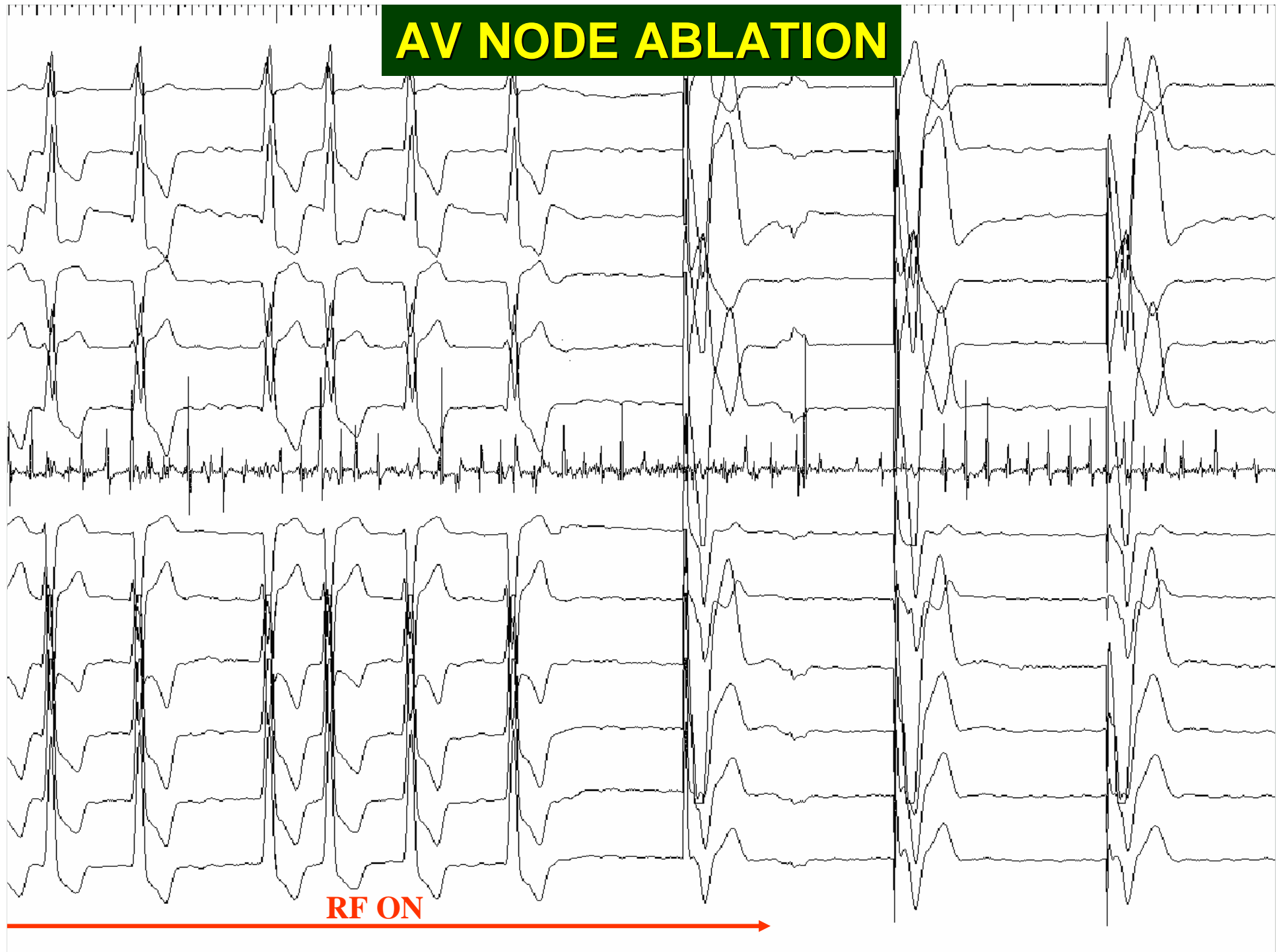


**L' ABLATION DANS LES
ARYTHMIES
SUPRAVENTRICULAIRES**

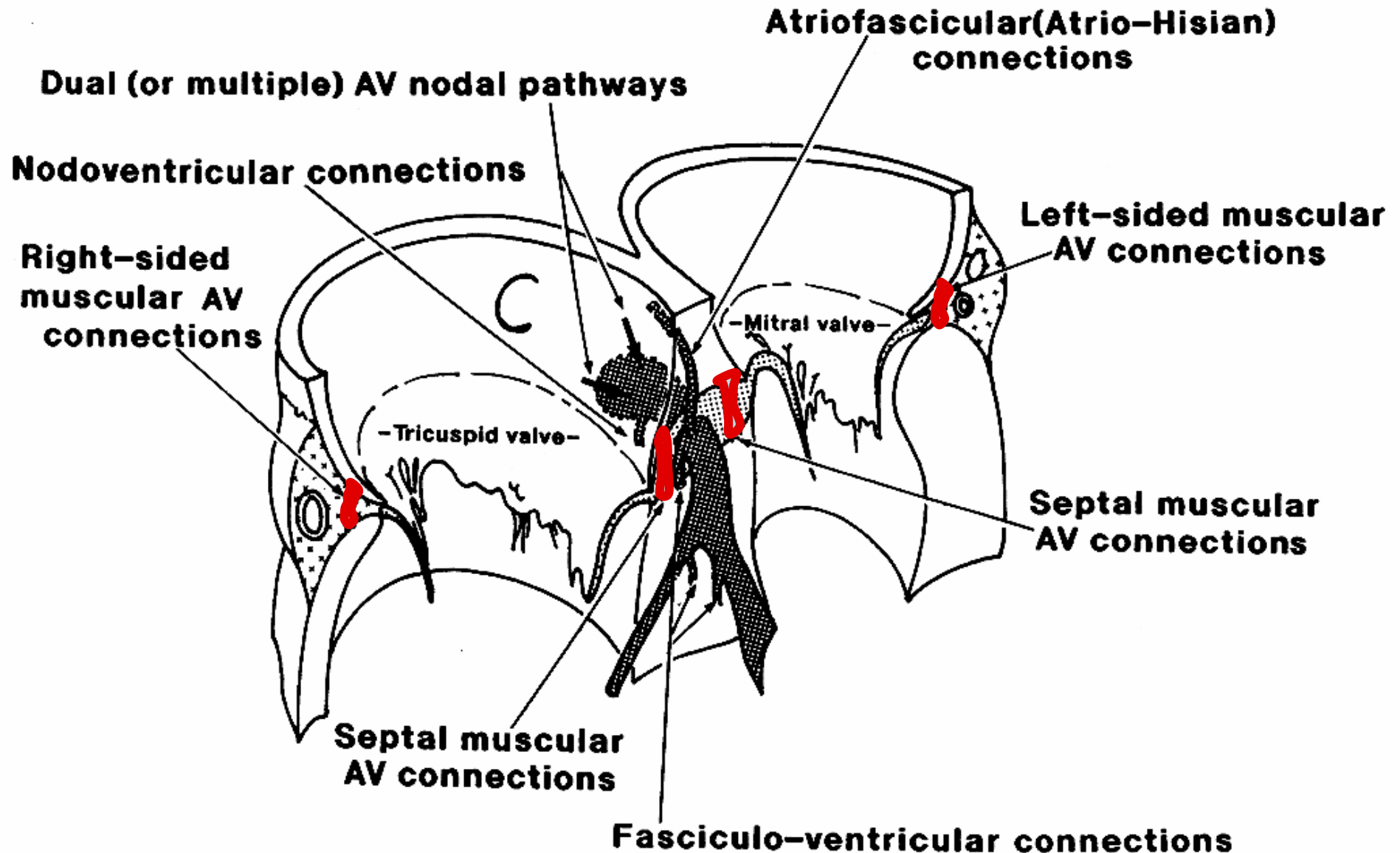
**PROF L DE ROY
UNIVERSITE DE LOUVAIN
BELGIQUE**

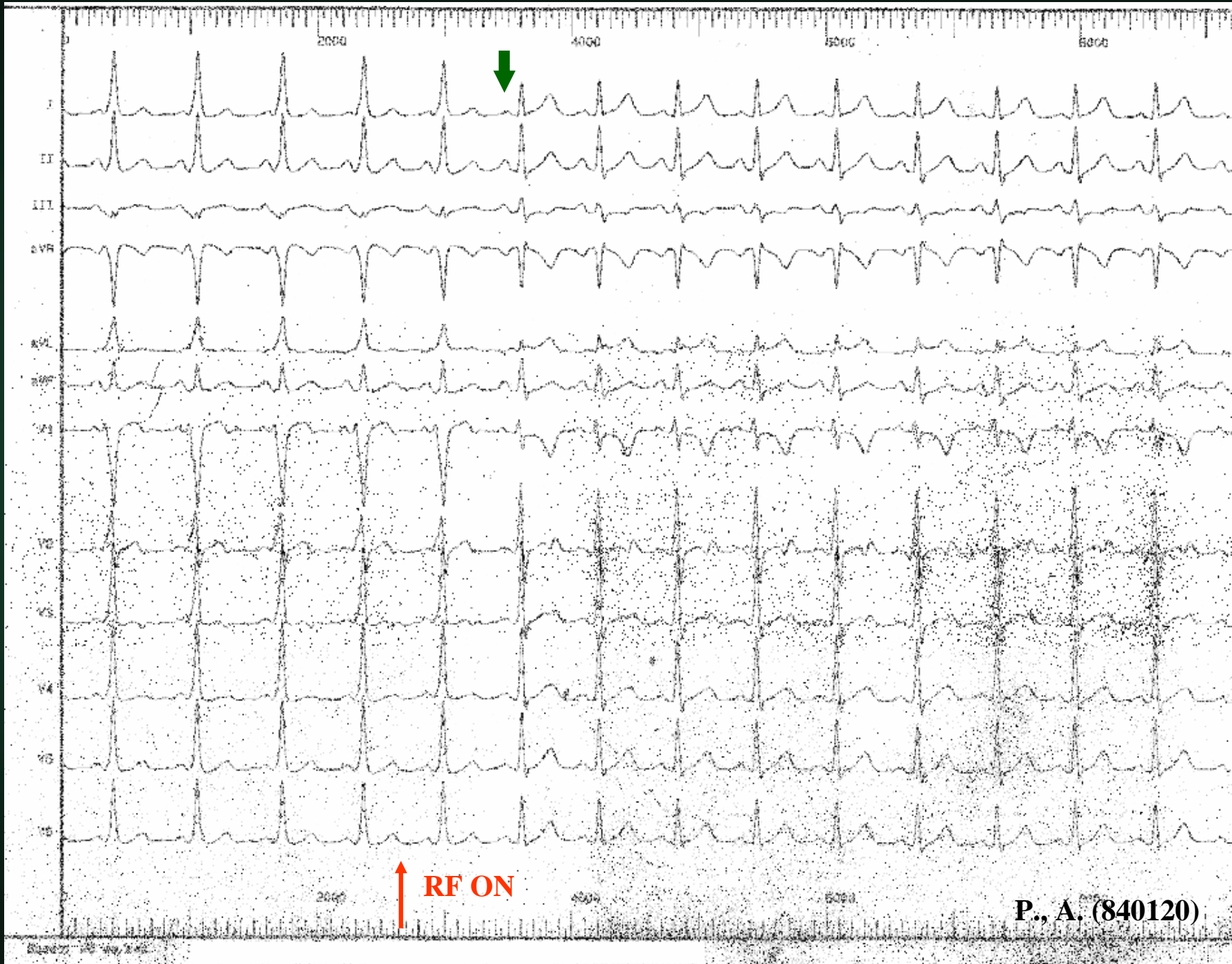
AV NODE ABLATION



RF ON

ACCESSORY PATHWAYS





P., A. (840120)

M, J-C

12 D

511026

I

II

III

aVR

aVL

aVF

V1

V2

V3

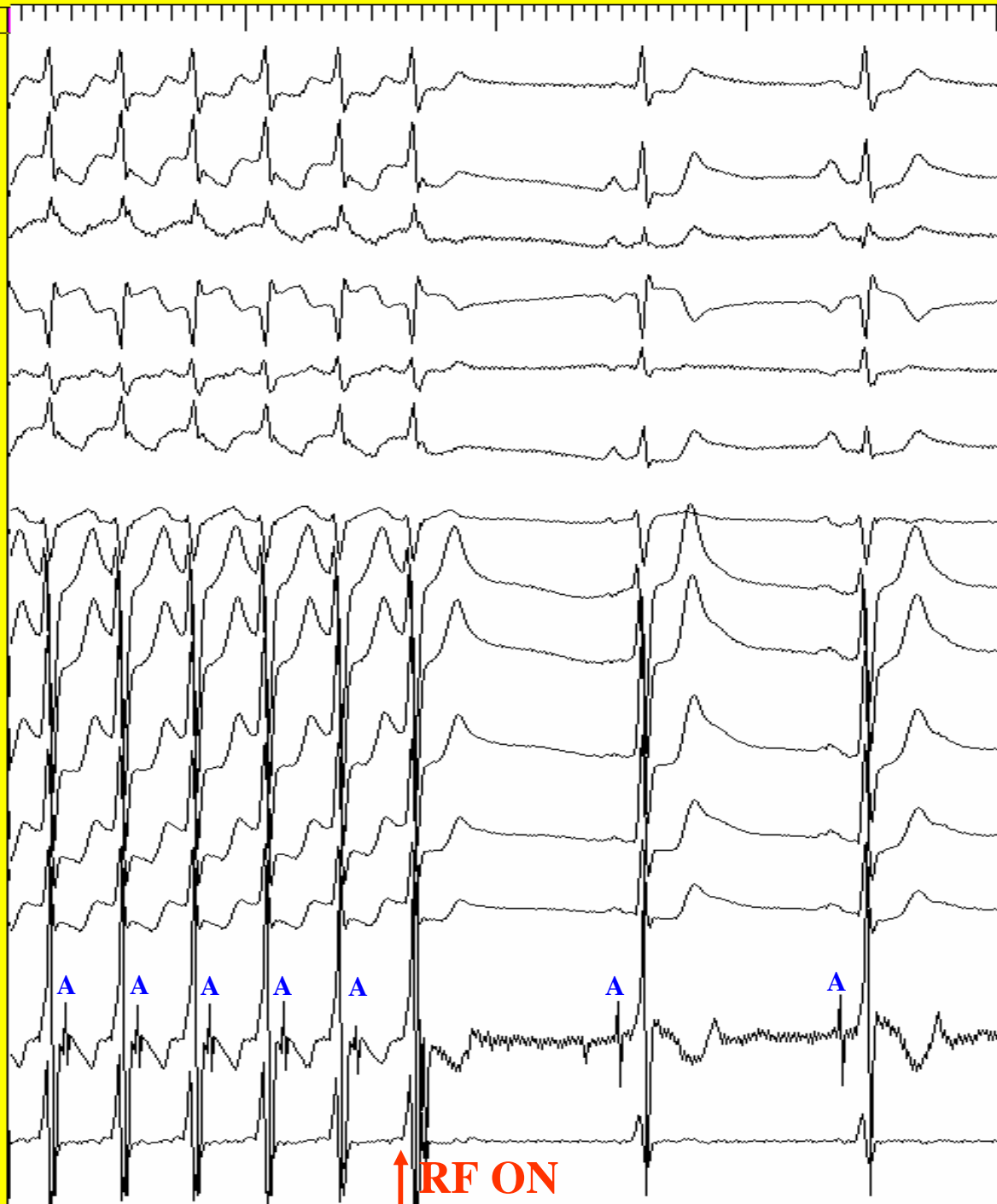
V4

V5

V6

ABL D

ABL P



↑ RF ON

ACCESSORY PATHWAYS

	Palpitations	:	HR : 260 - 280/min AF : CL < 180 ms
→	Syncope	:	11 - 29 %
	Cardiac arrest	:	0.15-0.39 % (3-10y) (1/1000 pts y)

