

Ablació de la fibril·lació auricular. Ha arribat l'hora de la generalització?

Arguments a favor

Dr. Julio Martí Almor

Secció arítmies Hospital del Mar



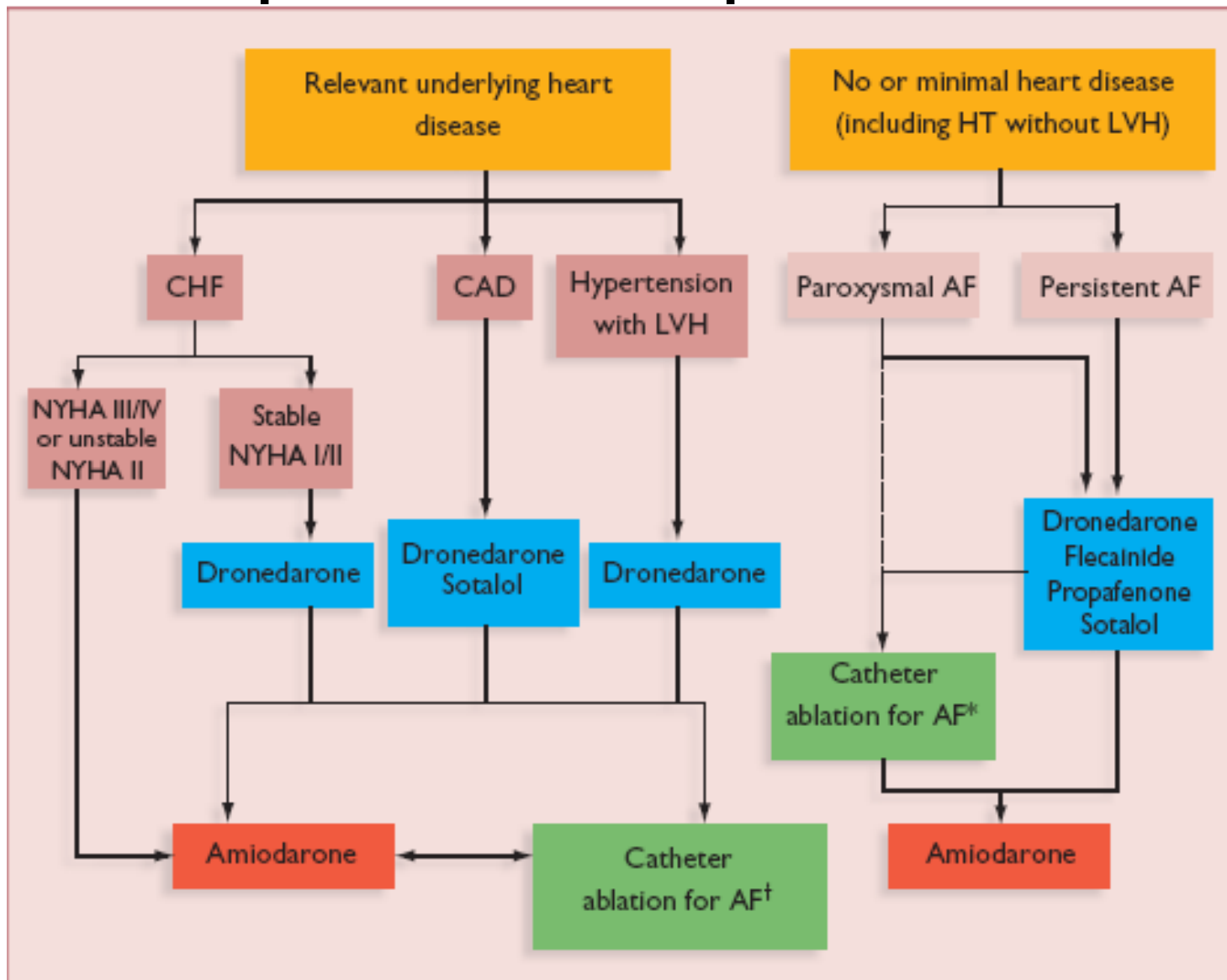
De que estem parlant?

- Val la pena fer ablació a tots els malalts amb FA?----- NO
 - Malalts amb FA permanent o long standing especialment asimptomàtics i amb bon control de FC
- Ara be: ¿hi ha un grup creixent de malalts que es poden beneficiar de la ablació de FA?----SI

Quins pacients es poden beneficiar de la ablació de FA?

- FA paroxismal
- FA persistent de menys de 6 mesos de duració
- Tot això avui dia amb malalt **simptomàtic**

Perque amb FA paroxistica?



En que es basa la recomanació?

- En estudis randomitzats. Quin son?
- En que la alternativa es pèssima: FAA
- Finalment en que les complicacions de la tècnica i els resultats a curt i llarg termini comencen a ser millors, i òbviament superen de lluny als FAA.

Estudio (año publicación)	Pacientes (n)	Edad media (años)	Tiempo medio de seguimiento (años)	Criterios de inclusión	Objetivo primario	Pacientes que alcanzaron el Objetivo primario		
						Control FC	Control Ritmo	p
PIAF (2000)	252	61,0	1,0	FA persistente (7-360 días)	mejora sintomática	70/127 60,80%	76/125 55,10%	0,32
AFFIRM (2002)	4060	69,7	3,5	FA paroxística o FA persistente, edad ≥ 65 a, o riesgo de ictus o muerte	Mortalidad de cualquier causa	310/2027 (25,9%)	356/2033 (26,7%)	0.08
RACE (2002)	522	68,0	2,3	FA persistente o flúter de menos de 1 año y 1-2 cardioversiones en los últimos 2 años y anticoagulación oral	Compuesto: muerte cardiovascular, IC, hemorragia severa, implantación de MP, efectos tromboembólicos y efectos adversos severos de los FAA	44/256 (17,2%)	60/266 (22,6%)	0,11
STAF (2003)	200	66,0	1,6	FA persistente (>4 semanas y < 2 años. Tamaño de la AI> 45mm, IC CF II-IV de la NYHA, FEVI < 45%	Compuesto: mortalidad total, complicaciones cerebrovasculares, reanimación cardiaca, eventos emboligenos	10/100 (10,0%)	9/100 (9,0%)	0.99
HOT CAFE (2004)	205	60,8	1,7	Primera FA persistente detectada (≥ 7 días, <2 años), edad 50-75 años	Compuesto: muerte, evento tromboembólico, hemorragia mayor/intracraneal	1/101 (1,0%)	4/104 (3,9%)	>0,71
AF-CHF (2008)	1376	66,0	3,1	FEVI $\leq 35\%$, signos de IC, antecedentes de FA(≥ 6 h o CVE en los últimos 6 meses	Muerte cardiovascular	175/1376 (25%)	182/1376 (27%)	0,59
J-RHYTHM (2009)	823	64,7	1,6	FA paroxística	Compuesto: mortalidad total, ictus isquémico sintomático, embolia sistémica, hemorragia mayor, hospitalización por IC/ afectación psicológica.	89/405 (22,0%)	64/418 (15,3%)	0,012

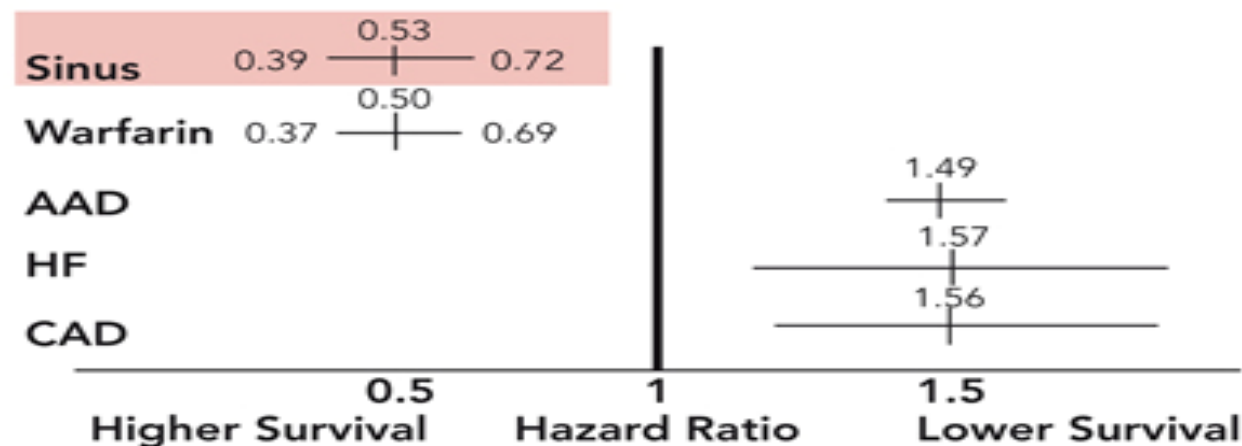
Es útil mantener el RS?

