



6ème édition

**SAMEDI, 2 DECEMBRE 2023**  
SALONS VARENNE, NOISY-LE-GRAND



# Ablation de FA chez le sujet jeune

Dr K. Ramoul (Mondor)

# Traitement invasif de la FA chez le patient jeune

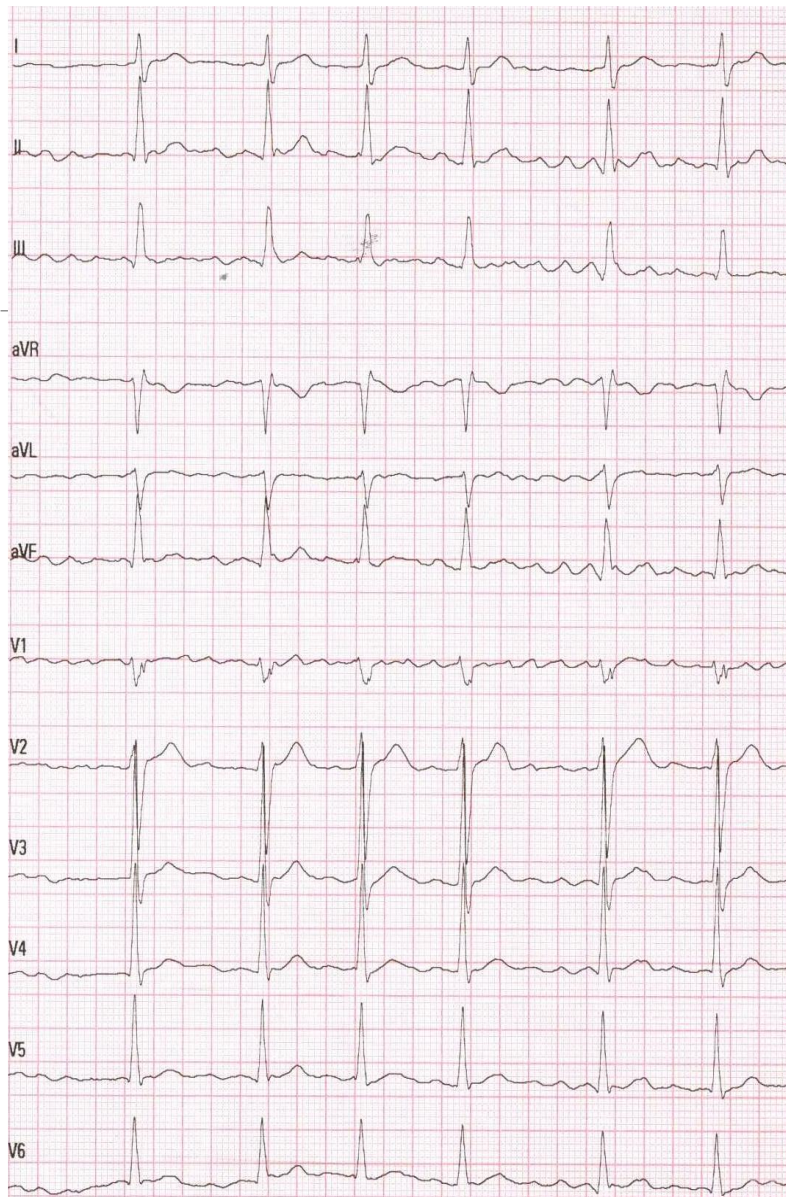
**Dr Khaled RAMOUL**

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**CHU Henri Mondor**

**Rythmologie**





# Mme L. 64 ans HTA, Diabète

Consultations tous les Jours  
Sur Rendez-vous

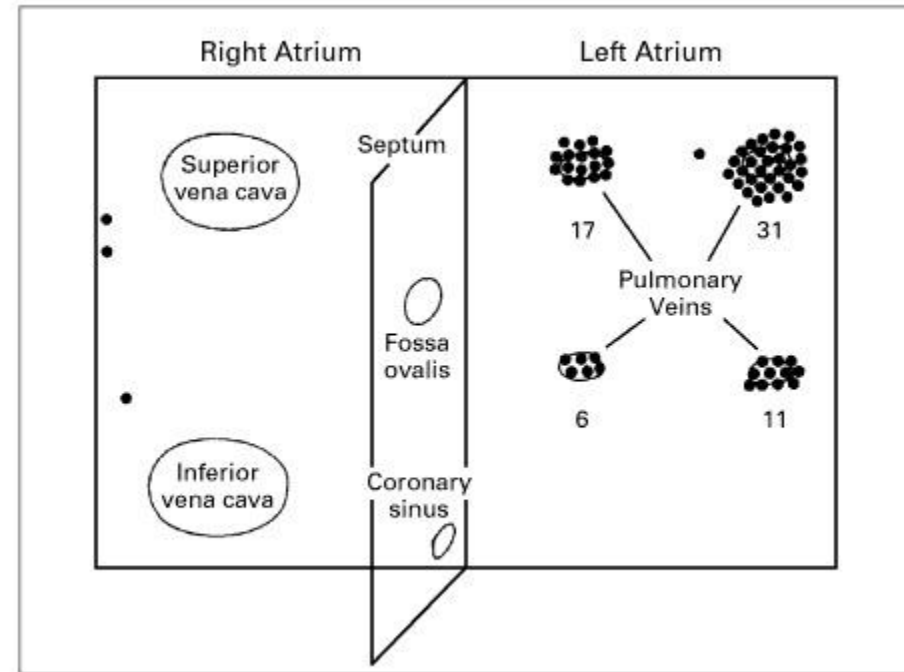
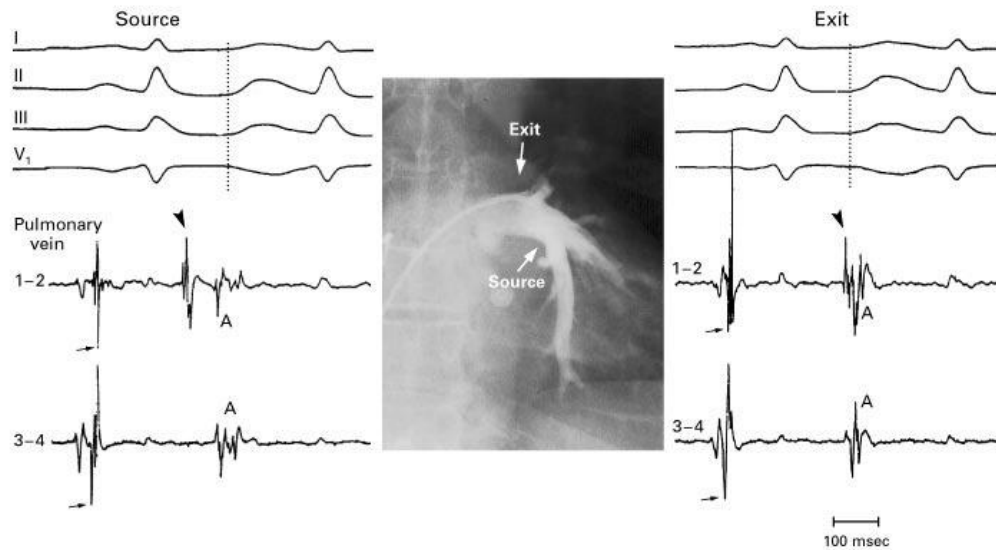
Sucy-en-Brie, le 27/06/2023

Chers amis,

Je vous adresse Mme \_\_\_\_\_ 64 ans, pour ablation d'une AC/FA récidivante découvert en Septembre dernier, très bien tolérée sur le plan hémodynamique.

# Spontaneous Initiation of Atrial Fibrillation by Ectopic Beats Originating in the Pulmonary Veins

Michel Haïssaguerre, M.D., Pierre Jaïs, M.D., Dipen C. Shah, M.D., Atsushi Takahashi, M.D., Mélèze Hocini, M.D., Gilles Quiniou, M.D., Stéphane Garrigue, M.D., Alain Le Mouroux, M.D., Philippe Le Métayer, M.D., and Jacques Clémenty, M.D.



