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PREGRESSI EPISODI DI FIBRILLAZIONE ATRIALE

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Ordine dei Medici ed Odontoiatri

21 Marzo 2012

Atrial Fibrillation (AF)

- Chaotic and disorganized atrial activity
- Irregular heartbeat
- Most common sustained arrhythmia
- Can be symptomatic or asymptomatic
- Incidence increases with age

Forms of Atrial Fibrillation

- Paroxysmal
 - Paroxysmal lasting less than 48 hours, transient
- Persistent
 - An episode of AF lasting greater than 48 hours, which can still be cardioverted to sinus rhythm
- Permanent
 - Inability of pharmacologic or non-pharmacologic methods to restore sinus rhythm

Lone (Idiopathic) AF

- Definition
 - Absence of any potential heart disease and no evidence of ventricular dysfunction
- Usually asymptomatic
- Could be genetic
- Significant stroke rate > 65 years of age
- Anticoagulation

Associated Diseases

- Hypertension
- Coronary heart disease
- Valvular heart disease
- Cardiomyopathy
- Sick sinus syndrome
- Congenital heart disease
- Cardiac surgery
- Others
- **ATHLETES**

Symptoms

- Palpitations
- Presyncope
- Fatigue
- Chest pain
- Dyspnea
- Syncope

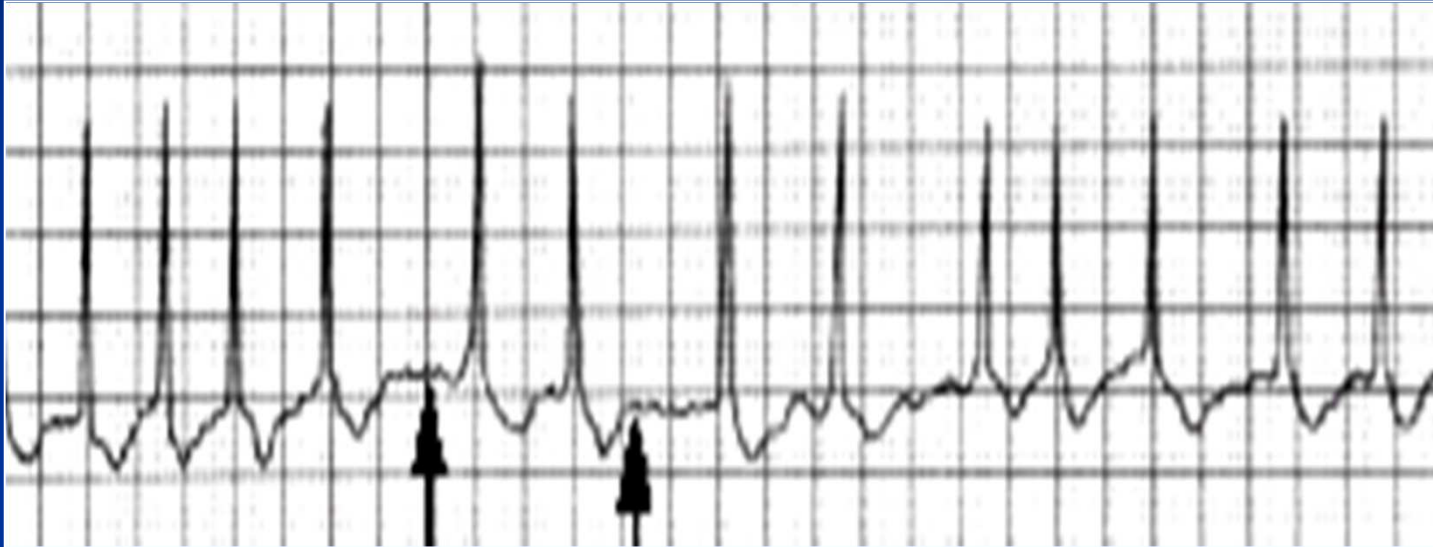
Mechanism

- Mechanism:
 - Multiple wavelets of reentry
 - Ectopic focus
- Termination:
 - Pharmacologic therapy
 - Cardioversion
 - Spontaneous

ECG Recognition

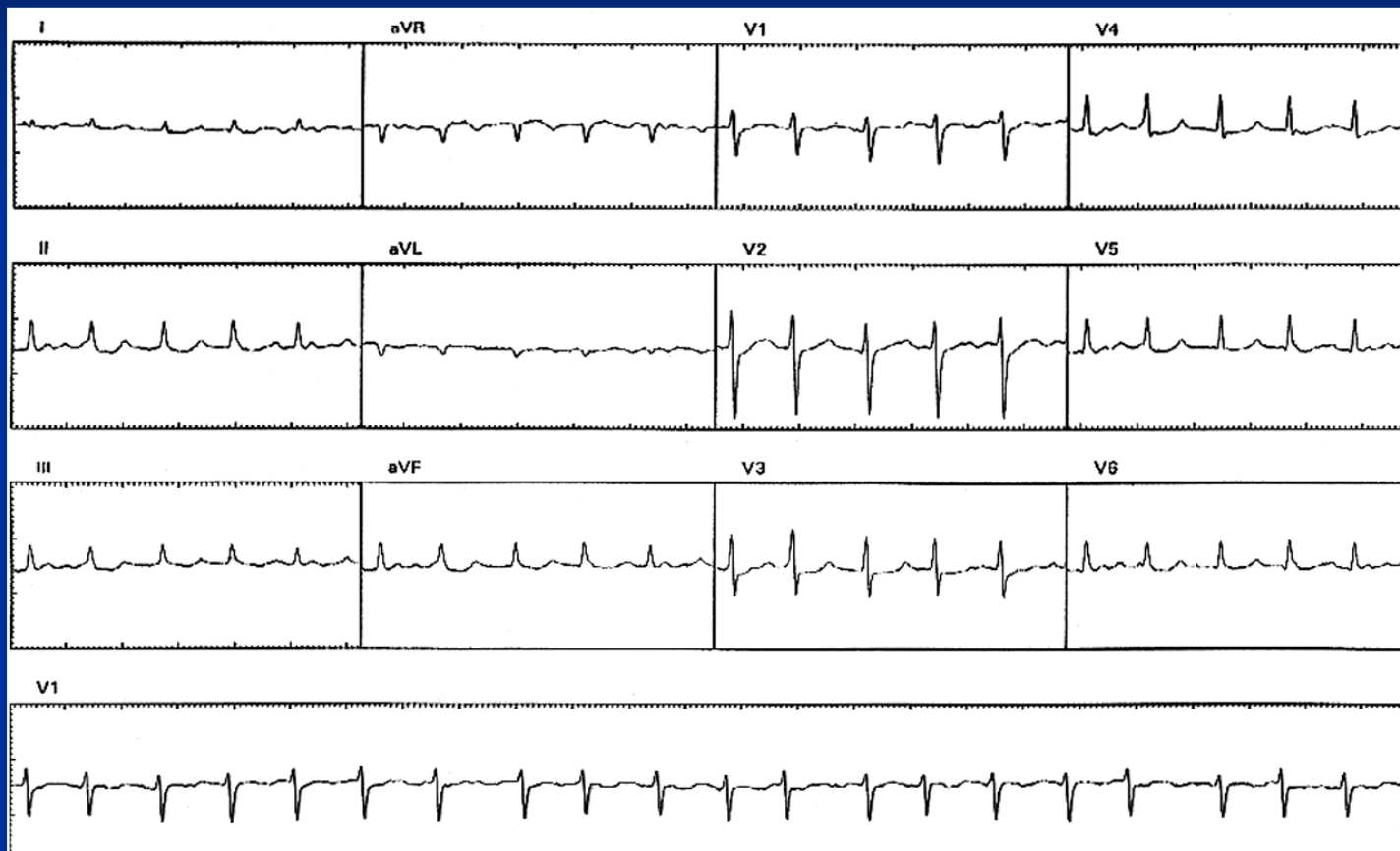
- Atrial Rate: > 300 bpm
- Rhythm: Irregular
- Ventricular Rate: Variable
 - Dependent upon:
 - AV node conduction properties
 - Sympathetic and parasympathetic tone
 - Drugs
- Recognition: Absence of P waves