→	RF ABL.	:	Success : 95 %
			Recurrences : 5 %

Munger circ 1993
Leitch circ 1990
Calkins circ 1999
Lesh JACC 1993

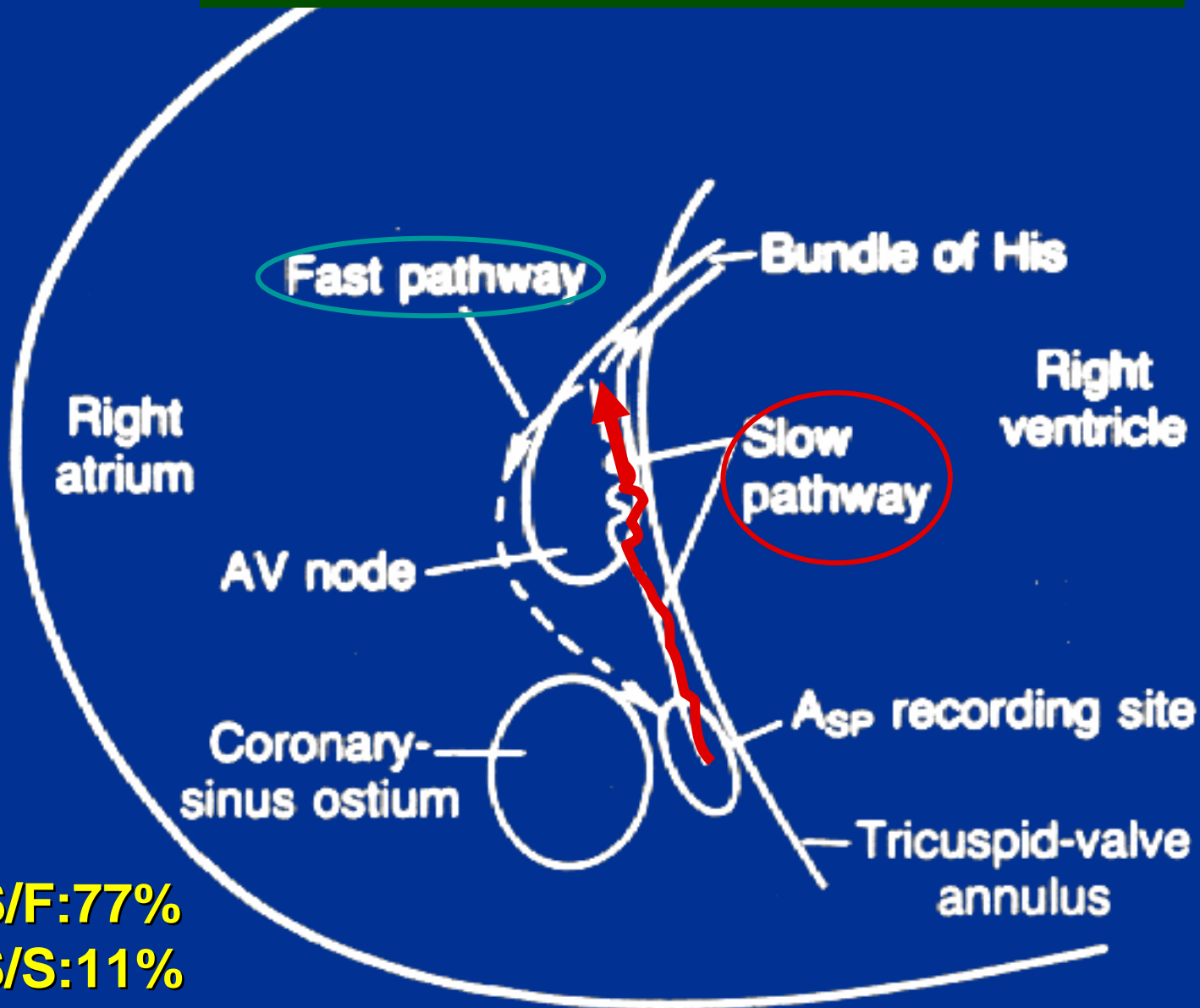
Recommendations for Long-Term Therapy of Accessory Pathway–Mediated Arrhythmias

Arrhythmia	Recommendation	Class	Level of Evidence	References
WPW syndrome (pre-excitation and symptomatic arrhythmias), well tolerated	Catheter ablation	I	B	(89,222,265,285)
	Flecainide, propafenone	IIa	C	(205,265-277)
	Sotalol, amiodarone, beta blockers	IIa	C	(278-282)
	Verapamil, diltiazem, digoxin	III	C	(283)
WPW syndrome (with AF and rapid-conduction or poorly tolerated AVRT)	Catheter ablation	I	B	(222,225, 284-290)
AVRT, poorly tolerated (no pre-excitation)	Catheter ablation	I	B	(222,225,284-290)
	Flecainide, propafenone	IIa	C	(205,265-277)
	Sotalol, amiodarone	IIa	C	(278-282)
	Beta blockers	IIb	C	(283)
	Verapamil, diltiazem, digoxin	III	C	(283)
Single or infrequent AVRT episode(s) (no pre-excitation)	None	I	C	
	Vagal maneuvers	I	B	
	'Pill-in-the-pocket'— verapamil, diltiazem, beta blockers	I	B	(211,212)
	Catheter ablation	IIa	B	(222,225,284-290)
	Sotalol, amiodarone	IIb	B	(278-282)
	Flecainide, propafenone	IIb	C	(205,265-277,283)
Digoxin	III	C		
Pre-excitation asymptomatic	None	I	C	
	Catheter ablation	IIa	B	(222,225,284-290)

The order in which treatment recommendations appear in this table within each class of recommendation does not necessarily reflect a preferred sequence of administration. Please refer to text for details. For pertinent drug dosing information, please refer to the ACC/AHA/ESC Guidelines on the Management of Patients With Atrial Fibrillation.

AF indicates atrial fibrillation; AVRT, atrioventricular reciprocating tachycardia; WPW, Wolff-Parkinson-White.

