

Ablatie bij boezemfibrilleren

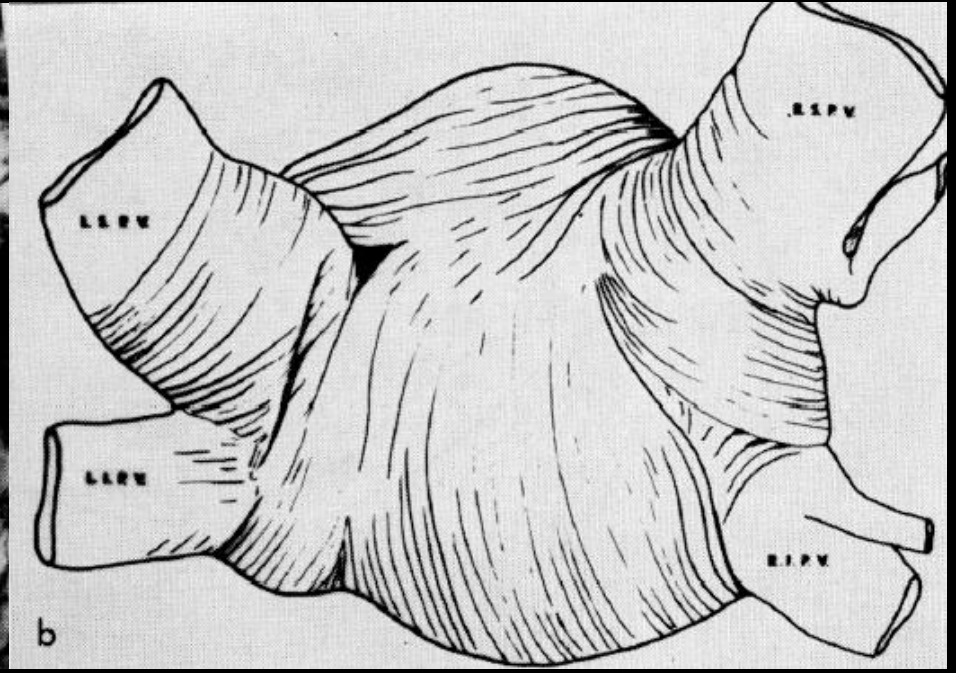
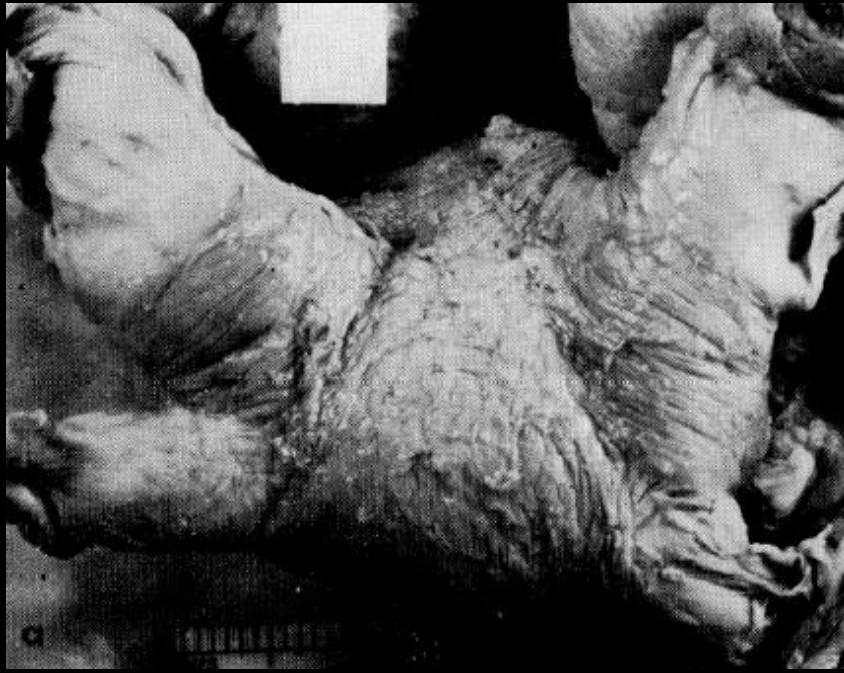
Herbert Hauer

Cardiologie Centra Nederland/VUMC

Thema's

- Waarom pulmonaalvenen isoleren?
- Techniek
- Risico's
- Resultaten en voorspellers

Atrial spierweefsel in pulmonaalvenen



Length of the myocardial sleeves extending over the veins (mm)

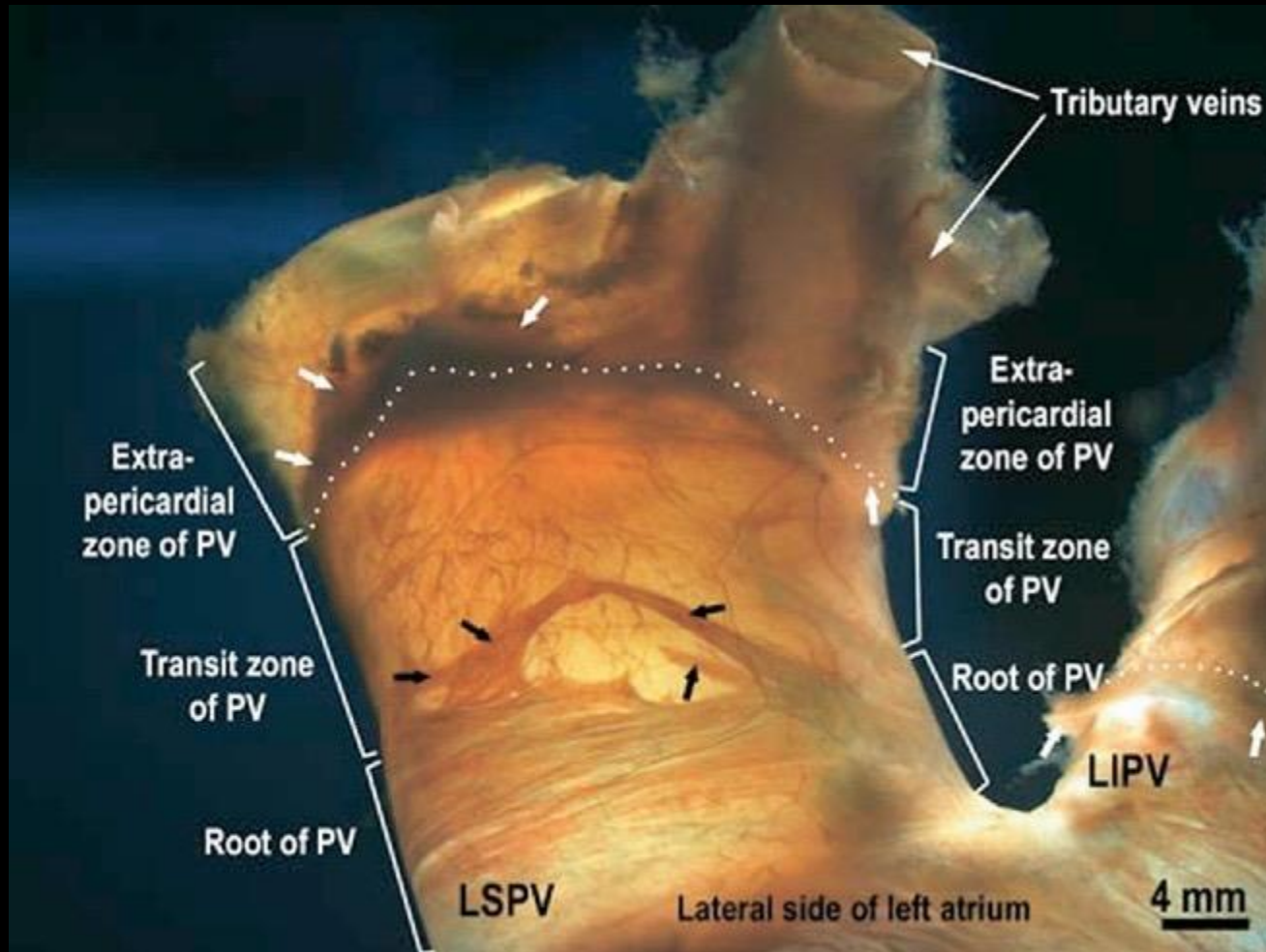
	RS	Pulmonary veins			Venae cavae	
		RI	LS	LI	S	I
Range	5 – 25	1 – 17	8 – 24*	1 – 19	15 – 33	8 – 10†
Average	13	8	18	10	24	9

Myocyten in pulmonaalvenen

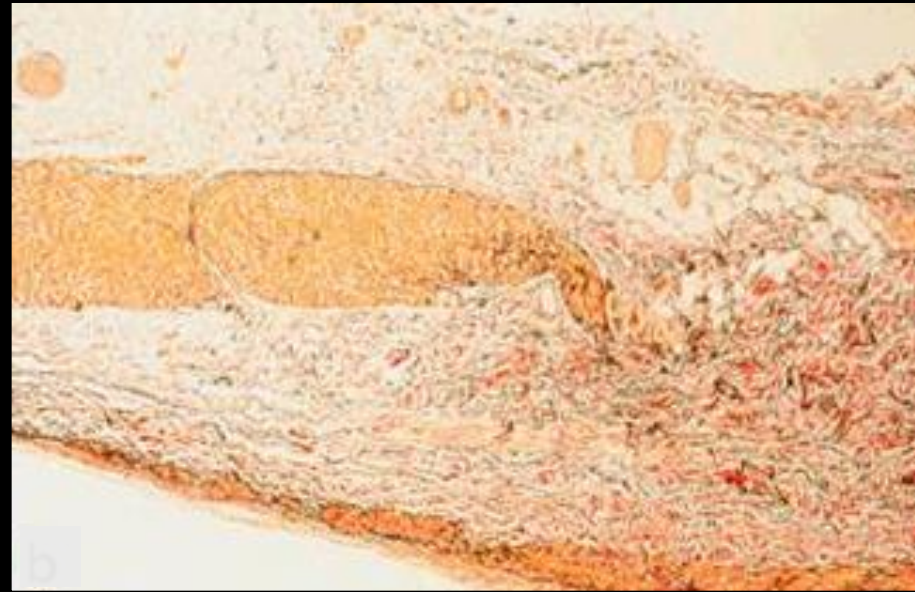
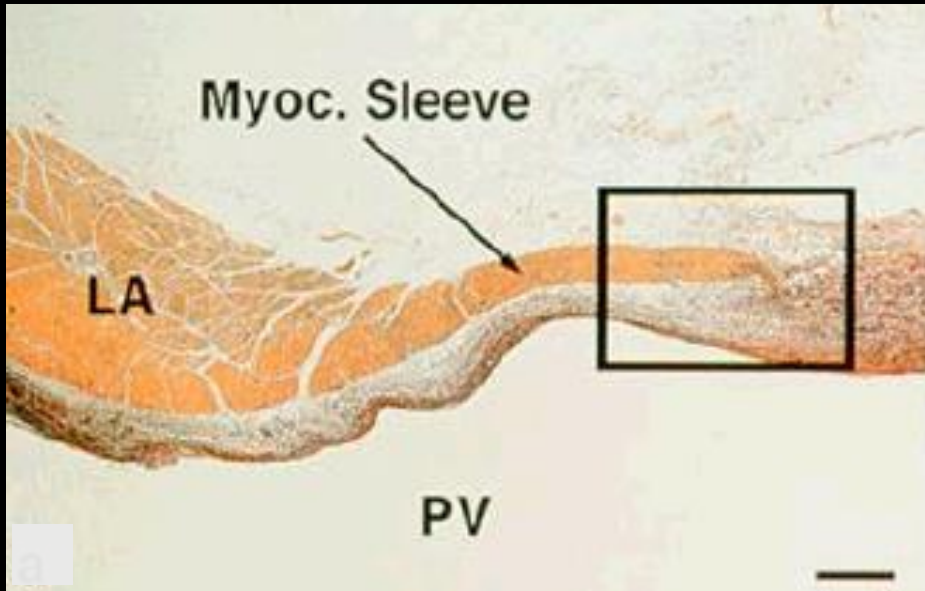