# Catheter Ablation Versus Antiarrhythmic Drugs for Atrial Fibrillation

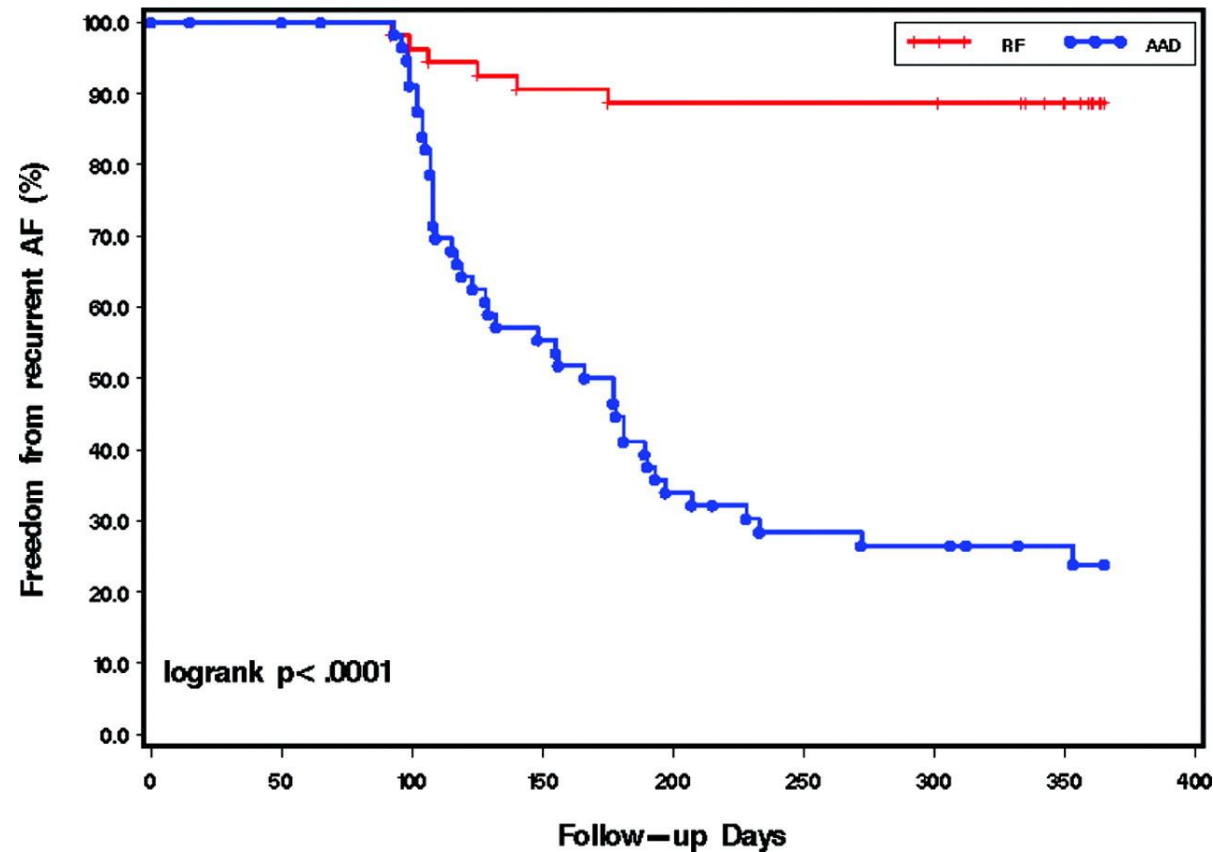
## The A4 Study

Pierre Jaïs, Bruno Cauchemez, Laurent Macle, Emile Daoud, Paul Khairy, Rajesh Subbiah, Méléze Hocini, Fabrice Extramiana, Frédéric Sacher, Pierre Bordachar, George Klein, Rukshen Weerasooriya, Jacques Clémenty and Michel Haïssaguerre

Originally published 24 Nov 2008 | <https://doi.org/10.1161/CIRCULATIONAHA.108.772582> | Circulation. 2008;118:2498–2505



December 9, 2008  
Vol 118, Issue 24



Jais et al Circulation 2008




# Pulsed Field or Conventional Thermal Ablation for Paroxysmal Atrial Fibrillation

Vivek Y. Reddy, M.D., Edward P. Gerstenfeld, M.D., Andrea Natale, M.D., William Whang, M.D., Frank A. Cuoco, M.D., Chinmay Patel, M.D., Stavros E. Mountantonakis, M.D., Douglas N. Gibson, M.D., John D. Harding, M.D., Christopher R. Ellis, M.D., Kenneth A. Ellenbogen, M.D., David B. DeLurgio, M.D., *et al.*, for the ADVENT Investigators\*


**RF Ablation**

Damaged




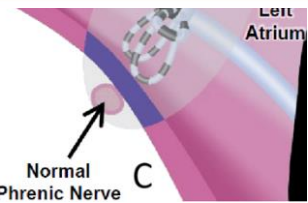
**Cryoballoon Ablation**

Damaged



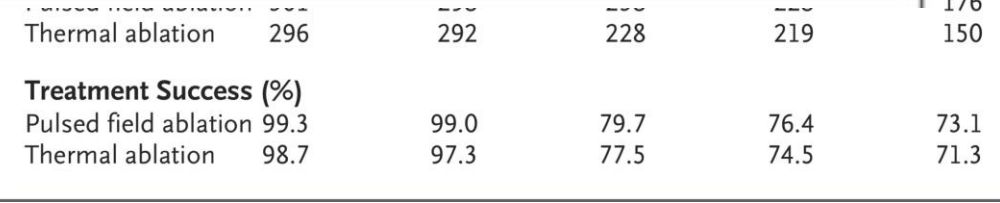
**Table 1. Characteristics of the Patients at Baseline.\***

Characteristic	Pulsed Field Ablation (N = 305)		Thermal Ablation (N = 302)†	
Age — yr	<b>62.4±8.7</b>		<b>62.5±8.5</b>	
Sex — no. (%)				
Male	202 (66.2)		195 (64.6)	
Female	103 (33.8)		107 (35.4)	
Body-mass index‡	28.3±4.6		29.0±4.8	
	296	292	228	219
<b>Treatment Success (%)</b>				
Pulsed field ablation	99.3	99.0	79.7	76.4
Thermal ablation	98.7	97.3	77.5	74.5

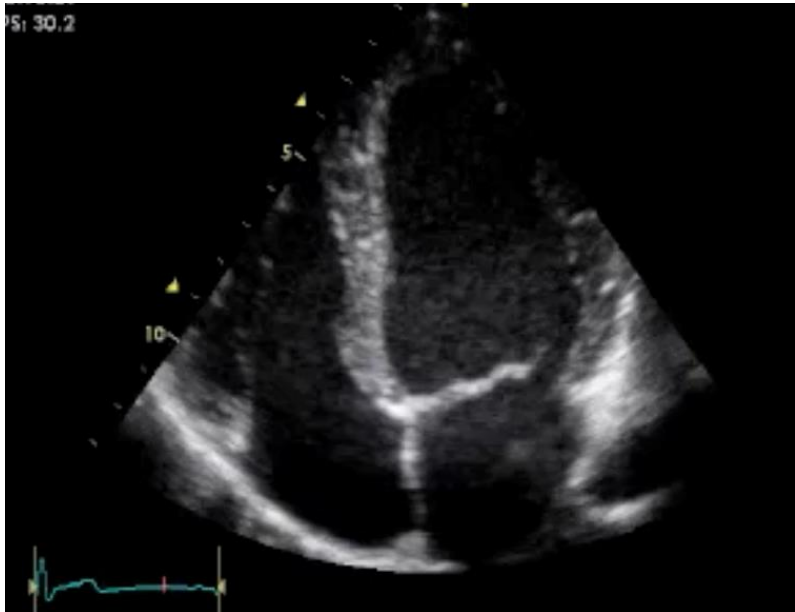
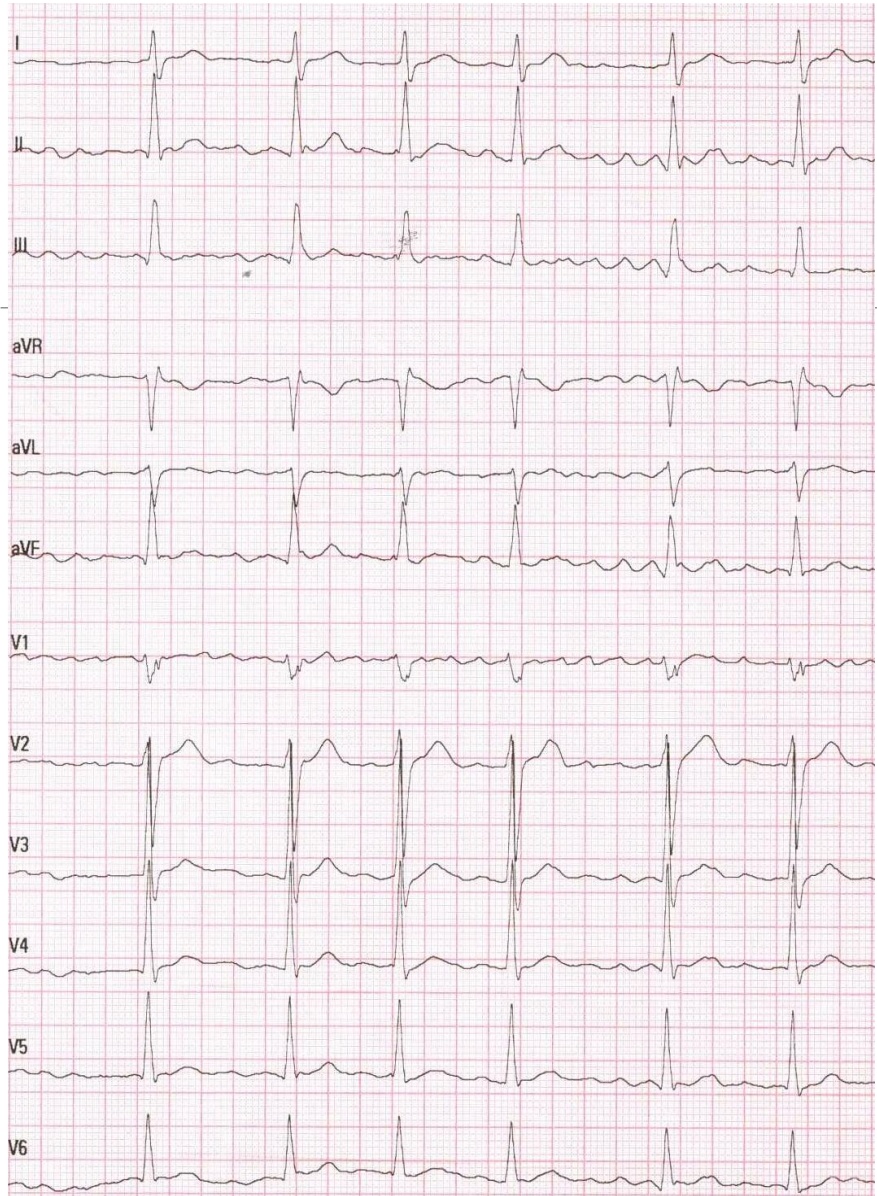
Left Atrium

Normal Phrenic Nerve



Mme L.  
Pas d'ATCD

**36 ans**



# Incidence de la FA

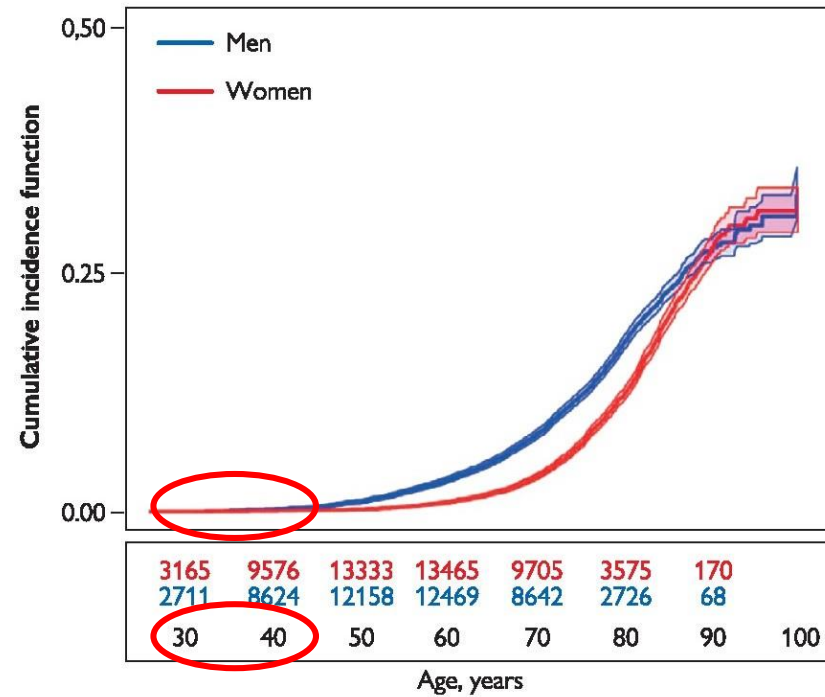
**LIFETIME RISK for AF**  
**1 in 3 individuals**



of European ancestry  
 at index age of 55 years  
 37.0% (34.3% to 39.6%)