AV NODAL TACHYCARDIA

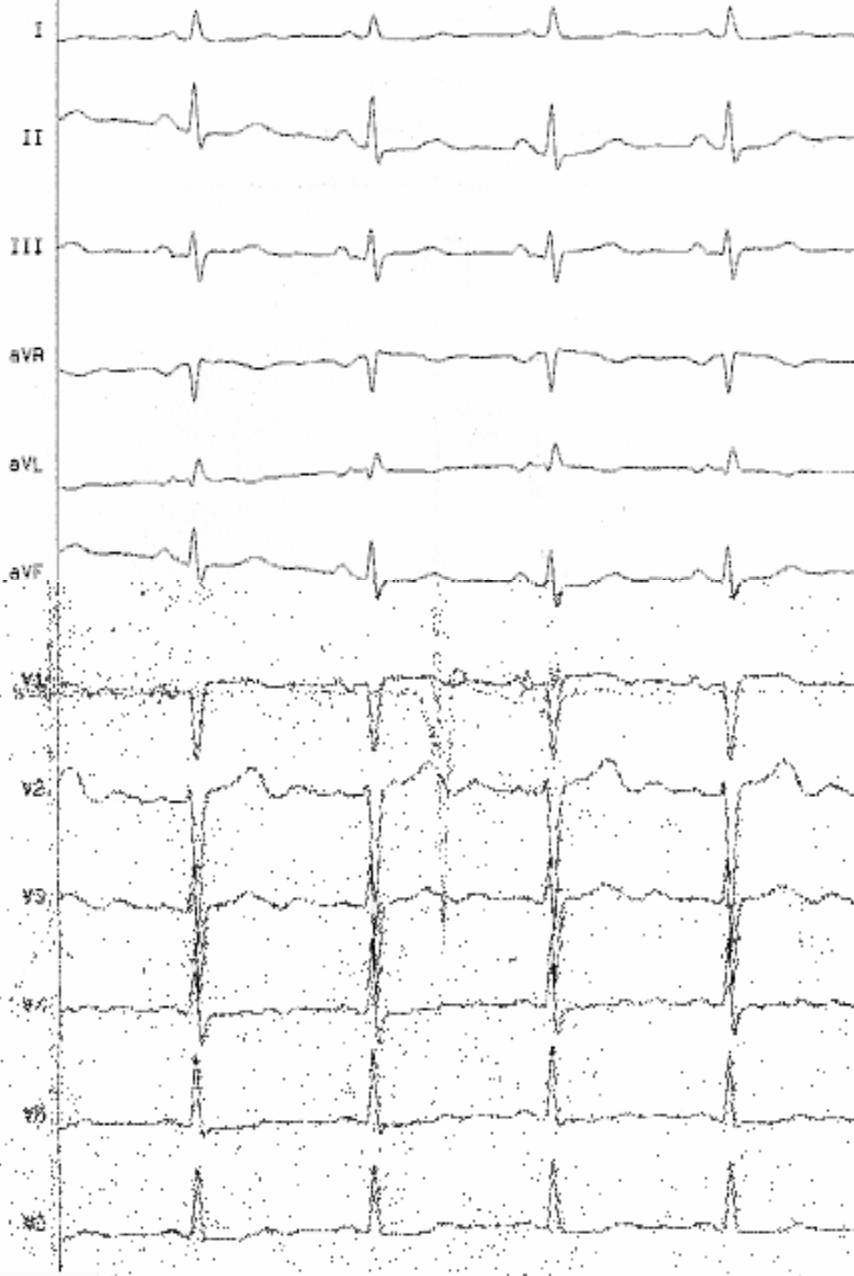


S/F:77%

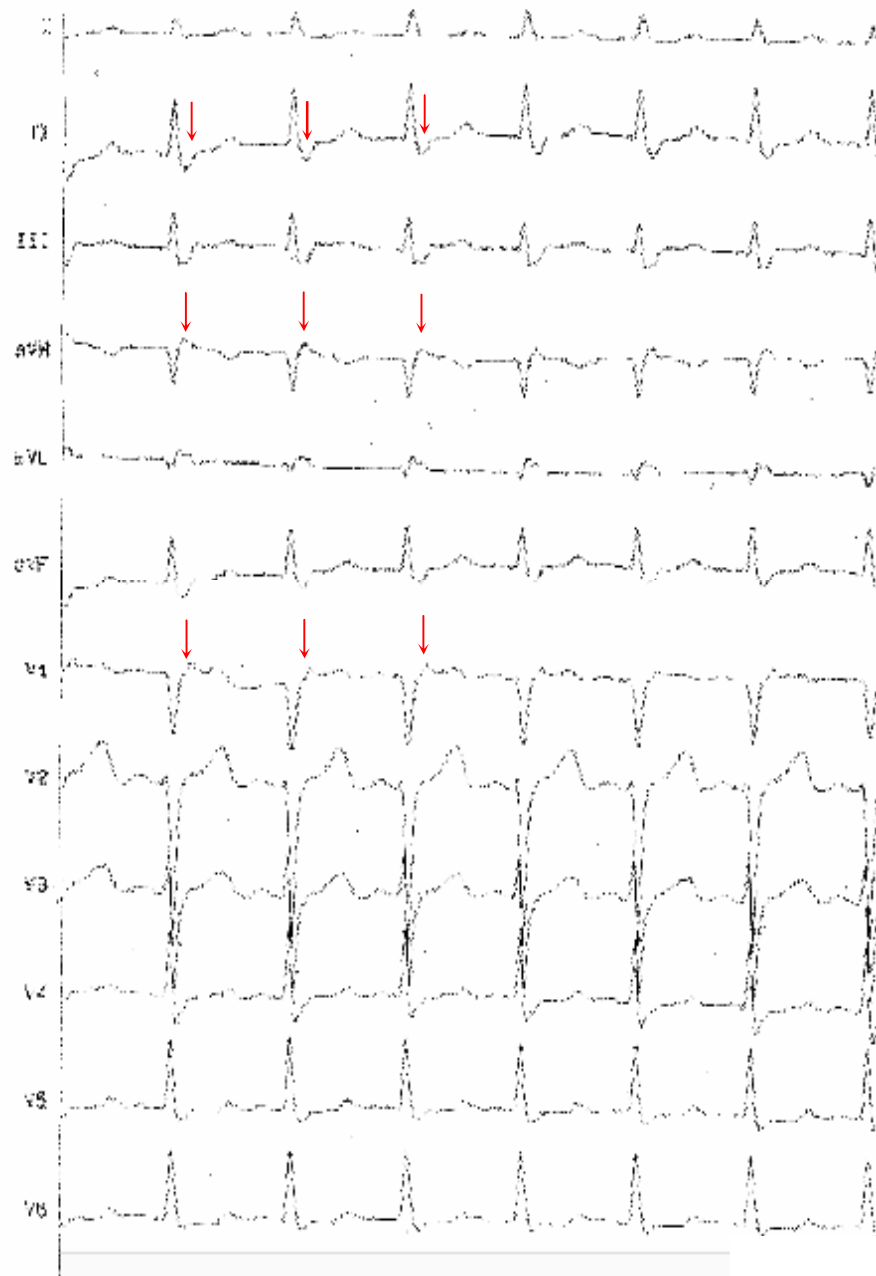
S/S:11%

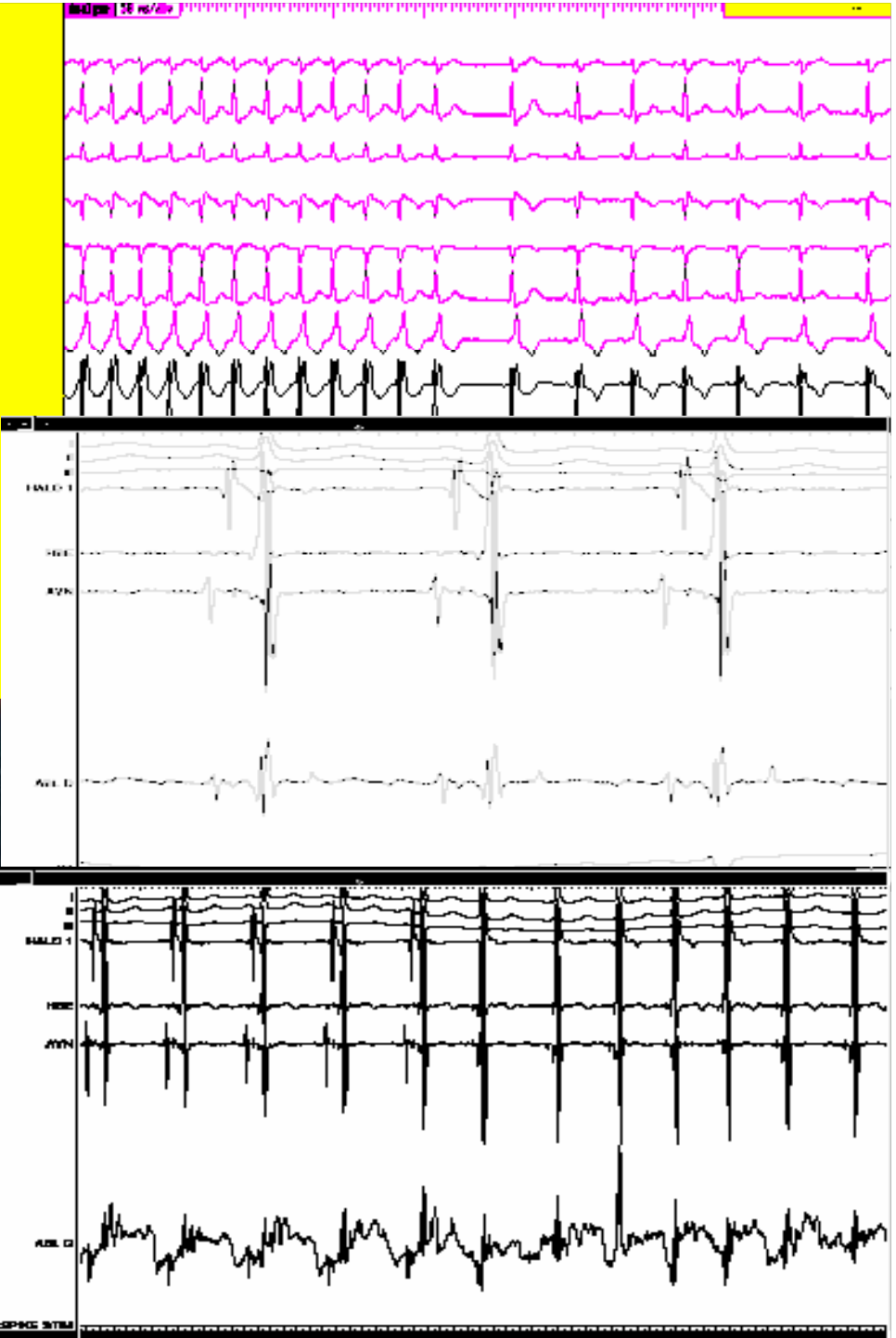
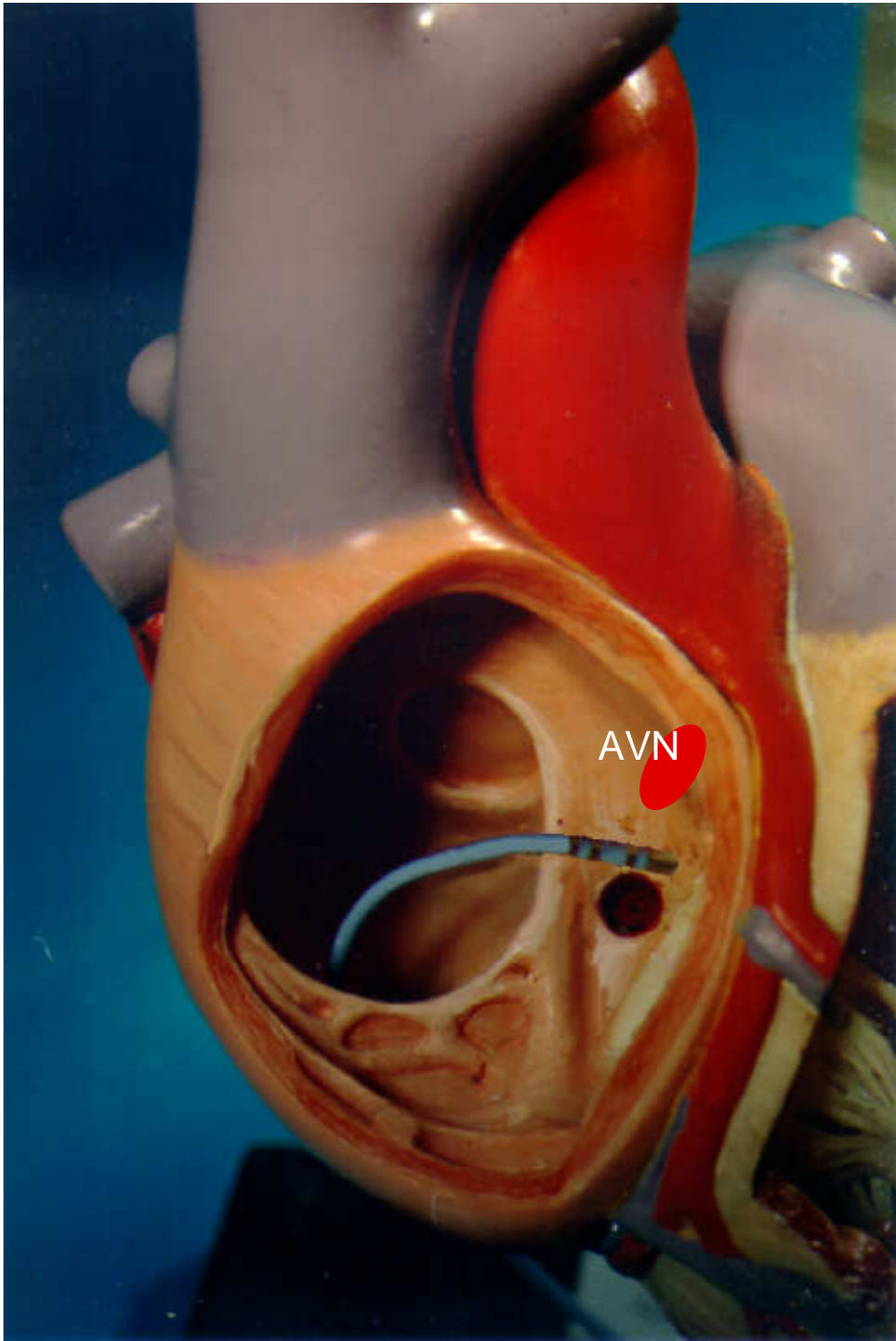
F/S:12%

L. M. 380522 / 98153



L. M. 380522 / 98153





AV NODAL TACHYCARDIA

Palpitations : HR : 240/min
AF



Syncope : 33 - 39 %

Cardiac arrest : anecdotal



RF ABL. : Success : 96.1 %

Recurrences : 3-7 %

Recommendations for Long-Term Treatment of Patients With Recurrent AVNRT

Clinical Presentation	Recommendation	Class	Level of Evidence	References
Poorly tolerated AVNRT with hemodynamic intolerance	Catheter ablation	I	B	(189)
	Verapamil, diltiazem, beta blockers, sotalol, amiodarone	IIa	C	(189)
	Flecainide,* propafenone*	IIa	C	
Recurrent symptomatic AVNRT	Catheter ablation	I	B	(189)
	Verapamil	I	B	(203)
	Diltiazem, beta blockers	I	C	(192)
	Digoxin†	IIb	C	
Recurrent AVNRT unresponsive to beta blockade or calcium-channel blocker and patient not desiring RF ablation	Flecainide,* propafenone,* sotalol	IIa	B	(194,197-199,205,208)
	Amiodarone	IIb	C	(210)
AVNRT with infrequent or single episode in patients who desire complete control of arrhythmia	Catheter ablation	I	B	
Documented PSVT with only dual AV-nodal pathways or single echo beats demonstrated during electrophysiological study and no other identified cause of arrhythmia	Verapamil, diltiazem, beta blockers, flecainide,* propafenone*	I	C	
	Catheter ablation‡	I	B	
Infrequent, well-tolerated AVNRT	No therapy	I	C	(189)
	Vagal maneuvers	I	B	
	"Pill-in-the-pocket"	I	B	
	Verapamil, diltiazem, beta blockers	I	B	
	Catheter ablation	I	B	(227)

The order in which treatment recommendations appear in this table within each class of recommendation does not necessarily reflect a preferred sequence of administration. Please refer to text for details. For pertinent drug dosing information, please refer to the ACC/AHA/ESC Guidelines on the Management of Patients With Atrial Fibrillation.

*Relatively contraindicated for patients with coronary artery disease, LV dysfunction, or other significant heart disease.

†Often ineffective because pharmacological effects can be overridden by enhanced sympathetic tone.

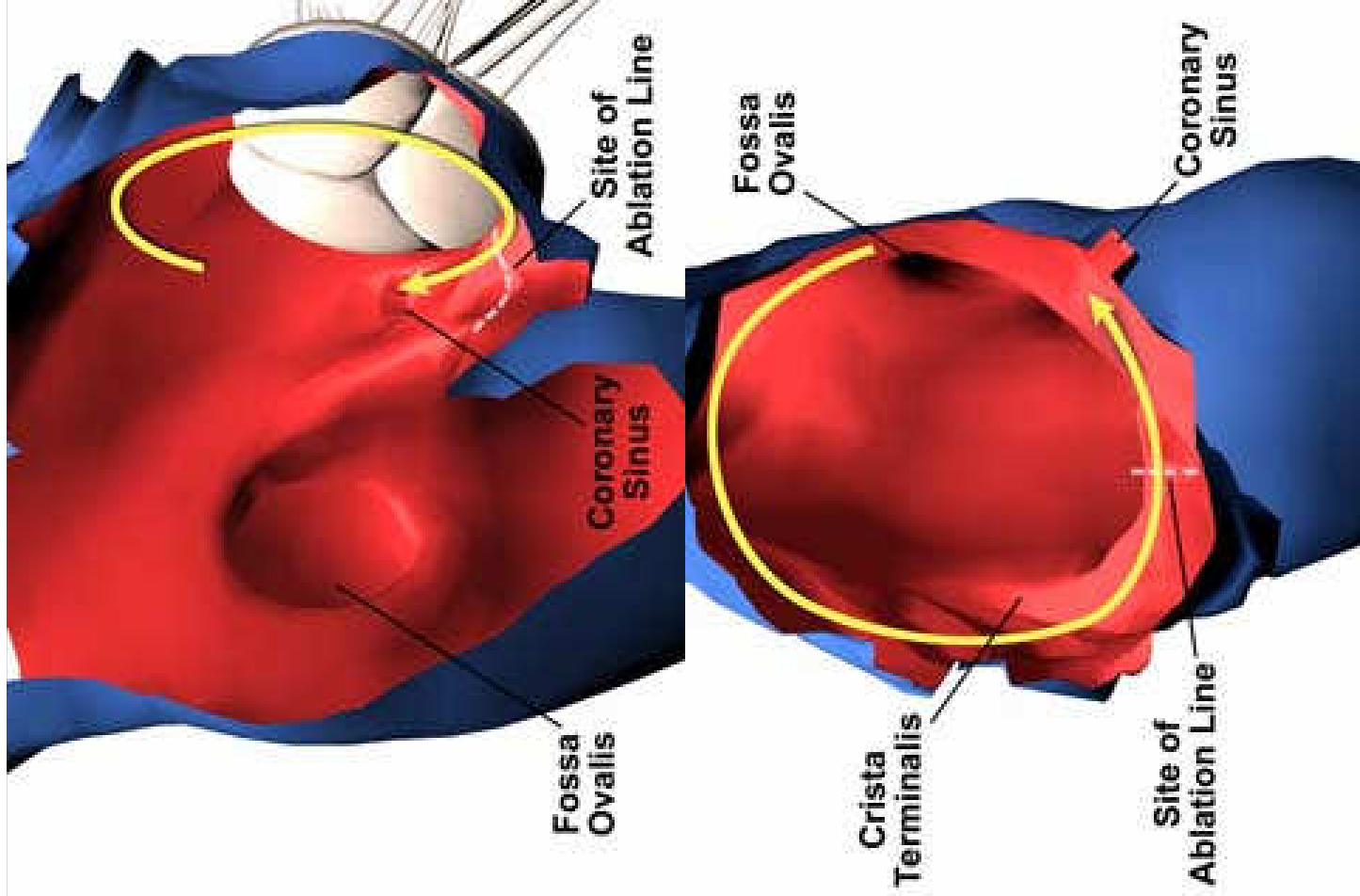
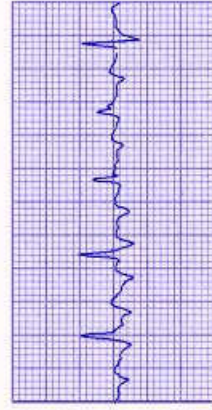
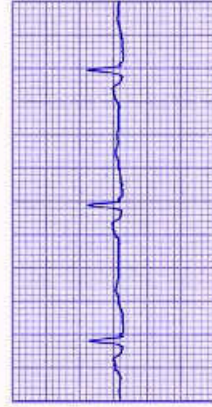
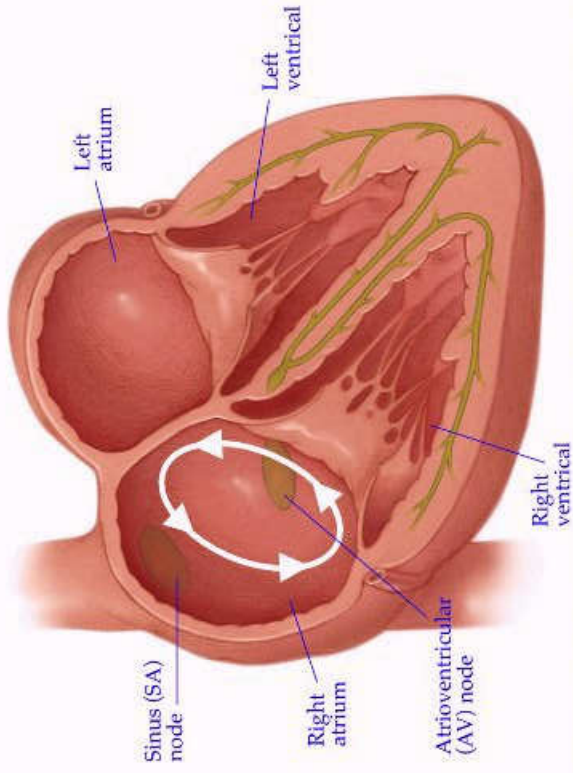
‡Decision depends on symptoms.

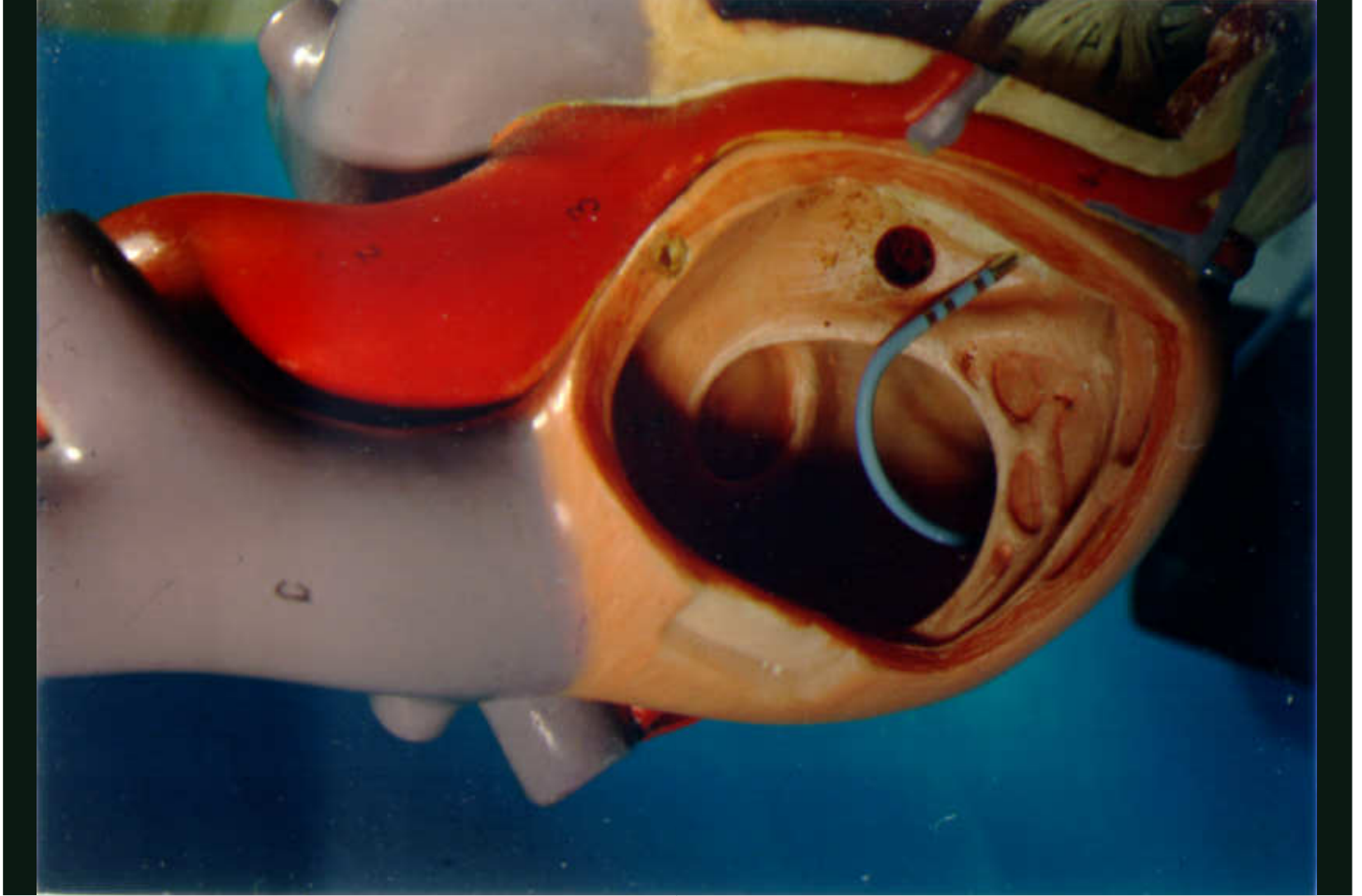
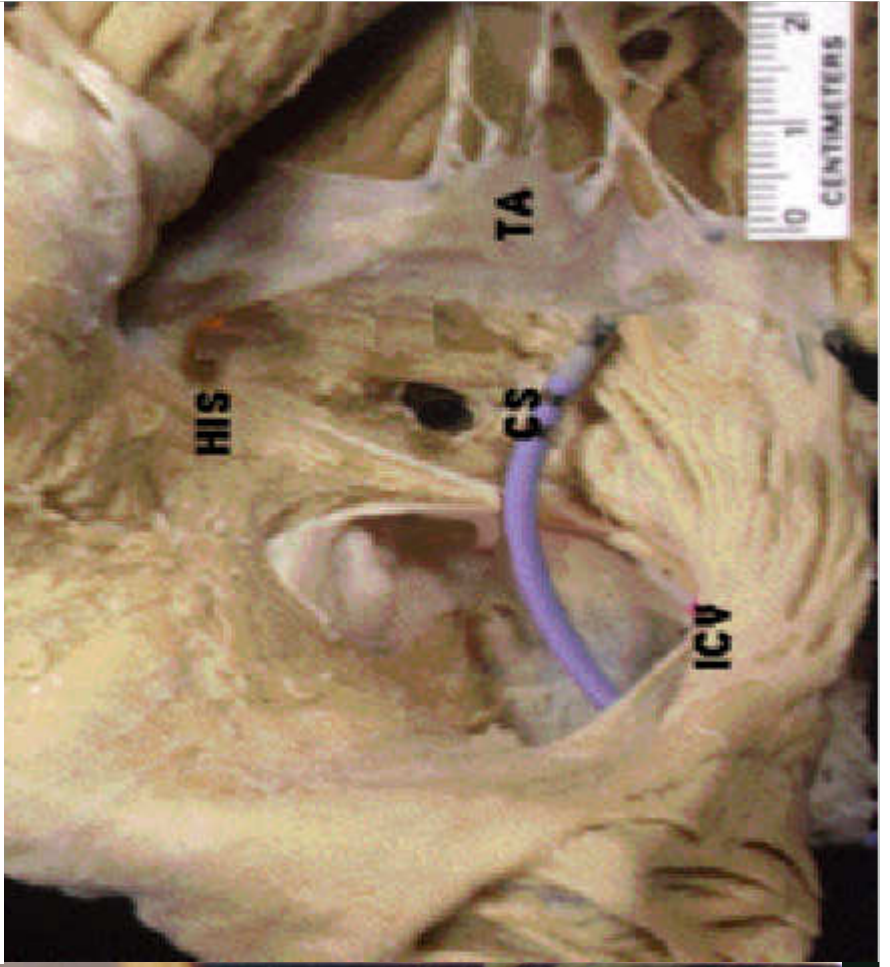
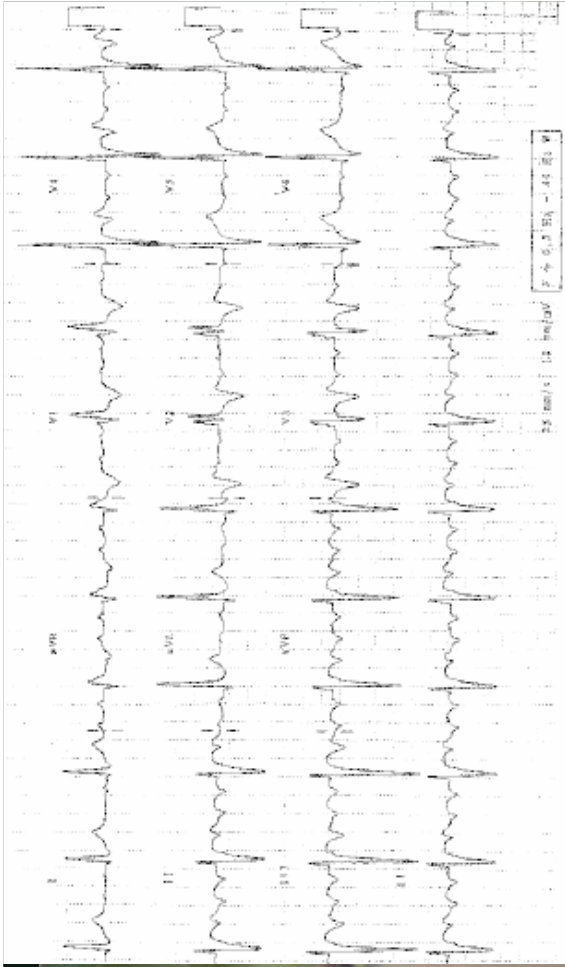
AV indicates atrioventricular; AVNRT, atrioventricular nodal reciprocating tachycardia; LV, left ventricular; PSVT, paroxysmal supraventricular tachycardia; RF, radiofrequency.