ECG Recognition

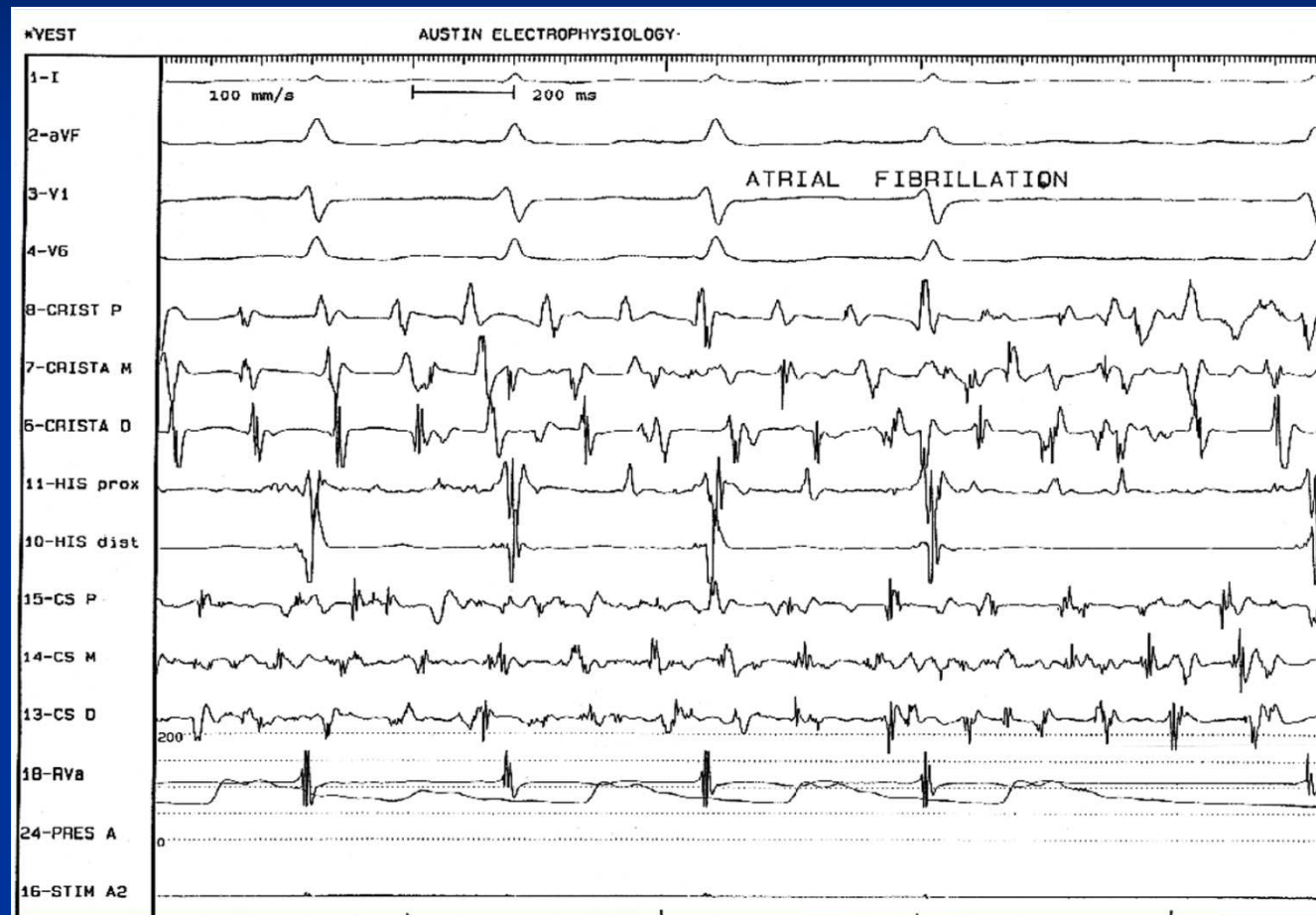


- Absence of discrete P waves
- Chaotic atrial activity
- Ventricular rate irregular

ECG Recognition



Intracardiac Recording



Other Characteristics

- Lost atrial kick and decreased filling times can result in congestive heart failure
- Ventricular rates < 100 bpm suggest AV conduction disease
- Irregular ventricular rhythm > 180 bpm
 - Suggest an accessory pathway (broad QRS)
 - Enhanced AV nodal conduction (narrow QRS)

Treatment Options

- Rate control during AF
 - Pharmacologic therapy
 - Catheter ablation
 - AV junction ablation (ablate and pace)
 - AV nodal modification
- Prevention of thromboembolism
 - Pharmacologic therapy
 - Warfarin
 - Aspirin

Causes of palpitations in athletes

Specific rhythm disturbances

Supraventricular rhythm disturbances

- sinus tachycardia
- premature atrial or junctional contractions (premature atrial contractions or premature nodal contractions)
- non-sustained and sustained supraventricular tachycardias
 - atrial flutter
 - atrial fibrillation
- re-entry arrhythmias, including Wolff-Parkinson-White syndrome and atrioventricular nodal re-entrant tachycardia

Ventricular rhythm disturbances

- premature ventricular contractions, and complex ventricular ectopy
- non-sustained and sustained ventricular tachycardia
 - sustained ventricular tachycardia
 - ventricular fibrillation

Underlying medical conditions that enhance cardiac irritability, and can either cause, or exacerbate many of the rhythm disturbances listed above

Any cardiac condition

- coronary
- valvular
- myocardial
- electrophysiological
- pericardial

Non-cardiac conditions known to cause cardiac irritability

- anaemia
- autonomic neuropathies, postural orthostatic tachycardia syndrome
- electrolyte disturbance
- fever
- hypersensitivity to β -stimulation
- hyper- or hypothyroidism
- hypo- or hyperglycaemia
- pheochromocytoma
- pulmonary diseases

Use of over-the-counter drugs, prescription medications, ingested cardiotoxic substances, supplements, or illicit drugs can either cause, or exacerbate above rhythms

Alcohol

Caffeine

Over-the-counter drugs

Prescription drugs (such as chemotherapeutic agents, mood-altering drugs)

Supplements with stimulants (such as caffeine, ephedra, bitter orange)

'Illicit and street drugs' (narcotics, cocaine, anabolic agents, androgenic steroids, β_2 stimulants, peptide hormones, mimetics and analogues, diuretics, agents with an anti-estrogenic activity, masking agents)

a Anxiety or panic disorders and their treatments can either cause, or exacerbate many of the rhythm disturbances listed in this table.

Diagnosis

- Screening, pre-competition examination
- ECG - at rest and during exercise when symptoms occur during physical activity
- Holter monitoring - for symptoms occurring within a 24-hour period
- Electrophysiologic evaluation - for special types of arrhythmias
- Other cardiologic testing - MRI, endomyocardial biopsy – according which device most likely to detect the rhythm disturbance

Treatment

- **Antiarrhythmic drugs**
(amiodaron, beta blockers, calcium-channel blockers)
- **Radiofrequency ablation** (return to sports provided there is no significant underlying heart disease present)
- **No participation in sport activities**
(known malignant disturbances, implantation of cardioverter-defibrillator device)