**AF is more common in males**

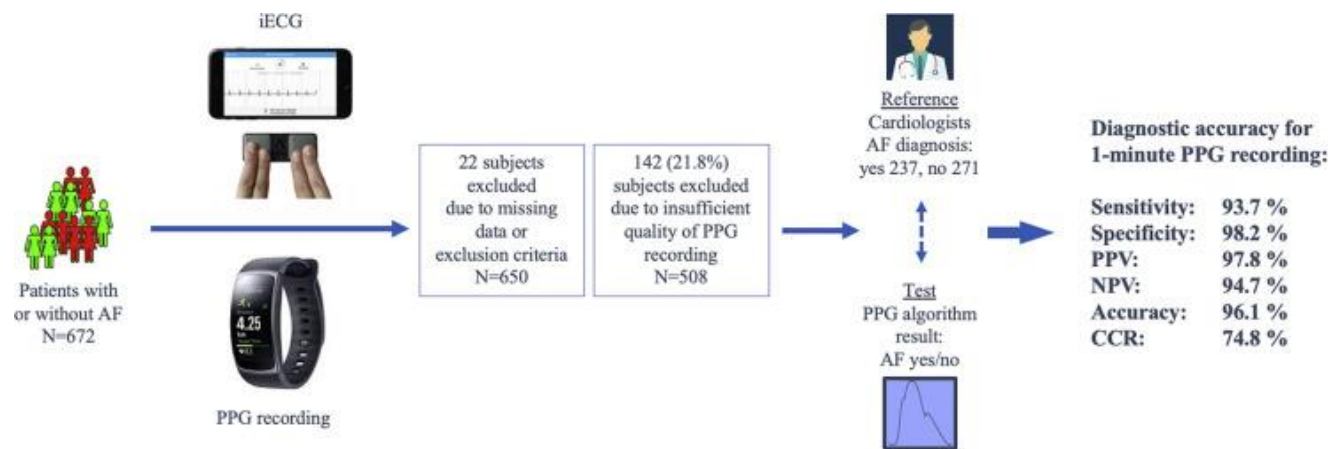
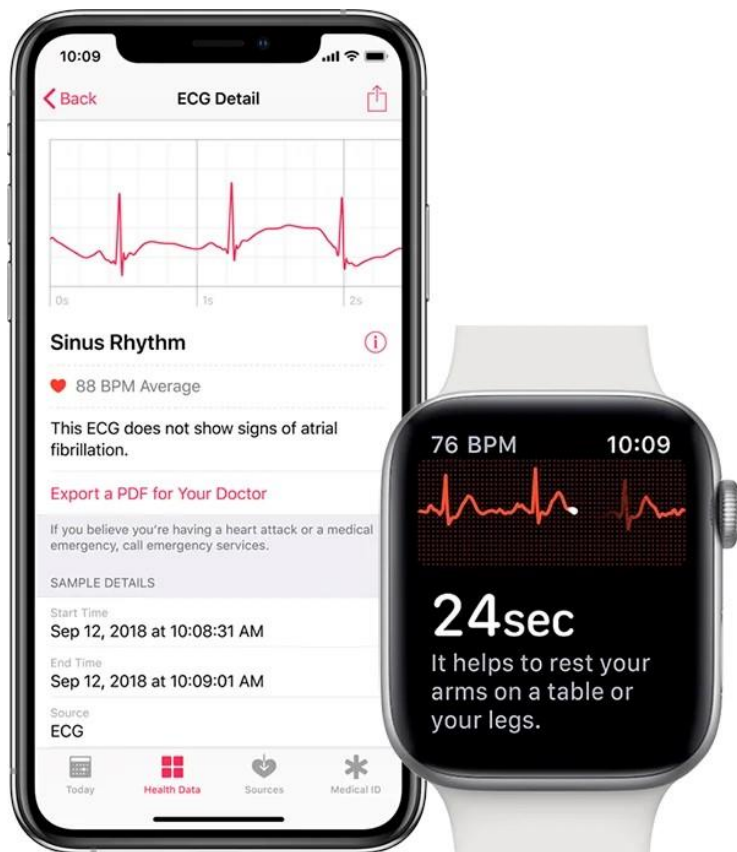
Cumulative incidence curves and 95% CIs  
 for AF in women and men with death as a competing risk





# Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation

Marco V. Perez, M.D., Kenneth W. Mahaffey, M.D., Haley Hedlin, Ph.D., John S. Rumsfeld, M.D., Ph.D., Ariadna Garcia, M.S., Todd Ferris, M.D., Vidhya Balasubramanian, M.S., Andrea M. Russo, M.D., Amol Rajmane, M.D., Lauren Cheung, M.D., Grace Hung, M.S., Justin Lee, M.P.H., et al., for the Apple Heart Study Investigators\*



## Outils connectés !

# Découverte de FA chez le jeune

Recherche et traitement des comorbidités

**IIa**

**Rechercher une cardiopathie structurelle**

Antiarythmiques  
flécaïnide  
sotalol

IA

IA

IIB (A)

Ablation

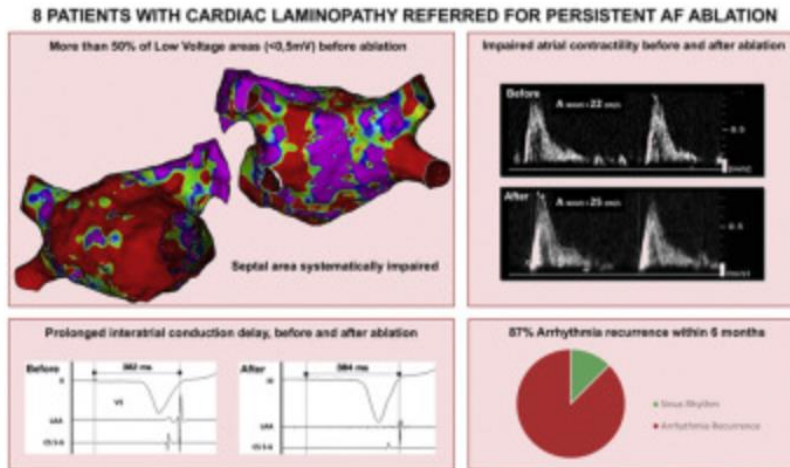
**IIa**

Clinical

Atrial Fibrillation

# Persistent atrial fibrillation ablation in cardiac laminopathy: Electrophysiological findings and clinical outcomes

Rémi Chauvel MD, Nicolas Derval MD, Josselin Duchateau MD, PhD, Arnaud Denis MD,



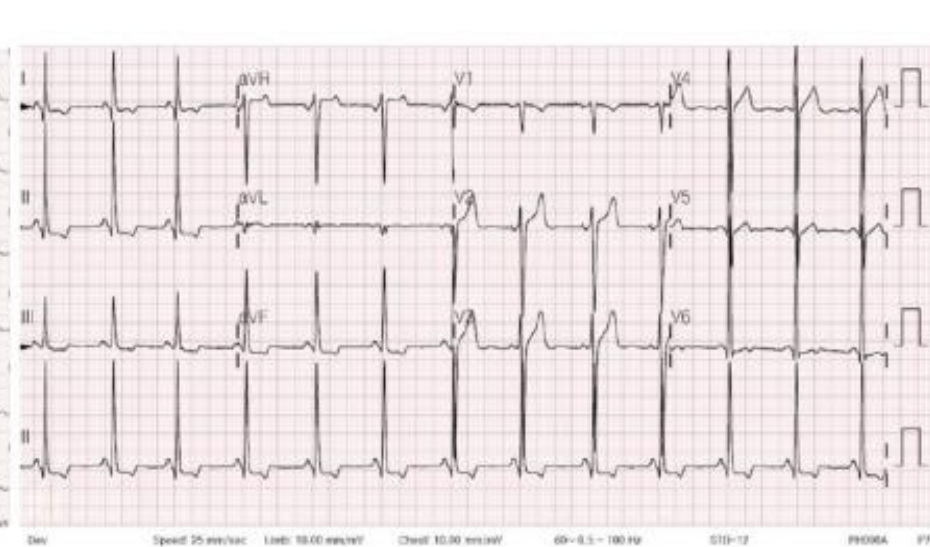
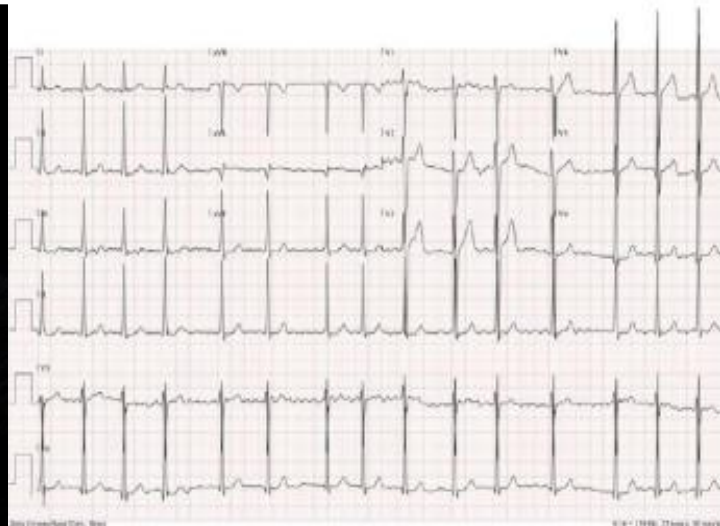
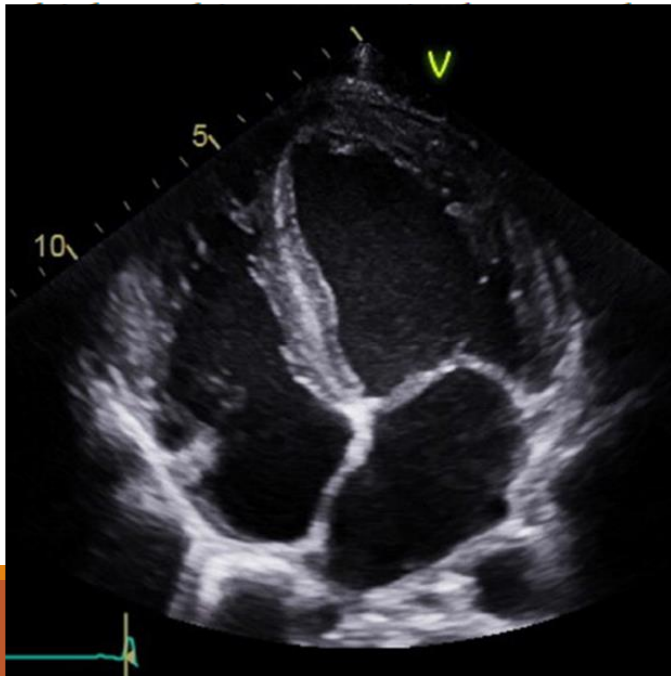
## Study group