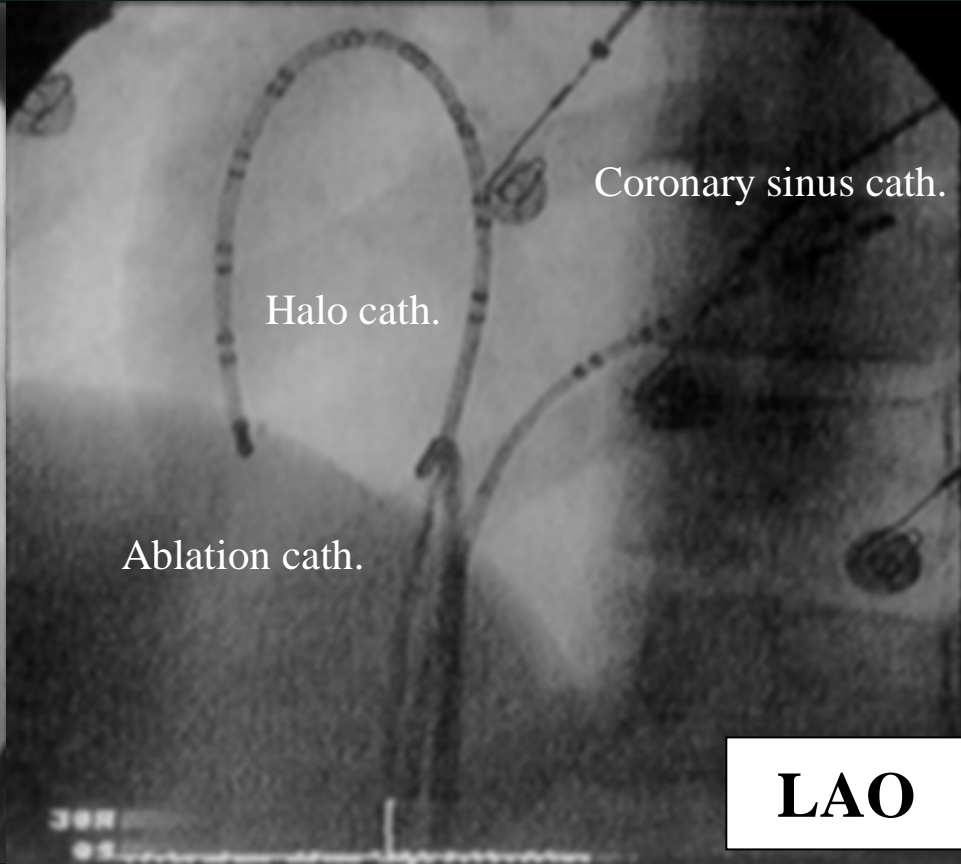
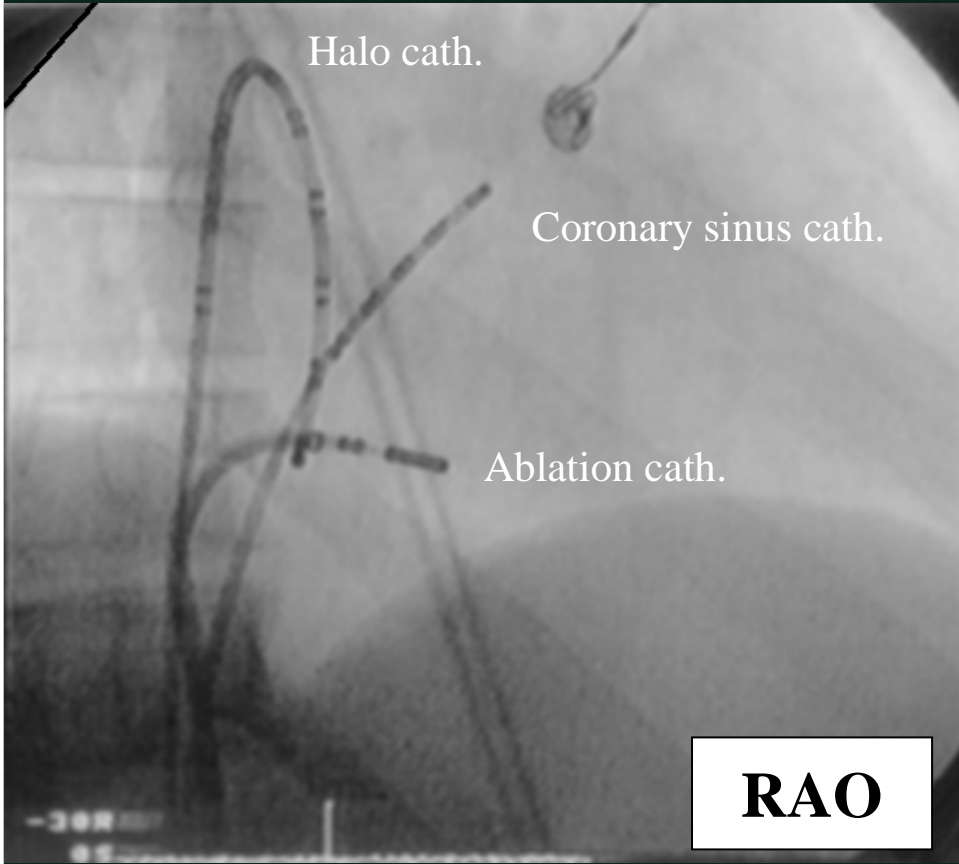
FLUTTER AURICULAIRE

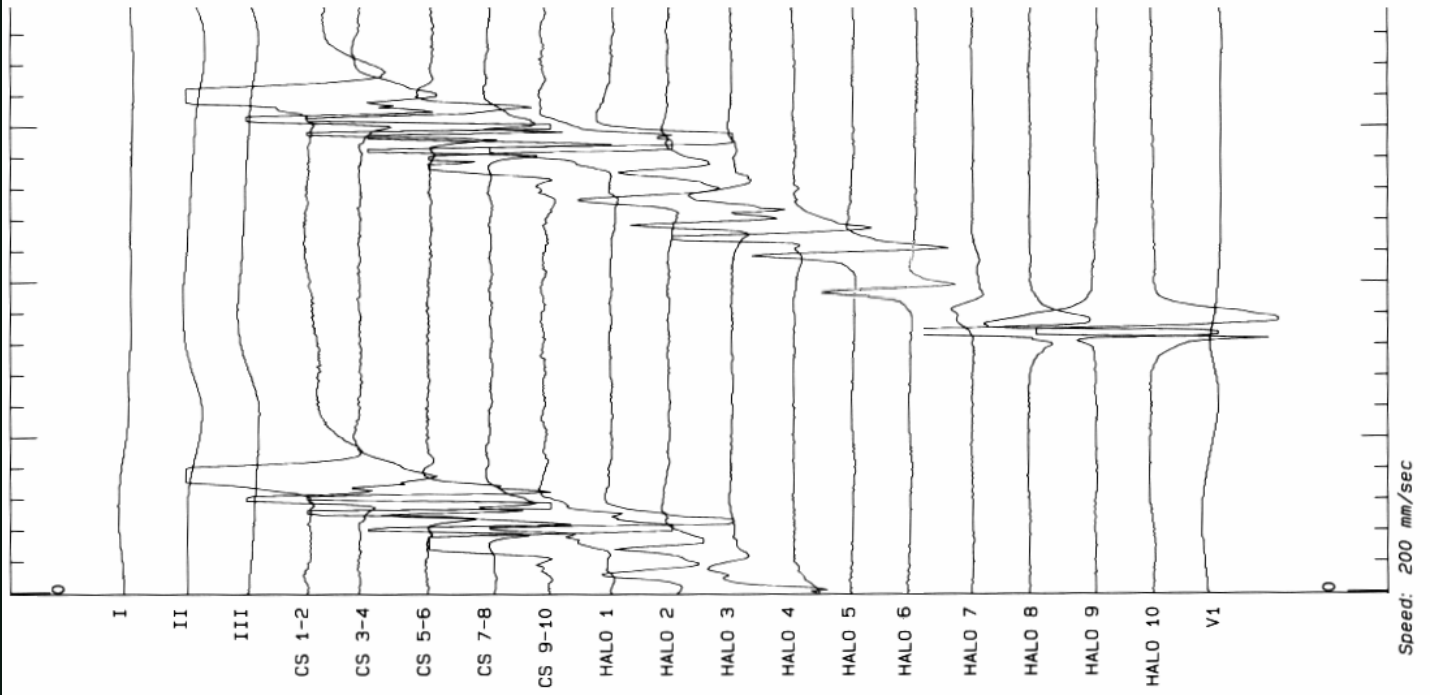
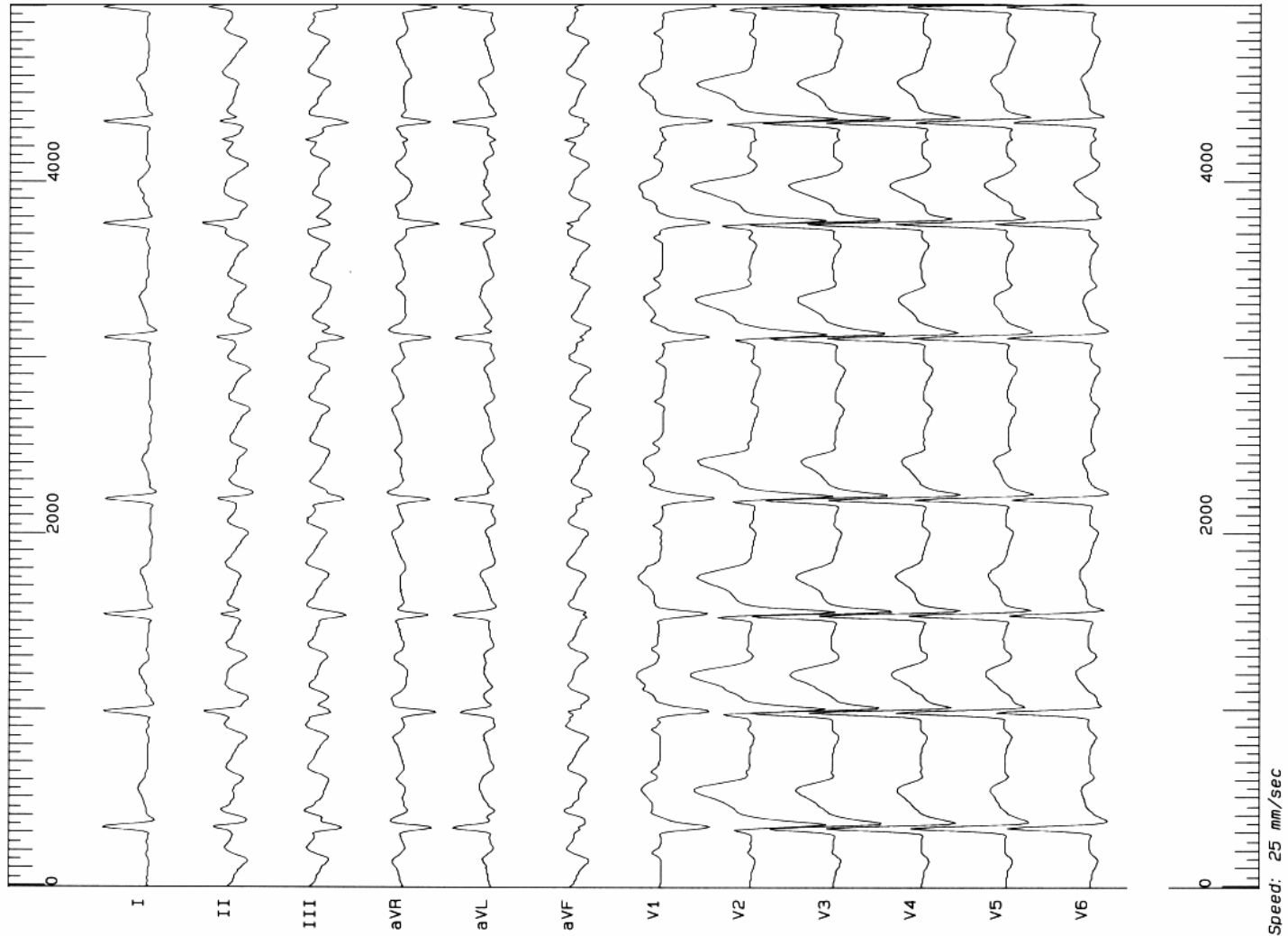
- FLUTTER ISTHMIQUE
ANTIHOAIRE
HOAIRE
- FLUTTER ATYPIQUE
CICATRICIEL
AUTRES

