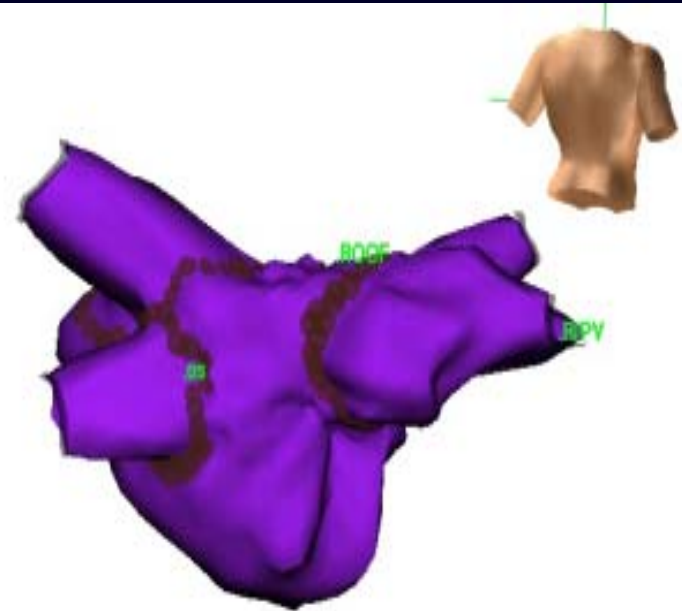
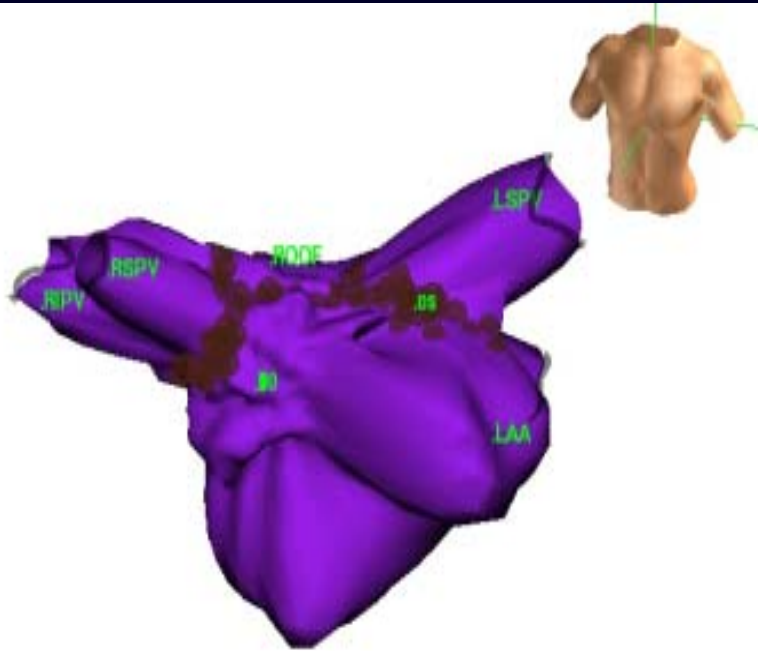
- ❖ Restoration and maintenance of SR by catheter ablation without the use of drugs in patients with CHF and AF significantly improve cardiac function, symptoms, exercise capacity, and QOL.