A total of 8 patients with a confirmed diagnosis of CLMNA underwent persistent AF ablation in our institute. The baseline characteristics of each patient are summarized in Table 1. Briefly, 3 patients (38%) were women and the mean age at the diagnosis of AF, diagnosis of CLMNA, and first AF ablation were  $43.7 \pm 11.6$ ,  $45.0 \pm 12.9$ , and  $46.7 \pm 14.3$  years, respectively. CLMNA diagnosis was made after first AF ablation in 4 patients (50%). At the time of ablation, 7 patients (88%) were ICD carriers, ...

# Anderson-Fabry disease presenting with atrial fibrillation as earlier sign in a young patient: A case report

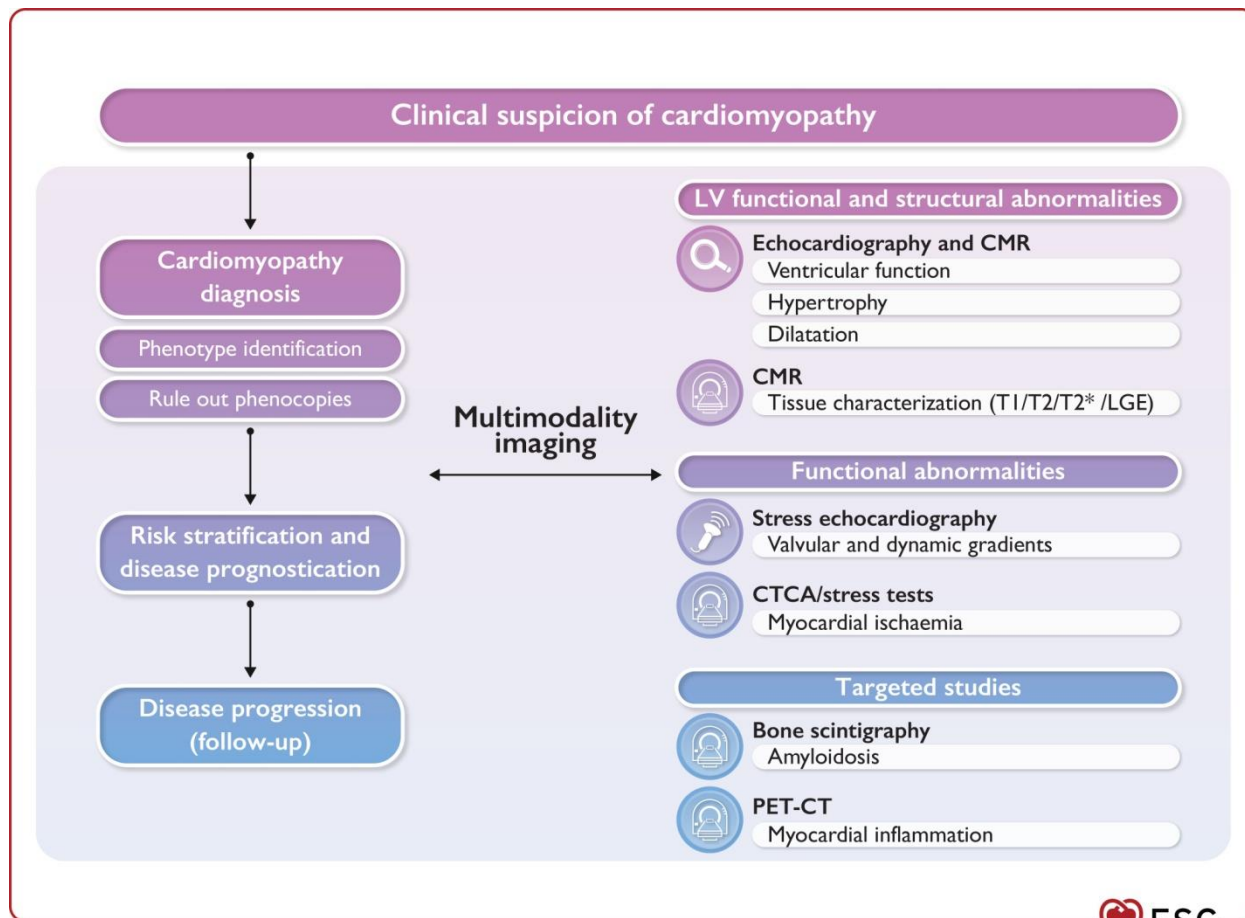
## CASE SUMMARY

We report a case of a 26-year-old man who was admitted with chest discomfort. Left ventricular hypertrophy was fulfilled in the criteria by the Sokolow-Lyon index and atrial fibrillation on the 12 Leads-electrocardiography (ECG) that was documented in the emergency room. After spontaneously restored to normal sinus rhythm, relationships between P and R waves, including a shorter PR interval on the ECG, were revealed



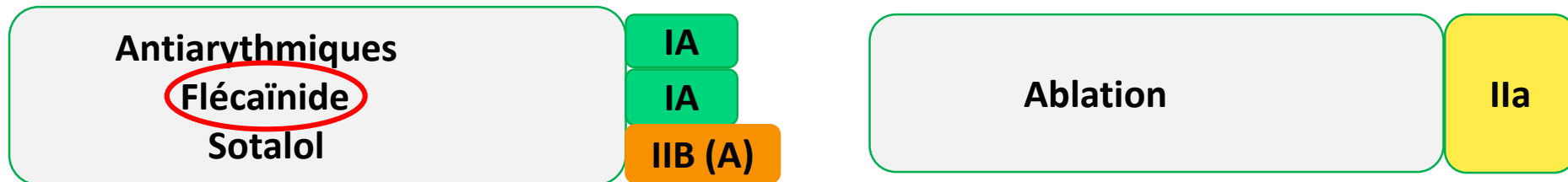


# IRM Cardiaque +++



Cardiomyopathy phenotype	Finding	Cardiac CMR examples	Specific diseases to be considered
HCM	Posterolateral LGE and concentric LVH Low native T1		Anderson-Fabry disease
	Diffuse subendocardial LGE, high native T1		Amyloidosis
	Patchy mid-wall in hypertrophied areas		Sarcomeric HCM
DCM	Short T2*		Haemochromatosis
	Subepicardial LGE		Post-myocarditis
	Lateral wall epicardial LGE		Dystrophinopathy
	Subepicardial and midwall LGE at basal septum +/- extension into inferolateral wall and RV insertion points		Sarcoidosis
	Apical transmural LGE		Chagas disease
NDLVC	Ring-like and/or subepicardial LGE pattern		DSP variants FLNC variants DES variants
	Septal mid-wall LGE		Laminopathy
ARVC	Fat and LGE (transmural RV plus sub-epicardial-midmural LV free wall)		Desmosomal variants
RCM	Partial LV or RV apical obliteration + LGE at endocardial level		EMF/hypereosinophilia