Conclusions

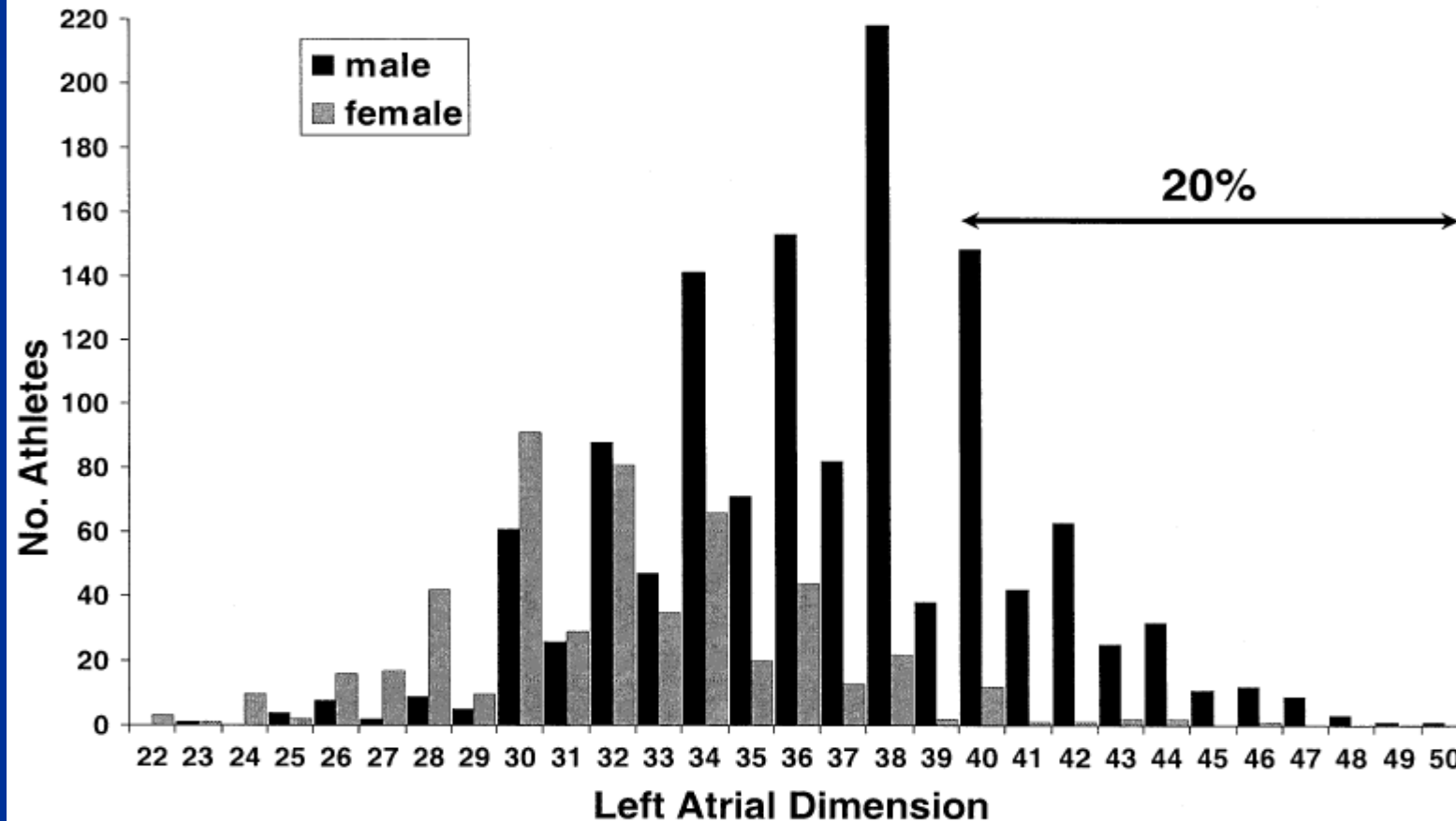
1. Palpitations in athletes in majority are benign
2. Prognosis relates to type of specific rhythm disturbance and presence or absence of underlying heart disease
3. Atrial fibrillation accounts for up to 9 % of rhythm disturbances in elite athletes (up to 40 % in those with long-standing symptoms)
4. Premature ventricular beats (PVCs) - heart disease most likely when more than 2000 PVCs/24 hours are counted
5. Careful examination, monitoring, proper treatment, further athletic activities recommendations are of crucial importance to prevent sudden cardiac death

Athletics and Cardiac Function

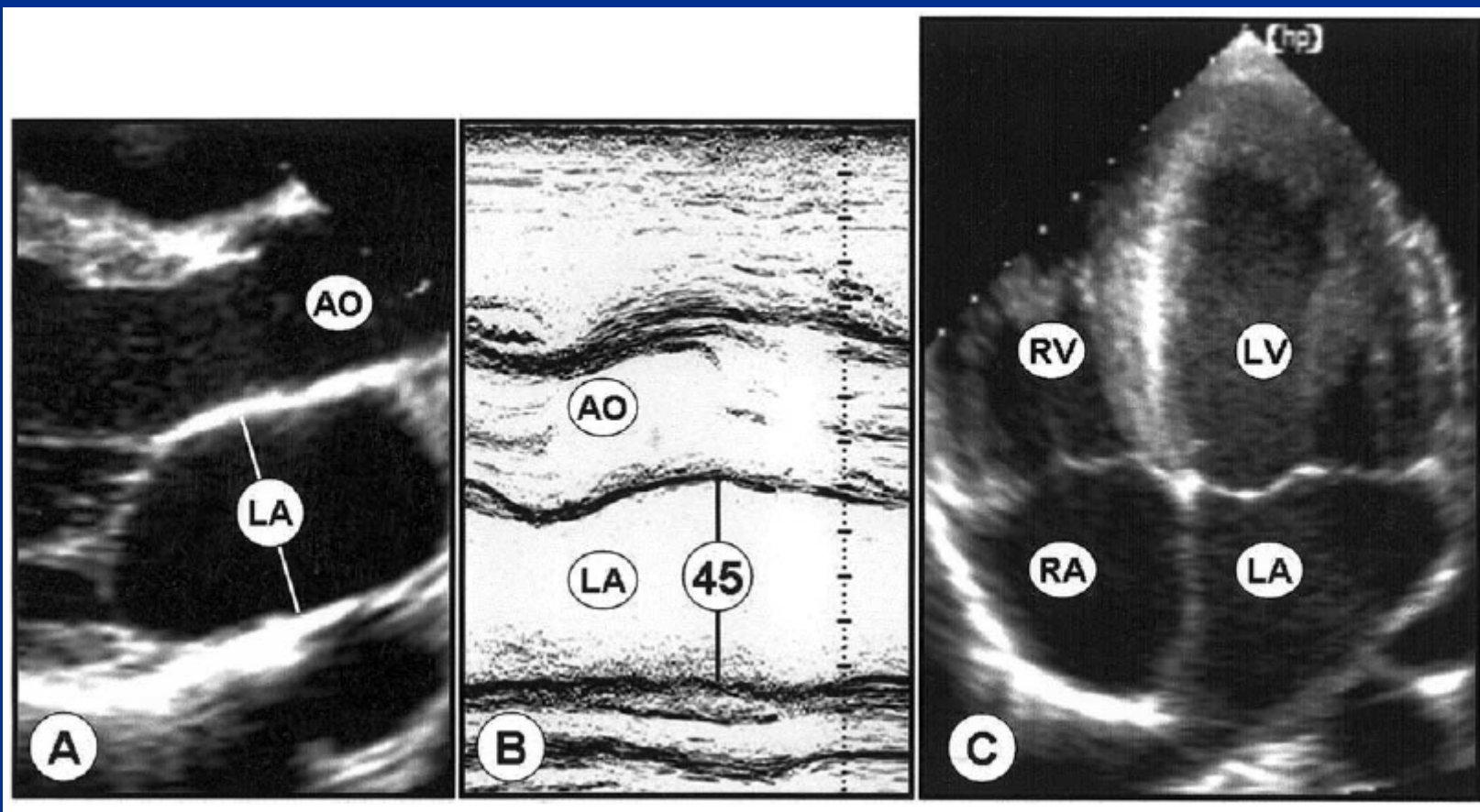
Prevalence and Clinical Significance of Left Atrial Remodeling in Competitive Athletes

Antonio Pelliccia, MD,* Barry J. Maron, MD,† Fernando M. Di Paolo, MD,* Alessandro Biffi, MD,* Filippo M. Quattrini, MD,* Cataldo Pisicchio, MD,* Alessandra Roselli, MD,* Stefano Caselli, MD,* Franco Culasso, PhD‡