Relationships Between Sinus Rhythm, Treatment, and Survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study

The AFFIRM Investigators*

Circulation. 2004;109:1509-1513.

AFFIRM: survival by actual rhythm



In this analysis, the presence of SR was associated with a considerable reduction in the risk of death. These findings are consistent with those of the DIAMOND Study, in which the presence of SR throughout that trial was associated with improved survival.

The association of SR but not AADs with improved survival may reflect the fact that currently available AADs are neither highly efficacious nor completely safe.

Quins són els estudis randomitzats?

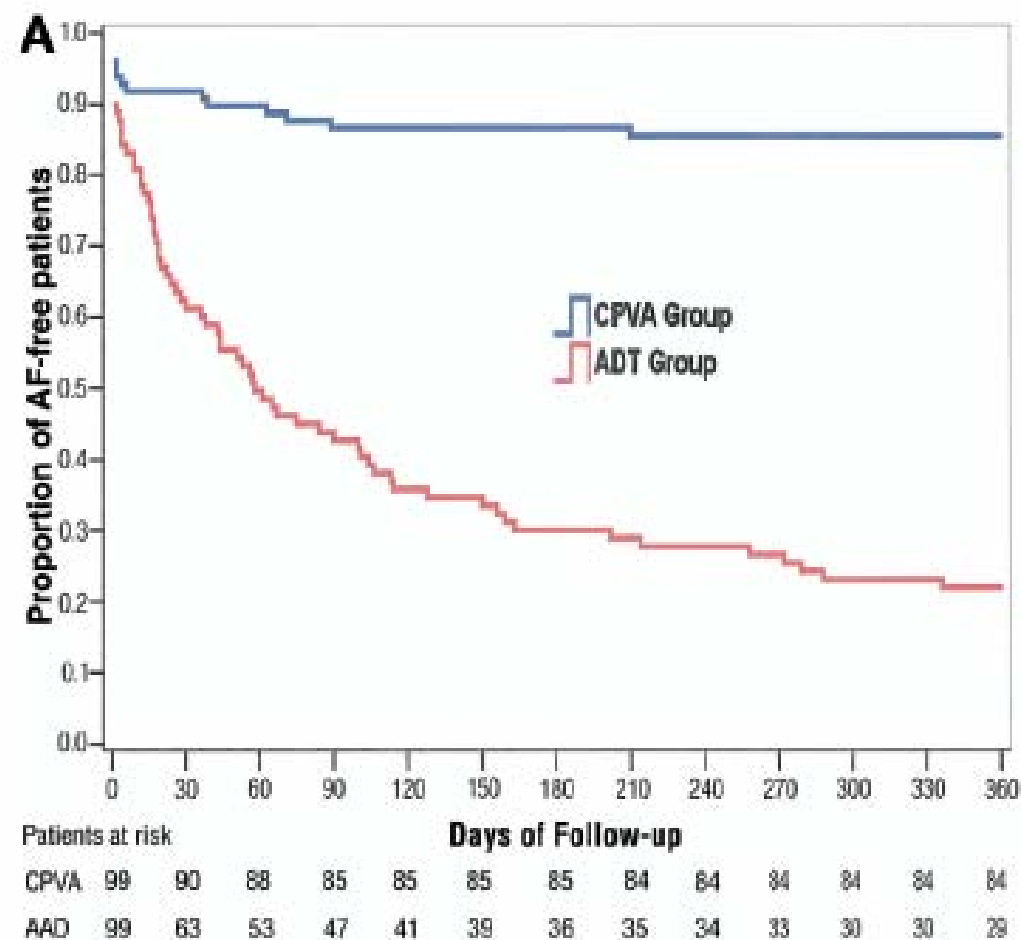
Tabla 1. Estudios controlados comparando ablación por catéter y fármacos antiarrítmicos (FAA)

Estudio	Tipo de FA	Técnica de ablación	Libres de FA a 1 año		Año
			Ablación	FAA	
Wazni et al. RAAFT (6)	96% FAP 4% FA per	AVP	87%	37%	2005
Papone et al APAF (3)	100% FAP	ACVP + ICT	86%	22%	2006
Stabile et al CACAF (5)	67% FAP 33% FA per	ACVP + líneas en AI ± ICT	66%	9%	2005
Jais et al A4 study (2)	100% FAP	AVP ± líneas en AI ± ICT	89%	23%	2008
Forleo et al (h)	41% FAP 59% FA per	AVP ± líneas en AI ± ICT	80%	43%	2008
Wilber et al. Thermocool (4)	100% FAP	AVP ± líneas en AI ± ICT ± EFC ± líneas en AD	66%	16%	2010
Kritayaphong et al (11)	100% FA per	AVP + líneas en AD	79%	40%	2003
Oral et al (10)	100% FA per	ACVP + linea mitral y techo	74%	58%	2006

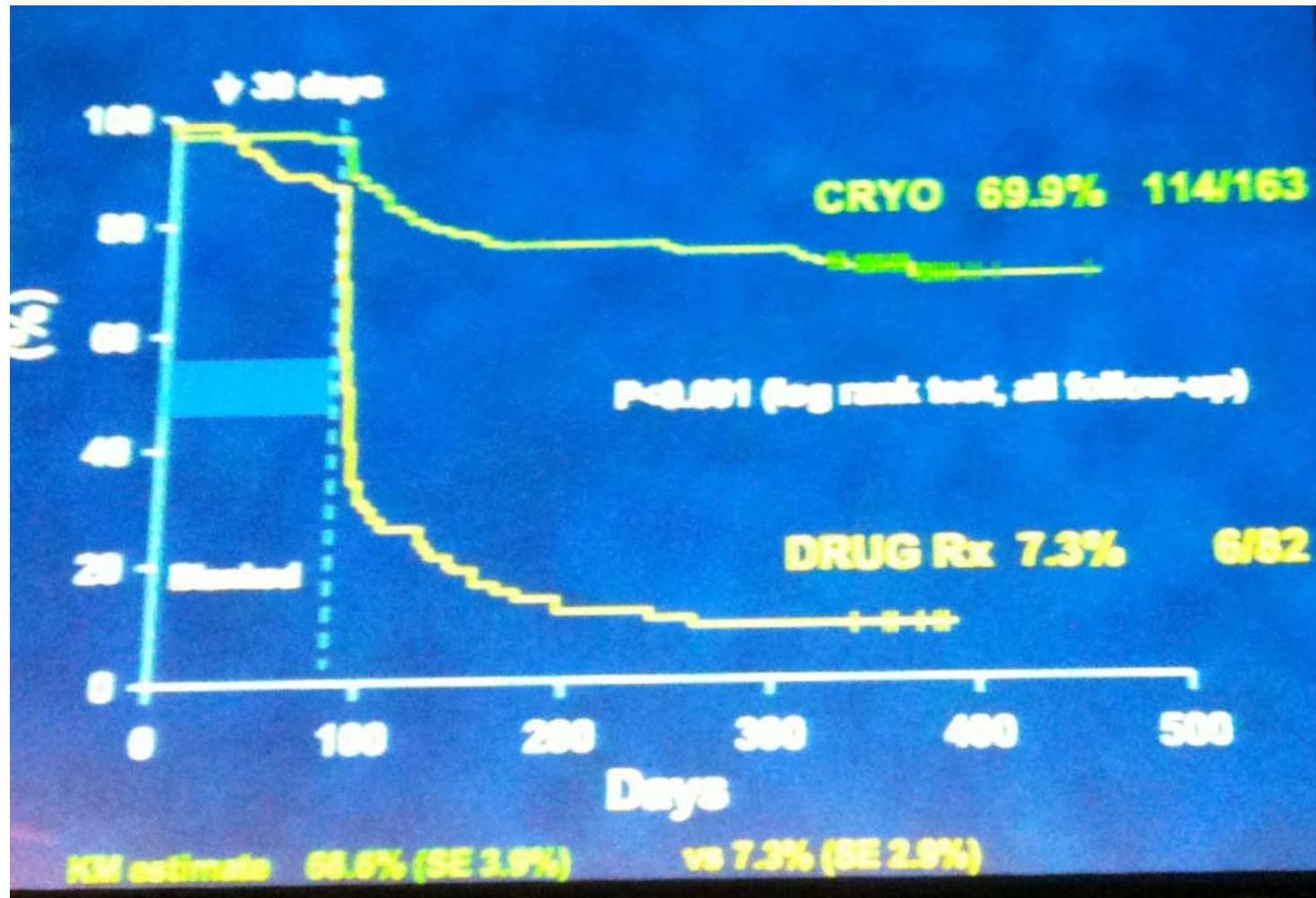
FAA: fármacos antiarrítmicos. FAP: FA paroxística. FA per: FA persistente. AVP: aislamiento de VP. ACVP: ablación circunferencial de VP. ICT: istmo cavotricuspidal. AI: aurícula izquierda. EFC: electrogramas fraccionados complejos; AD: aurícula derecha