Atrial Flutter











Speed: 25 mm/sec

Protocol #10

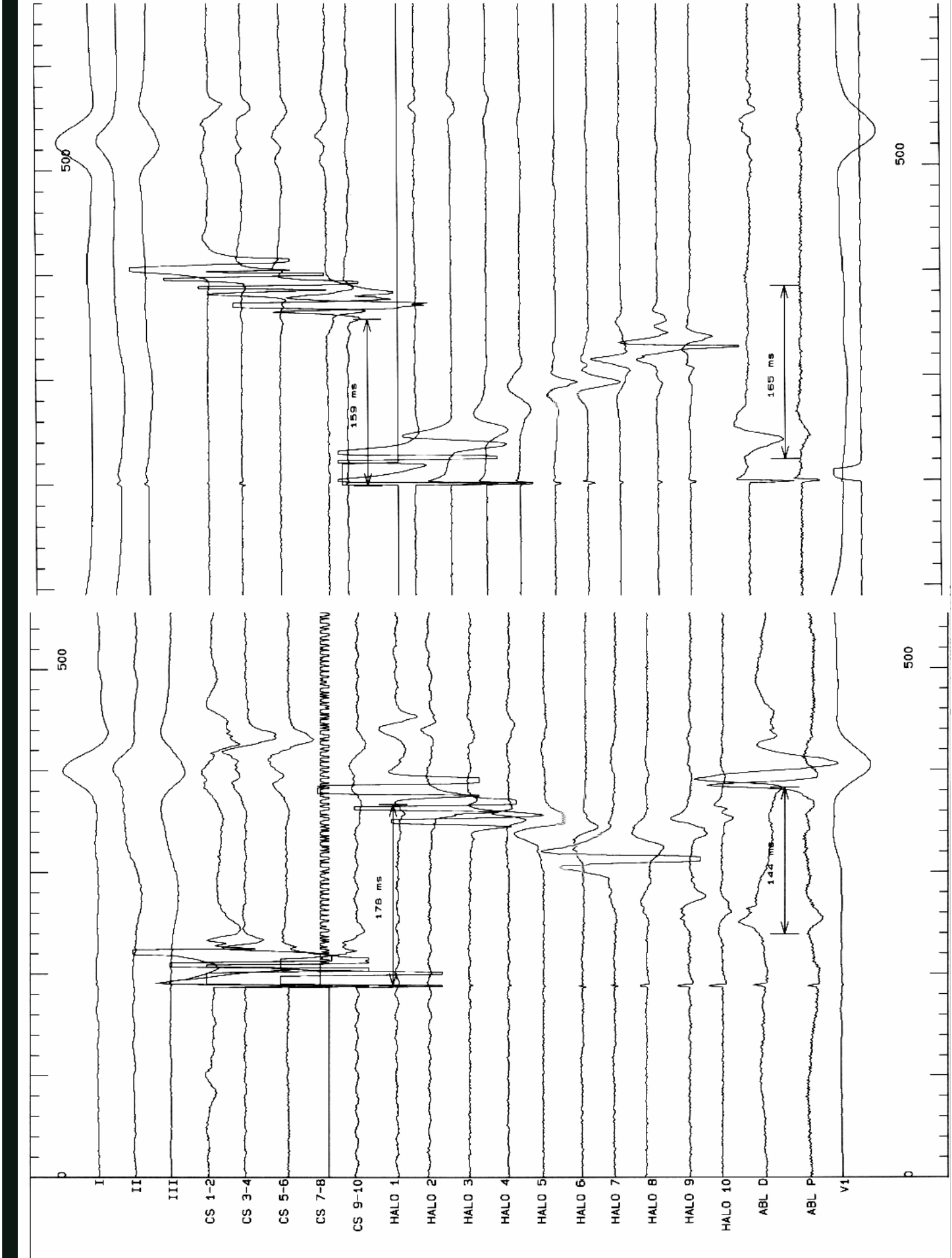
L. C. 541212 (22-11-2000)



Speed: 100 mm/sec

Protocol #30

L. C. 541212 (22-11-2000)



Comparison between antiarrhythmic therapy and first-line RF ablation in patients with atrial flutter

	RF Ablation (n = 31)	Drug therapy (n = 30)
Persistent AFLT	30	28
AFLT recurrence	6 % (2)*	93 % (28)
AF recurrence	29 % (9)*	60 % (18)
Rehospitalization	22 % (7)*	63 % (19)

* $p < 0.01$

Natale

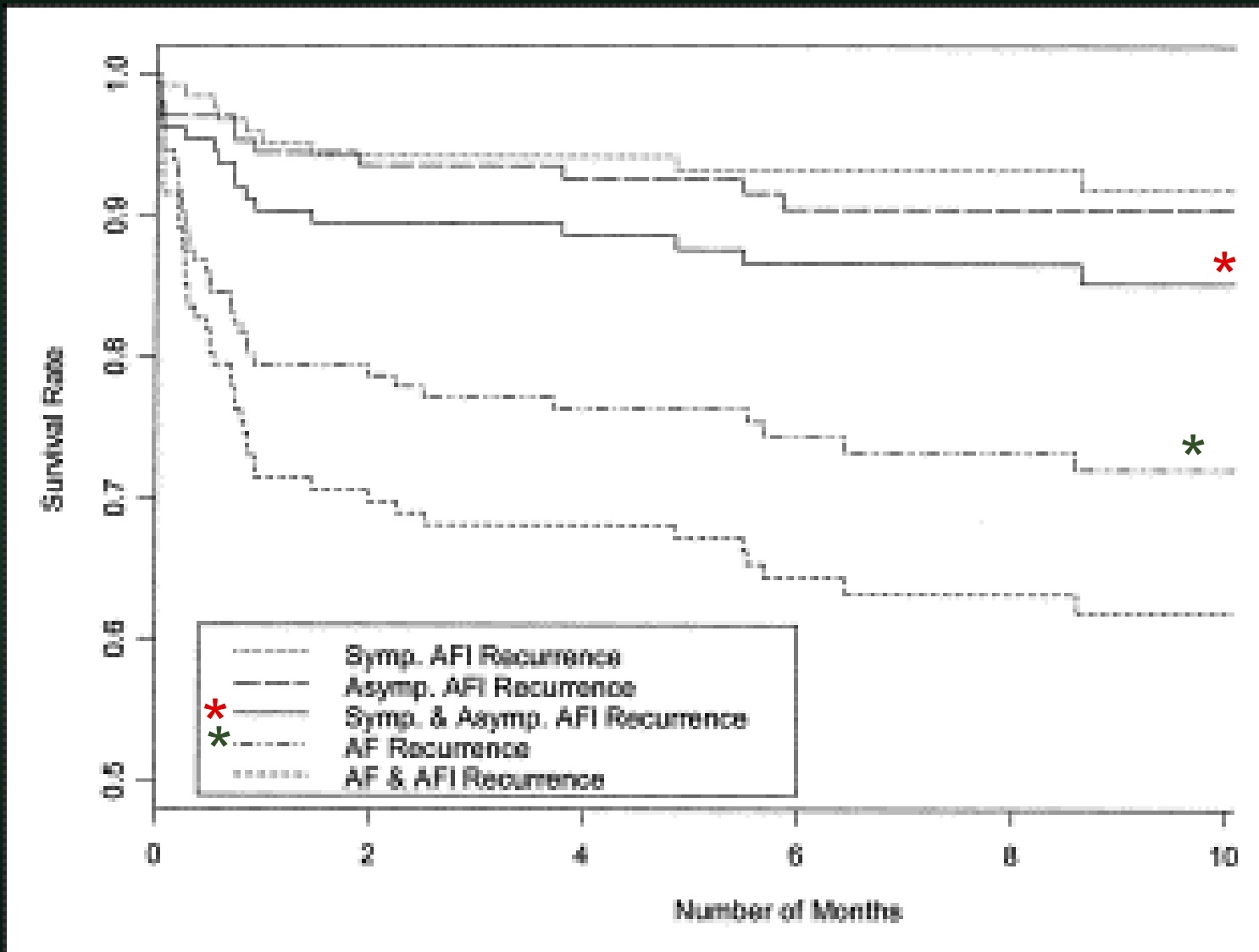
JACC 2000;35(7):1898



Heart Rhythm Society

Restoring the Rhythm of Life

Survival rate from recurrent typical atrial flutter (AFI) and atrial fibrillation (AF).



N: 150 pts

Calkins H et al
Am J Cardiol. 2004 Aug 15;94(4):437-42.

Recommendations for Long-Term Management of Atrial Flutter

Clinical Status/ Proposed Therapy	Recommendation	Class	Level of Evidence	References
First episode and well-tolerated atrial flutter	Cardioversion alone	I	B	(391)
	Catheter ablation*	IIa	B	(427)
Recurrent and well-tolerated atrial flutter	Catheter ablation*	I	B	(424-426)
	Dofetilide	IIa	C	(406,407)
	Amiodarone, sotalol, flecainide, †‡ quinidine, †‡ propafenone, †‡ procainamide, †‡ disopyramide †‡	IIb	C	(95,405,408)
Poorly tolerated atrial flutter	Catheter ablation*	I	B	(424-426)
Atrial flutter appearing after use of class Ic agents or amiodarone for treatment of AF	Catheter ablation*	I	B	(431,432)
	Stop current drug and use another	IIa	C	
Symptomatic non-CTI-dependent flutter after failed antiarrhythmic drug therapy	Catheter ablation*	IIa	B	(450-452)

The order in which treatment recommendations appear in this table within each class of recommendation does not necessarily reflect a preferred sequence of administration. Please refer to text for details. For pertinent drug dosing information, please refer to the ACC/AHA/ESC Guidelines on the Management of Patients With Atrial Fibrillation.

*Catheter ablation of the AV junction and insertion of a pacemaker should be considered if catheter ablative cure is not possible and the patient fails drug therapy.

†These drugs should not be taken by patients with significant structural cardiac disease. Use of anticoagulants is identical to that described for patients with AF (459).

‡Flecainide, propafenone, procainamide, quinidine, and disopyramide should not be used unless they are combined with an AV-nodal-blocking agent.

AF indicates atrial fibrillation; AV, atrioventricular; CTI, cavotricuspid isthmus.

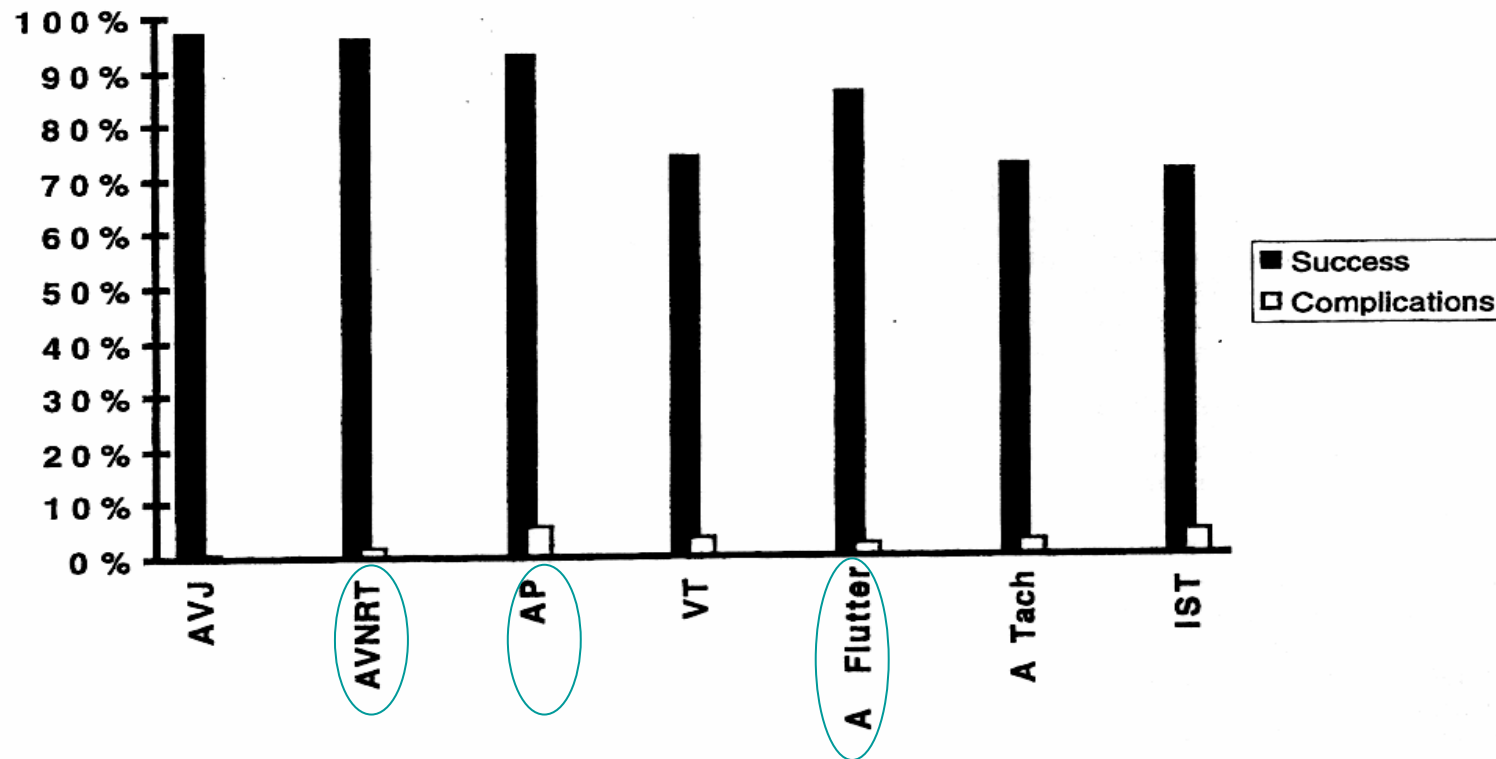
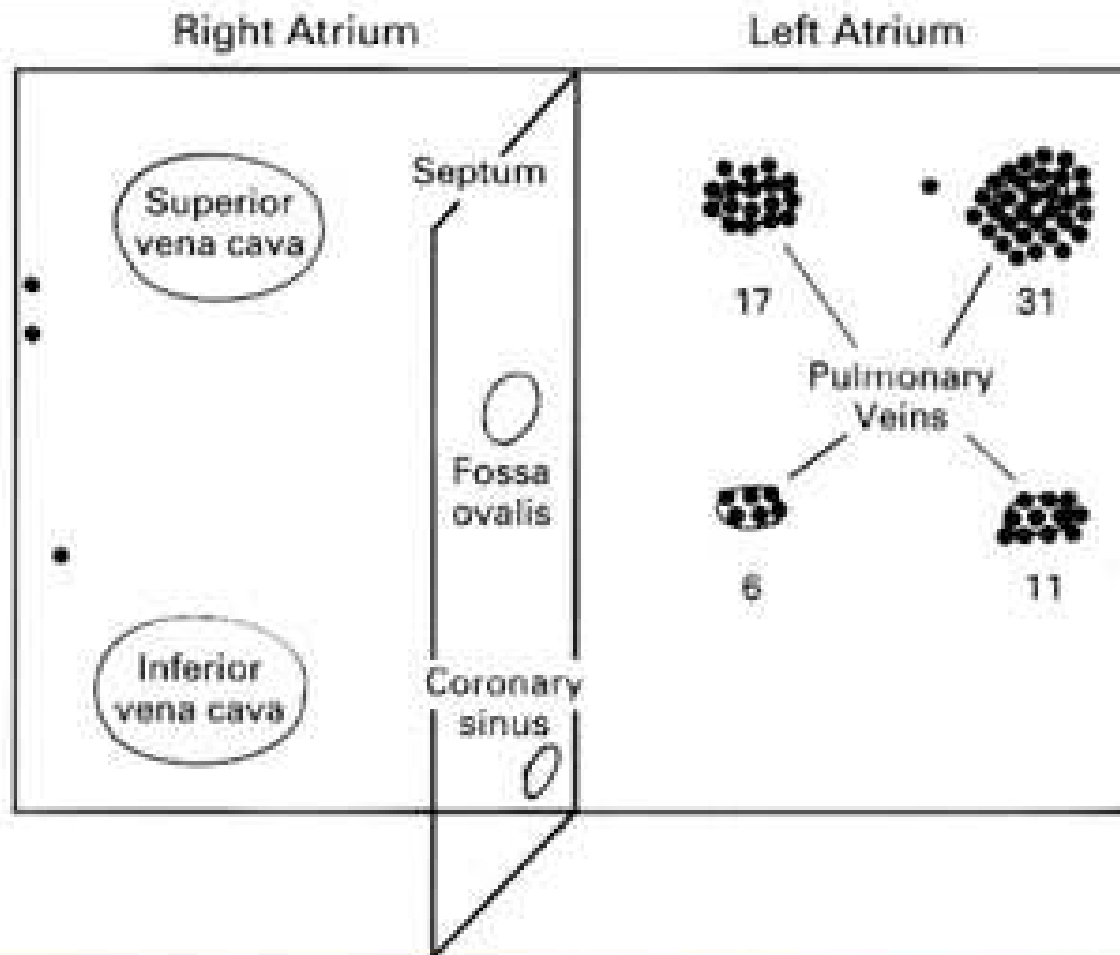


Figure 1. Percent of successful ablation and percent of complication for types of ablation. AVJ = atrioventricular junctional ablation; AVNRT = atrioventricular nodal reentrant tachycardia ablation; AP = accessory pathway ablation; VT = ventricular tachycardia ablation; A Flutter = atrial flutter ablation; A Tach = atrial tachycardia ablation; IST = inappropriate sinus tachycardia ablation.