Rome, Italy; and Minneapolis, Minnesota

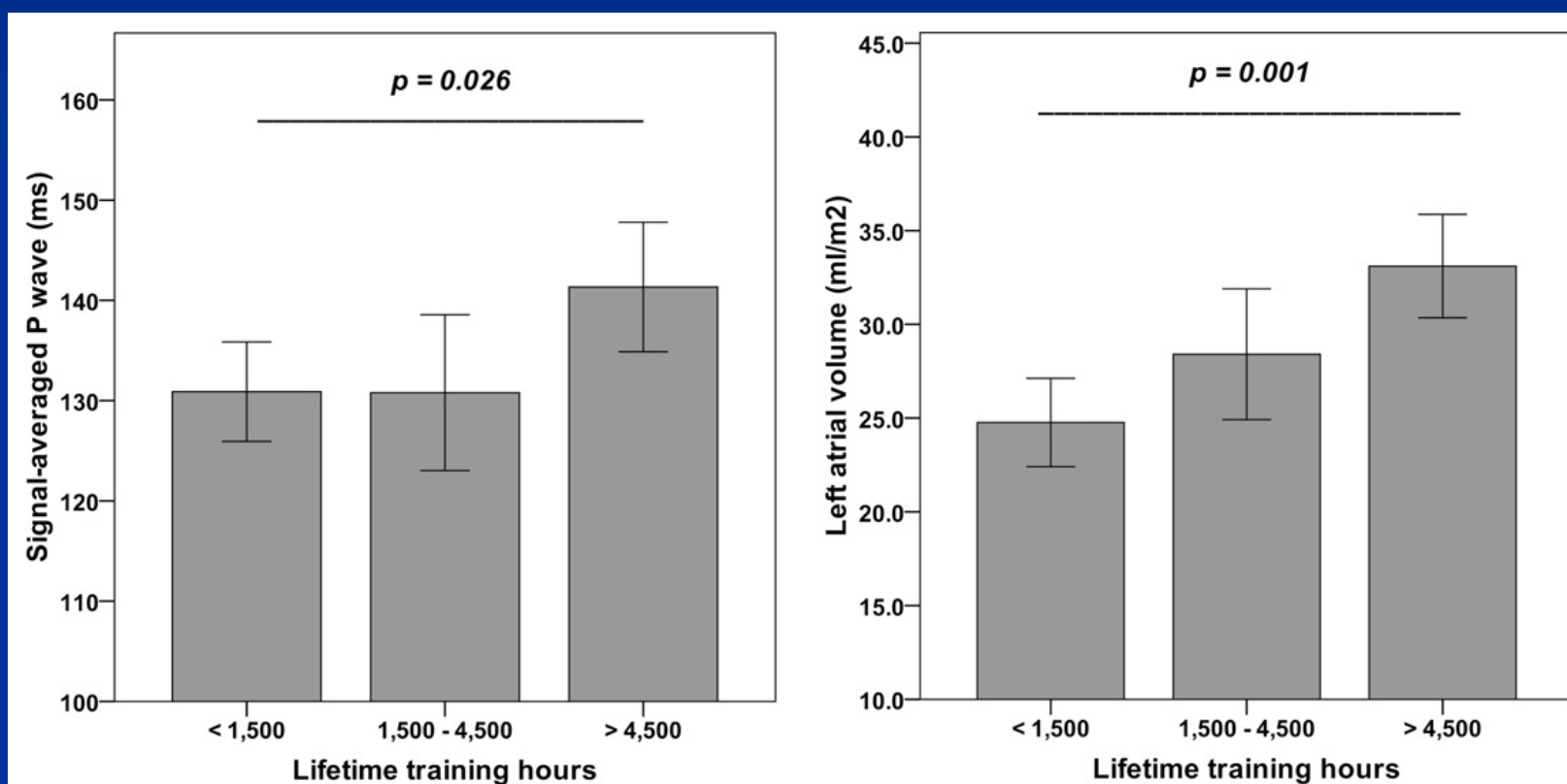


LA Remodelling



Atrial Remodeling, Autonomic Tone, and Lifetime Training Hours in Nonelite Athletes

Matthias Wilhelm, MD^{a,*}, Laurent Roten, MD^b, Hildegard Tanner, MD^b, Ilca Wilhelm, MD^c, Jean-Paul Schmid, MD^a, and Hugo Saner, MD^a



Case Background:

46 yr old athletic woman (cyclist, runner)

3 yr h/o increasingly frequent rapid palpitations → paroxysmal AF

- *Often immediately following exercise*

- *More recently may occur randomly*

No other medical conditions

Initial Evaluation:

- **ECG** : Sinus bradycardia at rest 54 bpm, normal morphology
- **Labs** : T4, TSH, lytes, *etc.* are WNL
- **Echo** : Structurally normal heart
- **Holter** : Frequent APCs, occas PVCs; salvos of AT and AF, some that are associated w/ symptoms on the patient log.
 - *Heart rate range (in sinus): 46 – 138 bpm*

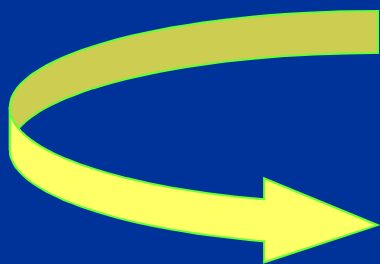
Treatment History:

Rate control strategy:

- Digoxin
- β - blockers
- CCBs

Rhythm control strategy:

- Propafenone (Rhythmol)
- Flecainide



What next?

Question:

What would you do *next* to effectively treat her life-style altering paroxysmal AF?

- [A] Trial of a class IC drug (*ex.* Propafenone).
- [B] Amiodarone treatment (with regular careful monitoring).
- [C] Referral for AV junction ablation and high-quality pacemaker
- [D] Refer for atrial defibrillator implant
- [E] Refer for catheter ablation of AF

Atrial Fibrillation Ablation

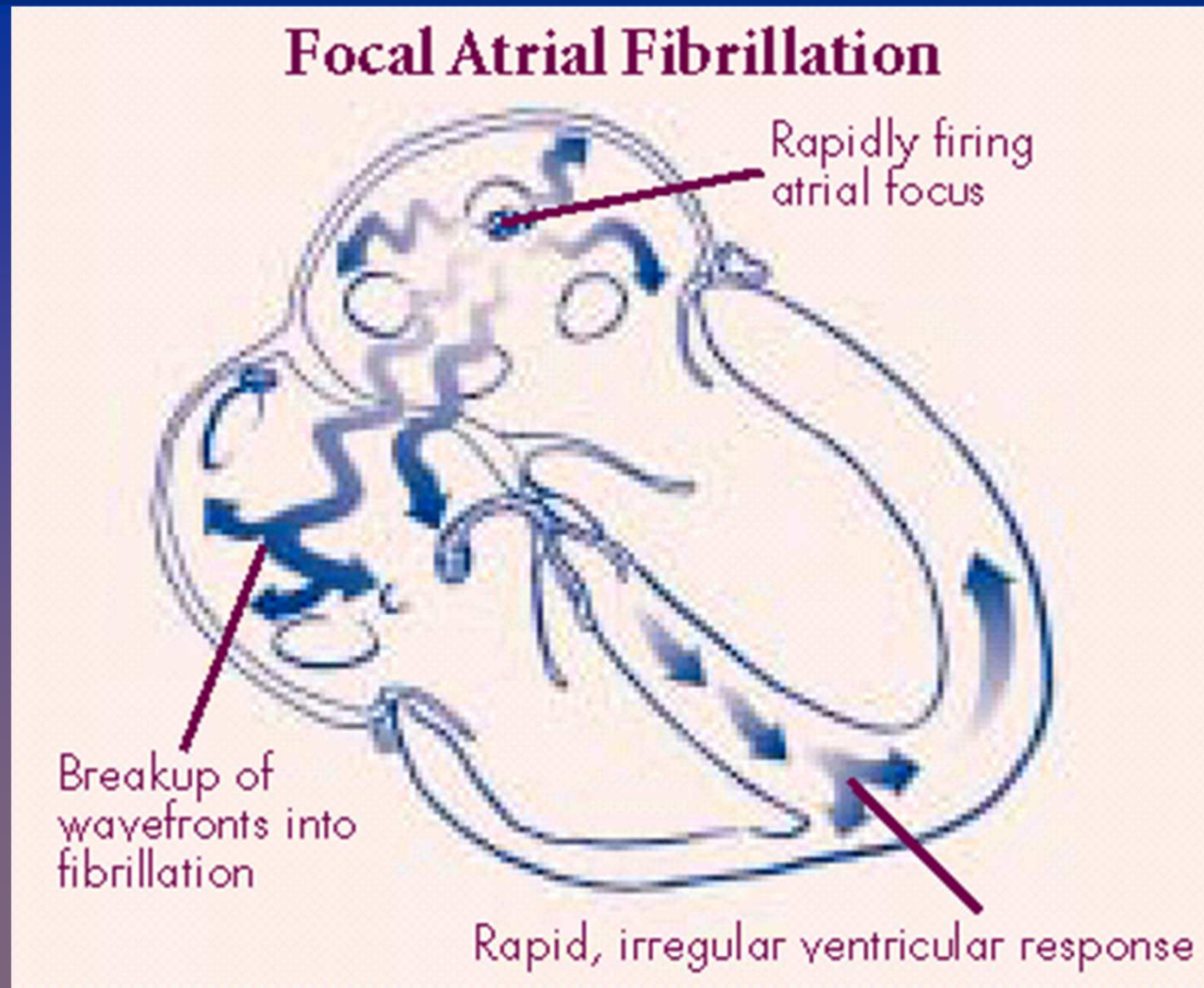
(What we did...)