A Randomized Trial of Circumferential Pulmonary Vein Ablation Versus Antiarrhythmic Drug Therapy in Paroxysmal Atrial Fibrillation

The APAF Study



No dependen del tipo de energía!!
STOP-AF



Que diuen els metaanàlisis?

- Piccini et al Circ Arrhythm 2009: en 763 pacients demostra una proporció al any de RS amb AR del 79% vs 32 % amb FAA.
- Calkins et al en Circ Arrhythm 2009: AR superior a FAA especialment després de diversos procediments i menor nombre de complicacions.

Treatment of Atrial Fibrillation With Antiarrhythmic Drugs or Radiofrequency Ablation: Two Systematic Literature Reviews and Meta-Analyses

Hugh Calkins, Matthew R. Reynolds, Peter Spector, Manu Sondhi, Yingxin Xu, Amber Martin, Catherine J. Williams and Isabella Sledge

Circ Arrhythmia Electrophysiol 2009;2;349-361; originally published online Jun 2, 2009;

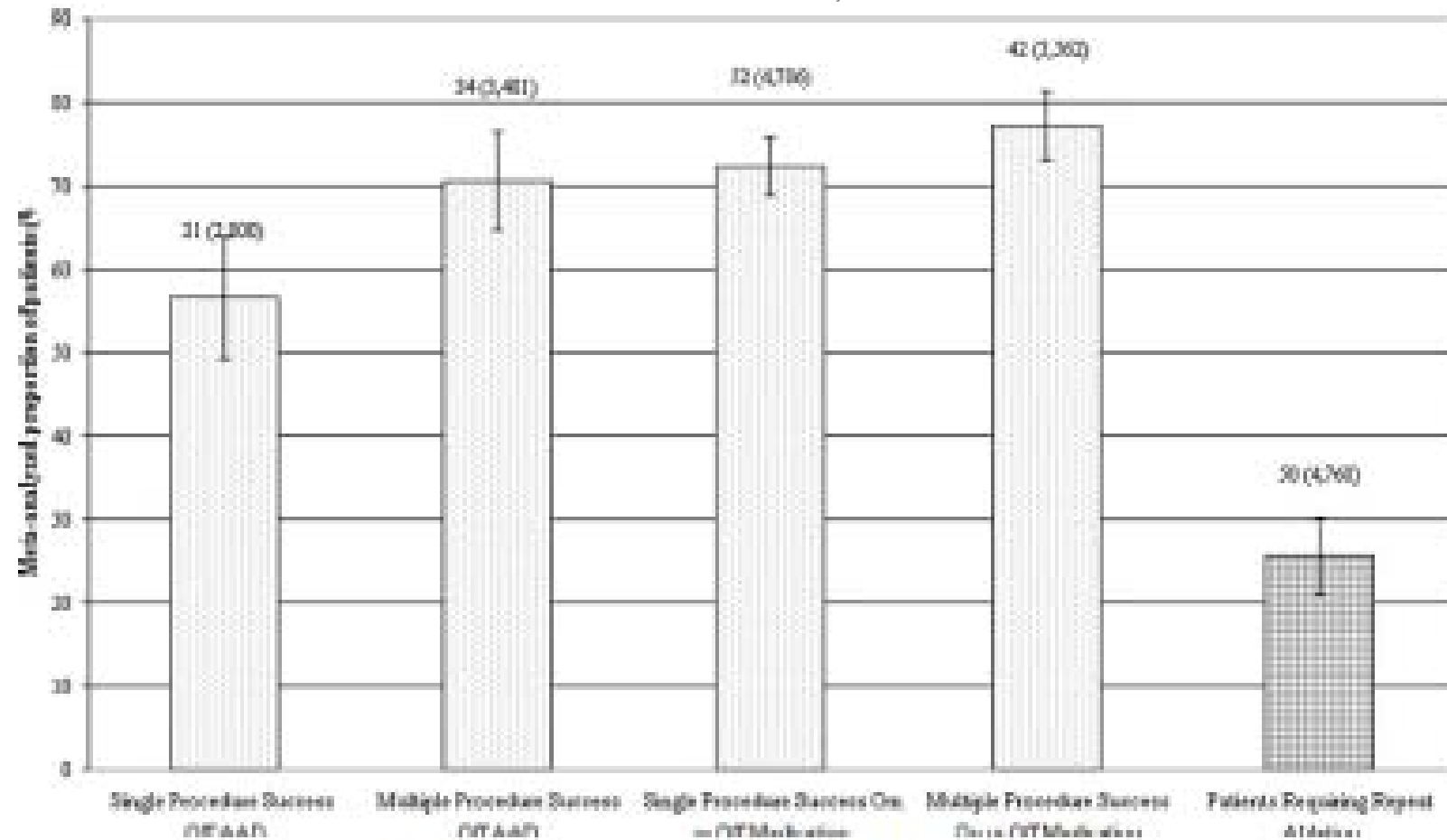


Figure 3. Efficacy of catheter ablation in patients with AF.

MANTRA-PAF: A Randomized Multicenter Comparison of Radiofrequency Ablation and Antiarrhythmic Drug Therapy as First-Line Treatment in 294 Patients with Paroxysmal Atrial Fibrillation

Background: Medical treatment of atrial fibrillation (AF) is characterized by potential side effects and is often only moderately effective.

Purpose: To compare medical antiarrhythmic drug therapy (AAD) to radiofrequency ablation (RFA) as first-line treatment in paroxysmal AF.

Design: Randomized, prospective, phase 3 Scandinavian/German multicentre study. 294 patients; 7-day Holter monitor results; 2-year follow-up.

Primary End Point: Cumulative AF burden (% of AF) over 35 days and then in follow-up.

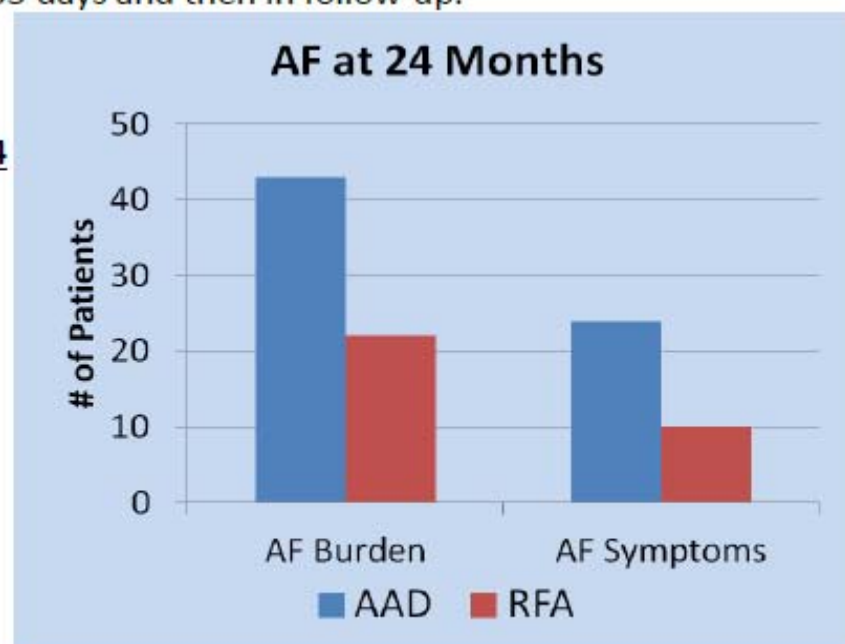
Results: At 24 months:

AF burden lower – 22/146 (RFA) vs. 43/148 (AAD), $p=0.004$

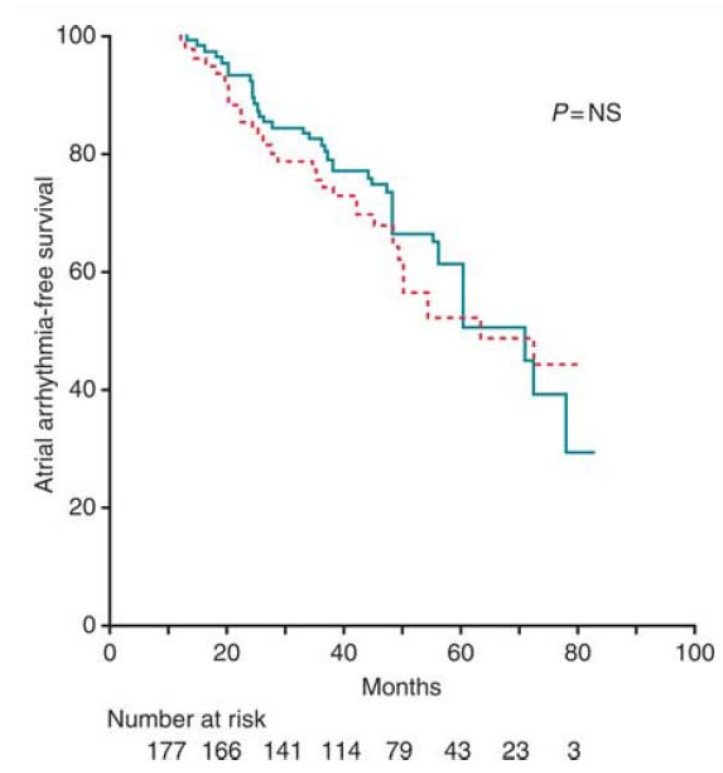
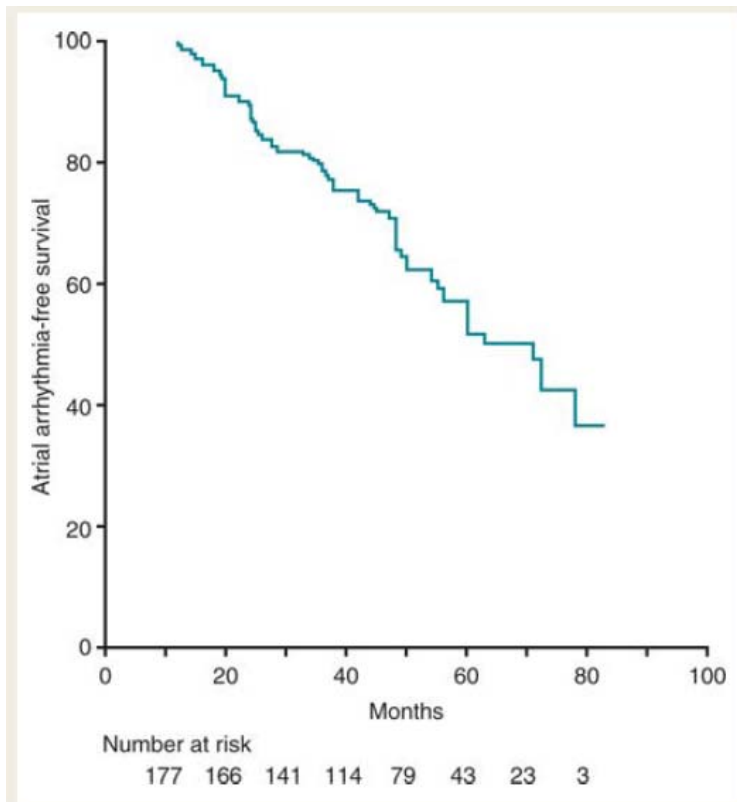
AF symptoms – 10/146 (RFA) vs. 24/148 (AAD), $p=0.012$

Atrial Flutter – no difference

Conclusion: AF burden, AF occurrence and AF with symptoms significantly lower in RFA group, but cumulative AF burden not significantly different.



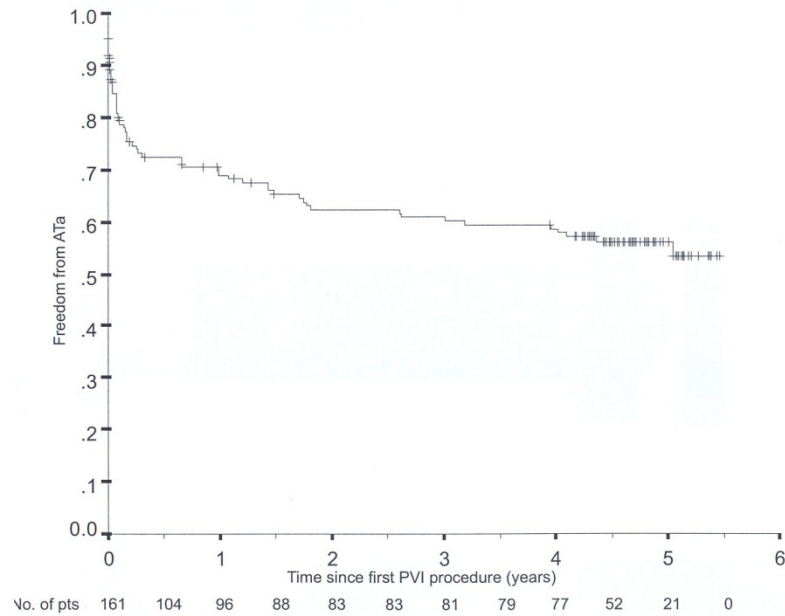
Quins son els resultats a llarg termini?



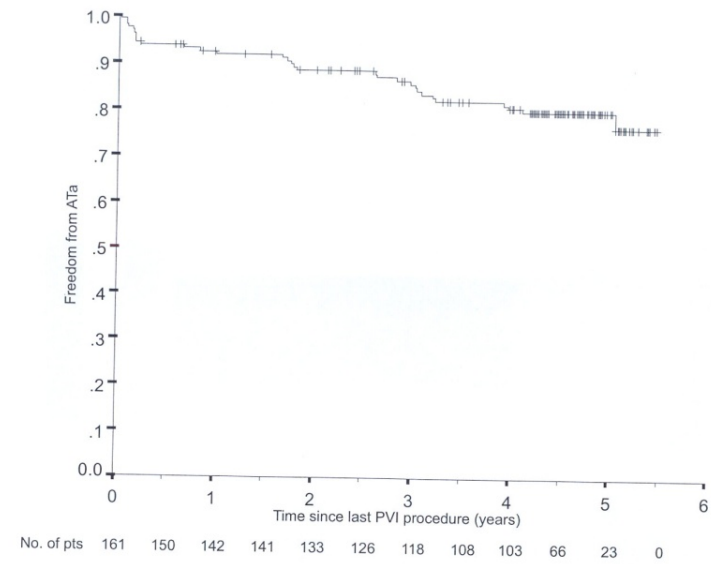
**Does catheter ablation cure atrial fibrillation?
Single-procedure outcome of drug-refractory
atrial fibrillation ablation: a 6-year
multicentre experience**

**Emanuele Bertaglia^{1*}, Claudio Tondo², Antonio De Simone³, Franco Zoppo¹,
Massimo Mantica⁴, Pietro Turco³, Assunta Iuliano⁵, Giovanni Forleo⁴,
Vincenzo La Rocca³, and Giuseppe Stabile⁵**

Ouyang et al (Circ 2010)