Becker

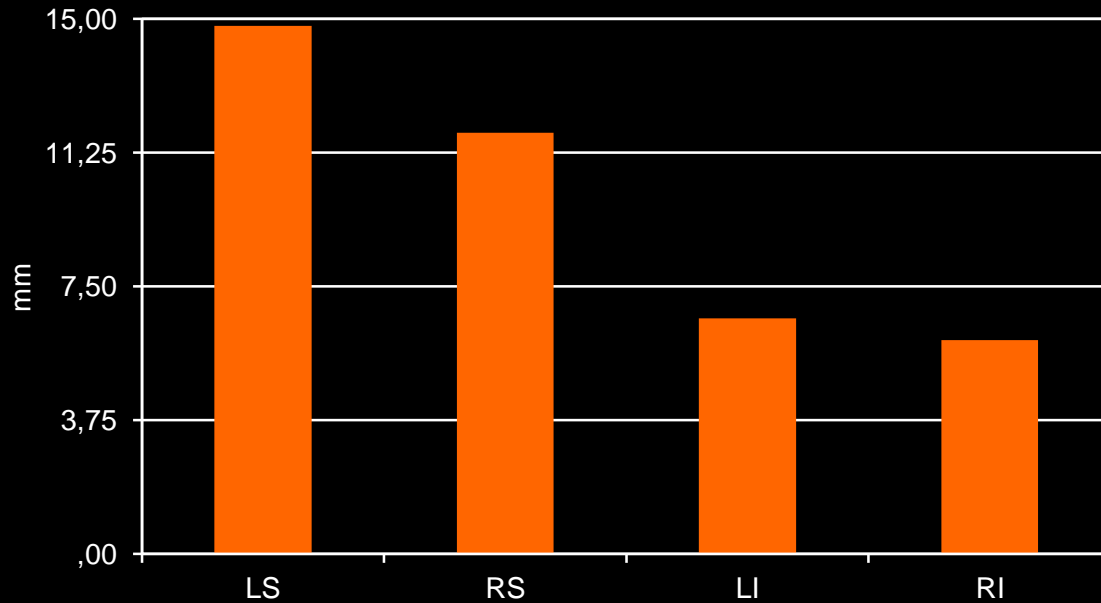
Myocyten in pulmonaalvenen



Myocyten in pulmonaalvenen

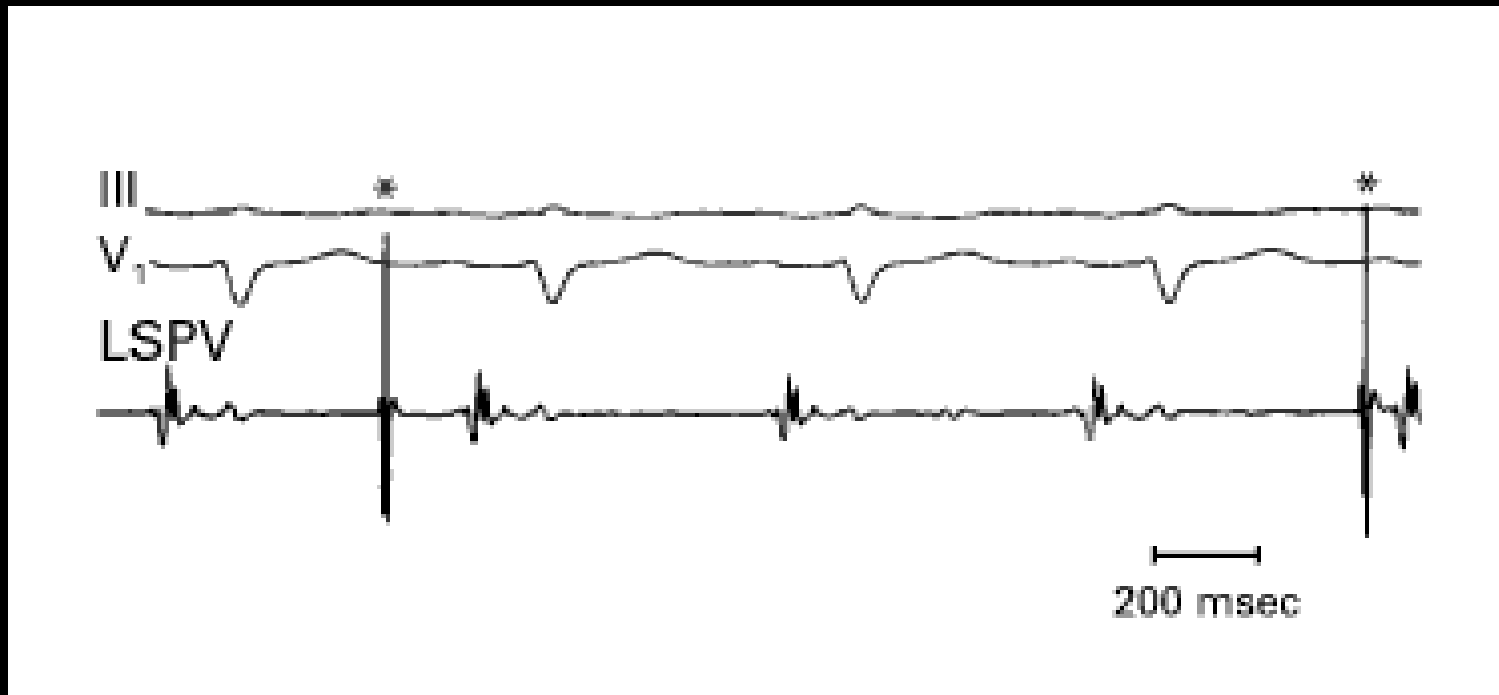


BECKER

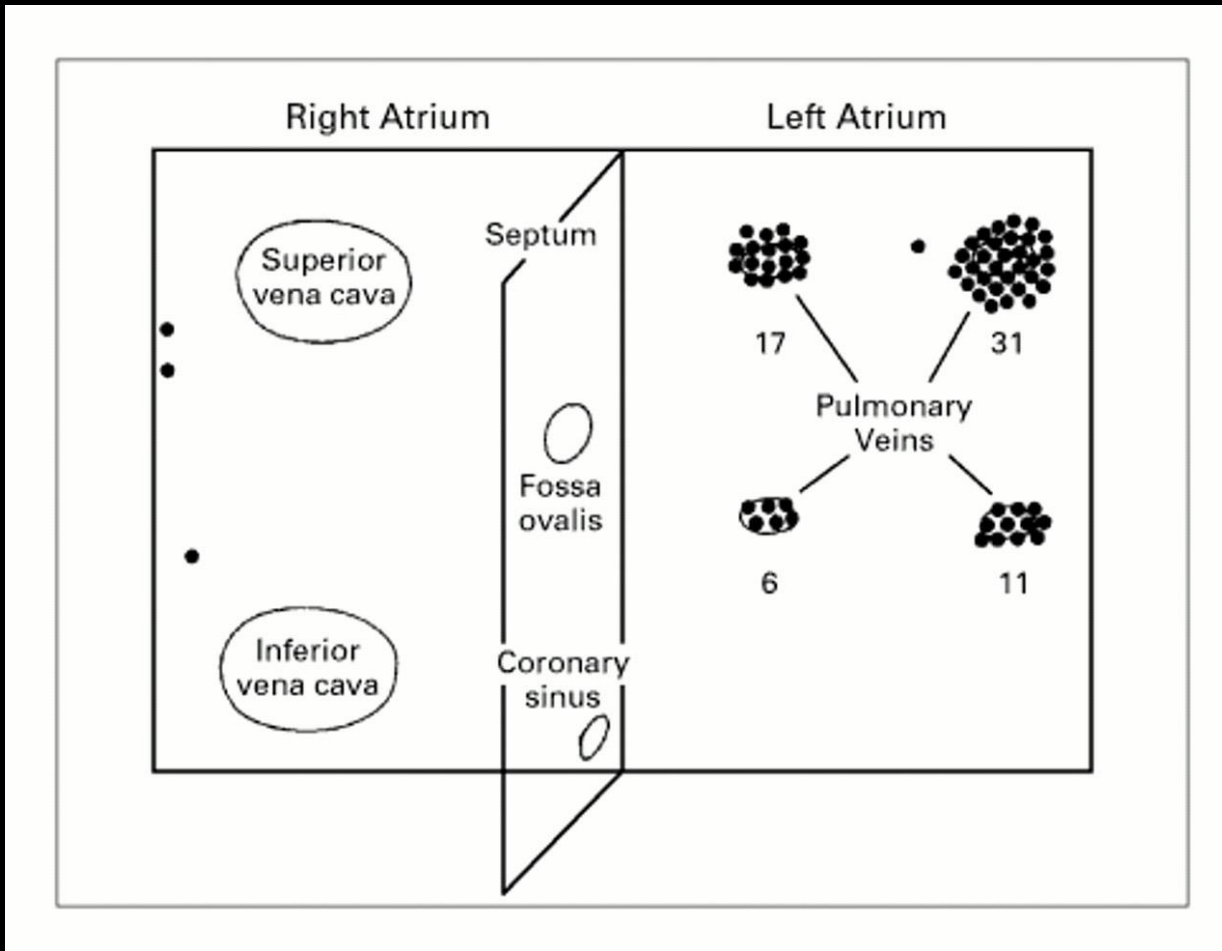


Saito
Length of Myocardial Sleeves

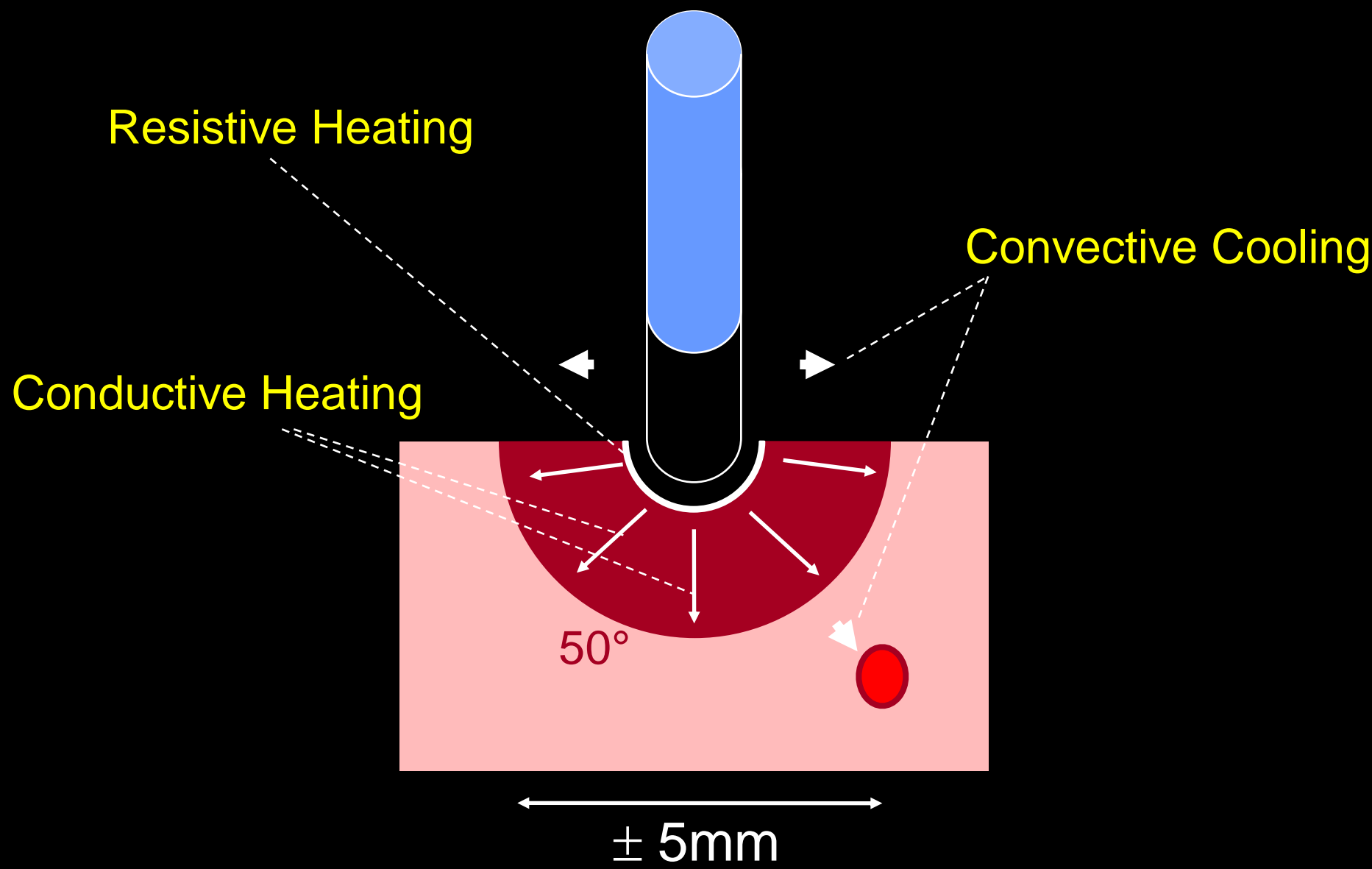
Ectopische activiteit heeft zijn eigen frequentie