FOR WHOM? (Paroxysmal)

1. AF w/ “*significant symptoms*” associated
2. Refractory to AADs
3. Absence of severe structural heart dz.

Atrial Fibrillation

Initiation Mechanism – PV Triggers



Left Atrium

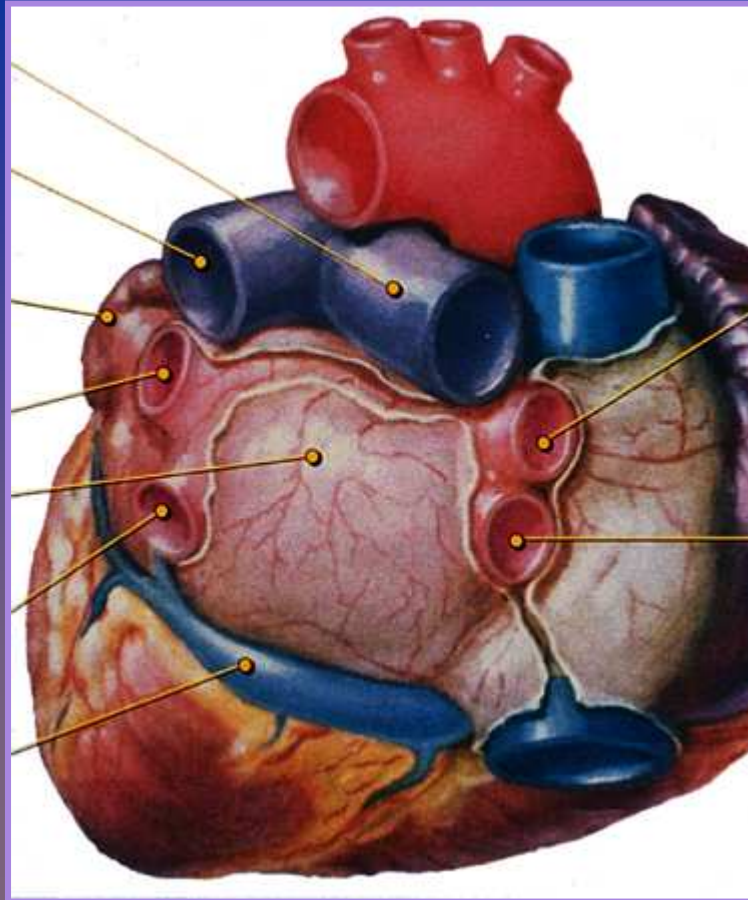
Posterior Basal View

R. pulmonary
artery
L. pulmonary artery

L. auricle
L. superior
pulmonary vein
L. atrium

L. inferior
pulmonary vein

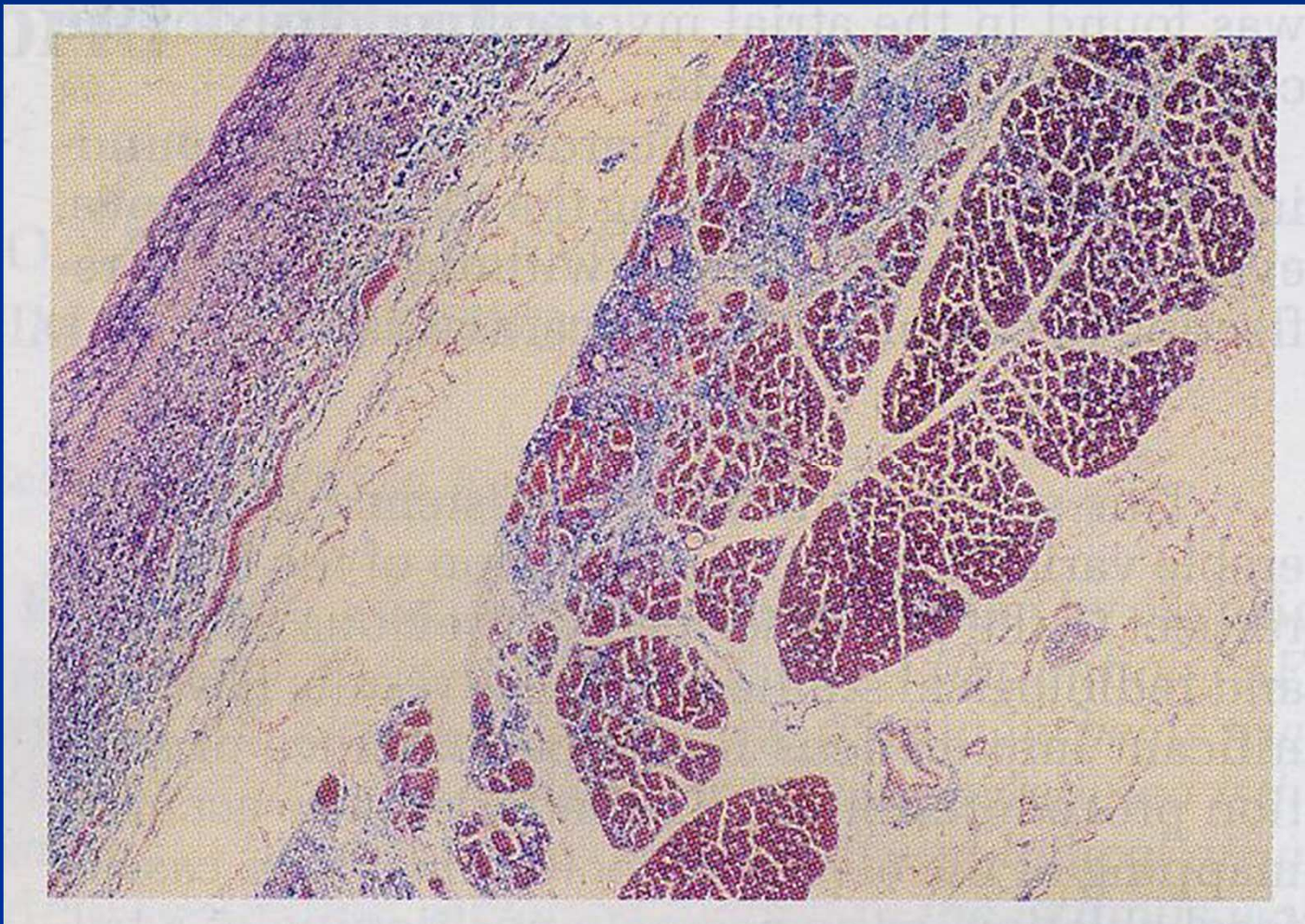
Coronary
sinus