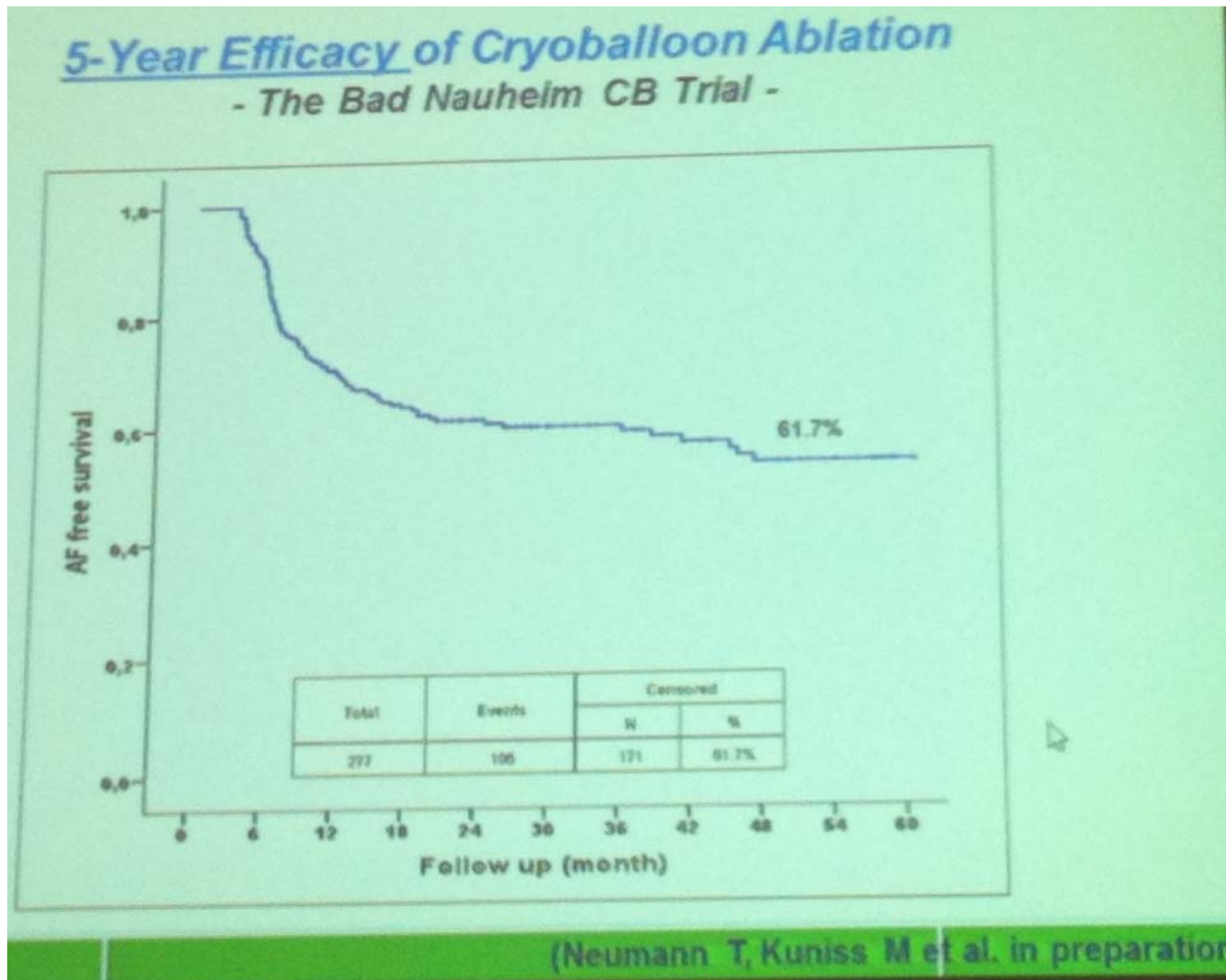


Un procediment



Varios procediments

I amb criobalo?



Quins son els resultats amb FA persistent?

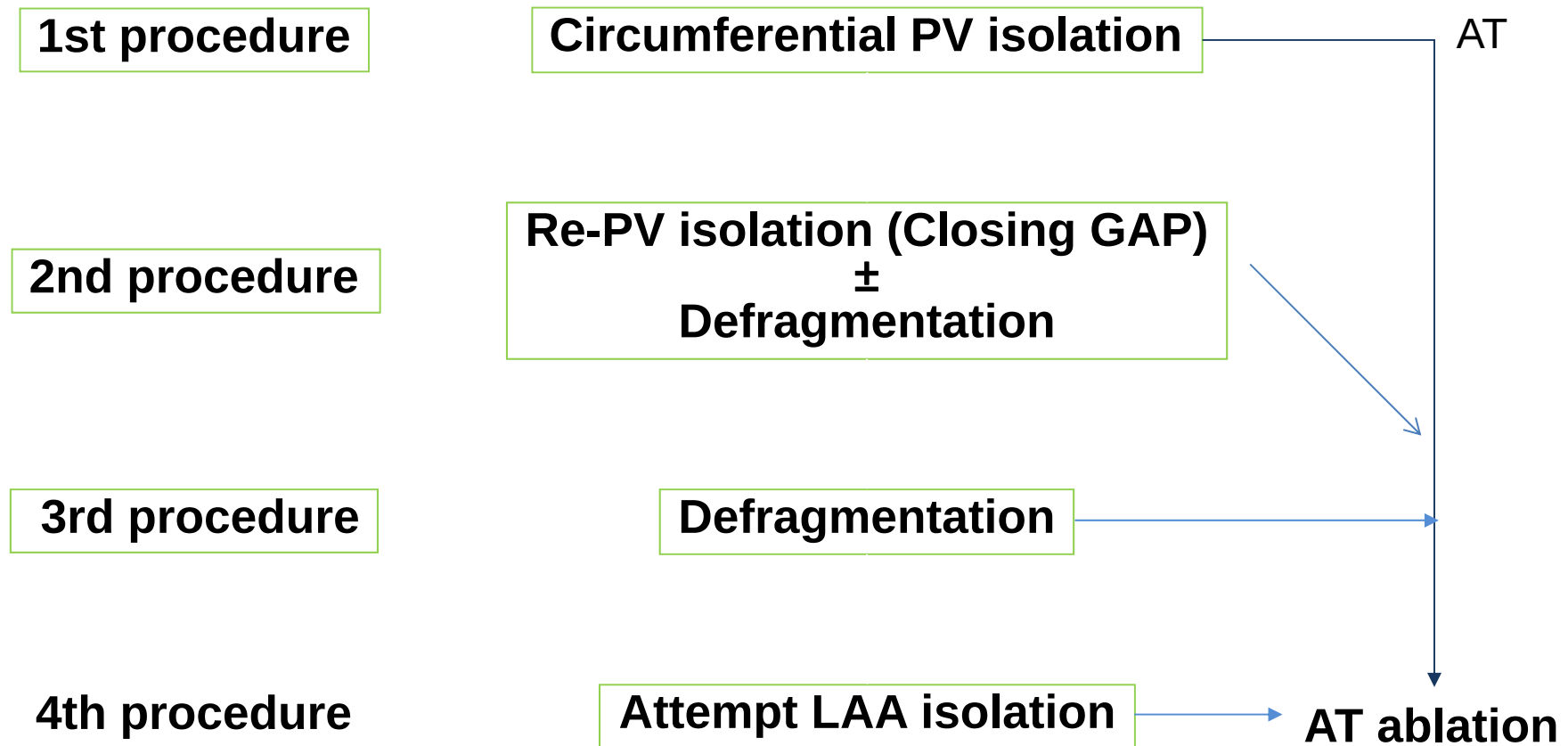
- Nomes hi han dos estudis randomitzats₁₀₋₁₁ que mirin aquest tema incloent entre tots dos 176 pacients. Malgrat la superioritat de la ablació vs. FAA, molts dels pacients amb ablació varen necessitar múltiples procediments i a mes van haver fins un 77% de cross-over en el grup de FAA.

10. Oral H, Pappone C, Chugh A, Good E, Bogun F, Pelosi F Jr, et al. Circumferential pulmonary-vein ablation for chronic atrial fibrillation. N Engl J Med. 2006;354:934-41.