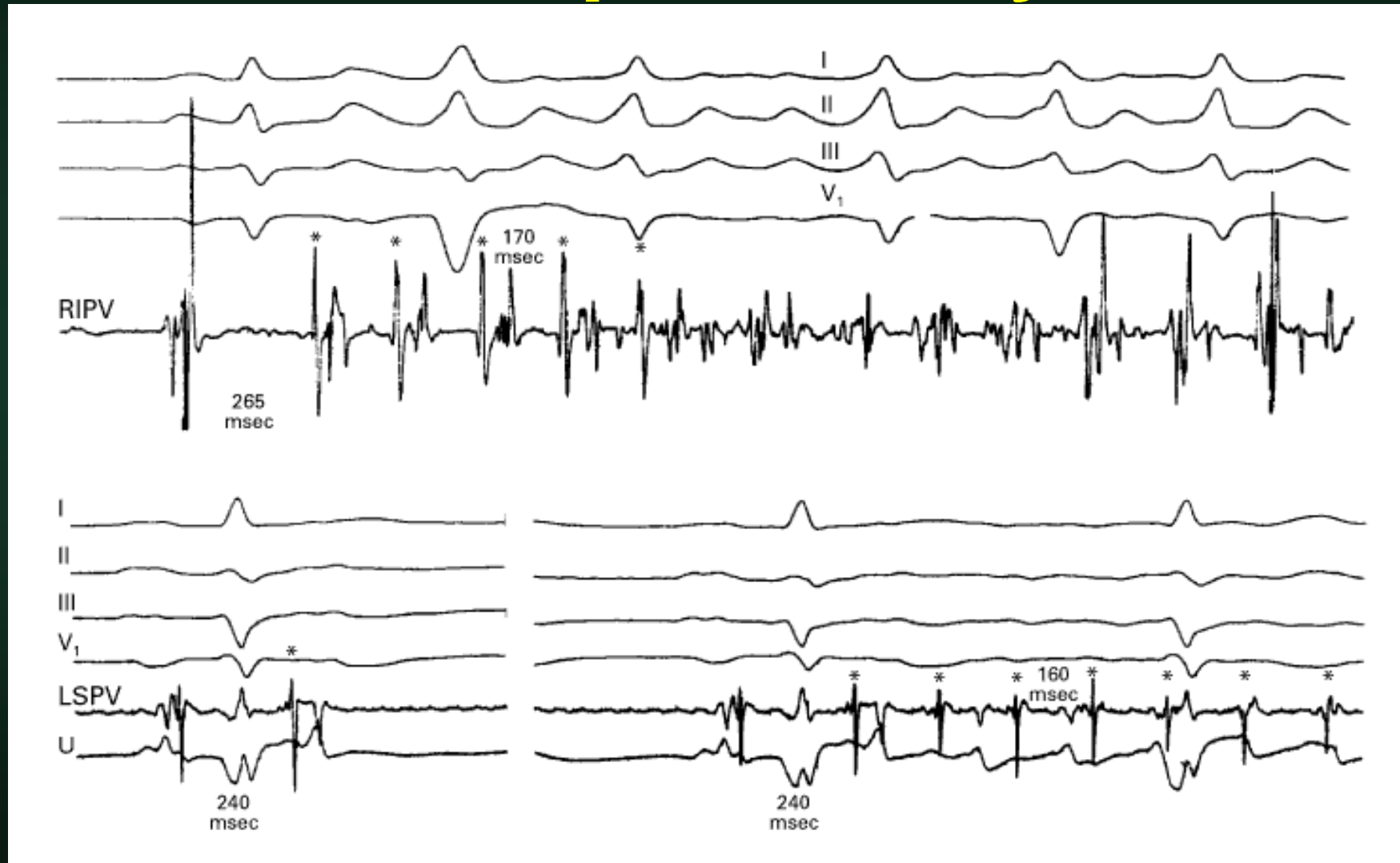
FIBRILLATION AURICULAIRE

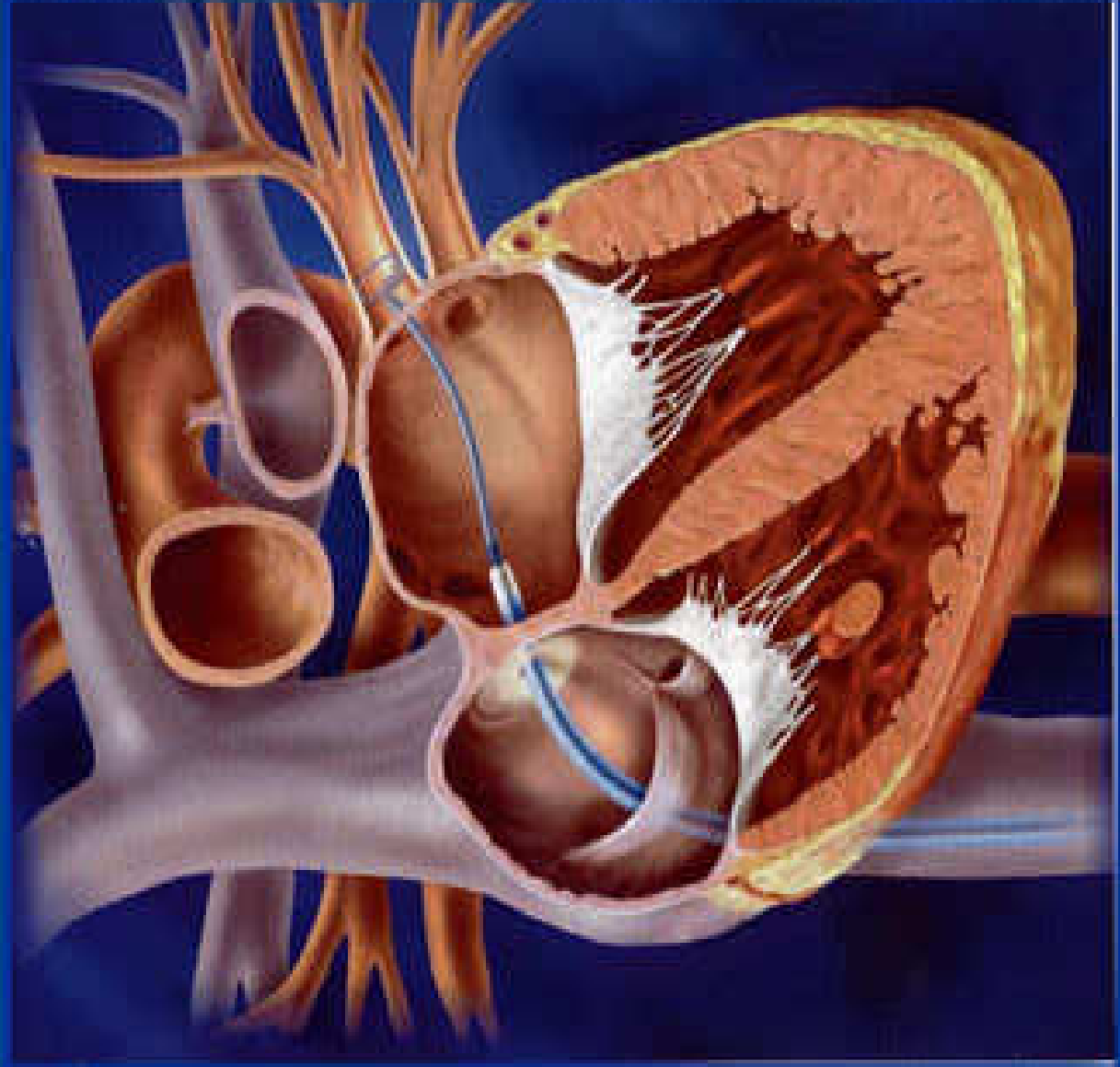
- FA PAROXYSTIQUE
- FA PERSISTANTE
- FA PERMANENTE

Source of Triggers of AF



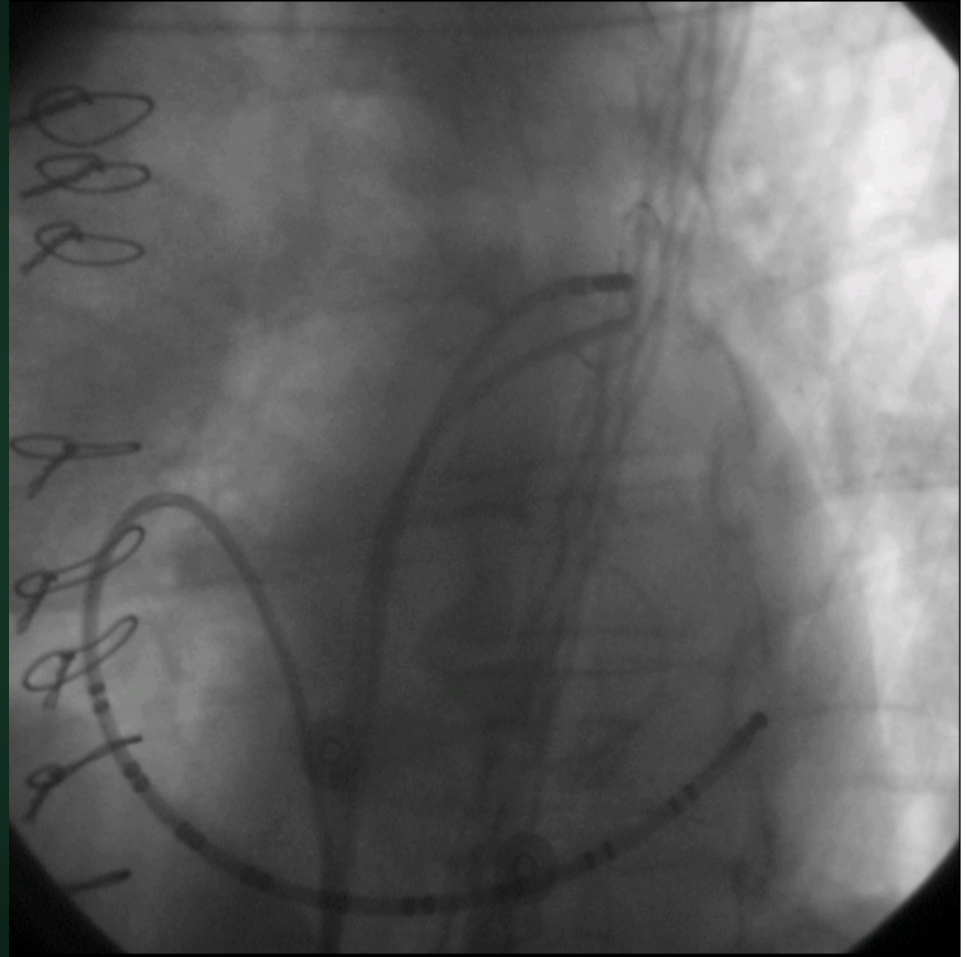
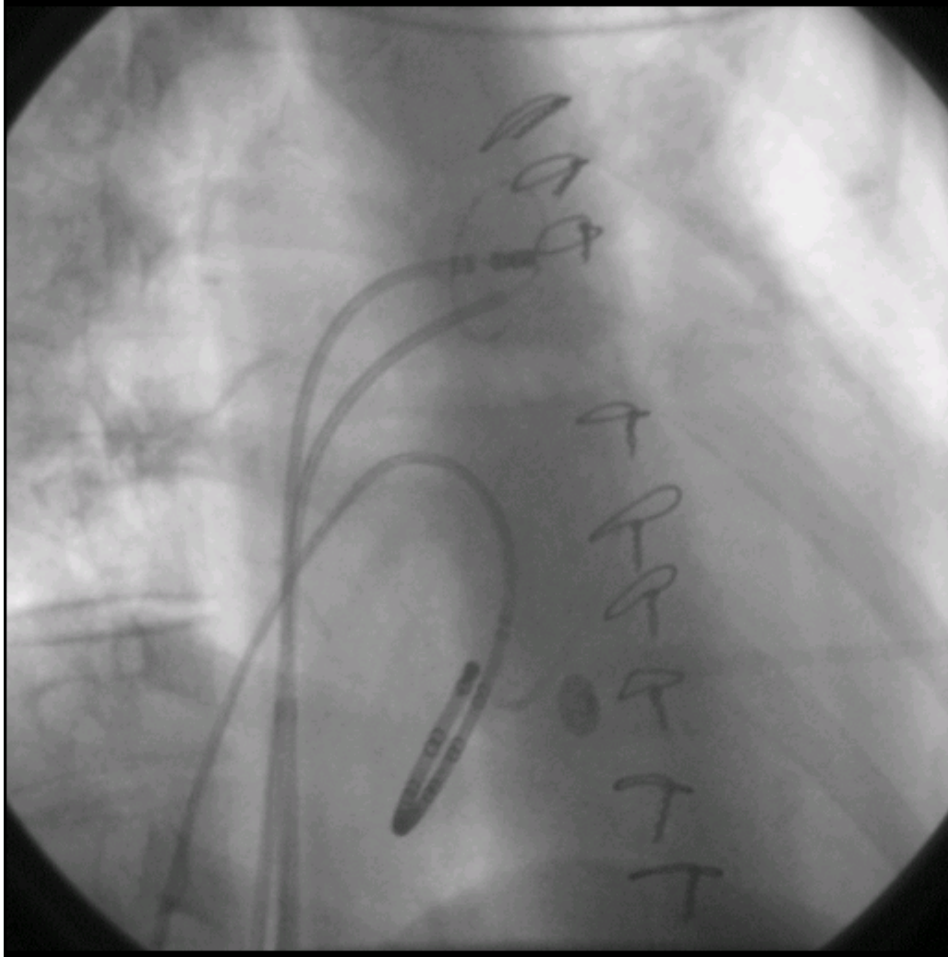
Initiation of AF by ectopic beats from pulmonary veins