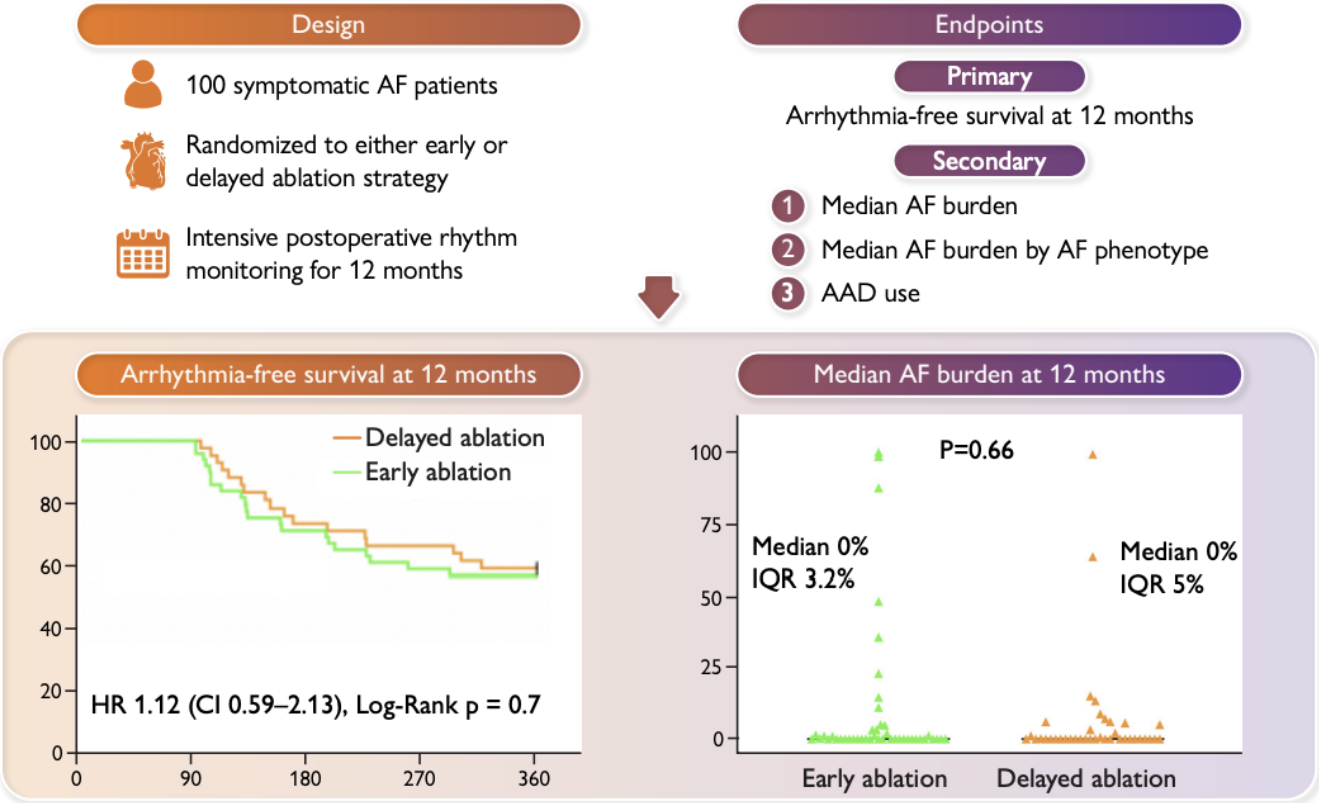
# Découverte de FA chez le jeune



# Impact of early vs. delayed atrial fibrillation catheter ablation on atrial arrhythmia recurrences

1

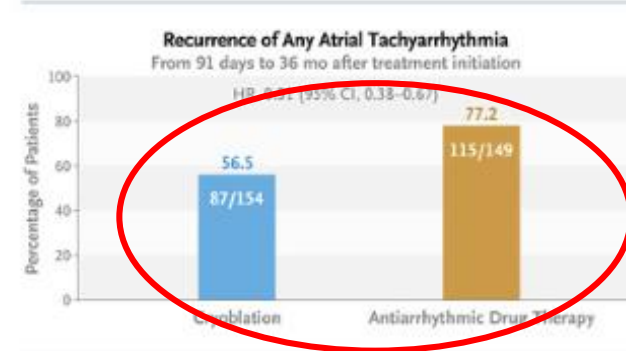
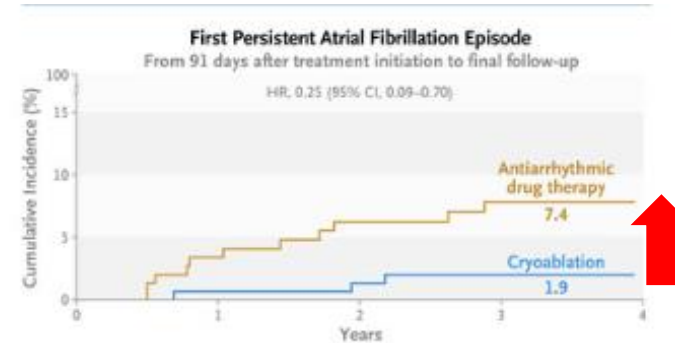
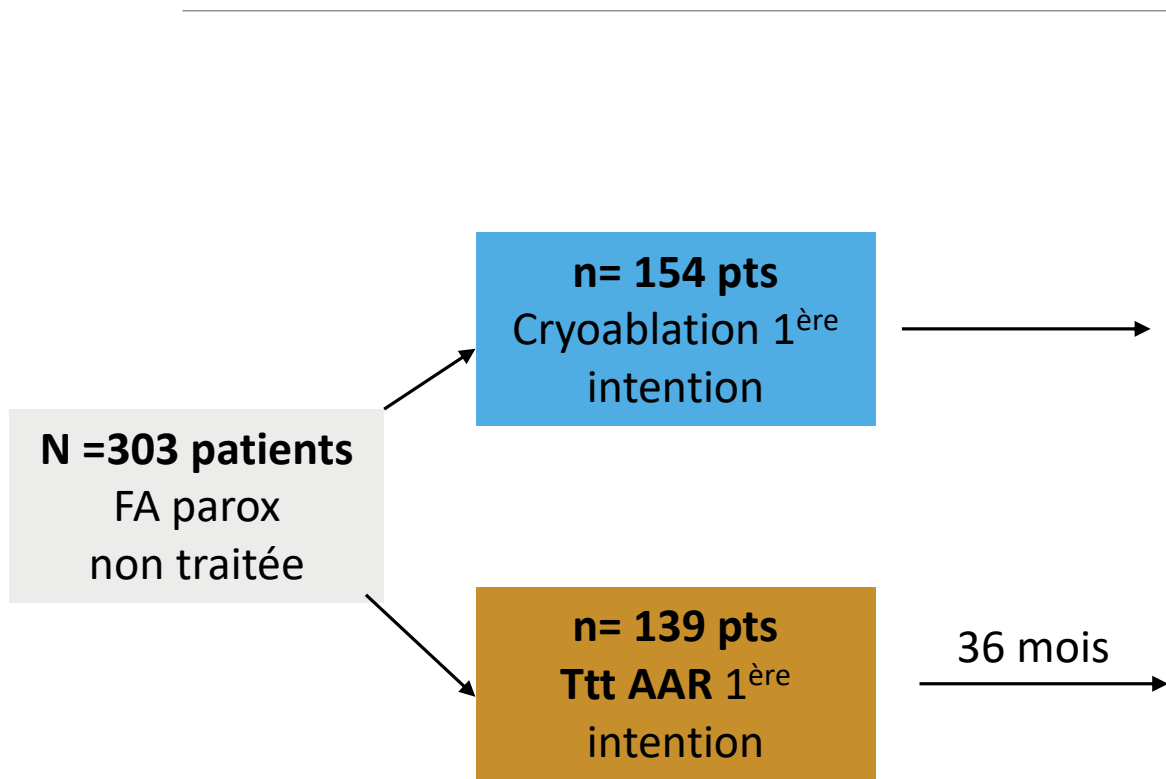
**➔ Pas d'urgence !**



**Résultats :** 230 patients "screenés", 100 randomisés  
50% de FA persistantes.

**1 an post ablation : taux de récurrence identique dans les 2 groupes (43,7 % pour l'ablation précoce, 41,4 % pour l'ablation retardée ; P=0.7).**

# Progression of Atrial Fibrillation after Cryoablation or Drug Therapy



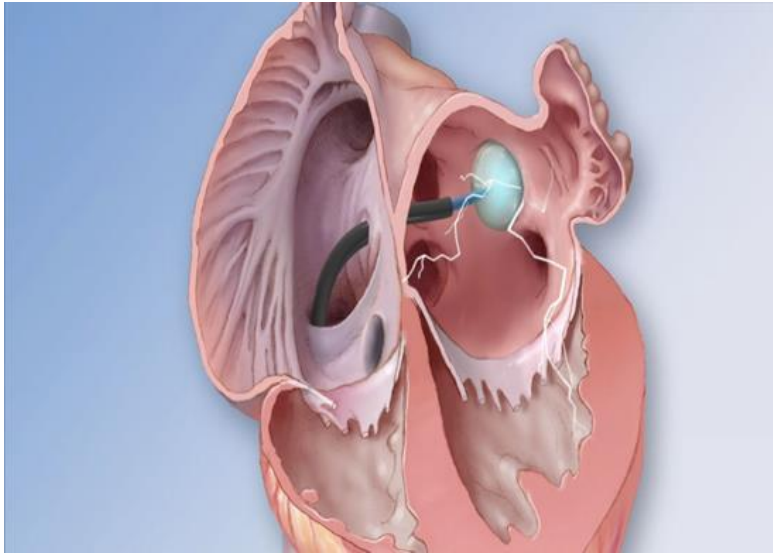
**Ablation 1<sup>e</sup> intention =**

- **Moins de récurrence de FA**
- **Moins d'évolution vers une forme de FA persistante**

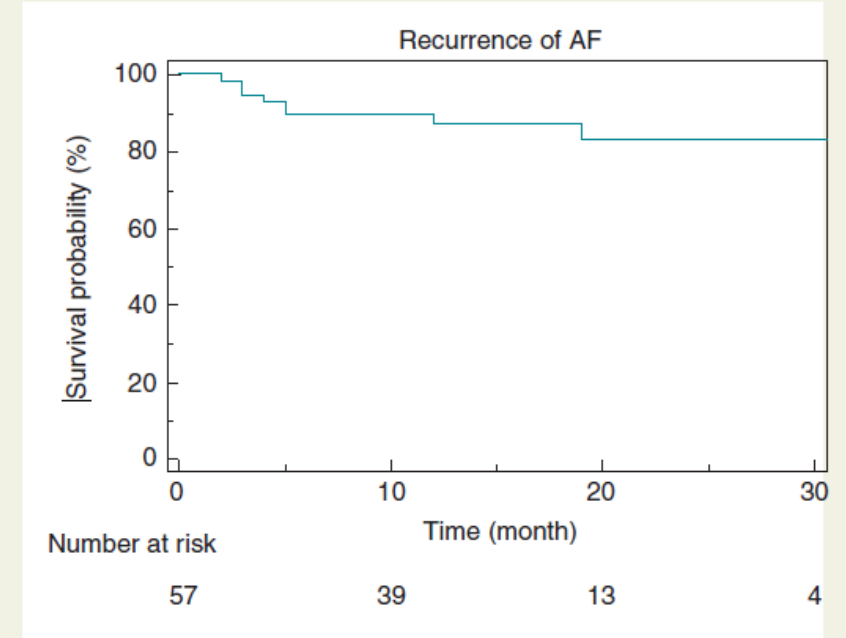


# Second generation cryoballoon ablation for atrial fibrillation in young adults: midterm outcome in patients under 40 years of age

Darragh Moran<sup>1†</sup>, Valentina De Regibus<sup>1†\*</sup>, Carlo de Asmundis<sup>1</sup>, Ken Takarada<sup>1</sup>,



**Age moyen : 32 ans  
88 % de succès à 18 mois**



**Figure 1** Kaplan–Meyer curve shows the survivor free of AF recurrence during the whole follow-up (AF = atrial fibrillation).