Hsu L-F, et al. NEJM 2004;351:2373

5, M/38

Catheter Ablation for AF

4 LA-PV Junctions and Roof Linear Ablation

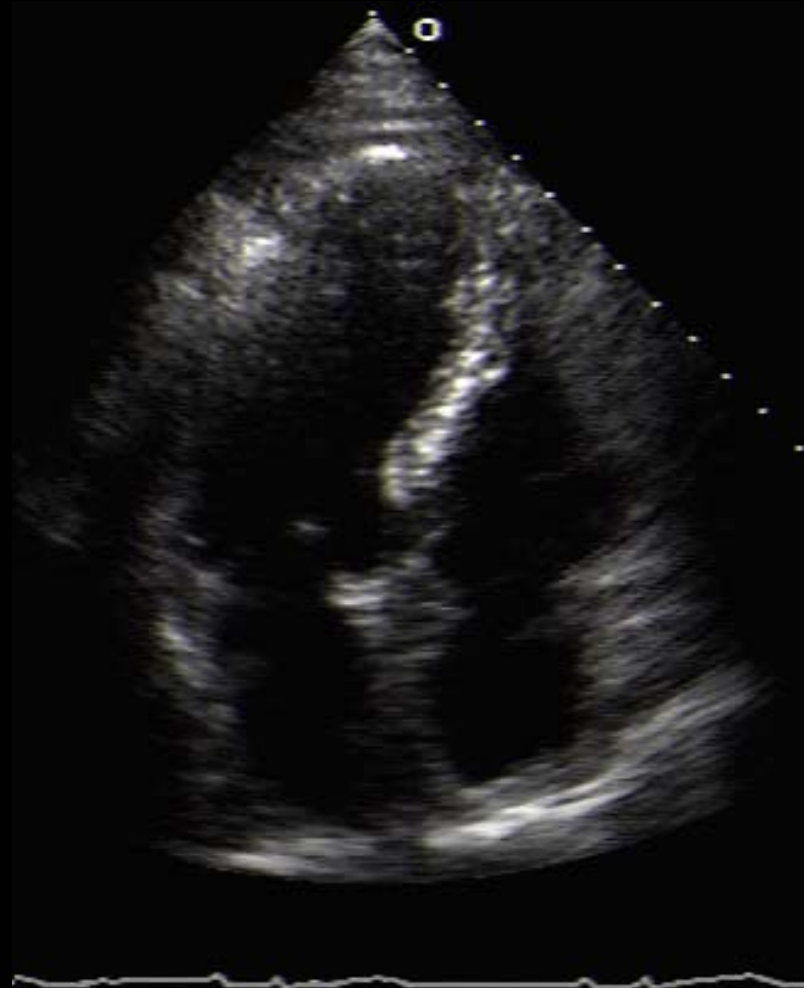


5, M/38

Immediate Before RFCA
EF 25%



Post-RFCA 12 Months
EF 55%



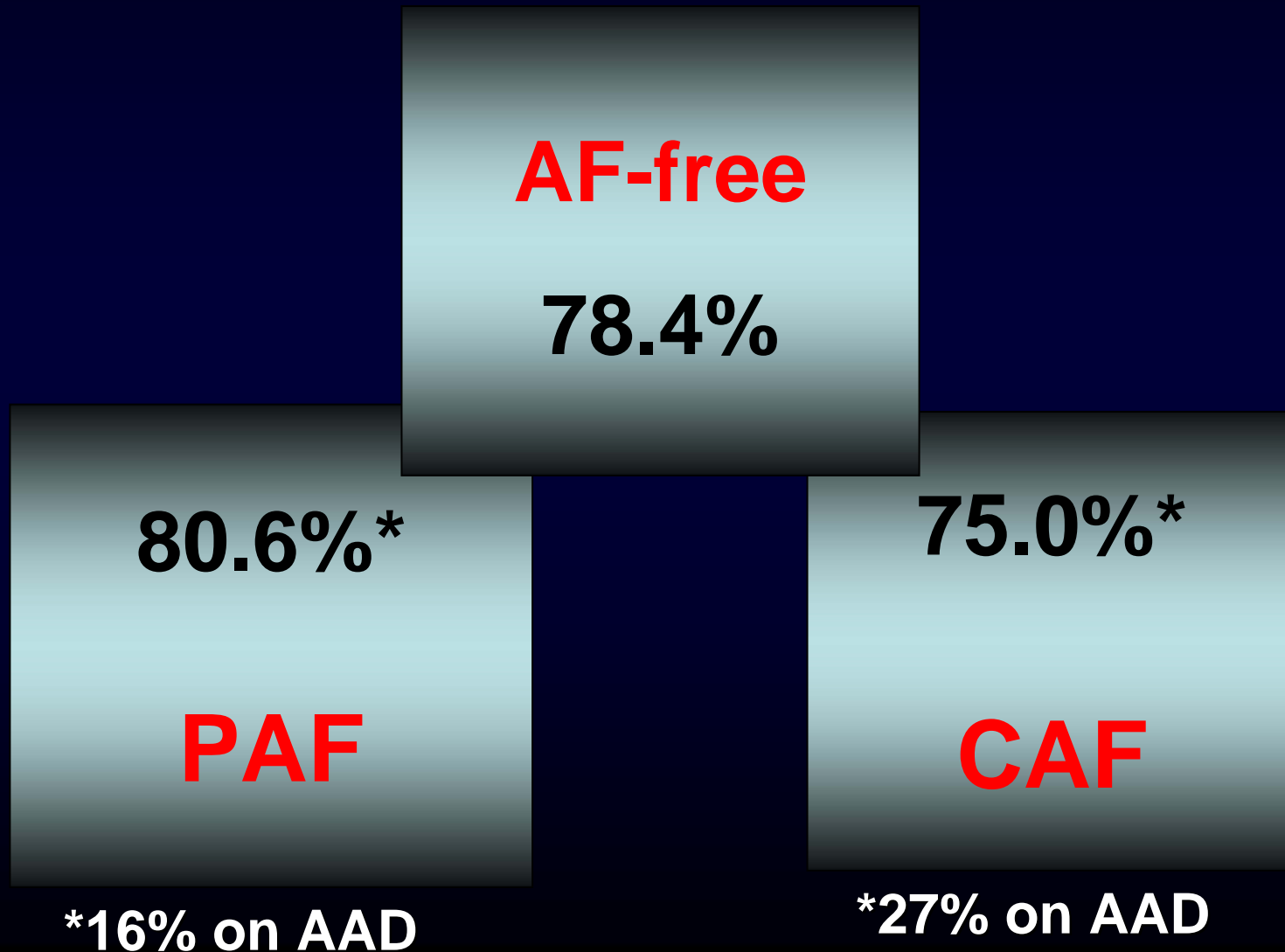
Post-RFCA Follow Up

- ❖ No Symptomatic Arrhythmias
- ❖ No AF on F/U Holter
- ❖ Stop Warfarin
- ❖ Stop Amiodarone (in 9 months)

Catheter Ablation of AF in KUMC

2003, 4 - 2005, 3

Follow-up for 9.8 ± 6.1 months





Conclusions

1)

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- ✓ Anticoagulation for high risk patients
- ✓ . , LV dysfunction

2)

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- ✓ Pill-in-the-pocket approach

3)

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- ✓ Effective rhythm control: Catheter ablation for AF



4) 75

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- ✓ Pacemaker implantation, Pacing site: low septal or BB
- ✓ Anticoagulation, INR: 1.5-2.5

5)

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- ✓ Rhythm control: DC cardioversion + Optimal drug therapy
Catheter ablation