Ectopische activiteit komt met name uit regio van de pulmonaalvenen

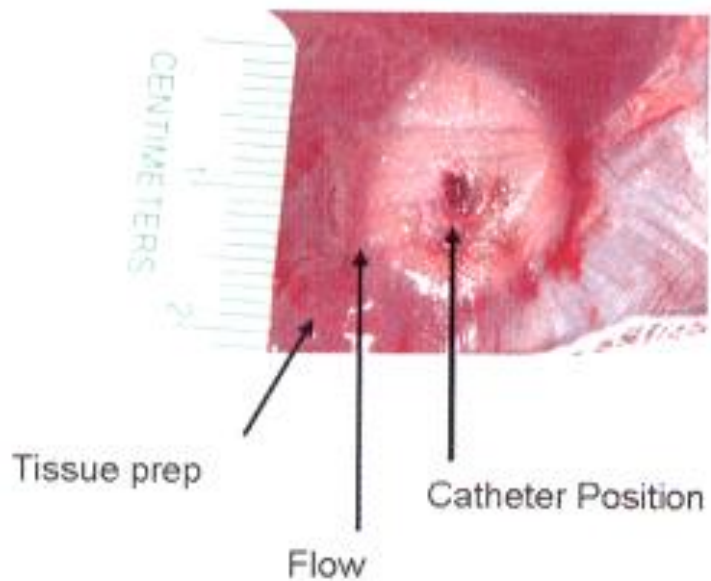


RF ablation

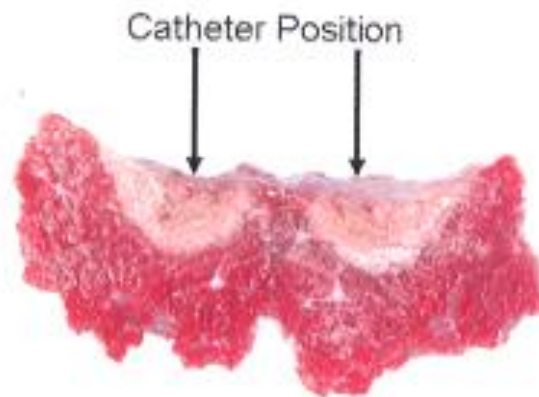


RF ablation

Open-Irrigated Lesion Surface



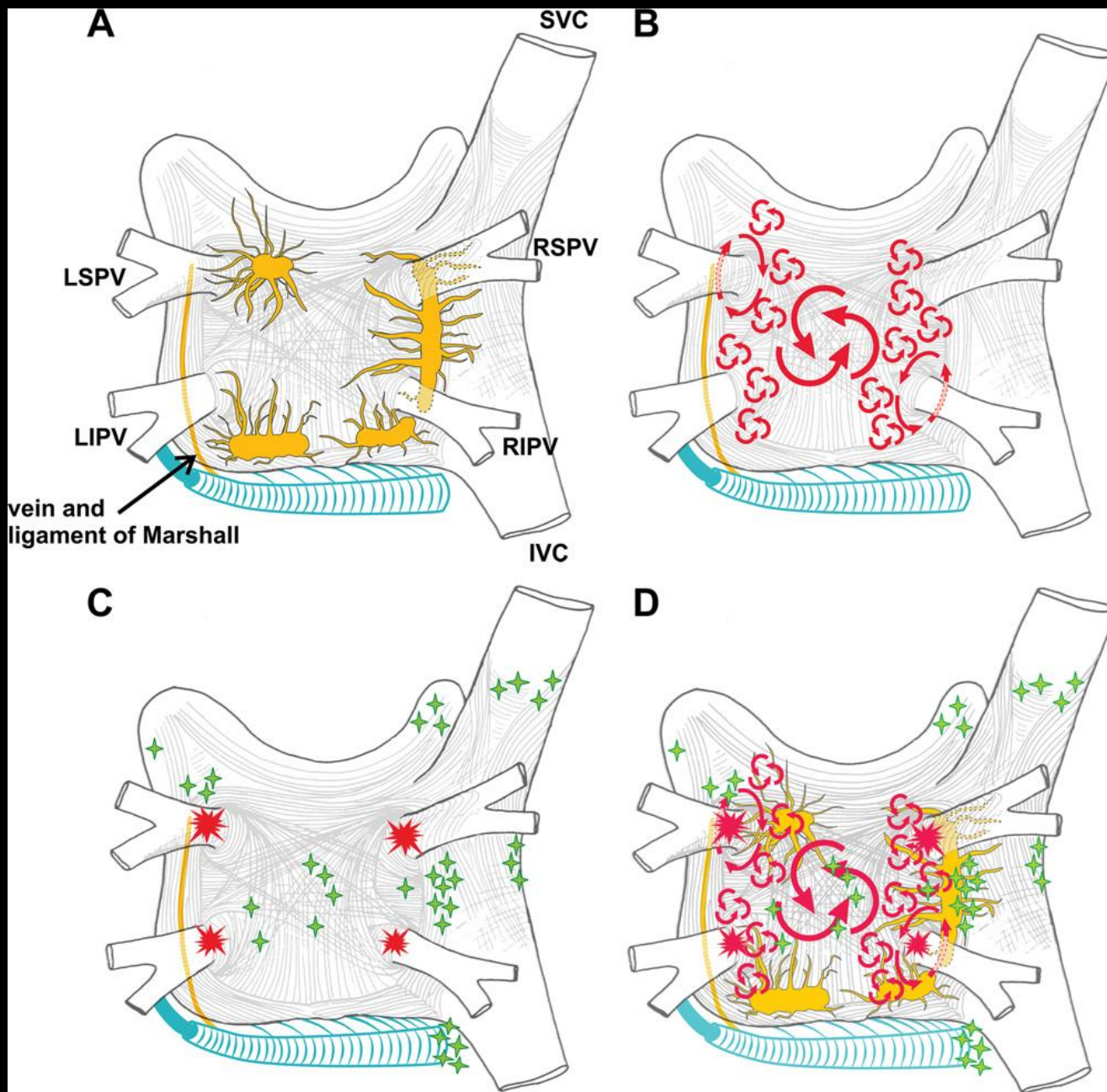
Open-Irrigated Lesion Cross-Section

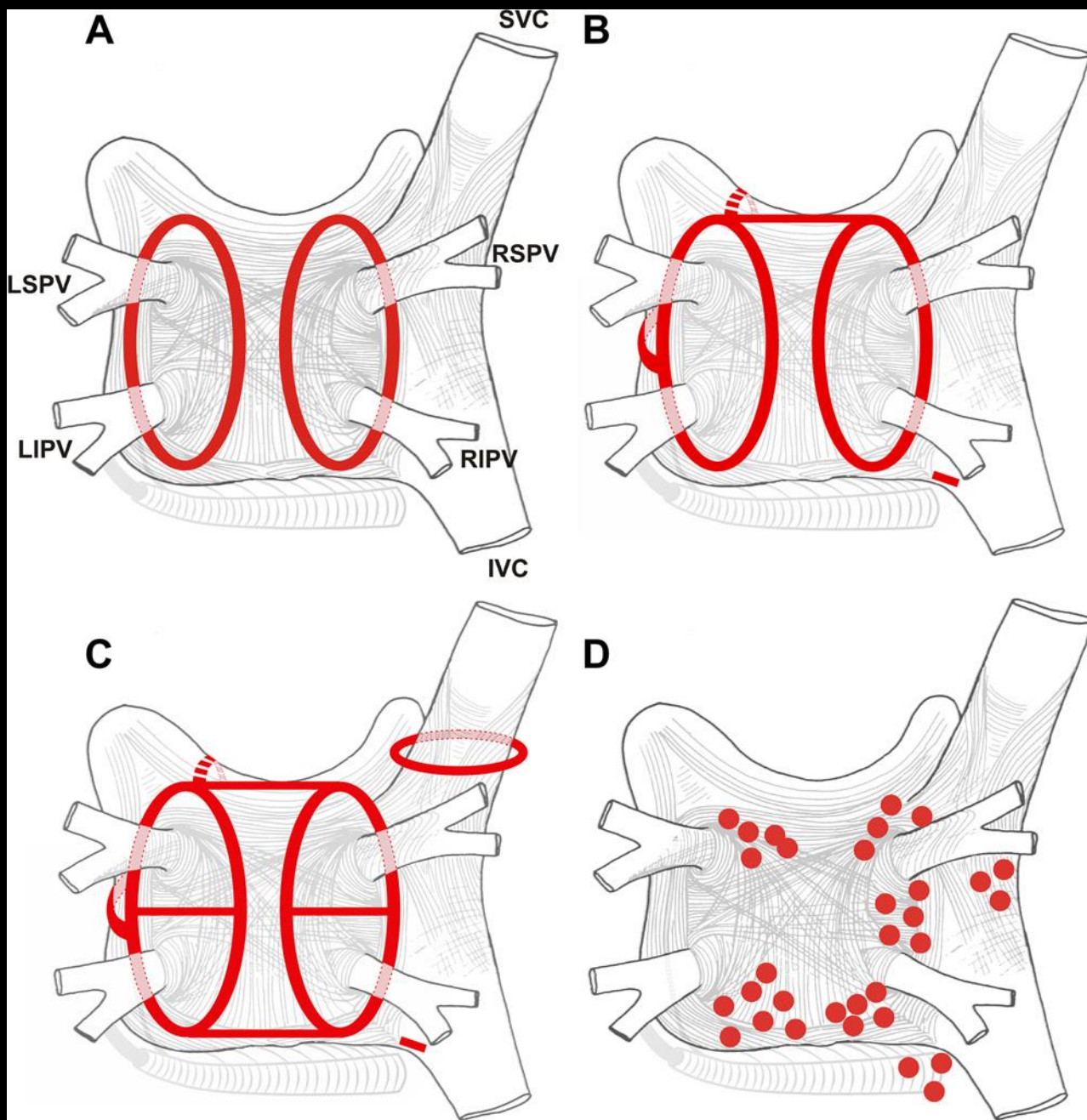


In maximaal drie sessies konden alle ectopische foci worden geableerd

TABLE 2. OUTCOME OF IN-HOSPITAL ABLATION ACCORDING TO LOCATION OF FOCUS.*

LOCATION AND No. of Foci†	INITIAL PROCEDURE (N=55)			SUBSEQUENTLY DETECTED FOCI (N=14)	SECOND PROCEDURE (N=25)			THIRD PROCEDURE (N=6)			NET OUTCOME NO. OF SUCCESSSES/ NO. OF PROCEDURES (%)‡
	NO. OF TARGETED FOCI	NO. OF SUCCESSSES/ NO. OF FAILURES	NO. OF RECURRENCES		NO. OF TARGETED FOCI	NO. OF SUCCESSSES/ NO. OF FAILURES	NO. OF RECURRENCES	NO. OF TARGETED FOCI	NO. OF SUCCESSSES/ NO. OF FAILURES	NO. OF RECURRENCES	
Atrium (n=4)	4	4/0	0	0	0	0/0	0	0	0/0	0	4/4 (100)
LSPV (n=31)	28	21/2	5	3	8	5/2	1	1	0/1	0	26/31 (84)
RSPV (n=17)	11	8/0	3	6	9	5/1	3	3	2/1	0	15/17 (88)
LIPV (n=11)	8	6/0	2	3	5	4/0	1	1	1/0	0	11/11 (100)
RIPV (n=6)	4	3/0	1	2	3	2/0	1	1	0/1	0	5/6 (83)

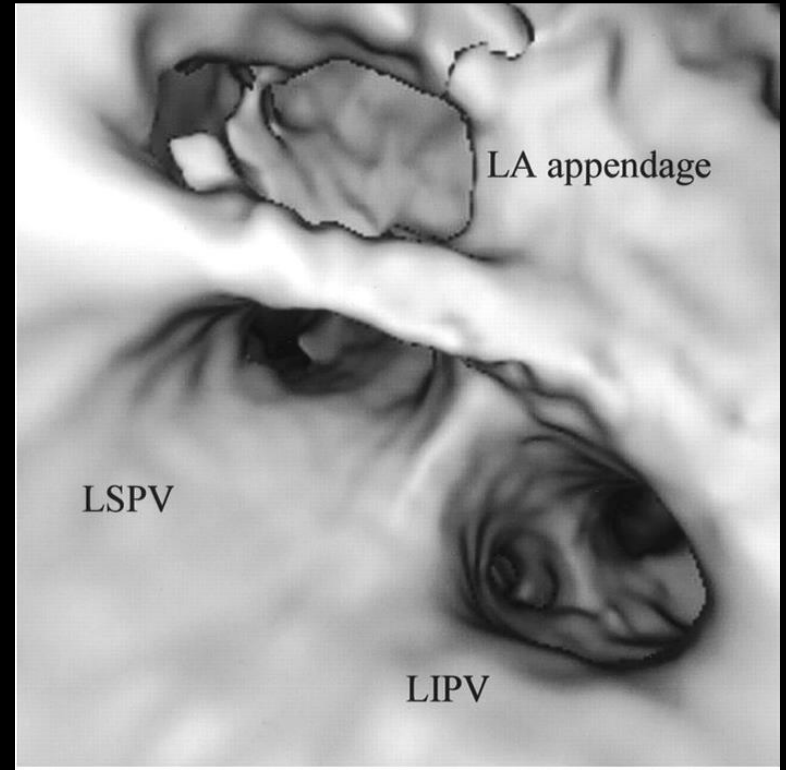
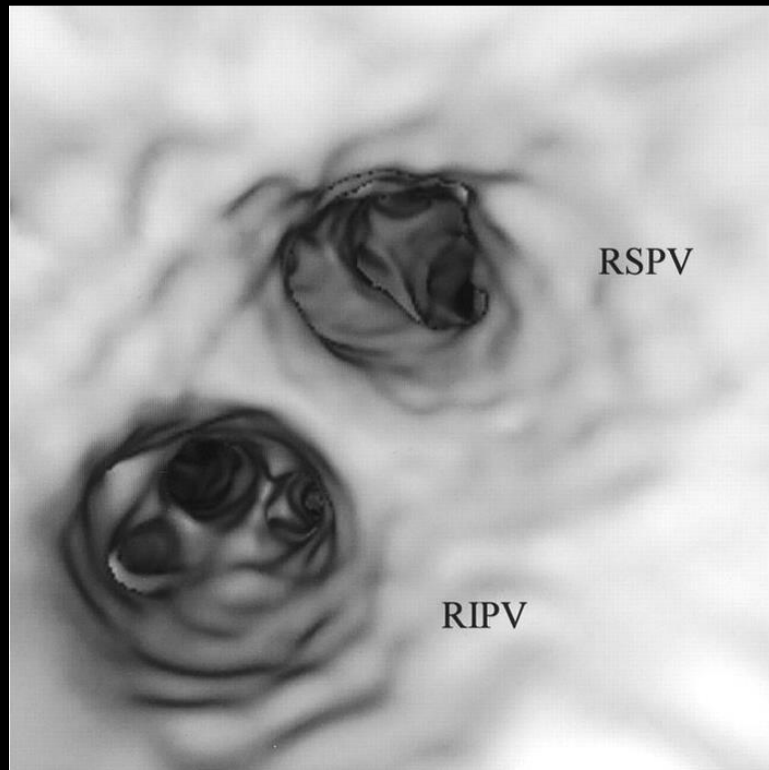




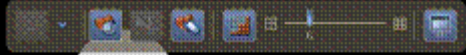
Gebruikte technieken

- Point-by-point RF-ablatie
- Multi-electrode, PVAC
- Cryo-ablatie

Pulmonaalvenen vanuit de linkerboezem

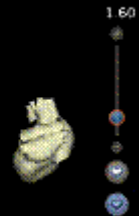
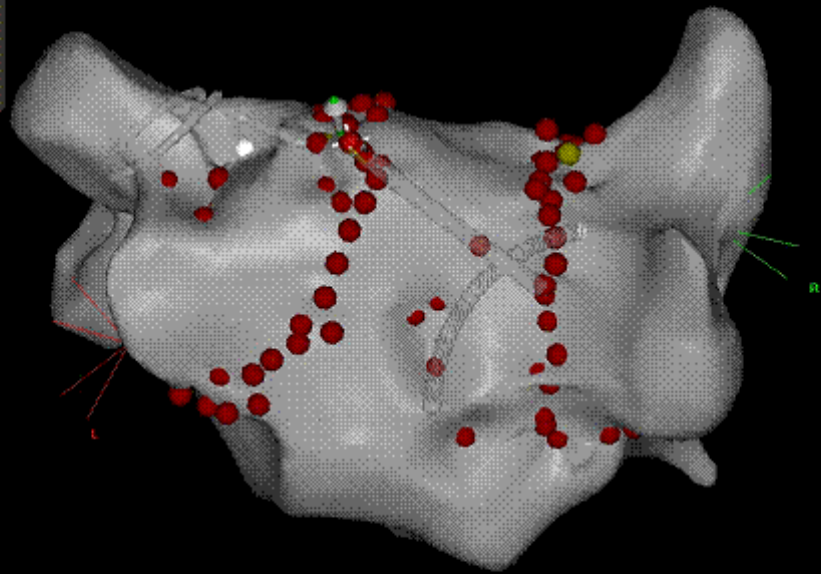


2-LA (134, 0)