**Table 1** Baseline clinical characteristics of patients with long-term follow-up

Characteristic	All patients (n = 74)	PAF (n = 46)	Pers AF (n = 28)	No SHD (n = 66)	SHD (n = 8)
Age at index ablation	31 (27;33)	31 (27;33)	32 (28;33)	31 (27;33)	32 (29;32)
Male, n (%)	49 (66%)	27 (59%)	22 (79%)	47 (71%)	2 (25%)
BMI (kg/m <sup>2</sup> )	26.6 ± 4.8	26.9 ± 4.7	26.3 ± 5.0	27.1 ± 4.6	22.5 ± 4.4
BMI >25 kg/m <sup>2</sup>	40 (54%)	24 (52%)	16 (57%)	37 (56%)	3 (38%)
BMI >30 kg/m <sup>2</sup>	19 (26%)	13 (28%)	6 (21%)	19 (29%)	0 (0%)
Arterial hypertension	17 (23%)	12 (26%)	5 (18%)	16 (24%)	1 (13%)
Diabetes mellitus	1 (1%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)
CHA <sub>2</sub> DS <sub>2</sub> -VASc score	1 (0;1)	1 (0;1)	0 (0;1)	0 (0;1)	2 (1;2)
EHRA Score	3 (3;4)	3 (3;4)	3 (3;4)	3 (3;4)	4 (2.5;4)
family history of AF < 55years	14 (20%)	10 (22%)	4 (14%)	13 (20%)	1 (13%)
Competitive athlete	12 (18%)	7 (15%)	5 (18%)	12 (18%)	0 (0%)
Excessive alcohol consumption	4 (6%)	1 (2%)	3 (11%)	4 (6%)	0 (0%)
LA diameter (mm)	41.9 ± 8.1	40.0 ± 6.4	44.7 ± 9.5	40.9 ± 6.5	49.3 ± 14.3
LVEF (%)	58.6 ± 7.2	60.3 ± 4.9	56.7 ± 8.9	59.8 ± 5.4	50 ± 12.3
Betablockers	58 (78%)	34 (74%)	24 (86%)	51 (77%)	7 (88%)
Class I AAD	34 (46%)	21 (46%)	13 (46%)	33 (50%)	1 (13%)
Class III AAD	13 (18%)	6 (13%)	7 (25%)	10 (15%)	3 (38%)
Oral anticoagulation/platelet inhibitors	31 (42%)	17 (37%)	14 (50%)	25 (38%)	6 (75%)

Values are means ± standard deviations, medians with 25th, 75th percentiles and frequencies (percentages).

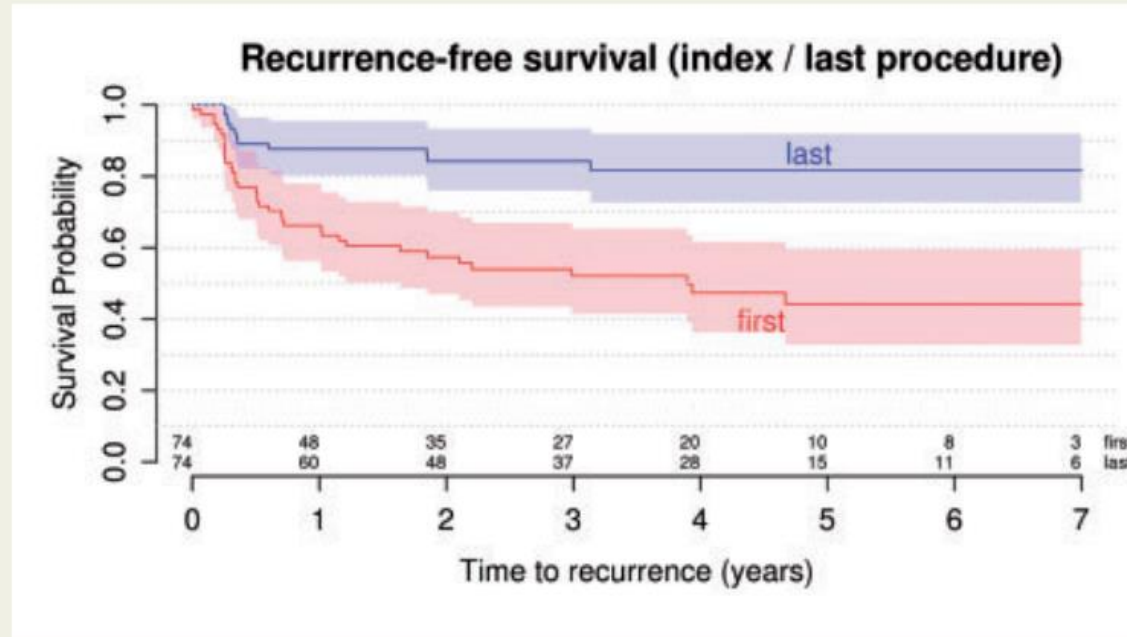
AAD, antiarrhythmic drugs; AF, atrial fibrillation; BMI, body mass index; EHRA, European Heart Rhythm Association; LA, left atrium; LVEF, left ventricular ejection fraction;

## Catheter young ad

**Ardan M. Sagun**  
**Christine Leme**  
**Bruno Reißmar**  
**Karl-Heinz Kuc**

Department of Cardiology, Ask

Received 31 May 2016; accepted



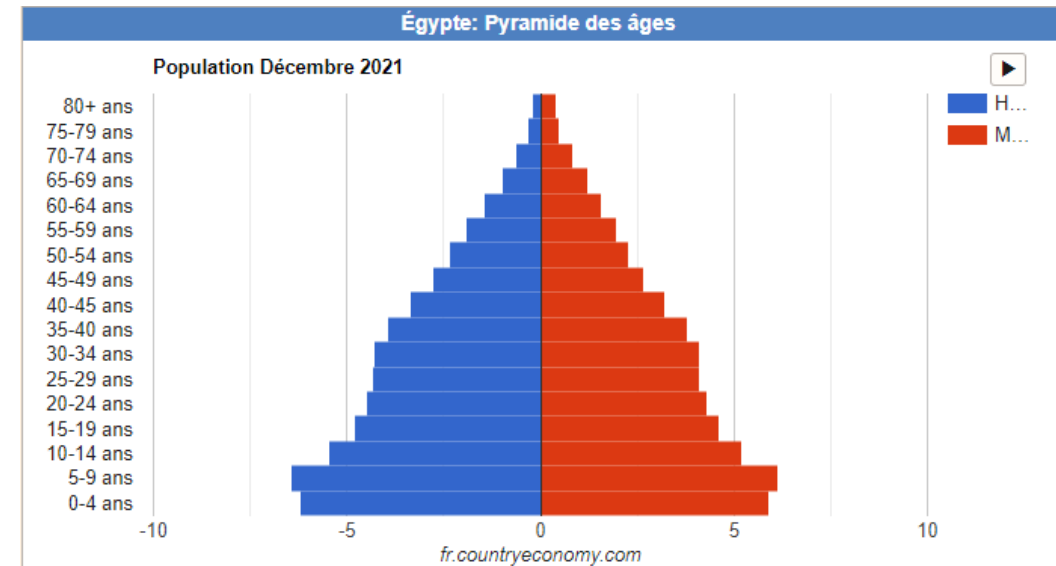
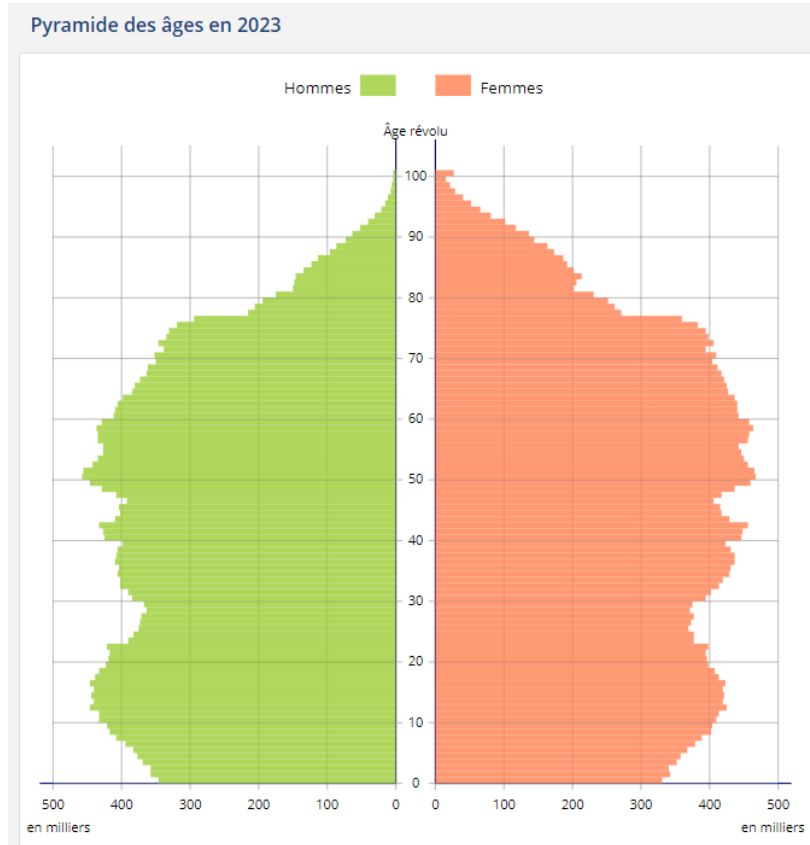
**Figure 1** Arrhythmia-free survival estimates and 95% confidence intervals after catheter ablation of atrial fibrillation after the index procedure (red curve) and last procedure (blue curve). Both graphs are derived from patients on and off antiarrhythmic drugs. Numbers indicate remaining patients at risk at each time point. Proc, procedure.