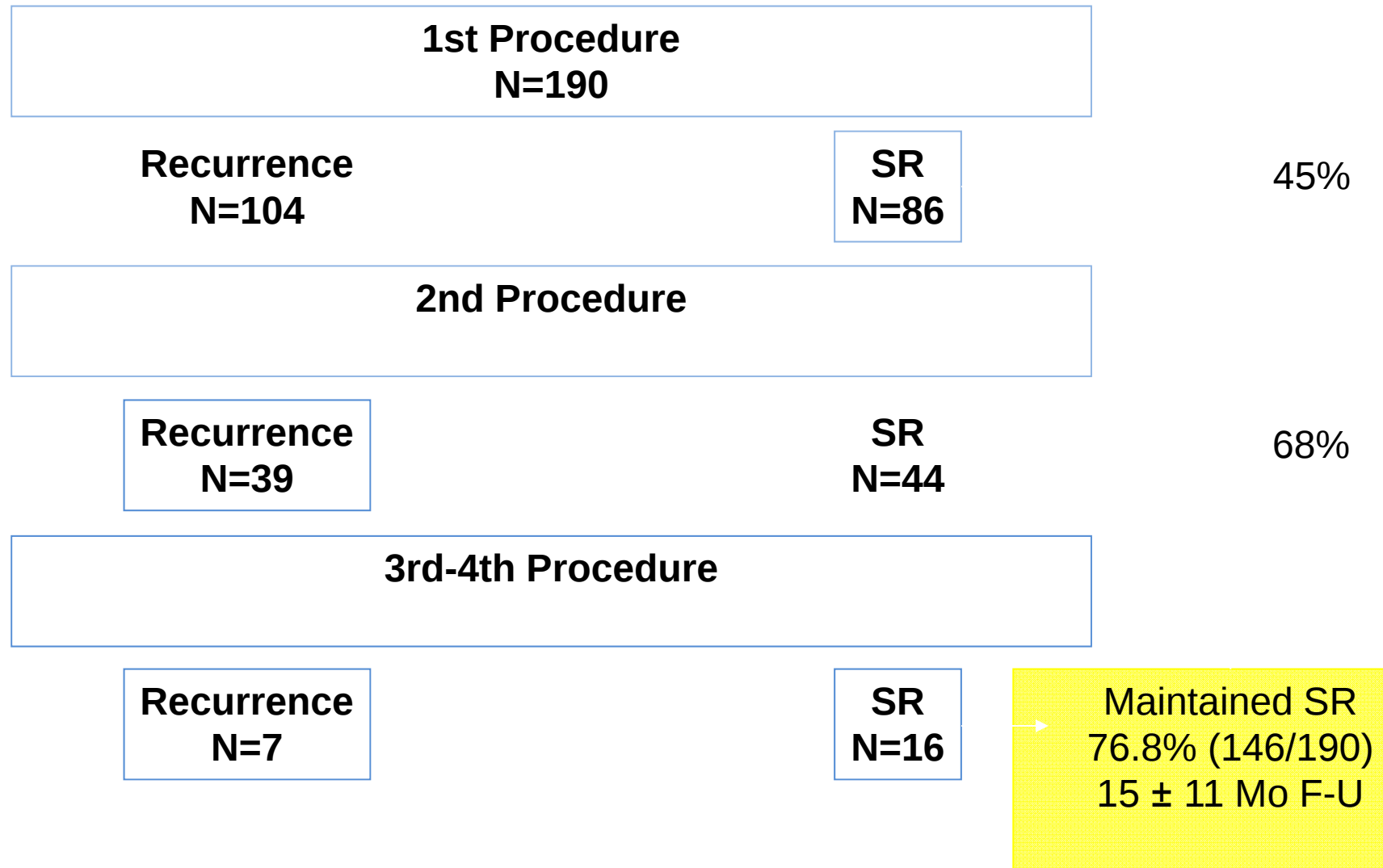
11. Krittayaphong R, Raungrattanaamporn O, Bhuripanyo K, Sriratanasathavorn C, Pooranawattanakul S, Punlee K, et al. A randomized clinical trial of the efficacy of radiofrequency catheter ablation and amiodarone in the treatment of symptomatic atrial fibrillation. J Med Assoc Thai. 2003;86(Suppl.1):S8-S16.

Procedure Protocol

Stepwise approach



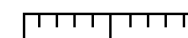
Procedure Outcome





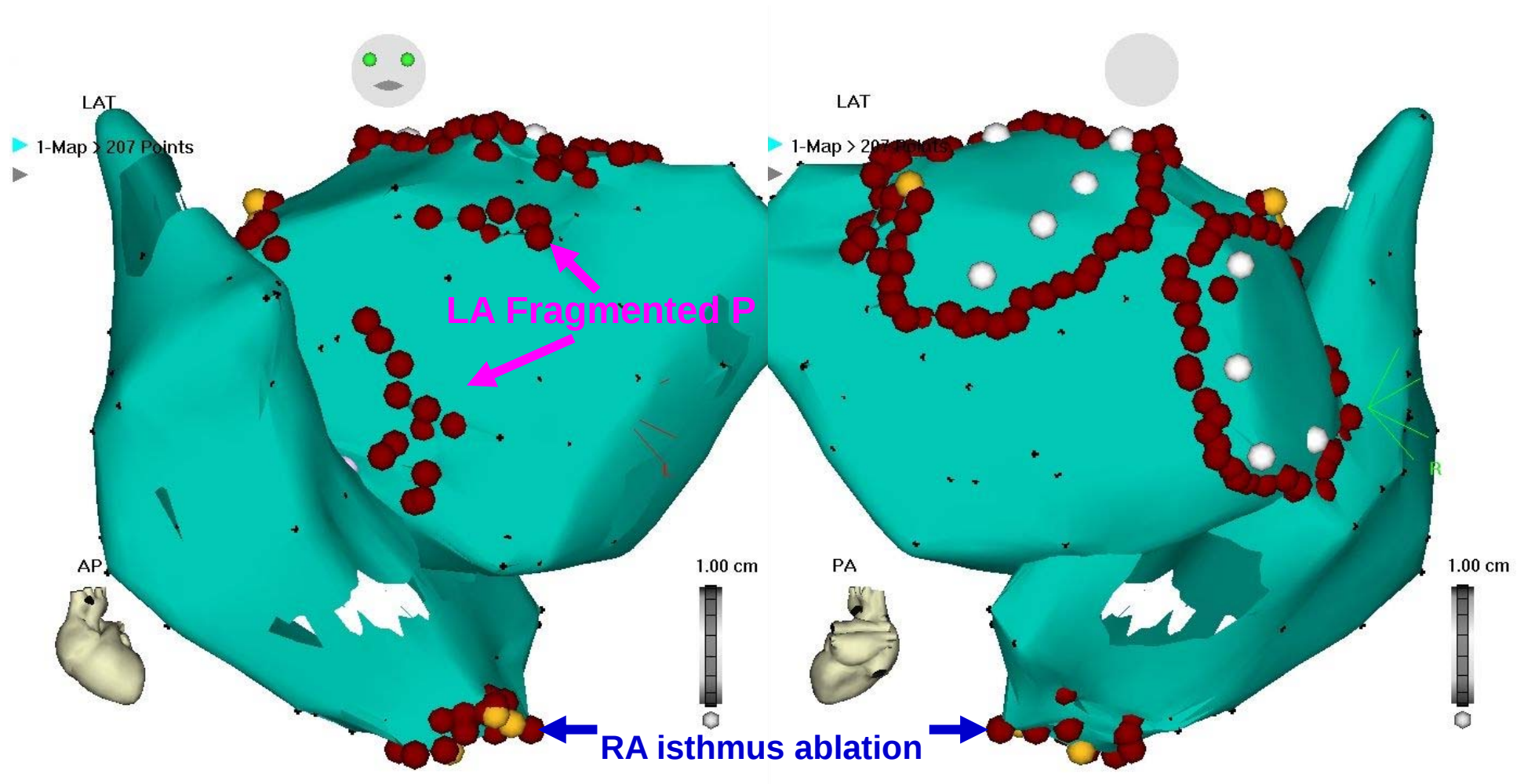
Afib before RF in patient with Permanent AF for 6 years