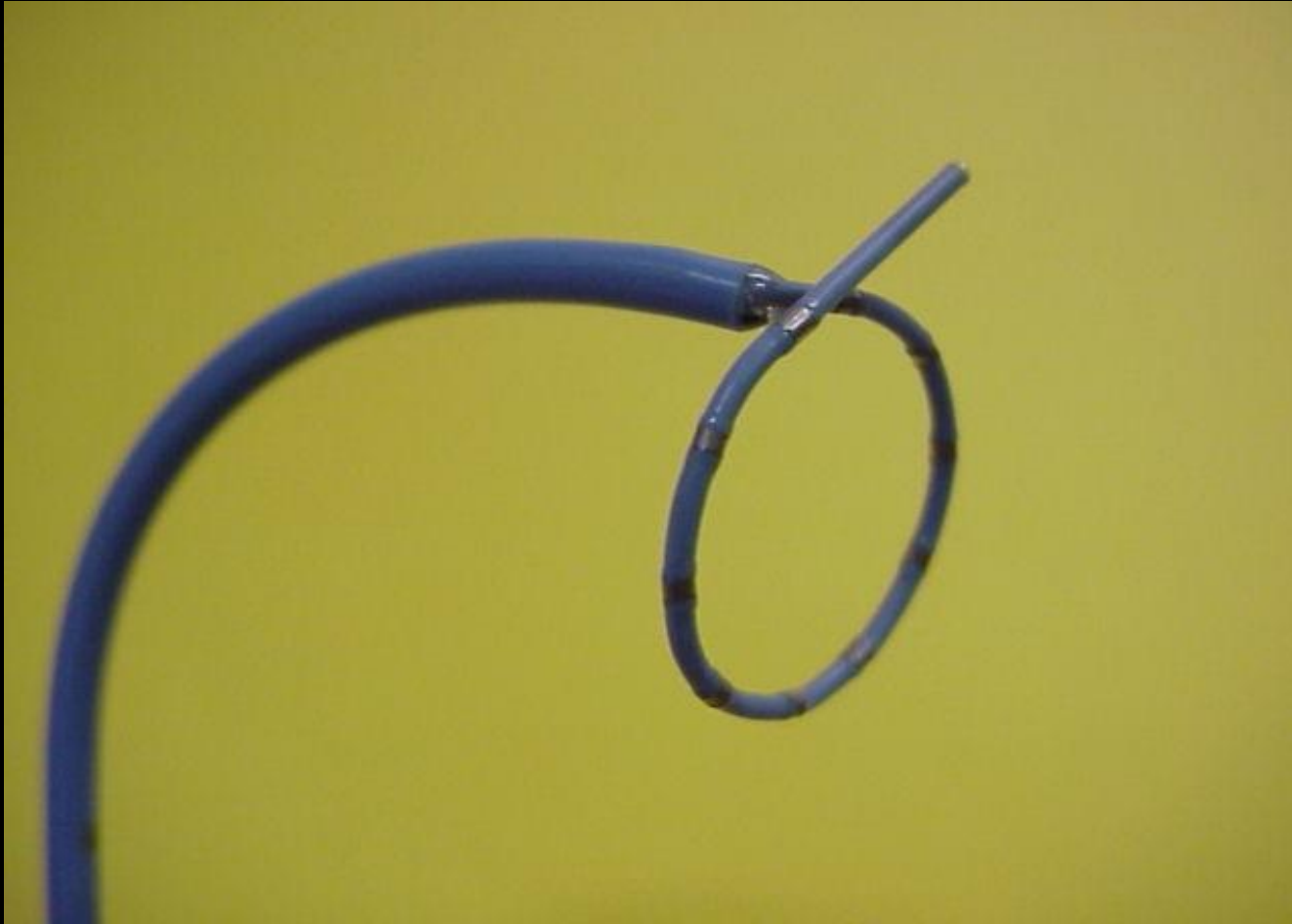
LAT

16
↻



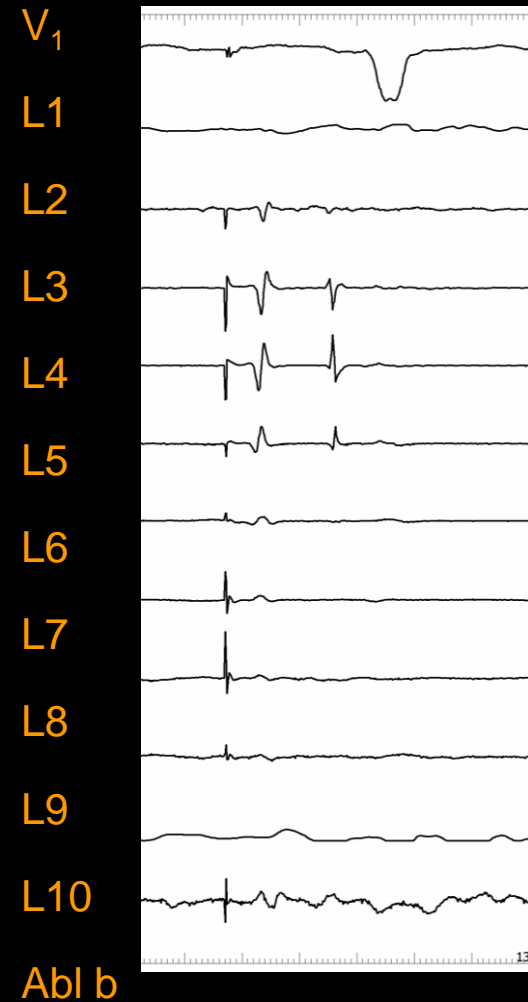
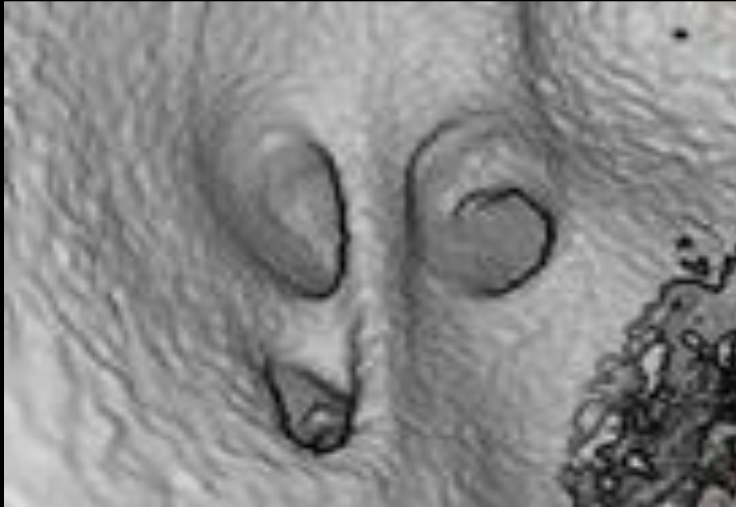
AP PA LAO RAO LL RL INF SUP

Lasso Catheter

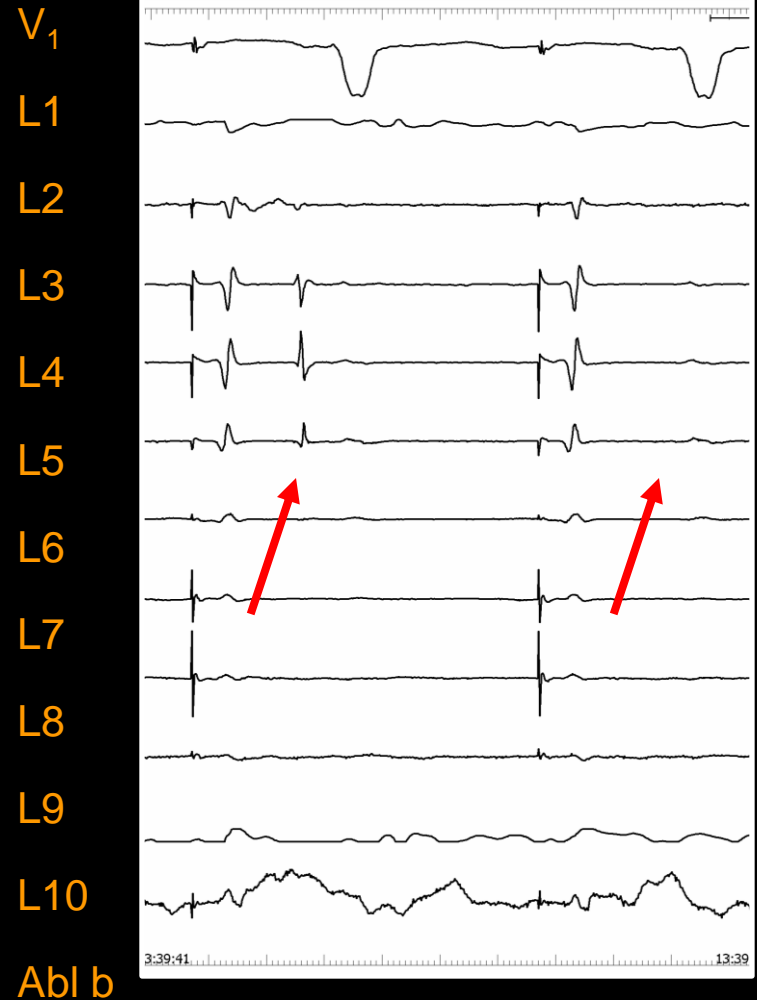
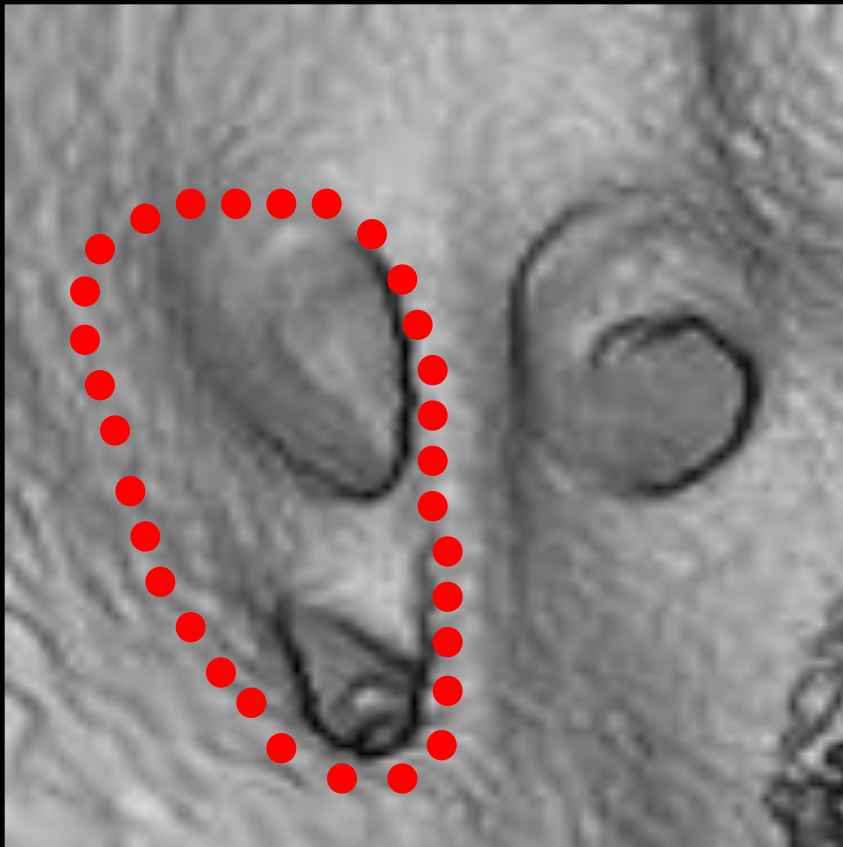