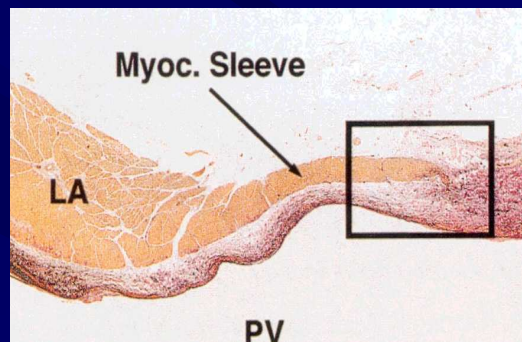


R. superior
pulmonary vein

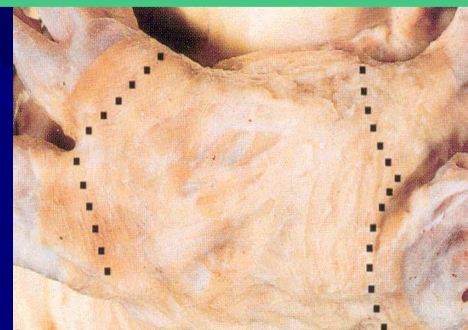
R. inferior
pulmonary vein

TESSUTO MUSCOLARE ALL'INTERNO DELLA V. POLMONARE

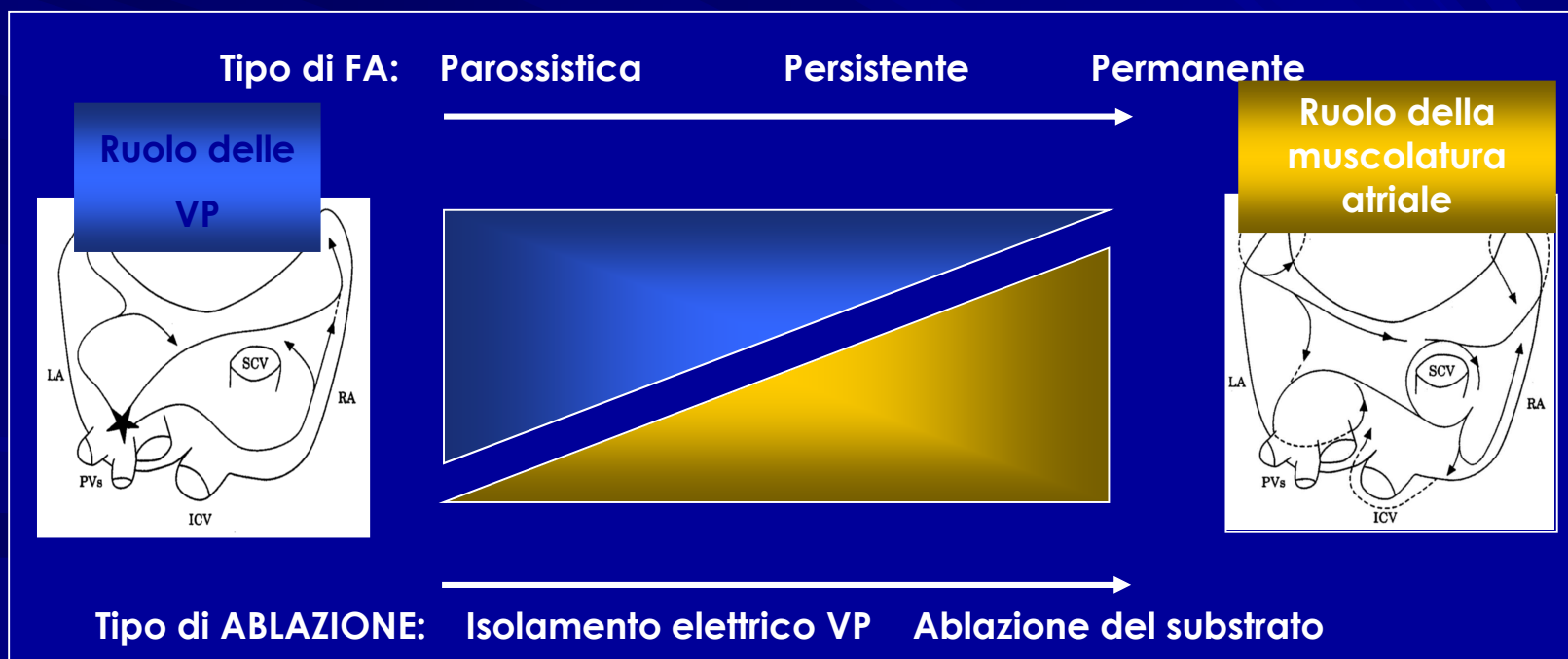


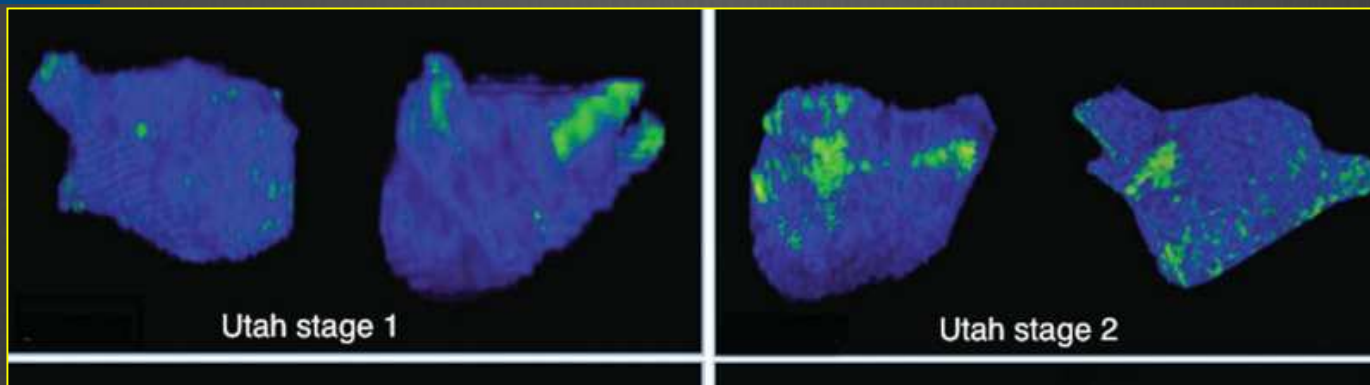


- VP: sede predominante dei “triggers” (INNESCO della FA)



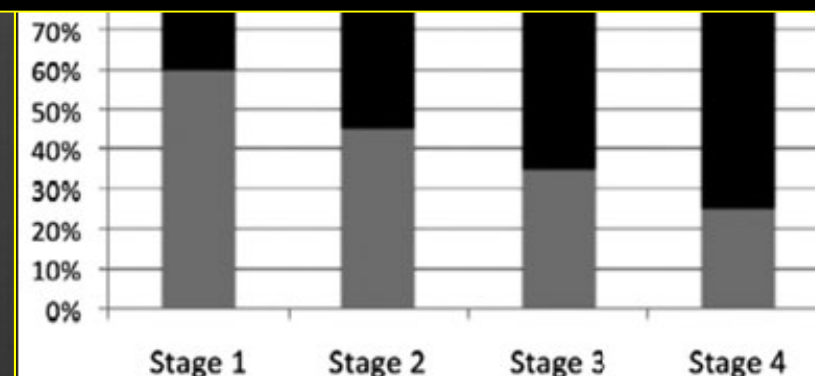
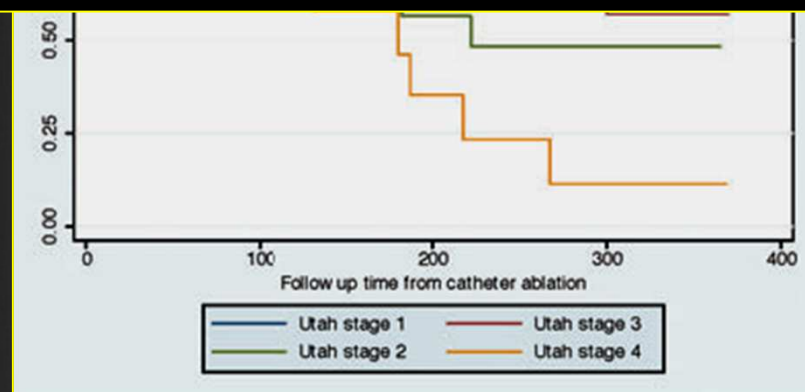
- VP: substrato aritmogeno (MANTENIMENTO della FA)