1 sec

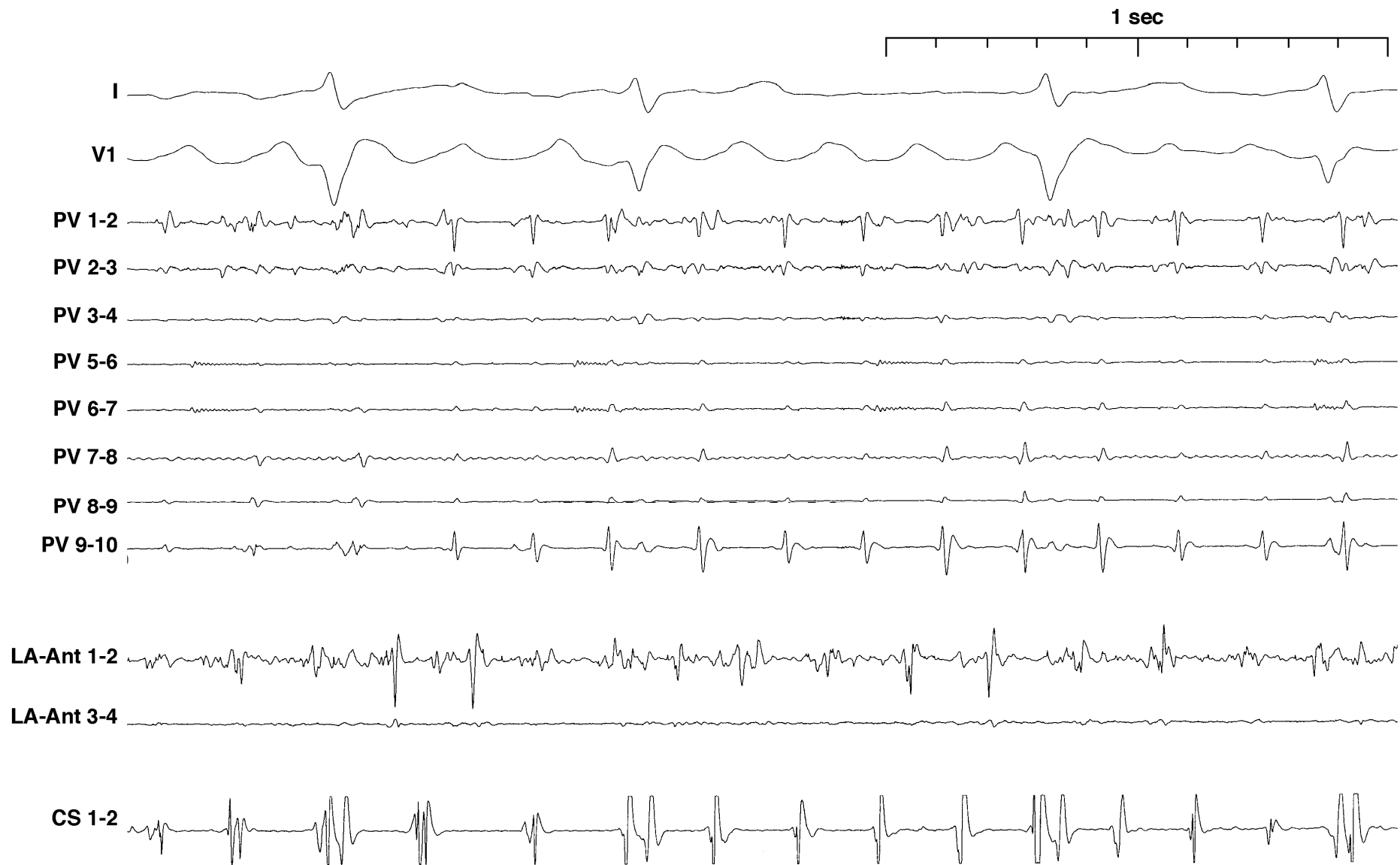


P-wave change after complete PV isolation

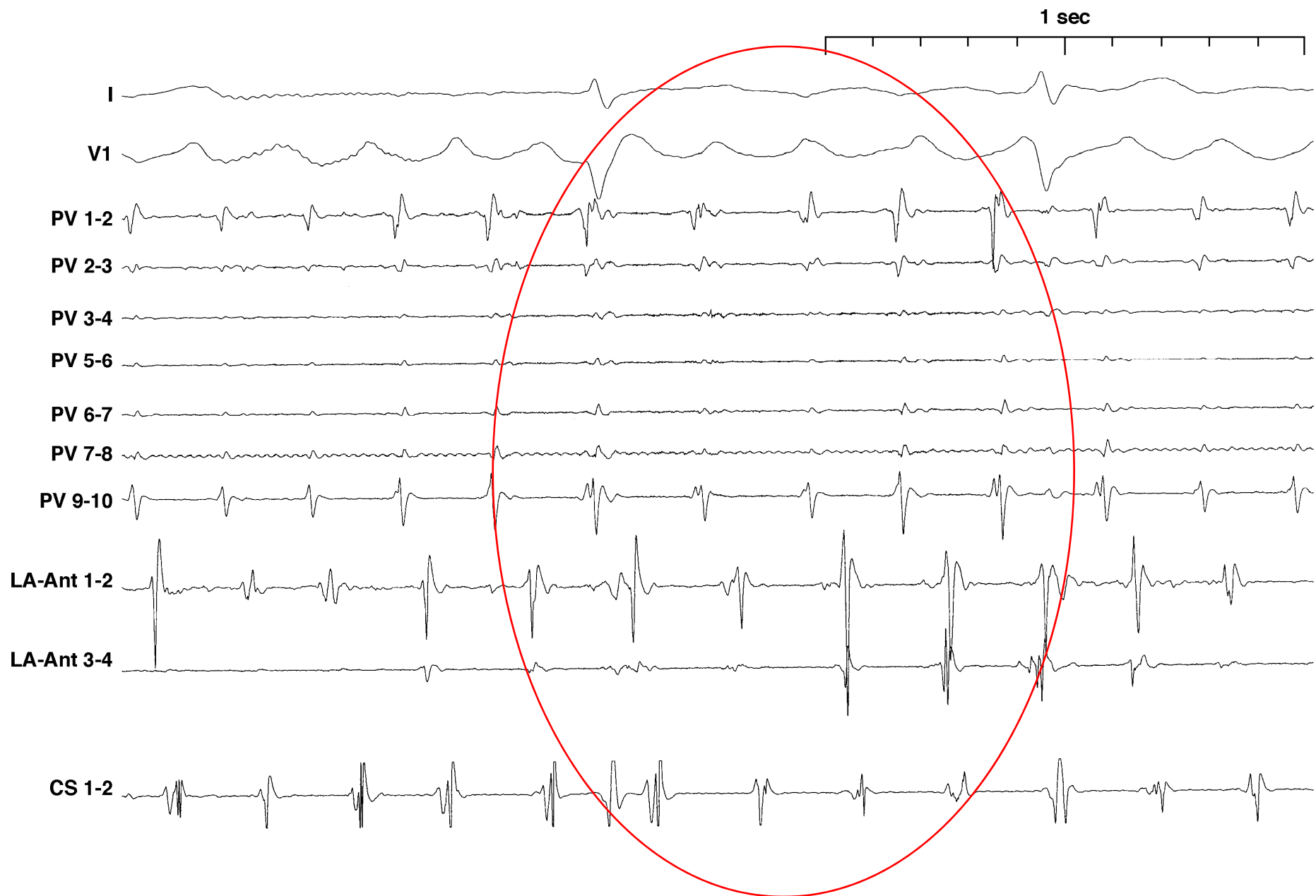
Complete PV isolation + ablation of FP



Only 5 RF application in LA anterior and anteroseptal area



Fragmentation potential



Afib to AfL during ablating FP in LA anterior wall



AFib to Afl after ablating fragmented potentials



Stable SR after AFL termination

Resultats a llarg termini en LSPAF

- Resultats comunicats però no publicats del grup de Hamburg:
 - 30% en RS a 5 anys amb un sol procediment
 - 50% en RS a 5 anys després de múltiples procediments. “Stepwise approach”

Quin es el preu: es a dir quines son les complicacions?