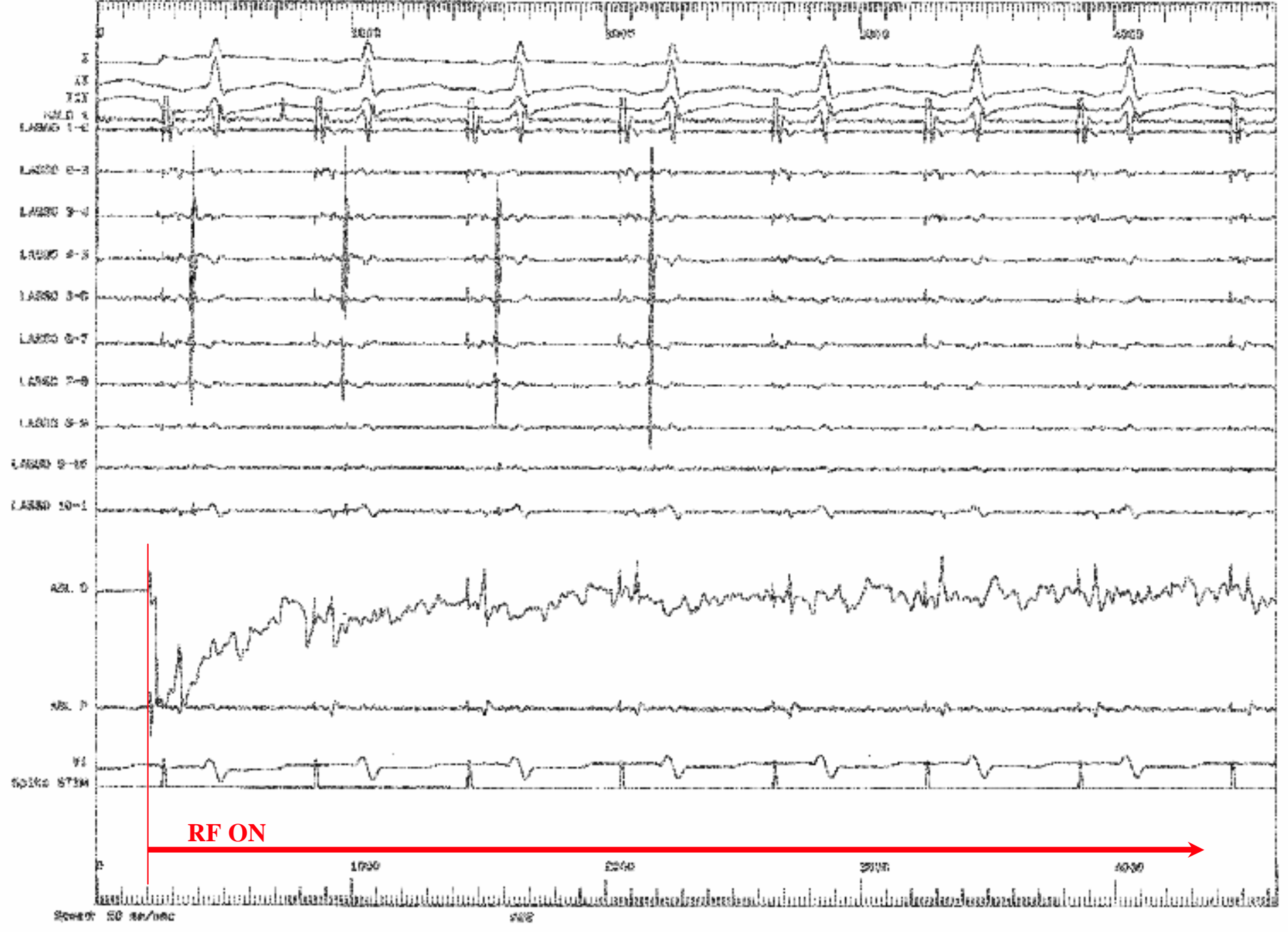


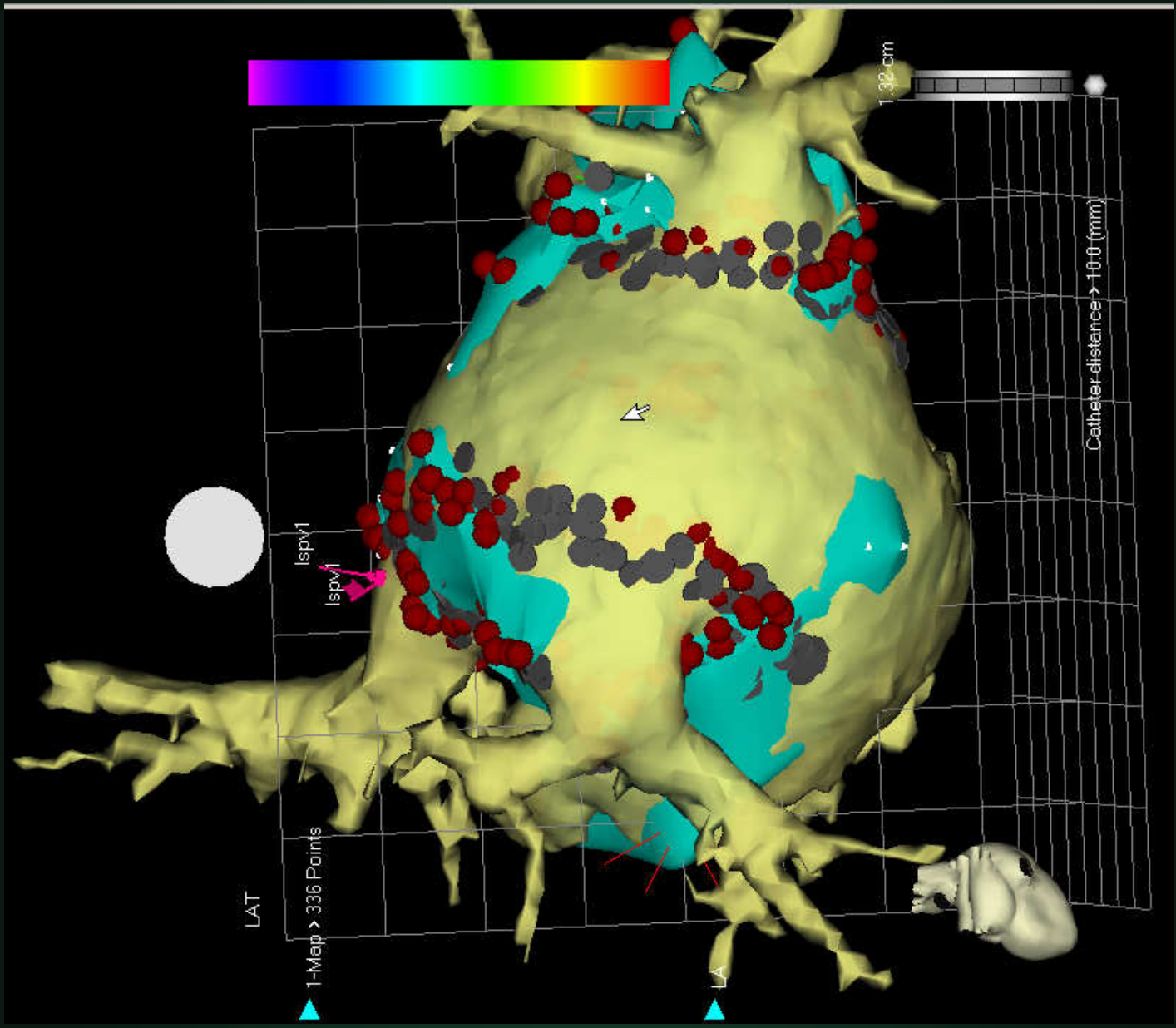
RAO 30

LAO 40

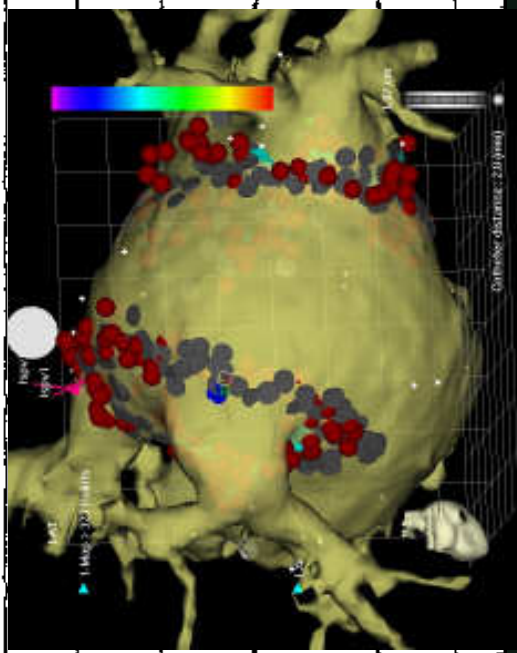
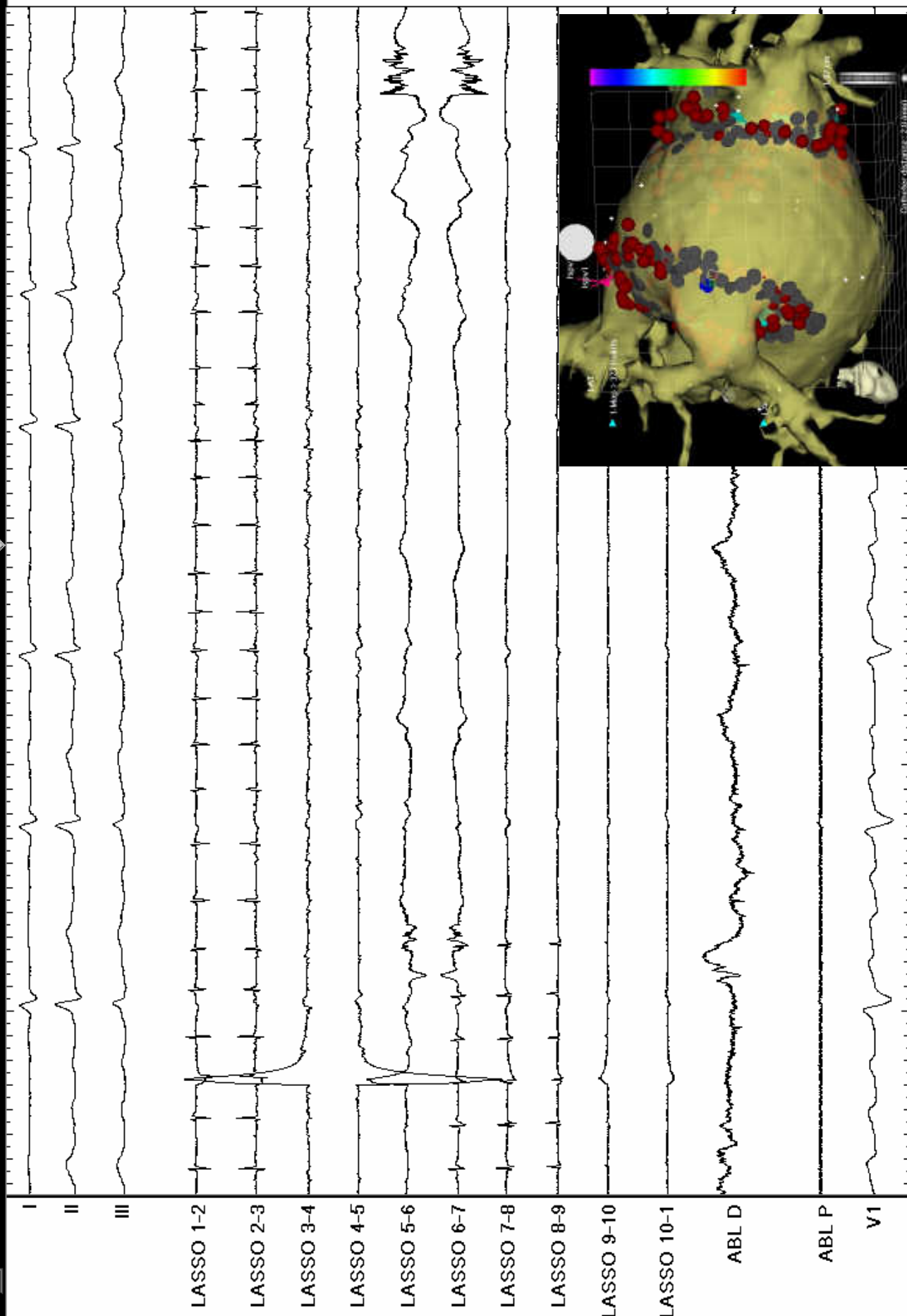


Patient: G . M. 08/08/2000





10 mm/s 1...