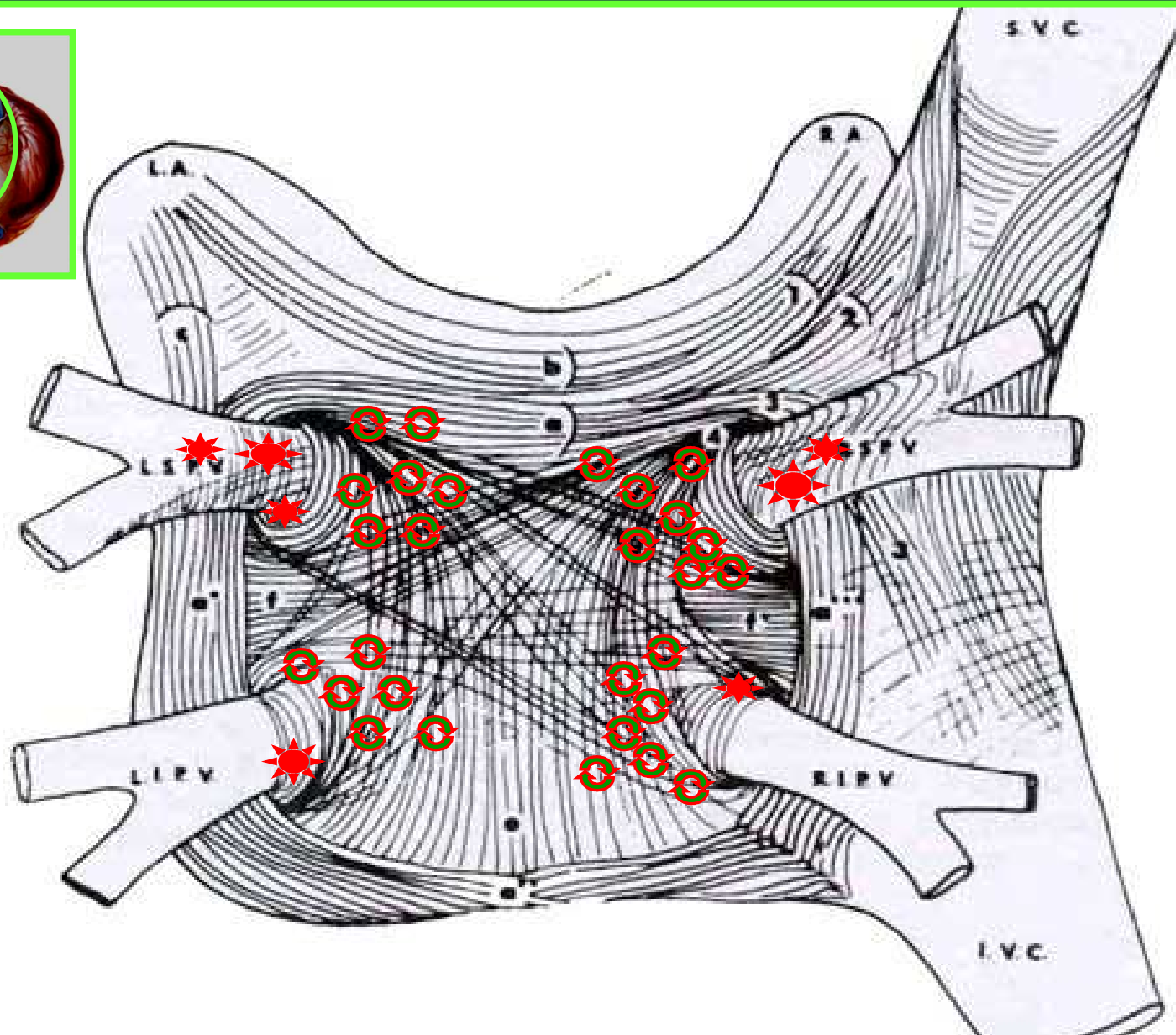
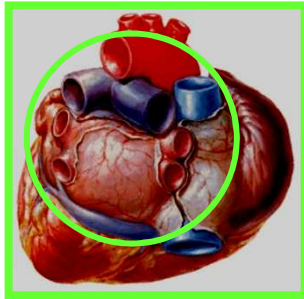


Clinical Implication

The results of this study have an important impact on clinical decision making both for the AF patient and the physician managing the arrhythmia. For the patient, expectations for the outcomes of the ablation procedure can be satisfactorily estimated and the patient can then weigh the risks of undergoing the ablation procedure against the benefits of maintaining sinus rhythm. For the ablationist, quantification of fibrosis/SRM can be used to counsel the patients better about the expected outcomes of catheter ablation. Moreover, the operator can plan the procedure better with the knowledge that **patients with advanced fibrosis/SRM will have a better outcome with a more extensive ablation rather than a PV isolation.**

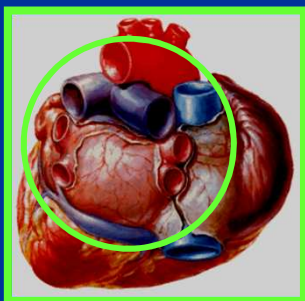
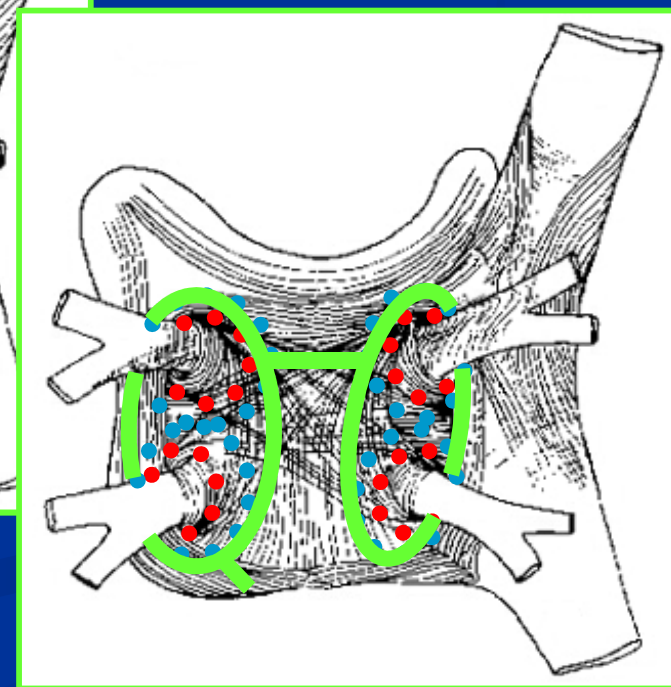
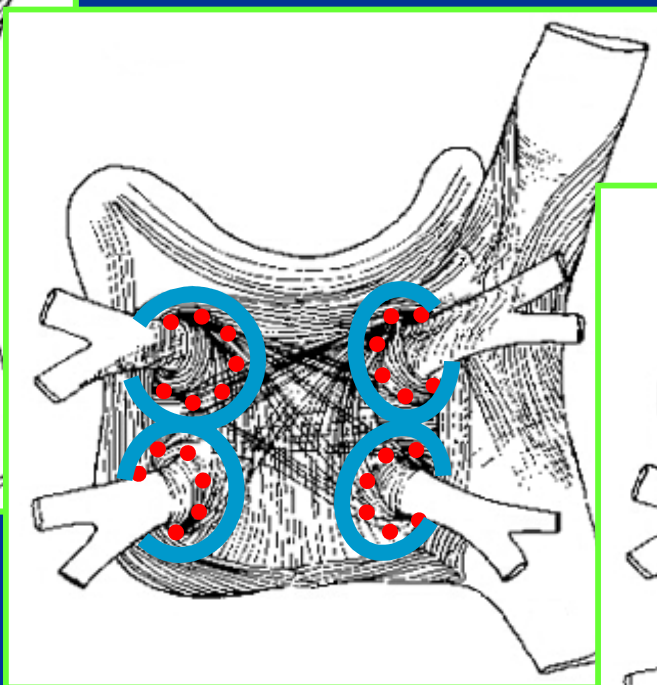
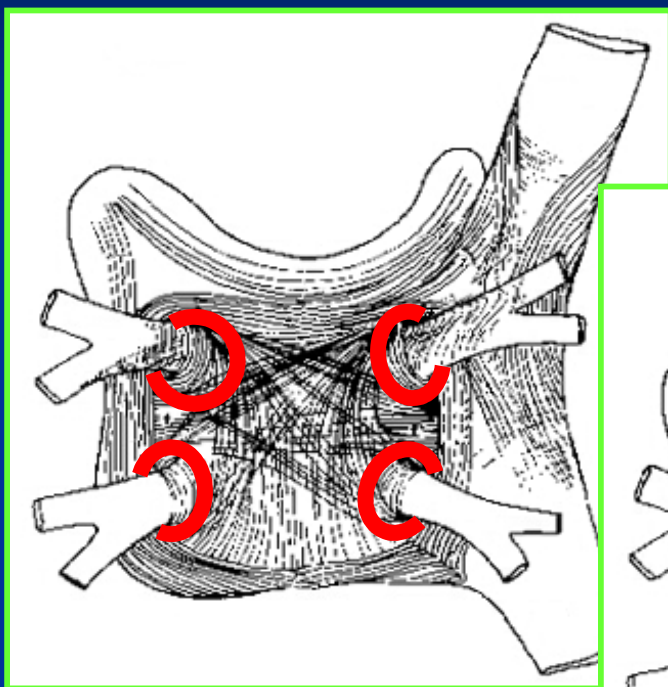