15-25 mm

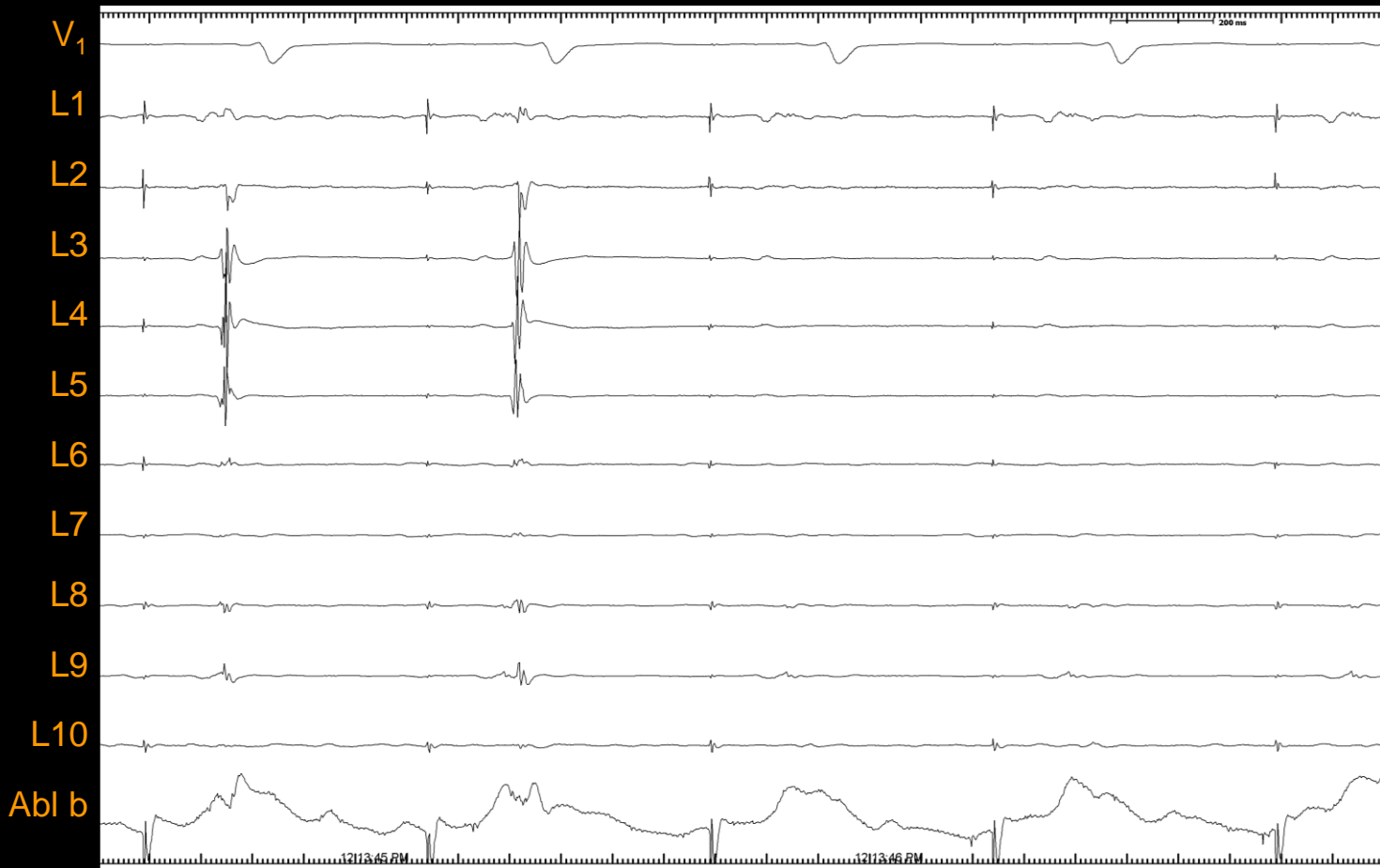
Pulmonaalvenen en Lasso catheter



Pulmonaalvenen en Lasso catheter

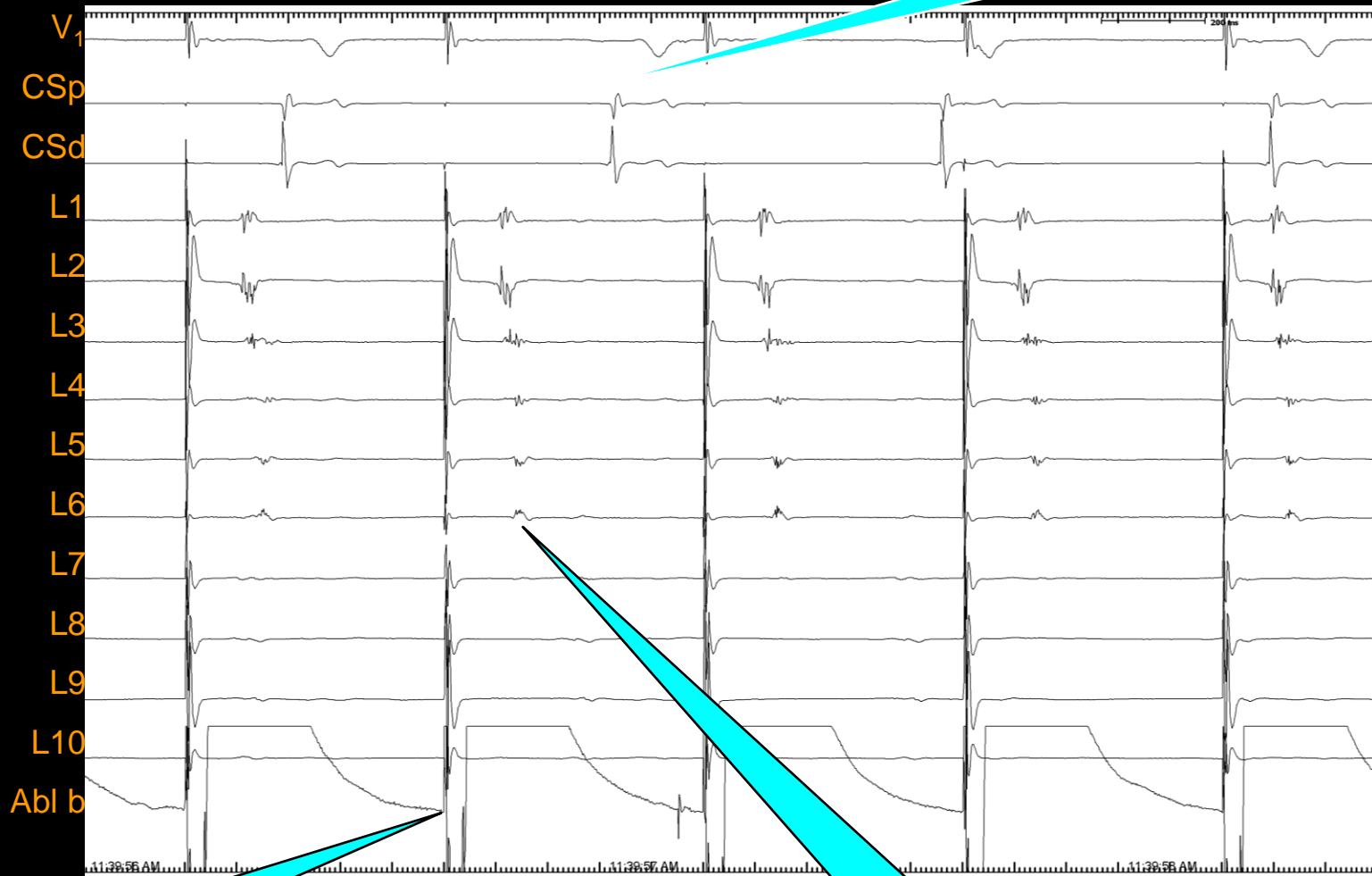


Pulmonary Vein Isolation



Pulmonary Vein Isolation

Dissociation: SR



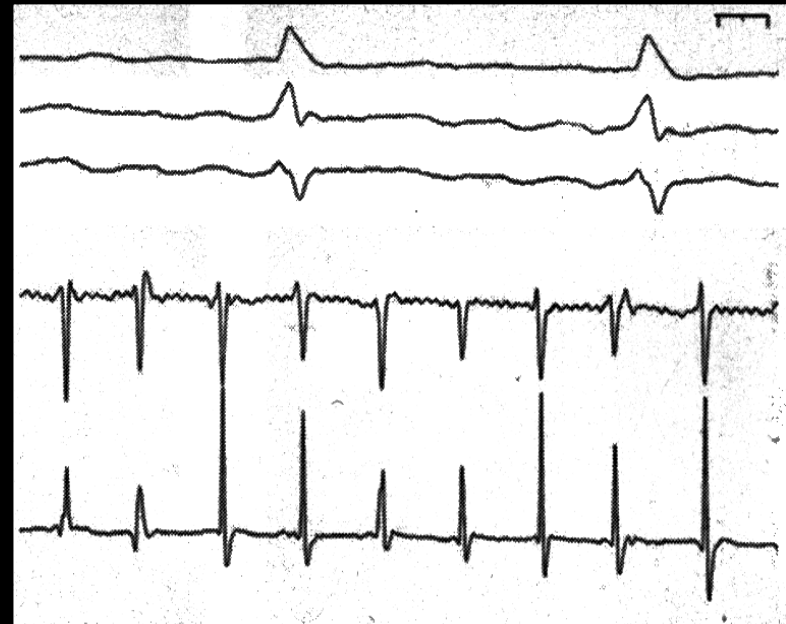
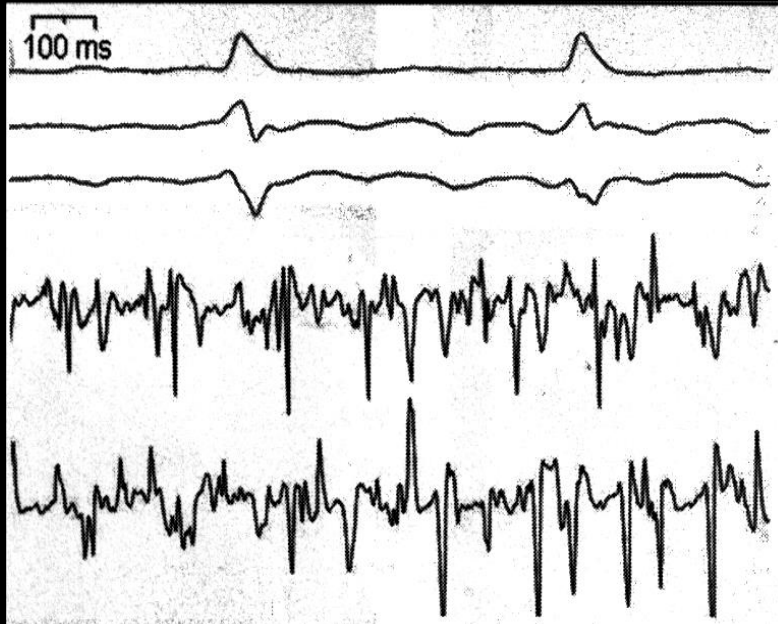
Stim in RS

→ PVP in RI

Persisterend boezemfibrilleren

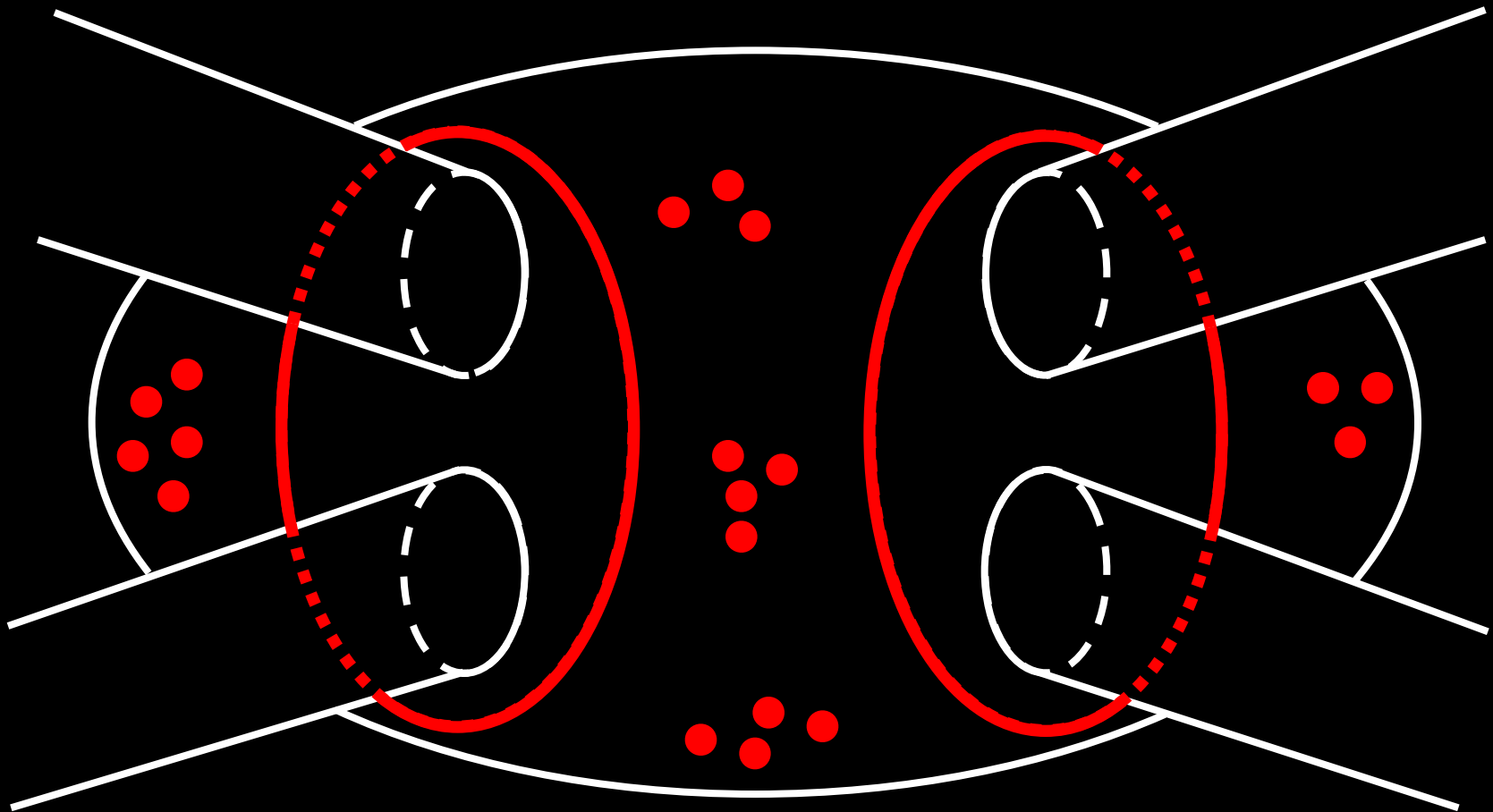
Defragmentatie

I
II
III
Abl, d
Abl, p



Persistent AF

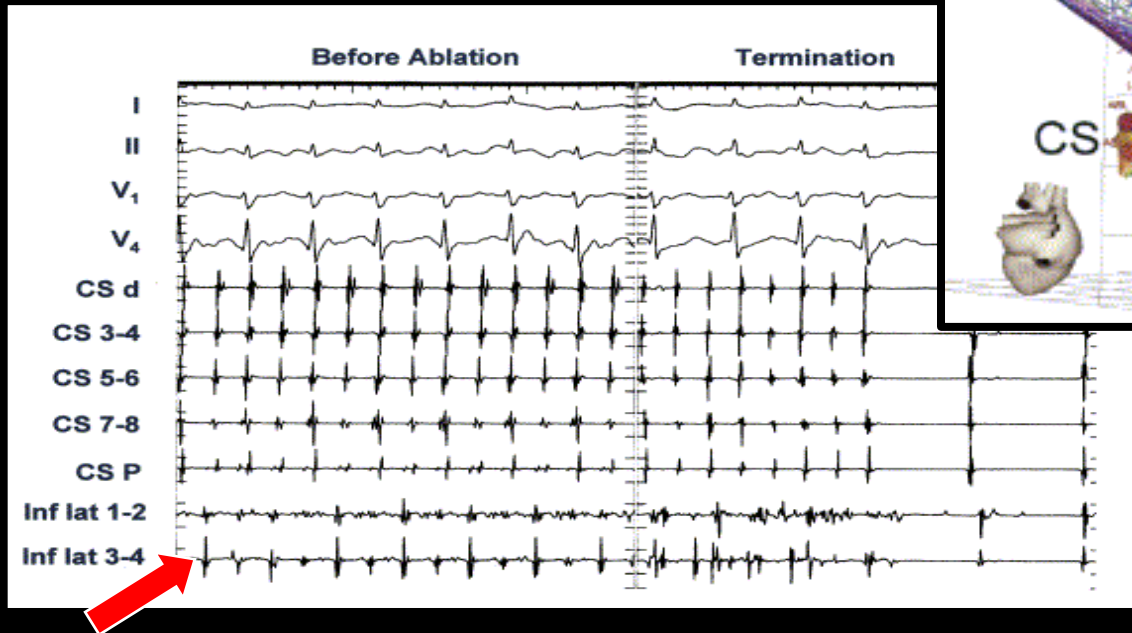
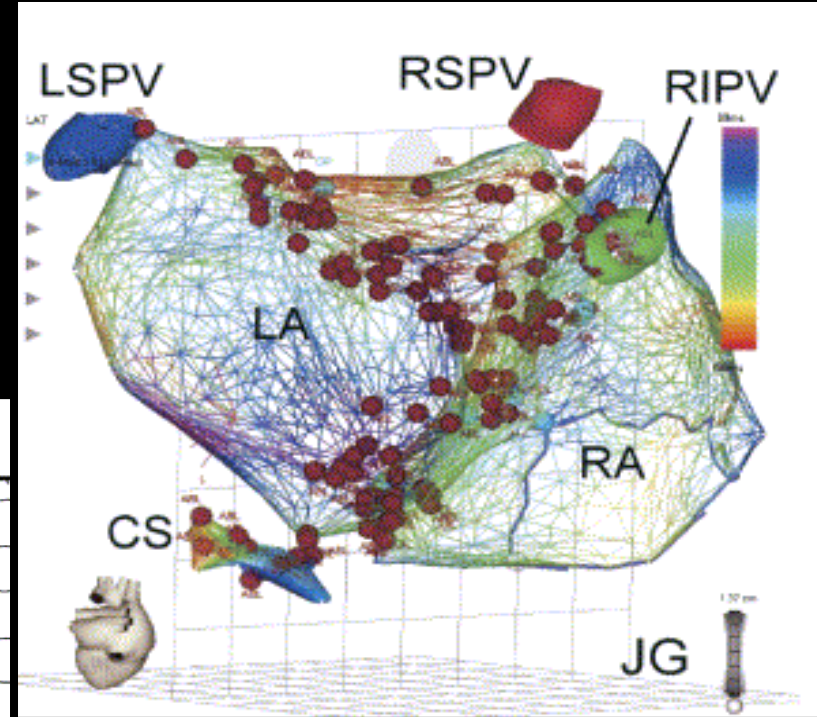
PV Isolatie en defragmentatie



AF Ablation

CFAEs

Nademanee JACC 2004



Casus

- Man 64 jaar
- Lange paroxysmen met AF; 165/min
- CHA2DS2VASc = 1 (perifeer vaatlijden), fenprocoumon (voorheen Ascal) en statine
- Matige rhythm control en goede rate-control onder flecainide en metoprolol
- Pulmonaalvenenisolatie
- Mag ik mijn pillen stoppen?

Zelfde casus, drie maanden later

- Medicatie voortgezet
- Klachtenvrij
- Holter en ECG gb.
- Mag ik mijn pillen stoppen?

PV isolation

02114859017

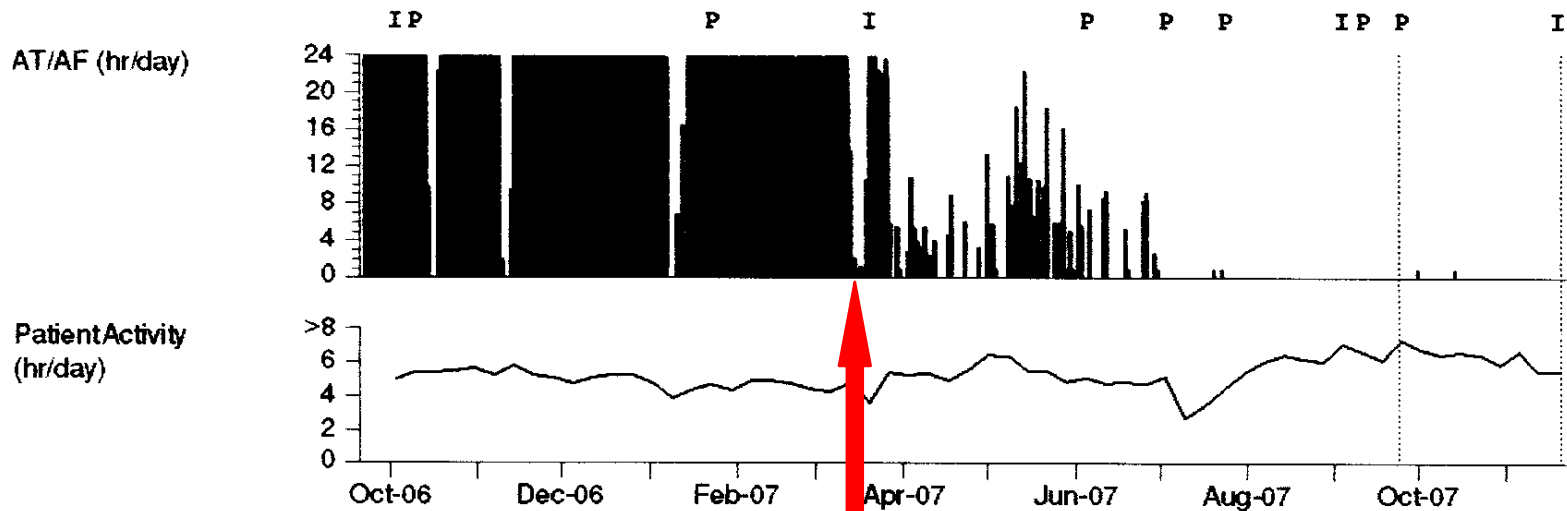
Device: EnRhythm P1501DR
Serial Number: PNP610675S

Date of Visit: 21-Nov-2007 14:50:01
9987 Software Version 1.5
Copyright © Medtronic, Inc. 2002

Initial Interrogation: Quick Look

Page 2

Cardiac Compass Trends (Sep-2006 to Nov-2007)



PVI

Na ablatie

Anti-arrhythmische medicatie

- Drie maanden voortzetten.
- Daarna afbouwen of stoppen
- Rate-control medicatie evt voortzetten

Na ablatie Antistolling

- Drie maanden voortzetten
- Daarna weer volgens CHA2DS2VAS-score

Na ablatie Monitoring

- Controle op zes weken, 3, 6 en 12 maanden
- Klachten?
- ECG?
- Holter?
- Inwendige event recorder?