LA

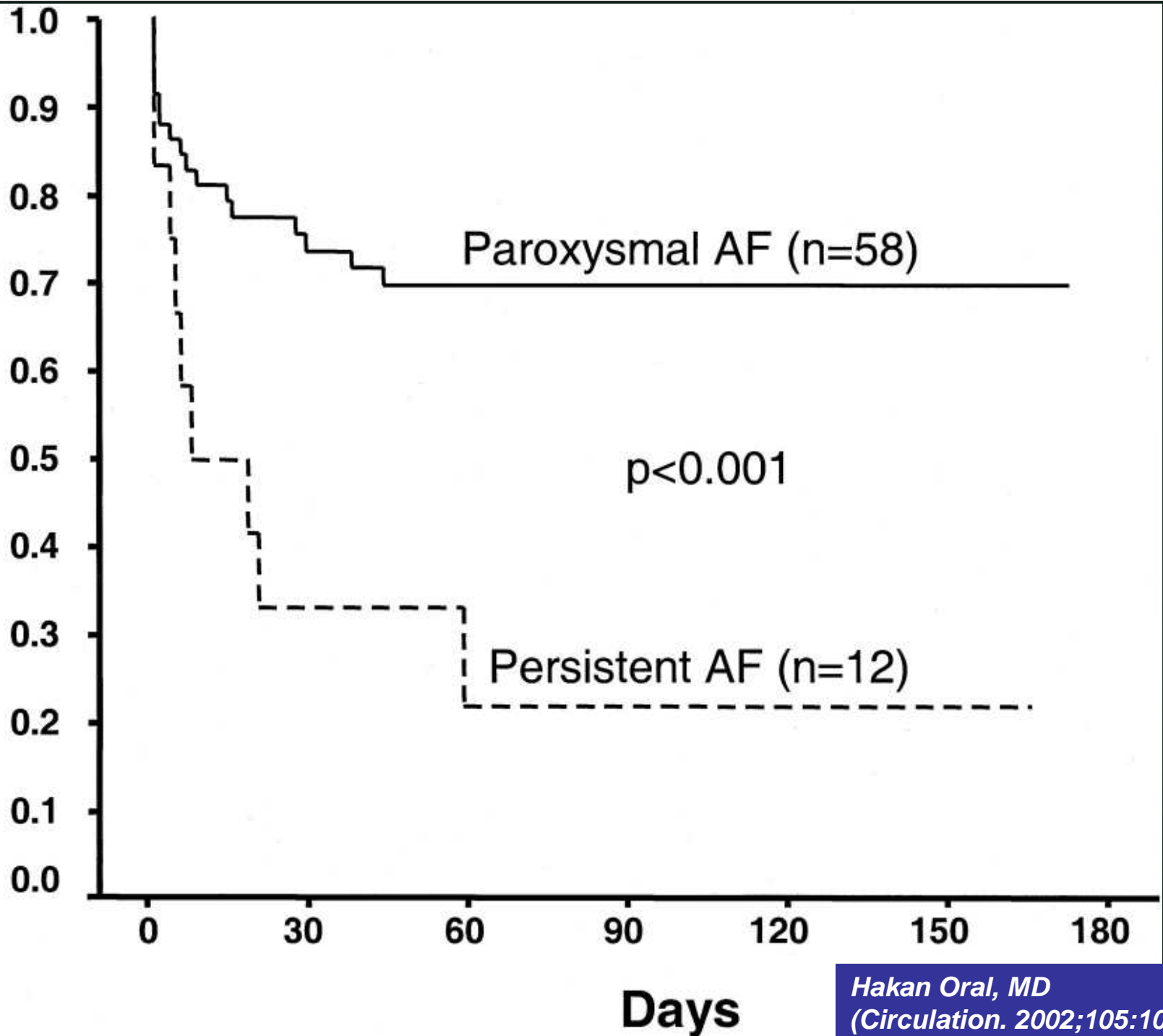
RA

RIPV

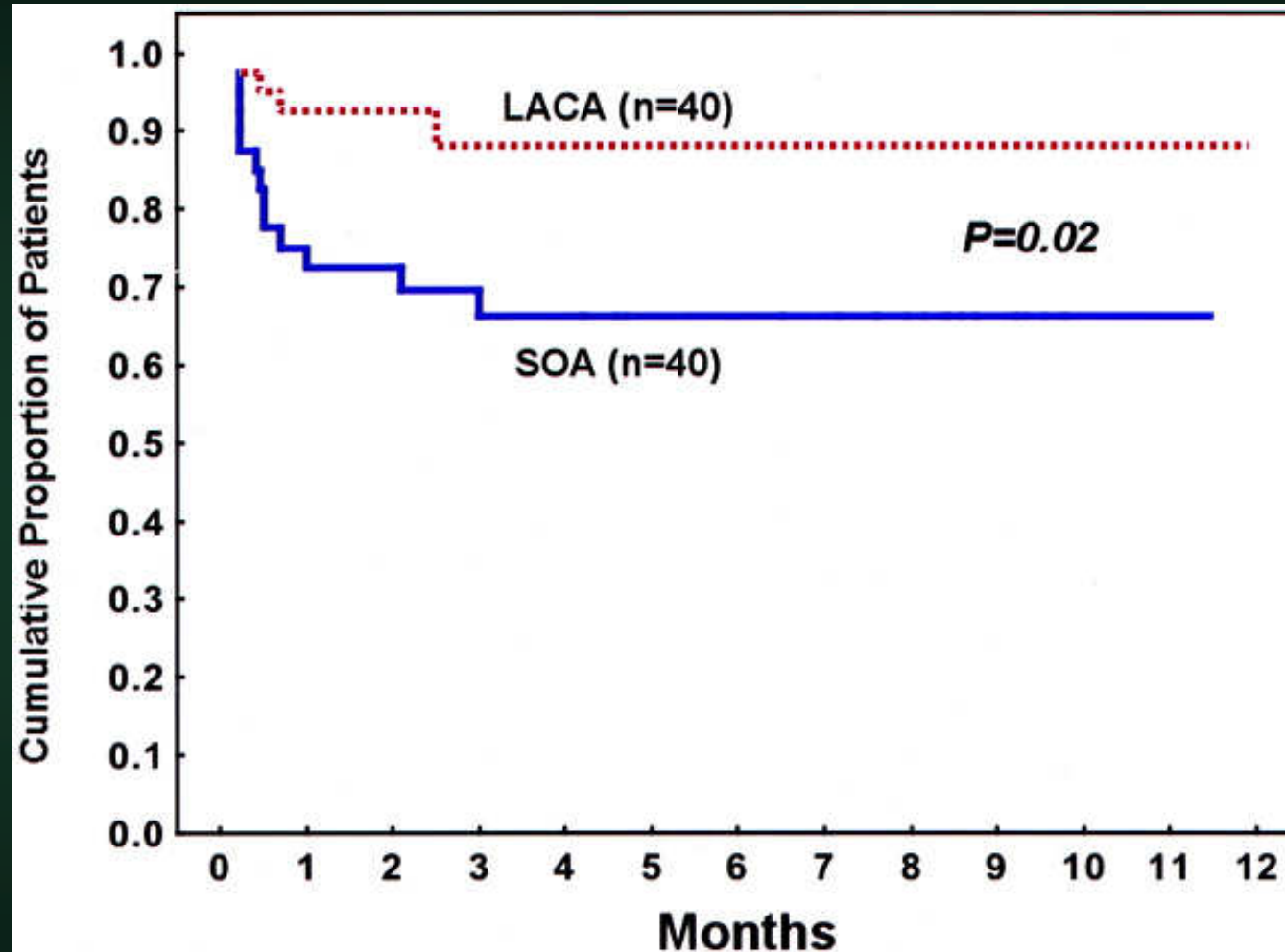
LASSO 1-2



Freedom from Recurrent AF



FREEDOM FROM RECURRENT PAF AFTER SEGMENTAL OSTIAL ABLATION (SOA, SOLID LINE) AND LEFT ATRIAL CATHETER ABLATION (LACA, DASHED LINE).

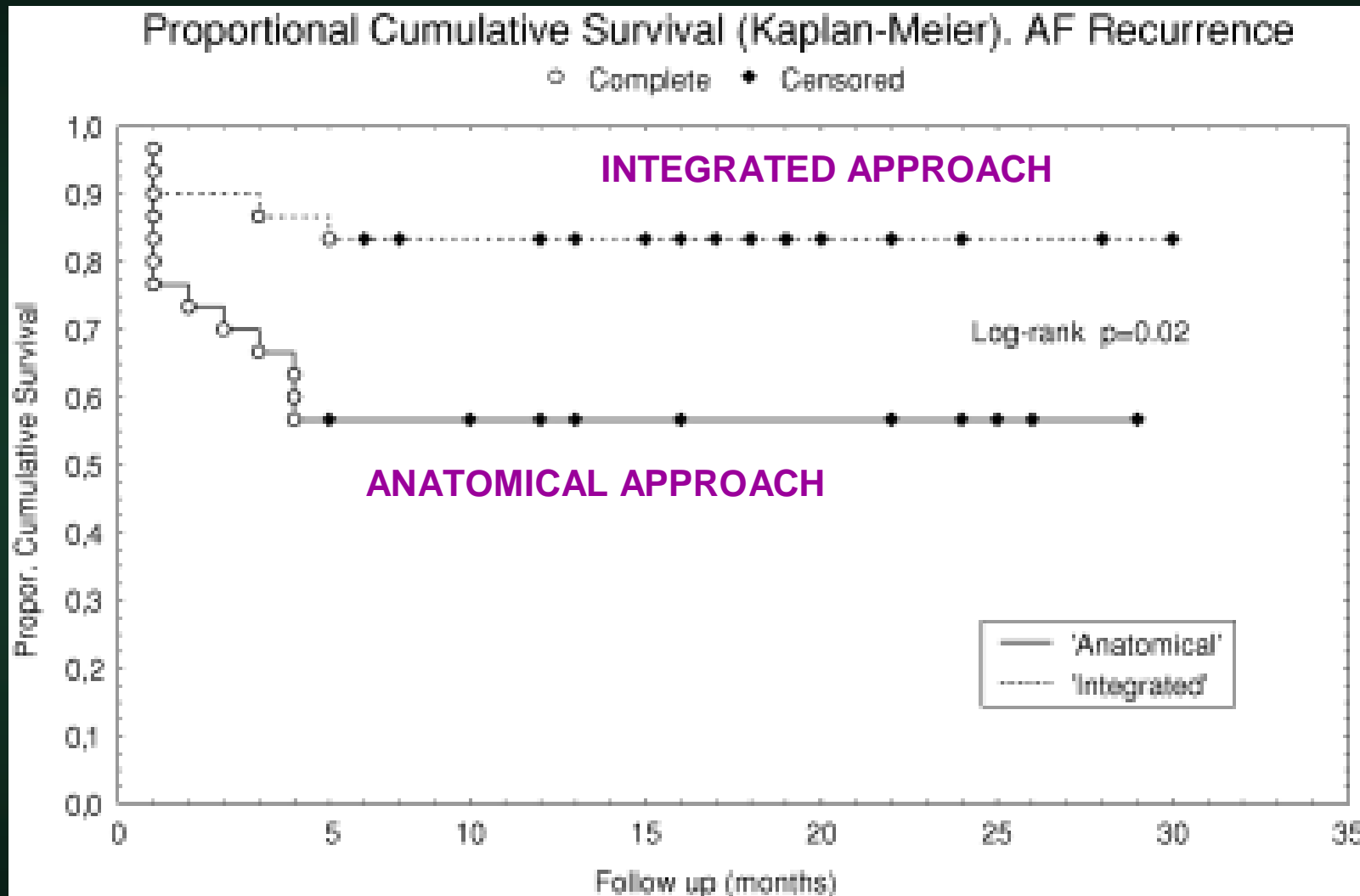


LONG-TERM RESULTS OF RF ABLATION FOR AF : IS IT WORTHWHILE ?

Results :

- Mean FU: 10.1 M (2- 36)
- Absence of AF recurrences: **70%** w/o AAD: 31%
with AAD: 69%
- If recurrences: **>50%** had impressive reduction of AF episodes.
- Global improvement: **82%**
- Quality of life (grading scale from 1 to 10 (1 meaning excellent, 10 very bad): score of **7.3** before to **3.4** after ABL.
- We observed 4.5 % significant PV stenoses.

FREEDOM FROM RECURRENT AF AFTER INTEGRATED APPROACH (DASHED LINE) AND ANATOMICAL APPROACH (SOLID LINE).



Rationalized Approach To AF Ablation



PV Isolation (+ CTI ablation)

Non-Inducible

54%

**NO MORE
ABLATION**

Persistent Inducibility

Linear Ablation or
Substrate Modification

Non Inducibility = 91% Arrhythmia free
without AA at 17 months

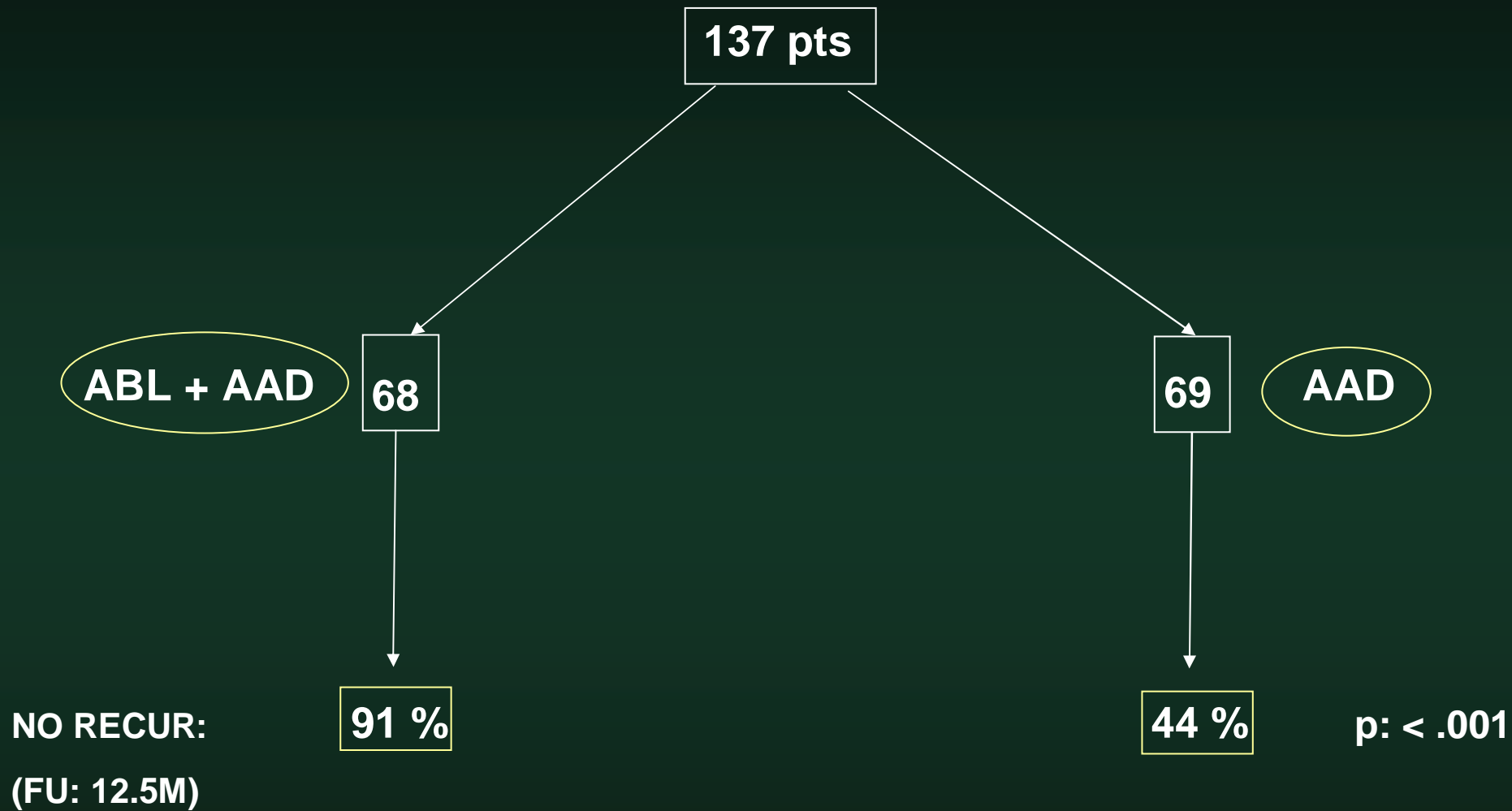
WORLD WIDE SURVEY AF ABLATION

TABLE 4. Major Complications

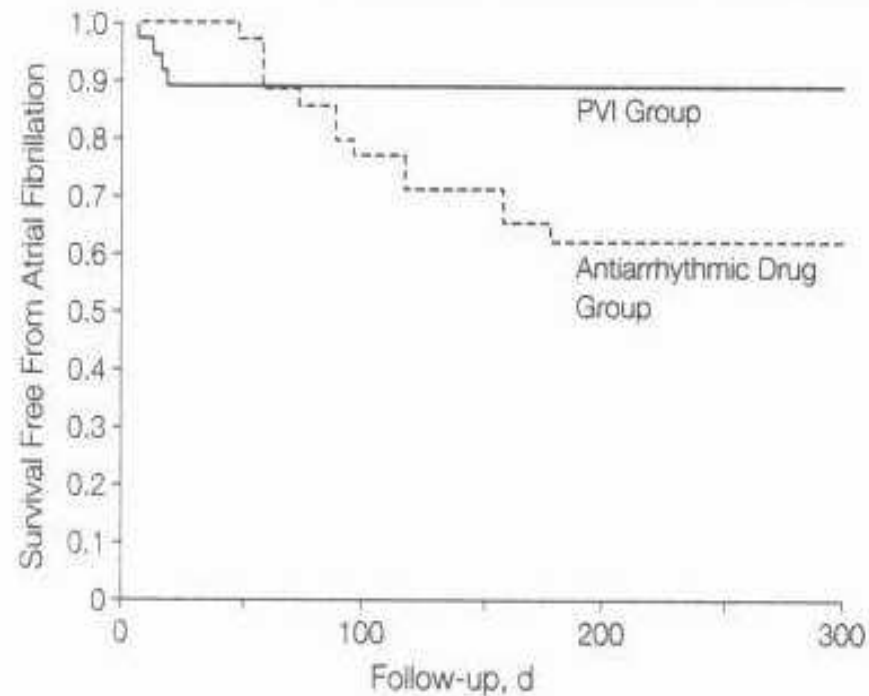
Complication Type	No. of Patients	% of Patients
For all types of procedures (n=8745 patients)		
Periprocedural death	4	0.05
Tamponade	107	1.22
Sepsis, abscesses, or endocarditis	1	0.01
Pneumothorax	2	0.02
Hemothorax	14	0.16
Permanent diaphragmatic paralysis	10	0.11
Femoral pseudoaneurysm	47	0.53
Arterovenous fistulae	37	0.42
Valve damage	1	0.01
Aortic dissection	3	0.03
For procedures involving left atrial ablation (n=7154 patients)		
Stroke	20	0.28
Transient ischemic attack	47	0.66
PV stenosis		
<u>No. with >50% stenosis</u>		
Acute	23	0.32
Chronic	94	1.31
<u>No. with closure</u>		
Acute	2	0.03
Chronic	15	0.21
<u>Patients with symptoms</u>		
Acute	3	0.04
Chronic	41	0.57
<u>Patients undergoing intervention</u>		
Percutaneous	51	0.71
Surgical	2	0.03
Grand total	524	5.9



CATHETER ABLATION FOR CURE OF ATRIAL FIBRILLATION



RF ABL vs MED as FIRST LINE TREATMENT AF RECCURENCES



No. at Risk	0	50	100	150	200	250	300
PVI Group	32	28	28	28	28	28	28
Antiarrhythmic Drug Group	35	34	23	19	13	13	13

PVI indicates pulmonary vein isolation.

CONCLUSIONS

- L'ABLATION EST UNE TECHNIQUE EXTREMEMENT EFFICACE POUR LE TRAITEMENT DES ARYTHMIES SUPRAVENTRICULAIRES
- LES COMPLICATIONS SONT DEVENUES RARES DANS DES MAINS EXPERIMENTEES
- LA PLUPART DES ARYTHMIES SV SONT ACTUELLEMENT CONSIDEREES COMME DES INDICATIONS DE CL I
- LA FA EST DEVENUE UNE ALTERNATIVE SERIEUSE AU TRAITEMENT MEDICAMENTEUX MAIS NECESSITE UNE GRANDE EXPERIENCE POUR EVITER CERTAINES COMPLICATIONS DONT L' INCIDENCE EST ACTUELLEMENT FORTEMENT REDUITE