Left Atrium, Posterior Wall



Left Atrium, Posterior Wall

Pulmonary Vein Isolation



Supporti per il mappaggio elettrico e/o anatomico

Catetere circolare

Catetere "basket"

ECO intracardiaco

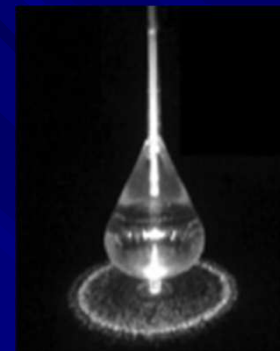
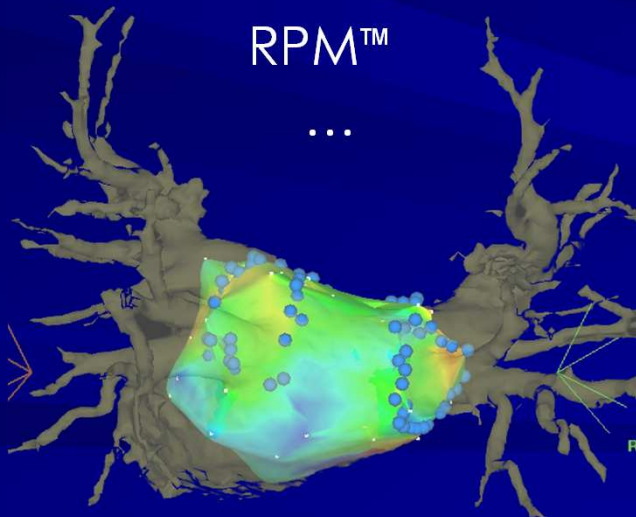
CARTO/CARTOMerge™

Localisa™

Navex™

RPM™

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Fonti di energia

RF (cat. standard, irrigato, 8 mm)

Crioenergia

Ultrasuoni

L.A.S.E.R.

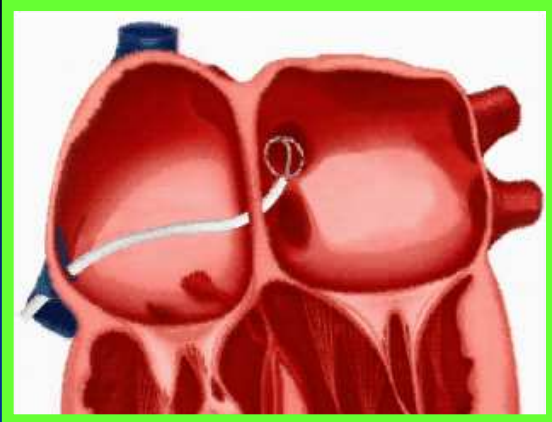
Microonde

β -radiazioni

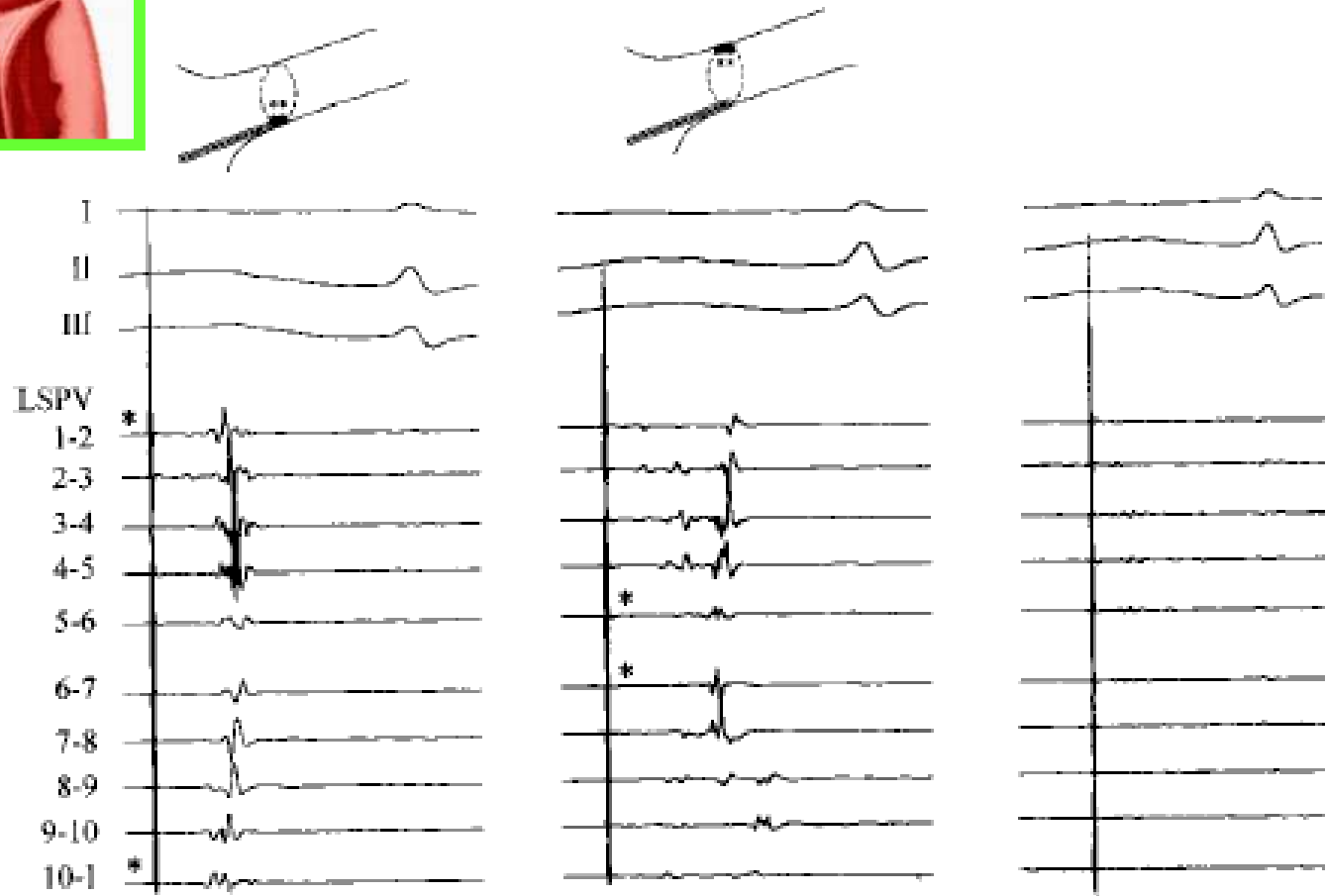
Stents a rilascio

...





Pulmonary Vein Isolation *Segmental Approach*



Going...

Going...

Gone !

Cosa dice il COCIS



C.O.C.I.S 2009

Fibrillazione atriale parossistica e persistente

L'idoneita' puo' essere concessa:

Limitatamente alle attivita' del gruppo A e B

- Assenza di cardiopatia
- Non sintomi di rilievo
- Frequenza al TE e al MH non superiore alla max.per l'eta'
- Bradicardie non importanti ($< 40/\text{min}$, pause con $\text{RR} > 3''$)
- In caso di terapia anticoagulante, per sport non a rischio di traumi

L'idoneita' va negata:

Nei rimanenti casi