Catheterablatie

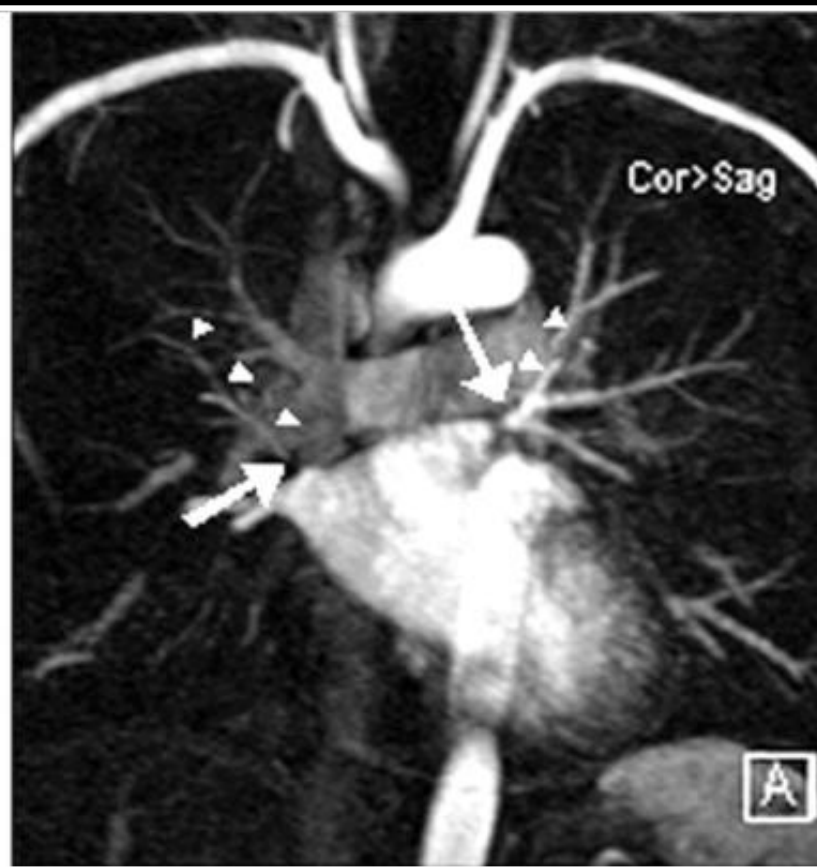
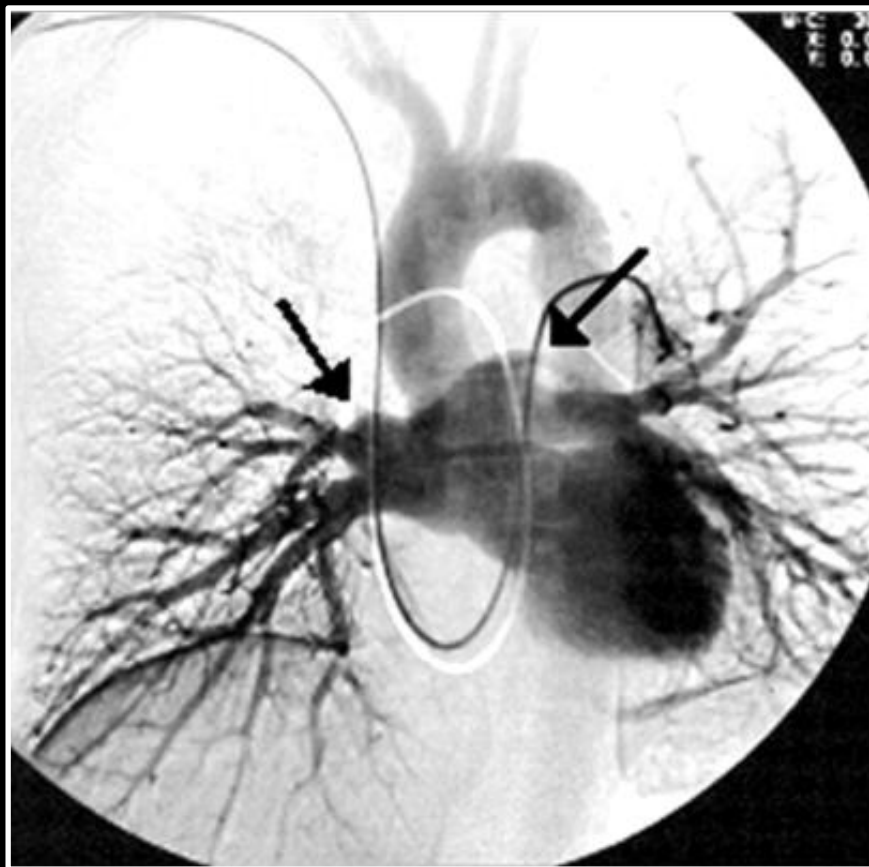
Complicaties

- Kleine complicaties
 - Haematoom lies
 - Pneumothorax
 - Pulmonaalvenestenose (zeer zelden significant)
- Grote complicaties (2%)
 - CVA
 - Tamponade
 - N. phrenicus parese
 - Fistel naar slokdarm (zeer zelden)

Survey (15.000 patienten)

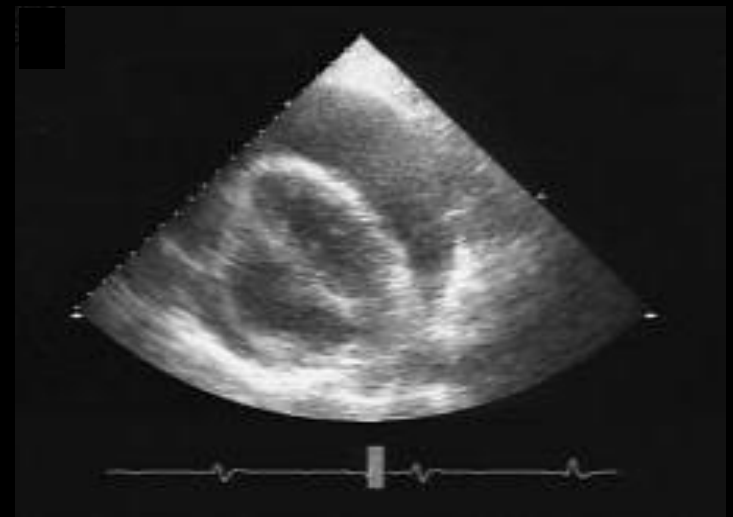
Table 7. Major Complications in the Overall Population

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



Tamponade

- 1-2%
- Pericard-drain
- Zelden thoractomie



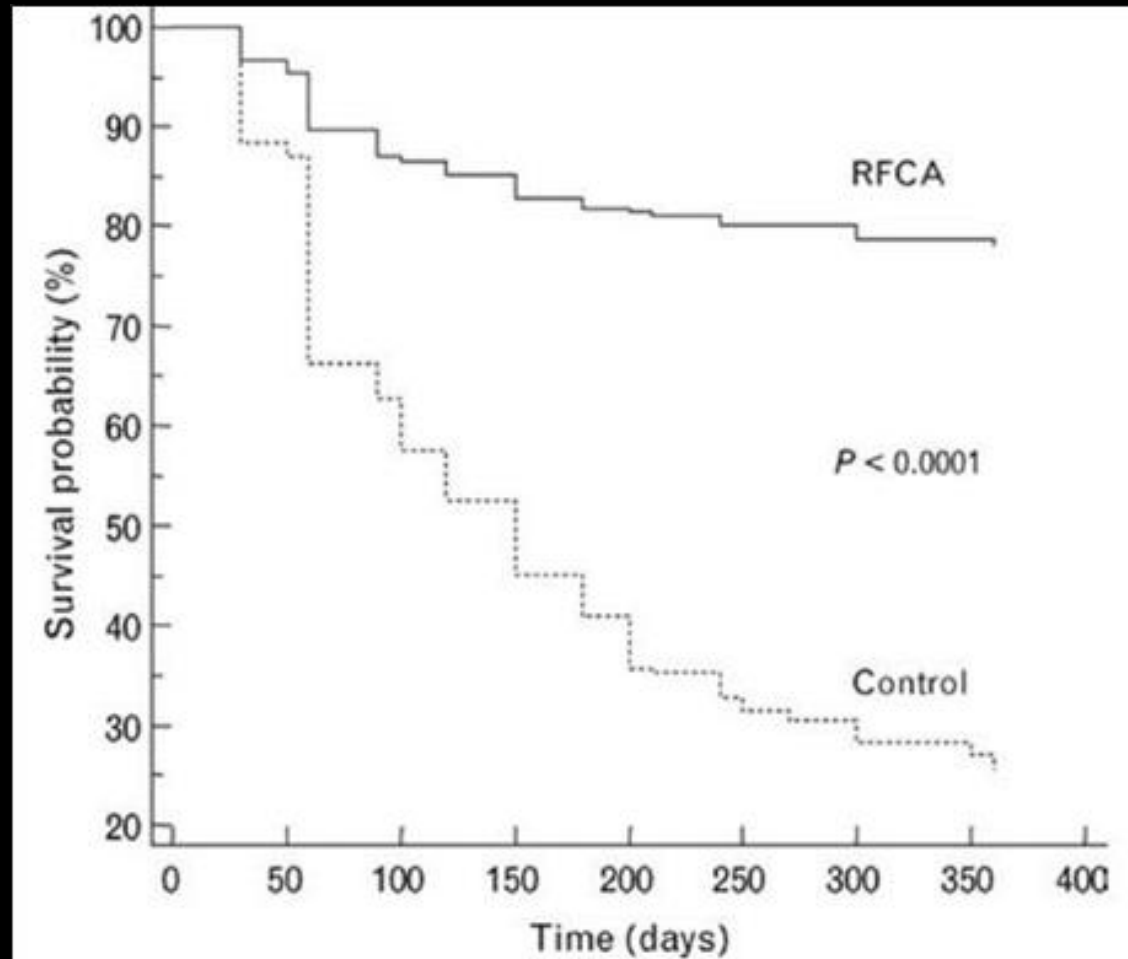
Casus

- Vrouw, 54 jaar
- VG blanco
- Boezemfibrilleren onbekende duur, maar wel achteruitgang conditie bemerkt
- Normaal echo
- Cardioversie zonder en met flecainide niet succesvol
- Ablatie?

Casus

- Man, 47 jaar
- VG: Hypertensie
- Paroxysmaal boezemfibrilleren, flecainide 200mg
- Dagelijks hinder, frequente bezoeken aan poli
- Echo normaal
- Ablatie?

Effectiviteit: meta-analyse van gerandomiseerde trials (ablatie versus medicatie)