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eger,  
**Peter Wohlmuth,**

**84 % de succès à 5 ans**  
**Multiples procédures**

# Pyramide des âges





RESEARCH

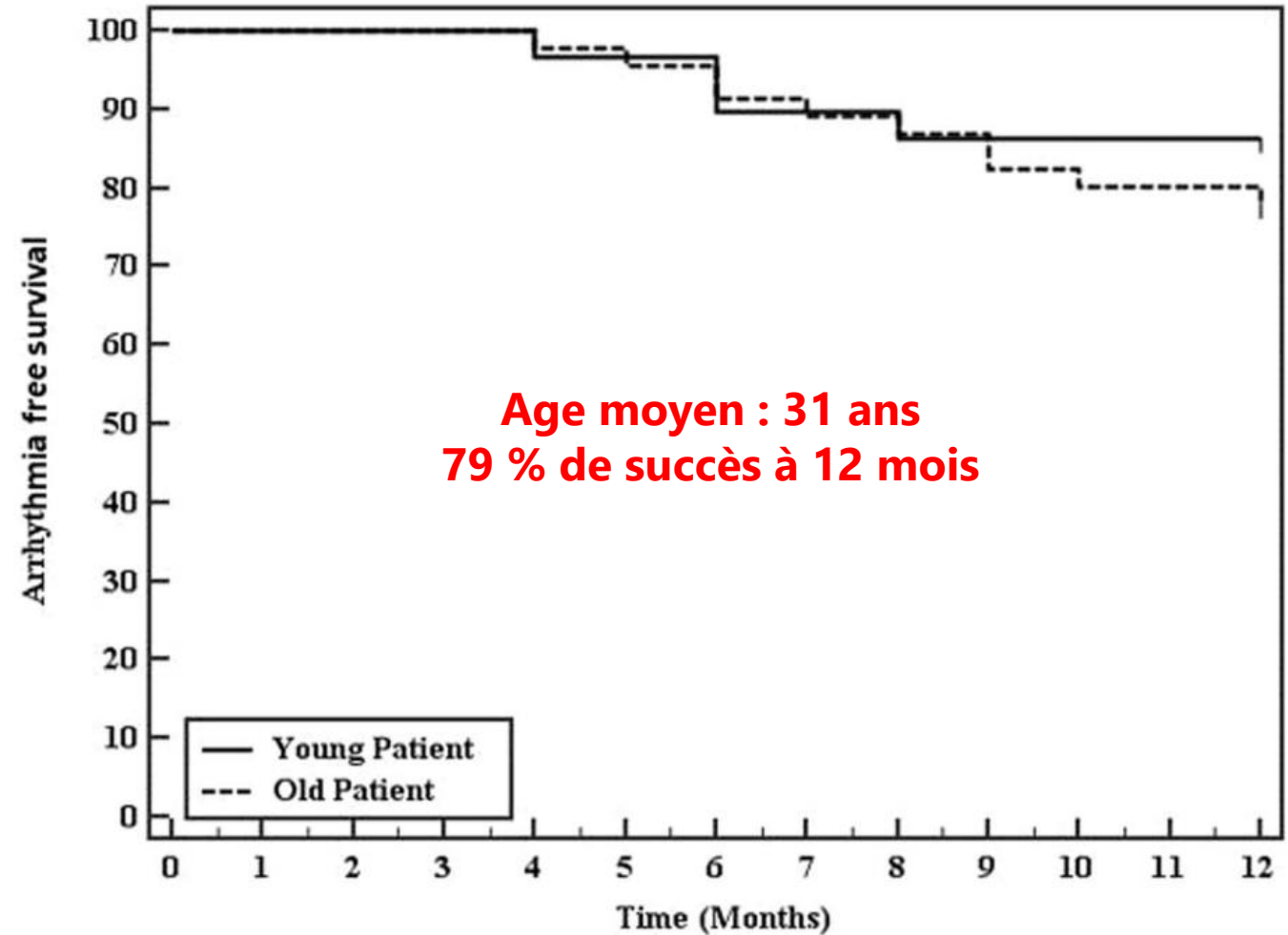
Open Access

# Clinical outcomes of catheter ablation of paroxysmal atrial



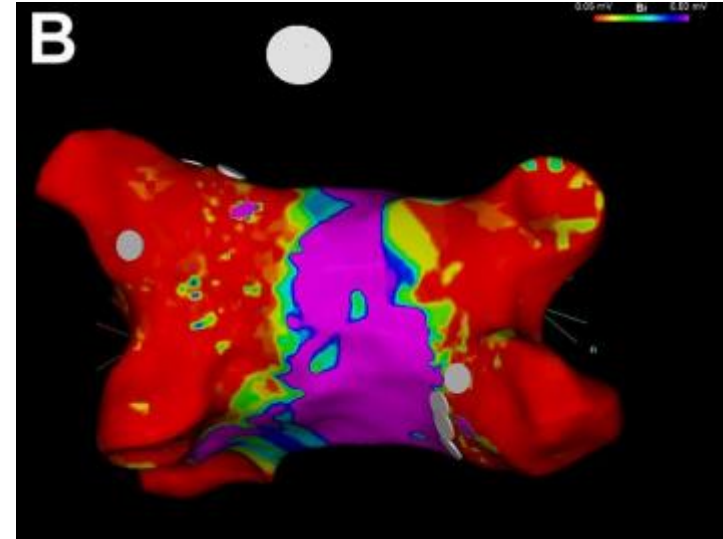
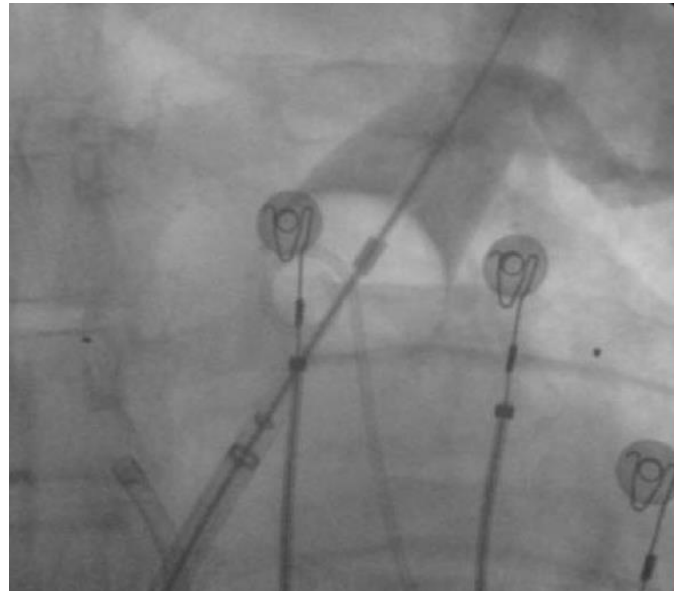
**Table 1** Baseline clinical characteristics of the study groups

Characteristic	Young group
Age at ablation time (years)	31.6 ± 4.2 (20–35)
Gender	
Male	23 (76.6 %)
Female	7 (23.3%)
BMI (kg/m <sup>2</sup> )	27 ± 3.7
BMI > 25 kg/m <sup>2</sup>	10 (33.3%)
BMI > 30 kg/m <sup>2</sup>	8 (26.6%)
Arterial hypertension	15 (50%)
Diabetes mellitus	5 (16.6%)
Smoking	5 (16.6%)
Thyroid disease	0
Structural heart disease	1 (3.3%)
IHD	0
DCM	0
HCM	1
VHD	0