Table 7. Major Complications in the Overall Population

Type of Complication	No. of Patients	Rate, %
Death	25	0.15
Tamponade	213	1.31
Pneumothorax	15	0.09
Hemothorax	4	0.02
Sepsis, abscesses, or endocarditis	2	0.01
Permanent diaphragmatic paralysis	28	0.17
Total femoral pseudoaneurysm	152	0.93
Total artero-venous fistulae	88	0.54
Valve damage/requiring surgery	11/7	0.07
Atrium-esophageal fistulae	6	0.04
Stroke	37	0.23
Transient ischemic attack	115	0.71
PV stenoses requiring intervention	48	0.29
Total	741	4.54

Treatment of Atrial Fibrillation With Antiarrhythmic Drugs or Radiofrequency Ablation: Two Systematic Literature Reviews and Meta-Analyses

Hugh Calkins, Matthew R. Reynolds, Peter Spector, Manu Sondhi, Yingxin Xu,

Amber Martin, Catherine J. Williams and Isabella Sledge

Circ Arrhythmia Electrophysiol 2009;2;349-361; originally published online Jun 2, 2009;

Table 5. Safety Outcomes for Patients With AF Undergoing Catheter Ablation

Outcomes	t	n/N	%
Mortality			
Death overall	65	42/5781	0.7
Procedure-related	64	0/5192	0.0
Vascular access complications			
Arteriovenous fistula	32	1/2885	0.0
Bleeding	33	1/2960	0.0
Hematoma	38	17/3719	0.5
Pneumothorax	34	0/2974	0.0
Femoral artery pseudoaneurysm	34	15/3032	0.5
Periprocedure events			
Stroke, ischemic	62	17/5665	0.3
TIA	60	13/5467	0.2
Cardiac tamponade	63	45/5723	0.8
PE	60	3/5496	0.1
DVT	56	1/4758	0.0
Other embolism	57	10/5347	0.2
LA-esophageal fistula	60	0/5496	0.0
Other fistula	58	3/5407	0.1
Pericardial effusion	64	36/5719	0.6
PV stenosis*	65	91/5831	1.6
AV block	60	1/5496	0.0
CHF exacerbation	60	0/5496	0.0
Need for a pacemaker	46	4/3902	0.1
Total No. of patients with events	28	97/1964	4.9

t indicates No. of treatment groups; n, No. of patients with this adverse event; N, No. of patients evaluated in studies reporting this adverse event; %, percent of patients with adverse event of interest; TIA, transient ischemic accident; PE, pulmonary embolism; DVT, deep vein thrombosis; LA, left atrial; PV, pulmonary vein; AV, atrioventricular; CHF, congestive heart failure.

*>70% Stenosis (early, <7 days after ablation; late, >7 days after ablation).

Table 6. Safety Outcomes for Patients With AF Receiving AAD Therapy

Safety Outcomes	Overall		
	t	n/N	%
Mortality			
Death overall	33	120/4291	2.8
Sudden death	21	18/2900	0.6
Treatment-related death	22	15/3179	0.5
Not treatment-related death	20	40/3023	1.3
Adverse events			
CV events	10	58/1572	3.7
Bradycardia	19	44/2349	1.9
GI	16	97/1499	6.5
Neuropathy	4	48/969	5.0
Thyroid dysfunction	5	19/576	3.3
Torsades	12	16/2238	0.7
Q-T* prolongation	12	5/2034	0.2
Total No. of patients with events	24	989/3318	29.8
Discontinuations			
Total	32	1035/4347	23.8
Due to AE	32	384/3682	10.4
Due to inefficacy	12	229/1694	13.5
Due to noncompliance	4	19/457	4.2

t indicates No. of treatment groups; n, No. of patients with this adverse event; N, No. of patients evaluated in studies reporting this adverse event; %, percentage of patients with adverse event of interest; CV, cardiovascular; GI, gastrointestinal; AE, adverse events.

*Interval of the Q and T waves.

Updated Worldwide Survey on the Methods, Efficacy, and Safety of Catheter Ablation for Human Atrial Fibrillation

Riccardo Cappato, Hugh Calkins, Shih-Ann Chen, Wyn Davies, Yoshito Iesaka, Jonathan Kalman, You-Ho Kim, George Klein, Andrea Natale, Douglas Packer, Allan Skanes, Federico Ambrogi and Elia Biganzoli

Circ Arrhythm Electrophysiol 2010;3;32-38; originally published online Dec 7, 2009;

Table 1. Entry Criteria, Outcome, and Complications in the 2 Surveys

	Previous Survey	Current Survey
Period Investigated	1995–2002	2003–2006
No. of centers enrolled	90	85
No. of patients	8745	16 309
No. of patients per center	97	192
No. procedures	12 830	20 825
No. procedures per patient	1.5	1.3
Male, %	63.8	60.8
Lower and upper age limit for entry	18–82	15–90
Proportion of centers (%) performing ablation of		
Paroxysmal AF	100	100
Persistent AF	53.4	85.9
Long-lasting AF	20	47.1
Success rate, %, median		
Free of AADs	52.0	70.0
With AADs	23.5	10.0
Overall	75.5	80.0
Proportion of centers (%) using as exclusion		
Left atrial size upper limit	46.3	31.8
Prior heart surgery	65.1	23.5
Lower cut-off limit of LVEF	64.3	22.4
Overall complication rate, %	4.0	4.5
Idiopathic flutter	3.9	8.6

Table 7. Major Complications in the Overall Population

Type of Complication	No. of Patients	Rate, %
Death	25	0.15
Tamponade	213	1.31
Pneumothorax	15	0.09
Hemothorax	4	0.02
Sepsis, abscesses, or endocarditis	2	0.01
Permanent diaphragmatic paralysis	28	0.17
Total femoral pseudoaneurysm	152	0.93
Total artero-venous fistulae	88	0.54
Valve damage/requiring surgery	11/7	0.07
Atrium-esophageal fistulae	6	0.04
Stroke	37	0.23
Transient ischemic attack	115	0.71
PV stenoses requiring intervention	48	0.29
Total	741	4.54

Quin problema hi ha amb l'ablació?

- S'han fet diferents protocols: Circumferencial contra segmentària. Amb línies associades i sense. Malgrat tot qualsevol comparació amb FAA, aquest sempre són inferiors
- L'ablació és operador dependent, al menys en l'estratègia punt per punt. Pot ser això serà diferent en el "single shot"
- Els resultats a llarg termini no són òptims: Si però molt millors que amb FAA. A més la càrrega arrítmica disminueix de forma substancial.
- Les complicacions poden no ser banals.
- Ara bé al tant en deixar progressar la FA de paroxismal a persistent!!!

Progression From Paroxysmal to Persistent Atrial Fibrillation

Clinical Correlates and Prognosis

Cees B. de Vos, MD, Ron Pisters, MD, Robby Nieuwlaat, PhD, Martin H. Prins, MD, PhD, Robert G. Tieleman, MD, PhD, Robert-Jan S. Coelen, BSc, Antonius C. van den Heijkan, BSc, Maurits A. Allessie, MD, PhD, Harry J. G. M. Crijns, MD, PhD

	All Patients	No AF Progression	AF Progression	p Value
n	1,219	1,041 (85%)	178 (15%)	
Symptoms	366 (32%)	280 (29%)	86 (52%)	<0.001
Death	22 (2%)	16 (2%)	6 (3%)	0.118
Type of AF				
First detected	107 (9%)	107 (10%)	0	
Paroxysmal	860 (71%)	860 (83%)	0	
Persistent	81 (7%)	0	81 (46%)	
Permanent	97 (8%)	0	97 (54%)	
Considered cured	74 (5%)	74 (7%)	0	
Hospital admissions during 1 yr				
Cardiovascular admissions	523 (53%)	419 (50%)	104 (71%)	<0.001
Pharmacological cardioversion	255 (23%)	217 (22%)	38 (24%)	0.534
Number of pharmacological cardioversions	0.4 ± 1.3	0.4 ± 1.3	0.5 ± 1.0	0.847
Electrical cardioversion	161 (15%)	122 (13%)	39 (26%)	<0.001
Number of electrical cardioversions	0.2 ± 0.7	0.2 ± 0.7	0.4 ± 0.8	0.009
Catheter ablation	61 (5%)	57 (6%)	4 (2%)	0.065
Major adverse cardiovascular events				
Coronary artery disease	72 (6%)	57 (6%)	15 (8%)	0.168
Myocardial infarction	17 (1%)	12 (1%)	5 (3%)	0.091
Unstable angina	44 (4%)	34 (3%)	10 (6%)	0.130
Ischemic stroke or TIA	31 (3%)	20 (2%)	11 (6%)	0.003
Ischemic stroke	20 (2%)	12 (1%)	8 (5%)	0.005
TIA	11 (1%)	8 (1%)	3 (2%)	0.212
Combined survival/stroke	40 (3%)	27 (3%)	13 (7%)	0.005

On estem?

- Si en el futur (CABANA) es demostra superioritat en el braç de manteniment en RS amb ablació.....
- Si en el futur (EAST) es demostra que l'ablació quan abans millor per tal de que no hi hagi remodelat auricular....
- **Llavors, crec que sera el moment de generalitzar les indicacions al menys en paroxística.**