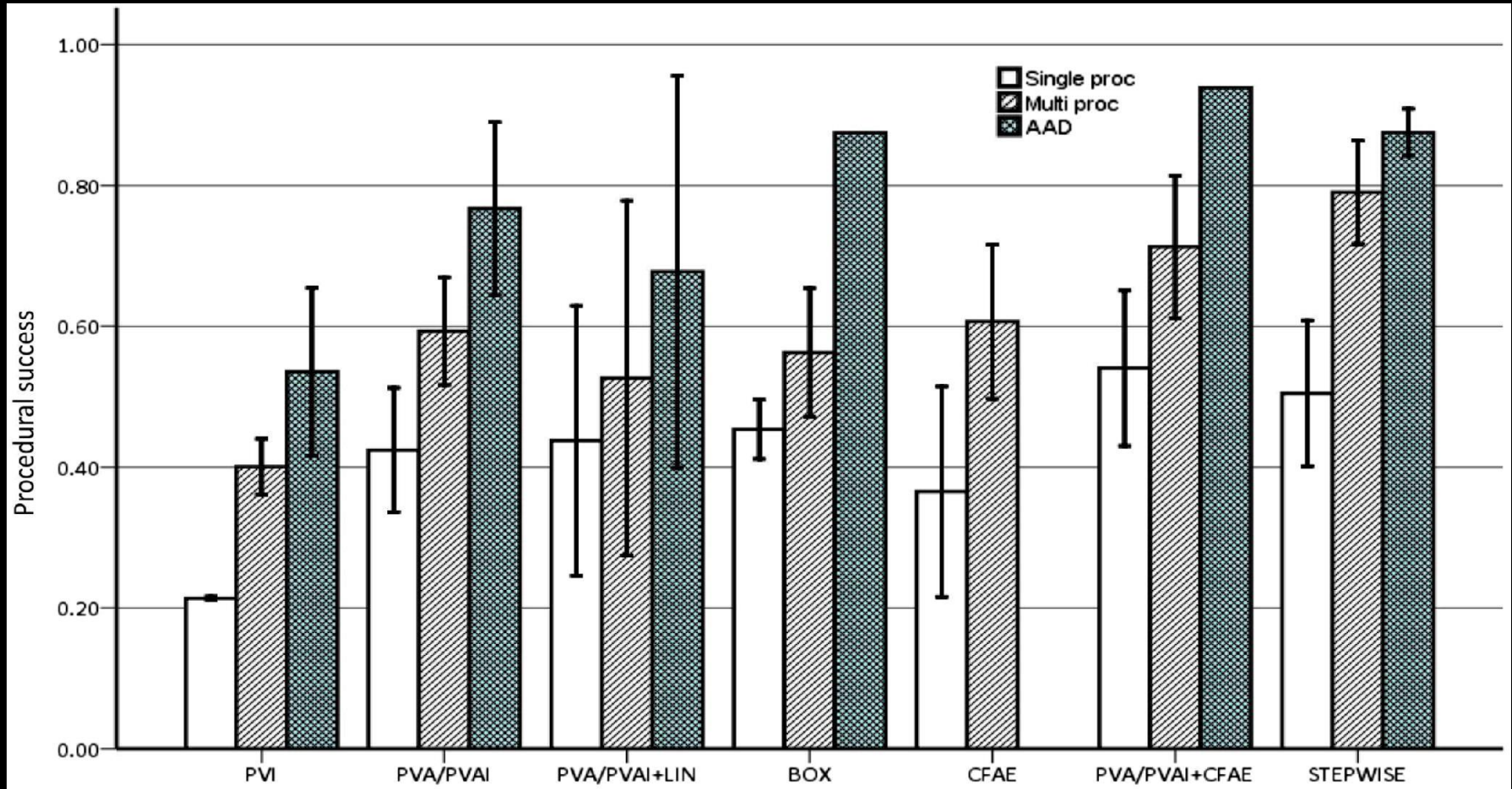


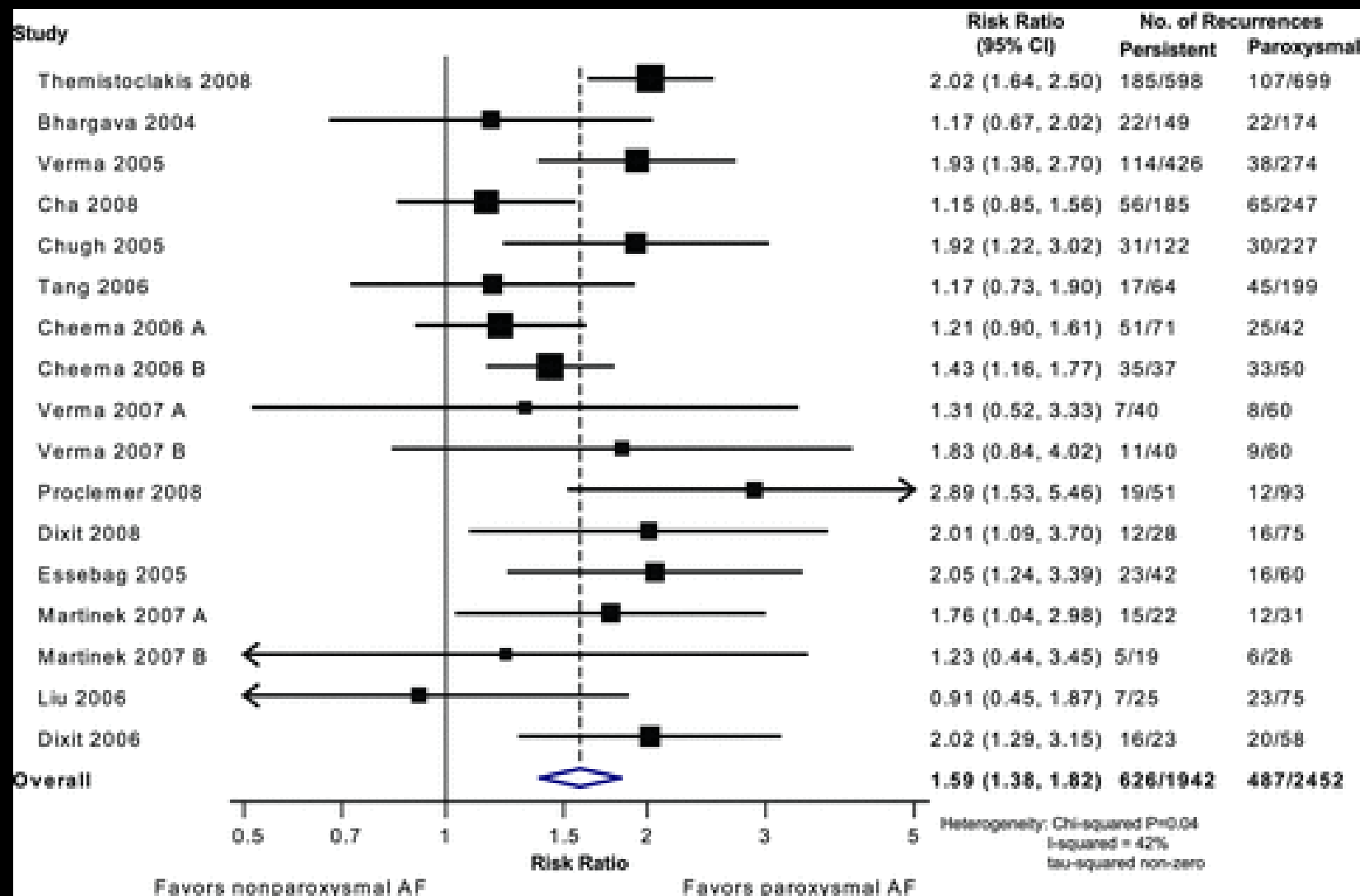
Bonanno, J Cardiovasc Med, 2010

Kaplan-Meier curve of survival free from atrial tachyarrhythmia. RFCA, radiofrequency catheter ablation.

Effectiviteit

Persisterend boezemfibrilleren





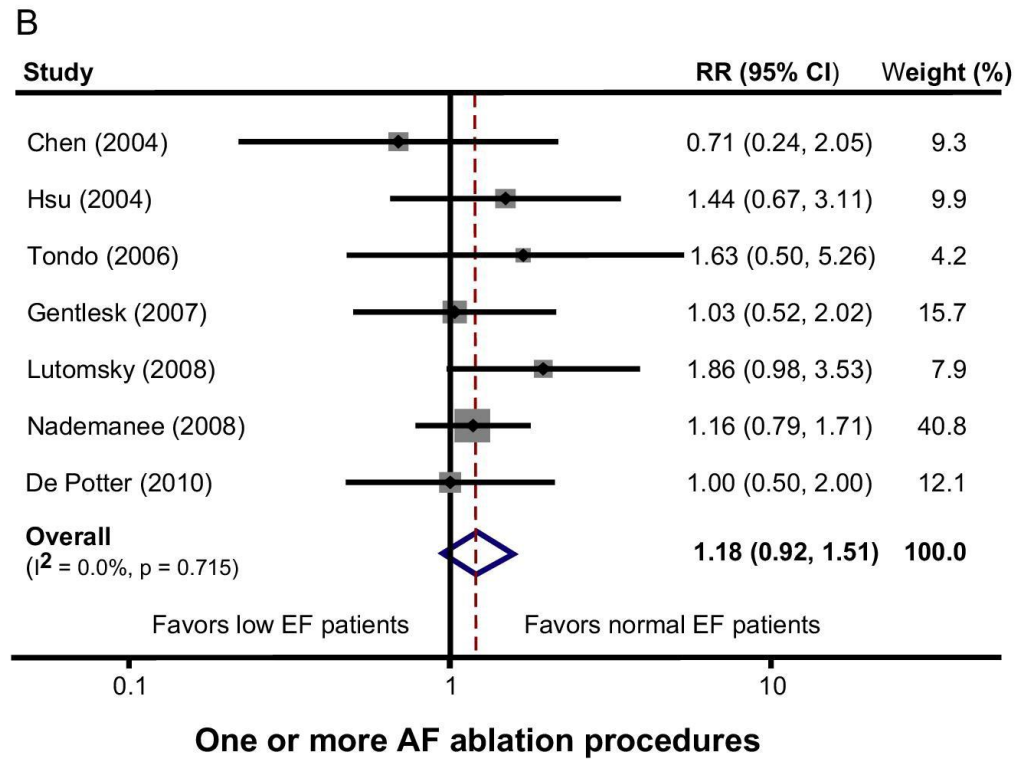
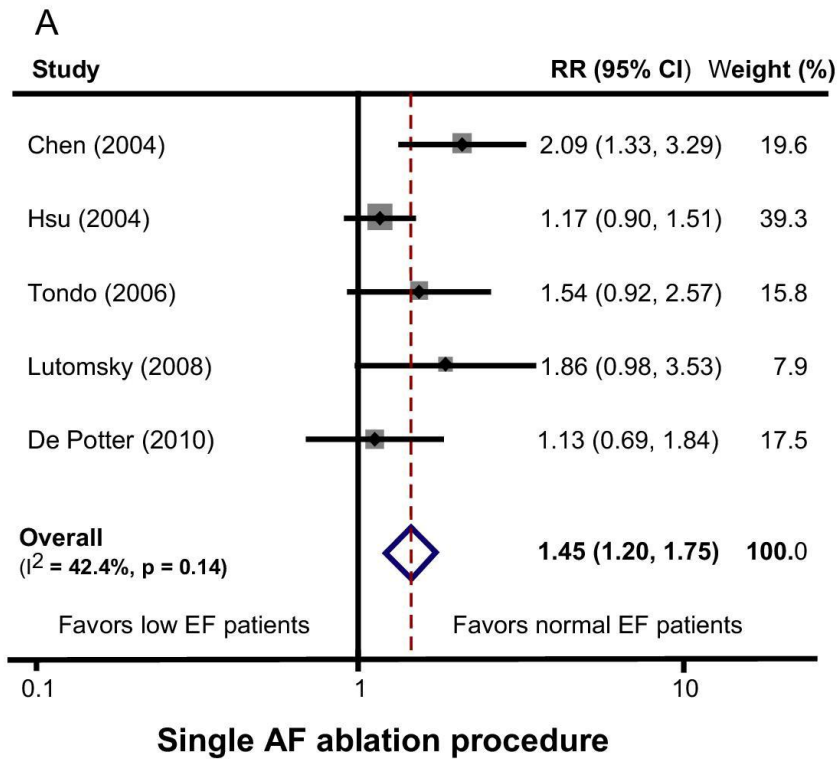
Survey

Table 3. Success Rates in Relationship With the Type of AF

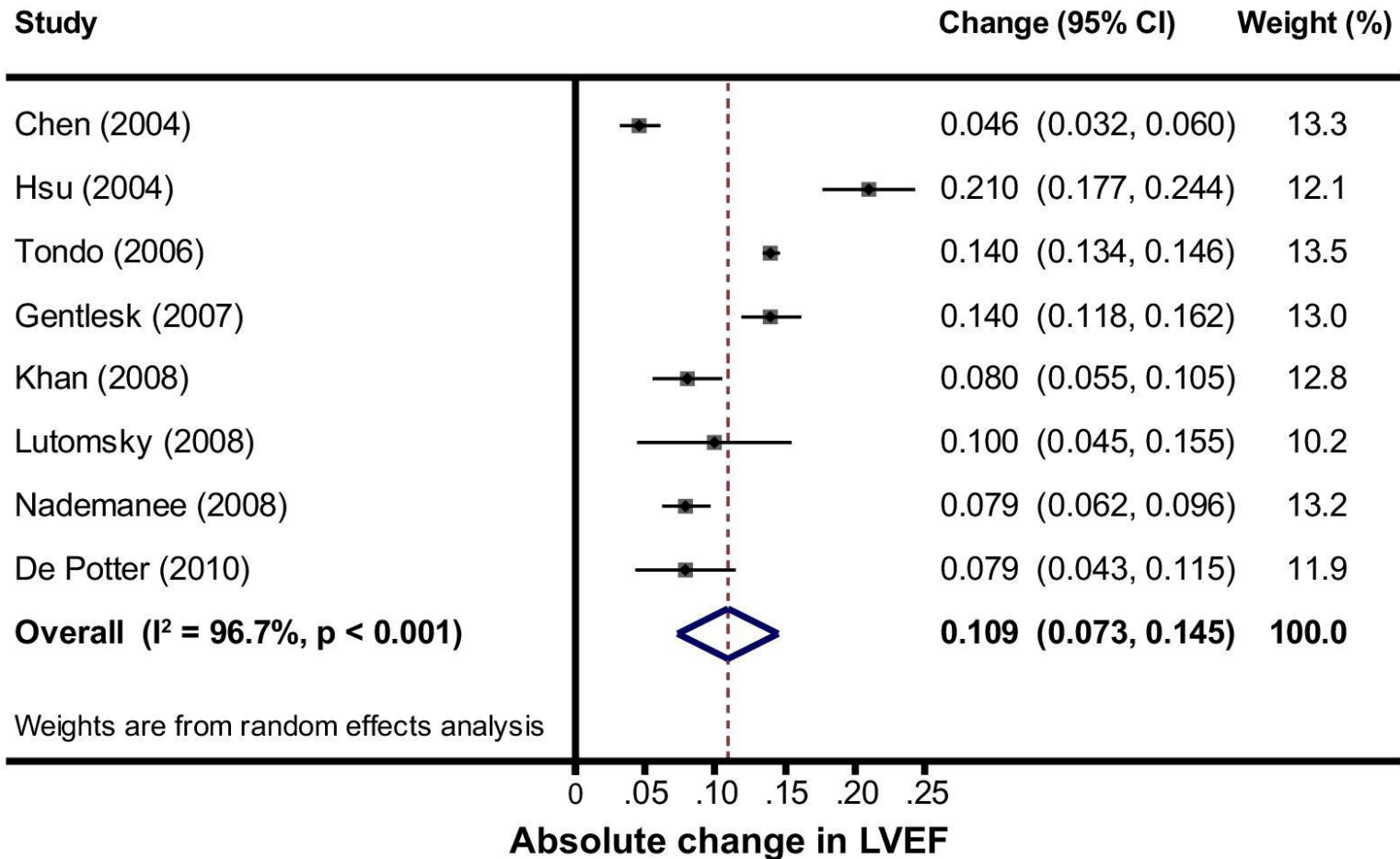
Type of AF	No. of Centers	No. of Patients	Success Without AADs		Success With AADs		Overall Success	
			No. of Patients	Rate, Median (Interquartile Range)*	No. of Patients	Rate Median (Interquartile Range)*	No. of Patients	Rate Median (Interquartile Range)*
Paroxysmal	85	9590	6580	74.9 (64.9–82.6)	1290	9.1 (0.2–14.7)	7870	84.0 (79.7–88.6)
Persistent	73	4712	2800	64.8 (52.4–72.0)	595	10.0 (0.8–15.2)	3395	74.8 (66.1–80.0)
Long-lasting	40	1853	1108	63.1 (53.3–71.4)	162	7.9 (0.9–15.9)	1270	71.0 (67.4–76.3)

*Median and interquartile range are calculated using center as unit of analysis.

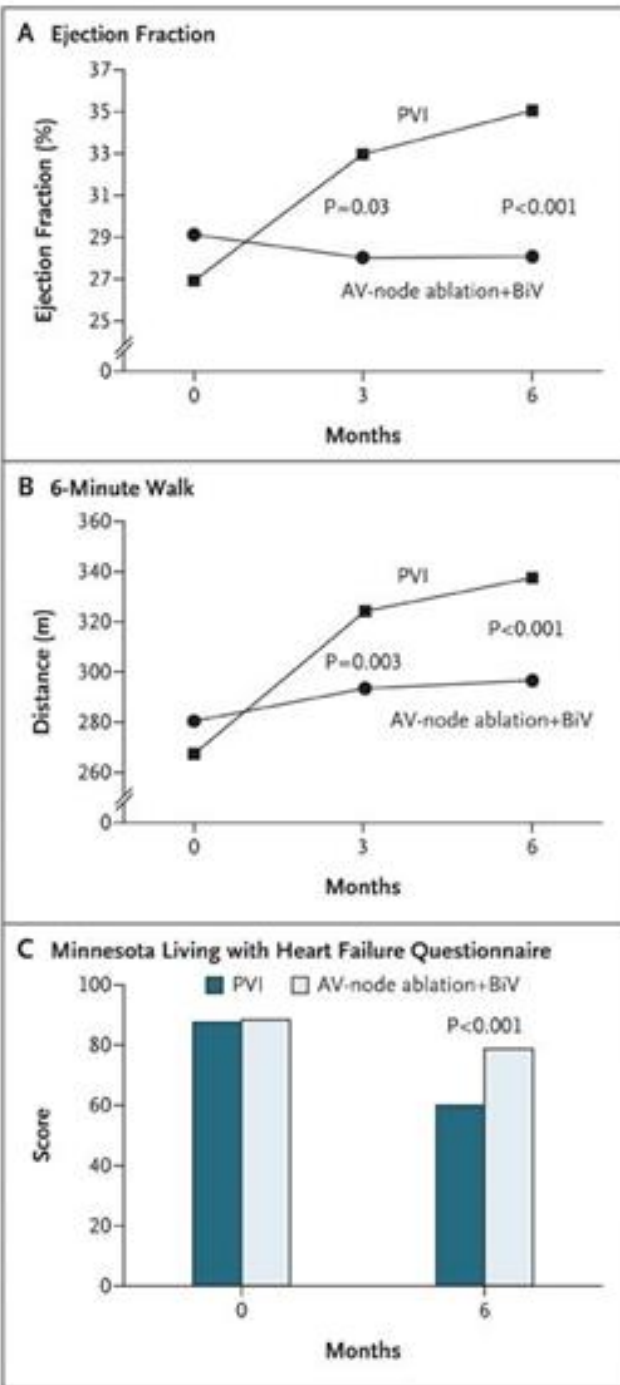
Hartfalen



Hartfalen: EF



NYHA 2-3



Casus

- Man, 79 jaar
- VG: prothese abdominale aorta, hypertensie
- Recidiverend persisterend boezemfibrilleren
- Echo: geen bijzonderheden
- Onvoldoende effect sotalol en flecainide
- Voelt AF duidelijk, ook bij adequate rate-control. Echter weinig erdoor beperkt.
- Vraagt om ablatie. Doen? En wat dan doen?

Uitdaging: behandeling AF bij ↑ leeftijd

- High prevalence; economic burden
- More co-morbidity
- Higher stroke risk
 - Framingham: 50-59y 1,5%
80-89y 23,5%
- Higher bleeding risk under warfarine
- Uncertain pharmacokinetics, more side effects, poly-pharmacy
- No data on pharmacological and interventional therapies
- Sinus rhythm seems better

PAVANE-trial

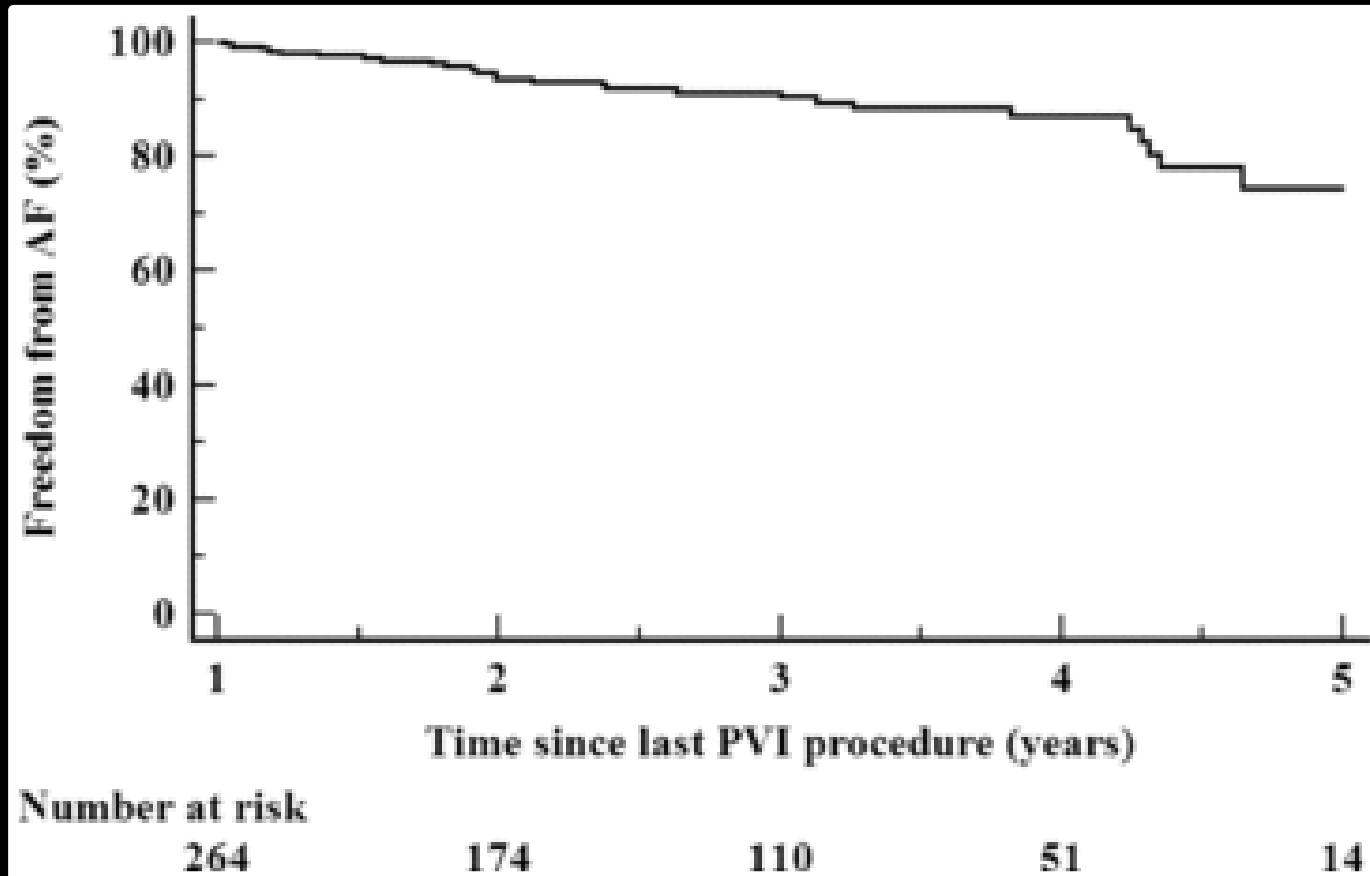
Pulmonary vein Ablation Vs. Amiodarone in the Elderly



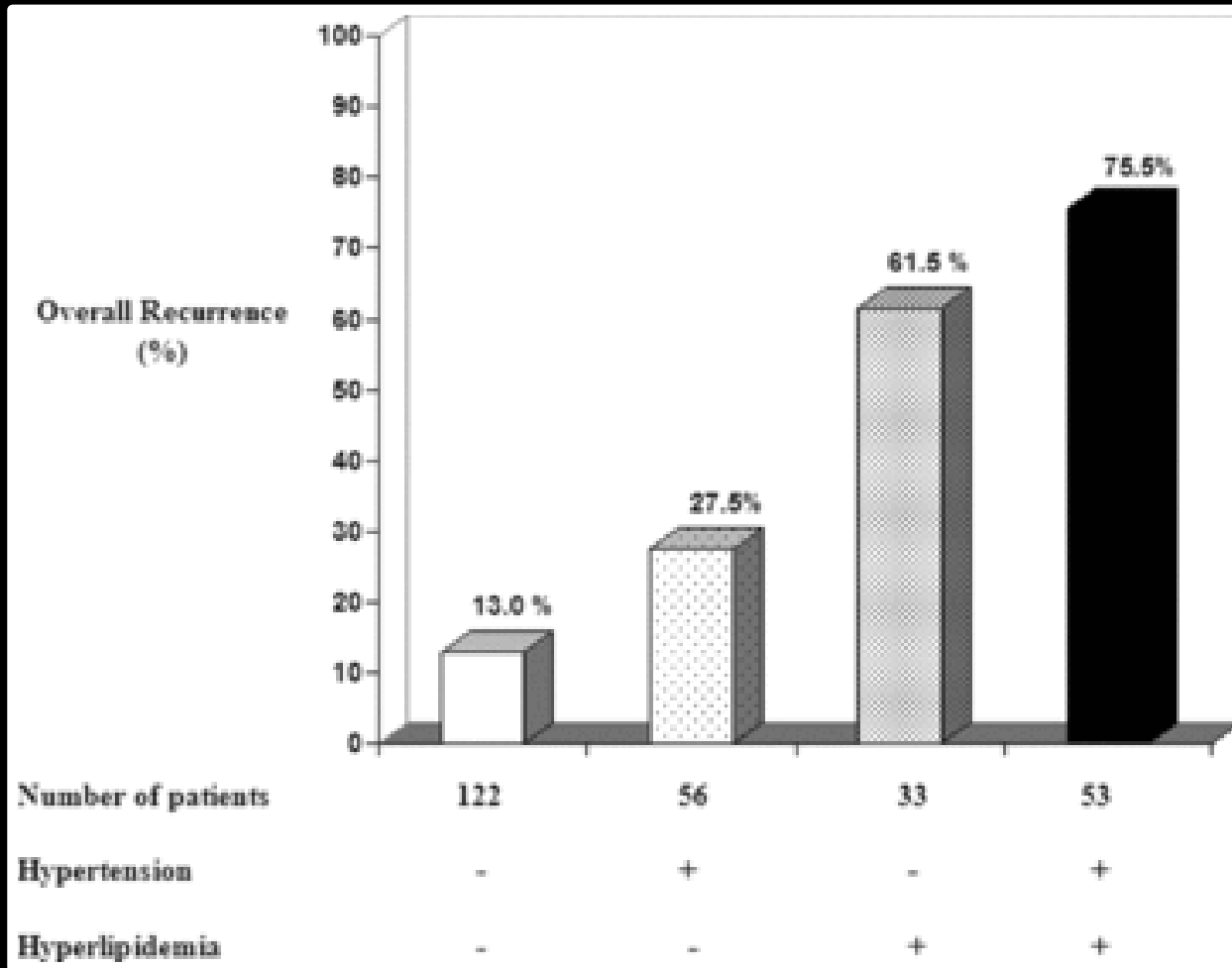
Protocol studie opzet

- Primair:
 - Vaststellen van de effectiviteit van PVI in vergelijking met amiodarone behandeling in patienten ≥ 65 jaar met symptomatisch, paroxysmaal AF
- Secundair:
 - Vaststellen van de veiligheid van PVI in vergelijking met amiodarone behandeling in patienten ≥ 70 jaar met symptomatisch, paroxysmaal AF
 - Vaststellen of PVI het samengestelde eindpunt van aantal en duur van hospitalizaties door cardiale oorzaak inclusief cardioversie, CVA en grote bloeding en dood reduceert.

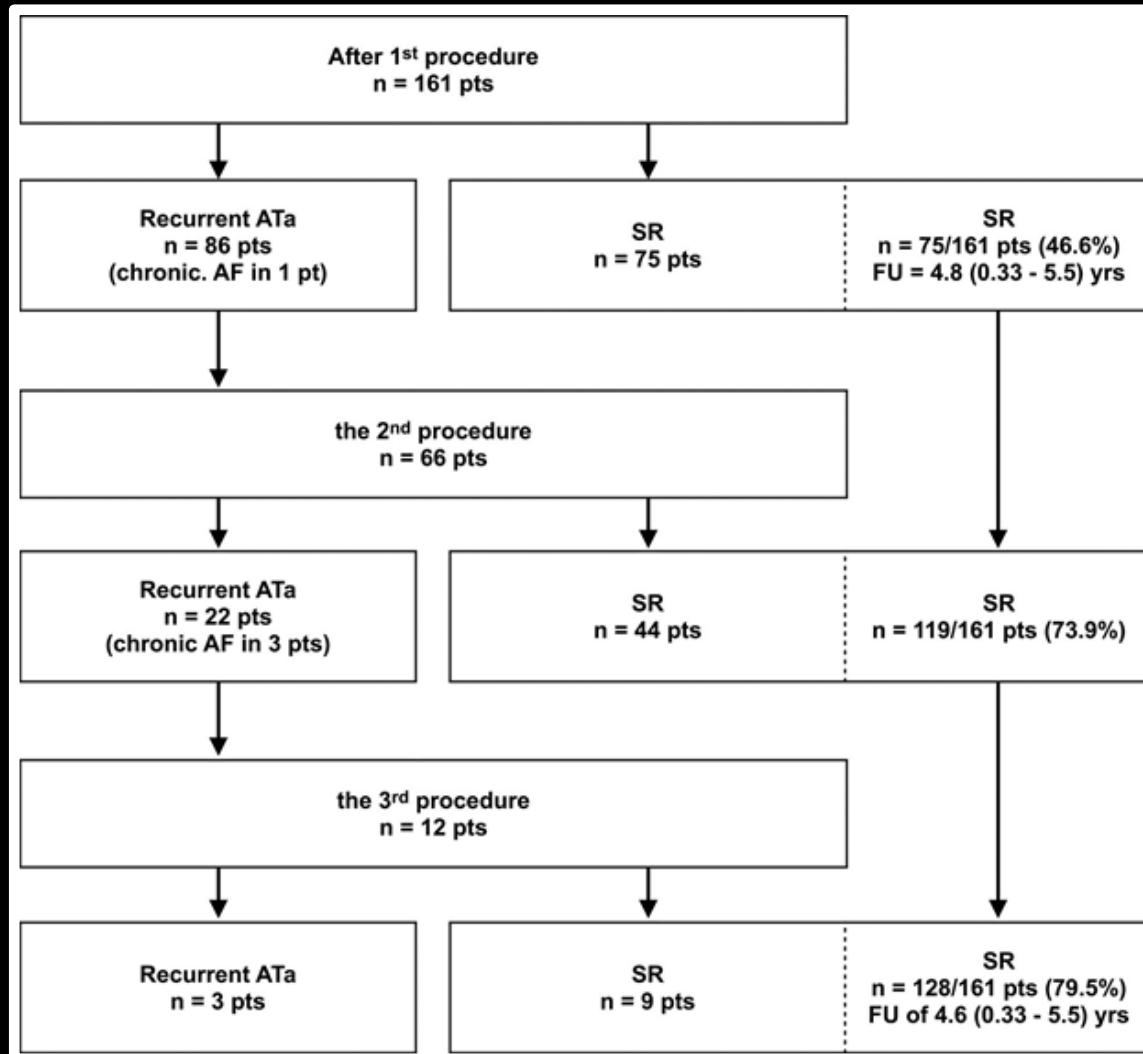
Langetermijn



Langetermijn



Langetermijn



Voorspellers

- AF-type?
- EF?
- LA-diameter?
- Structureel hartlijden?
- Duur bekend met AF?
- Leeftijd?
- Hypertensie?
- OSAS?
- LA-fibrose (MRI)?

Casus

- Vrouw, 51 jaar
- Echo: geringe mitralisklepinsufficiëntie
- Persisterend boezemfibrilleren ondanks sotalol en amiodaron.
- Pulmonaalvenenisolatie, nadien paar maanden klachtenvrij
- Recidief klachten
- Tweede pulmonaalvenenisolatie?

Wat nu weer?

Geslacht: Vrouw
Geboortedatum: 15-8-1951 60 jaren
P/PQ: - / -
QRS: 143 ms
QT/QTc/QTd: 400 ms / 519 ms / -
P/QRS/T as: - / 56° / 96°
Hartfrequentie: 128 spm

Verwijzende arts:
Aanvragende arts:
Behandelende arts:
Locatie:
Commentaar:

met tweedegraads AV-blok met 2:1 AV-geleiding
uitgesproken intraventriculaire geleidingsvertraging
RSR' in V1
kleine repolarisatiestoring hoog-laterale, overweeg ischemie, LV
overbelasting of aspecifieke verandering
negatieve T in aVL
met vlakke of kleine negatieve T in I

bevindingen zeker van pathologische betekenis