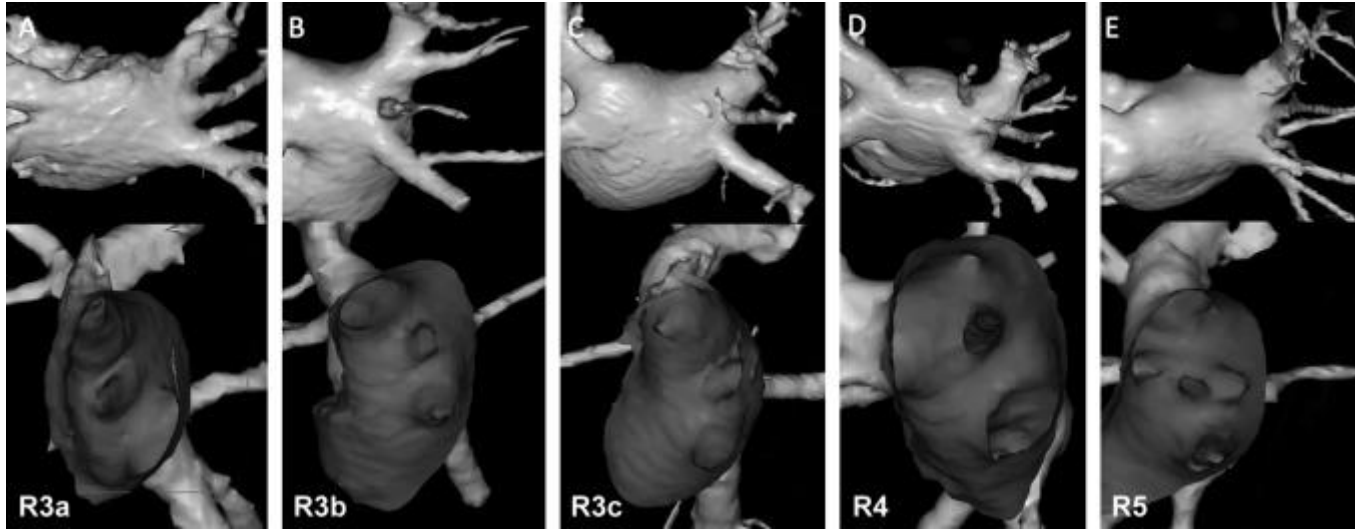


# Ablation de FA... mais avec quel outil ?

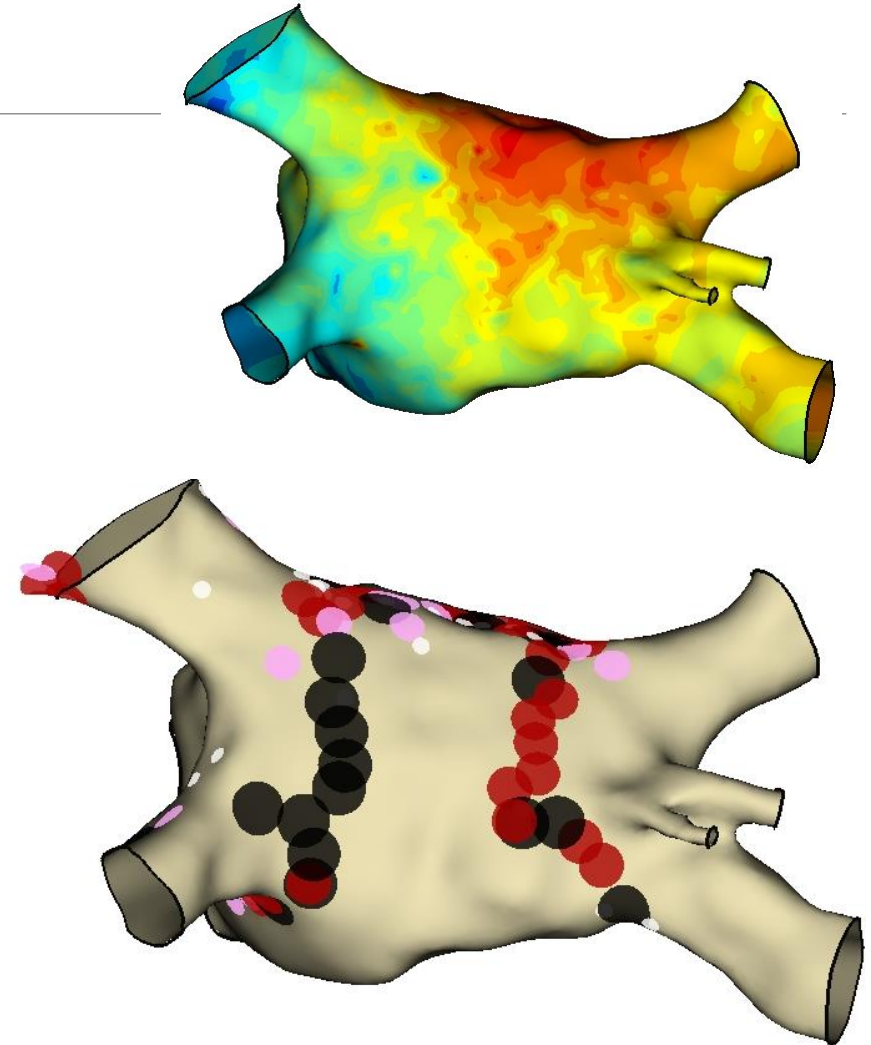
## Isolation des veines pulmonaires par CRYOTHERAPIE



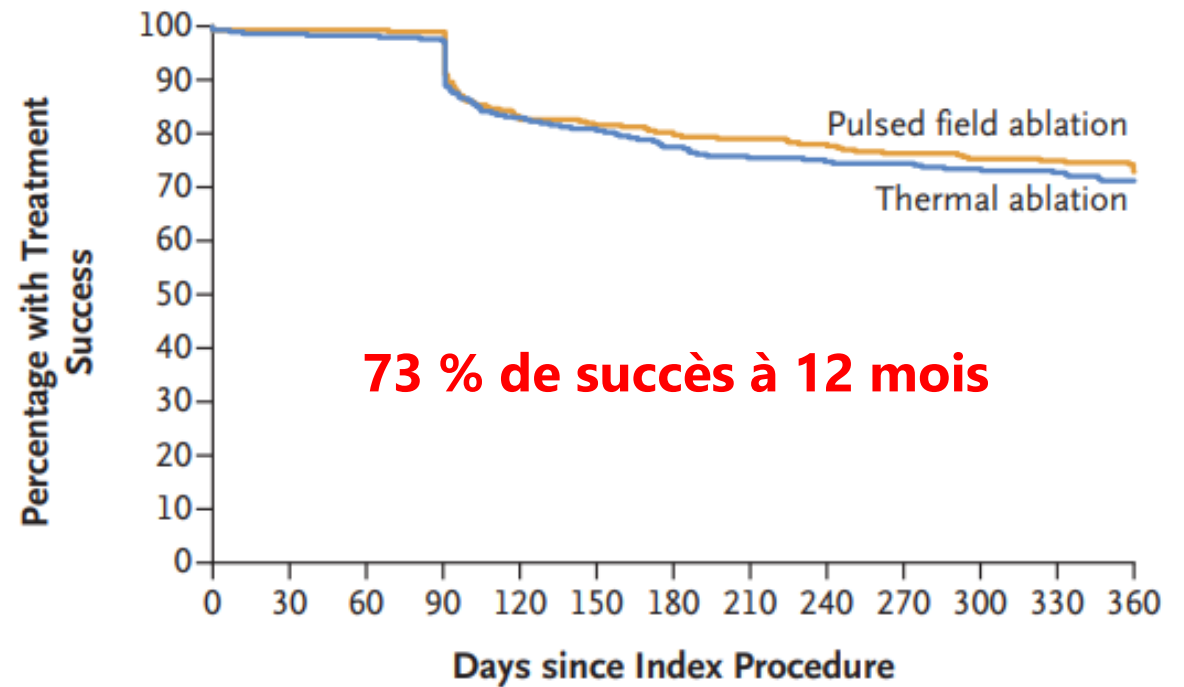
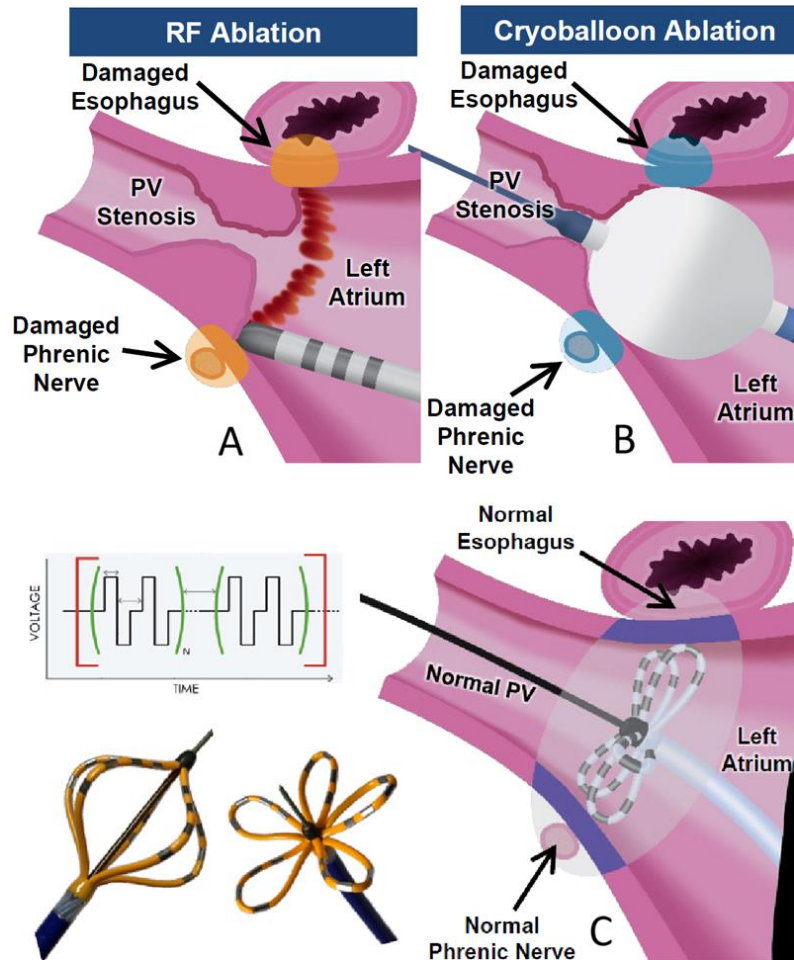
# Ablation de FA... mais avec quel outil ?



**10 à 20 % des Pts avec VPs  
surnuméraires**

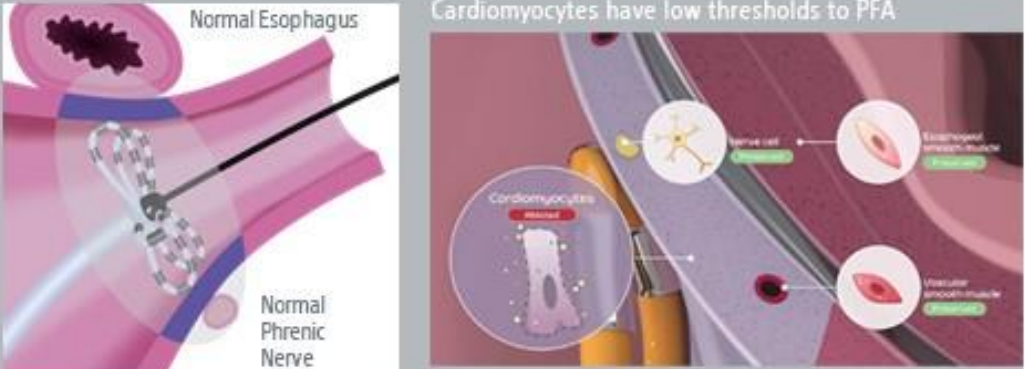


# Ablation de FA... mais avec quel outil



# Ablation de FA... mais avec quel outil

**PULSED FIELD ABLATION**



Normal Esophagus

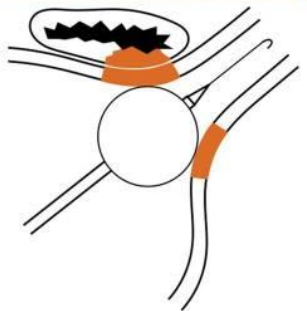
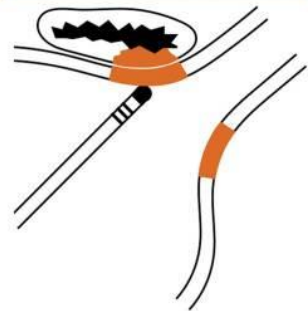
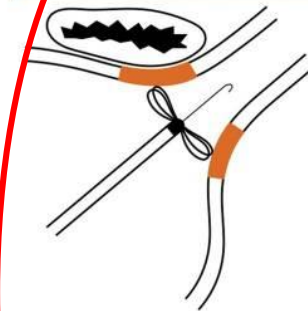
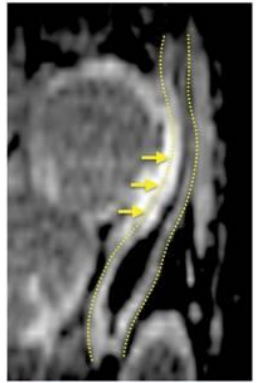
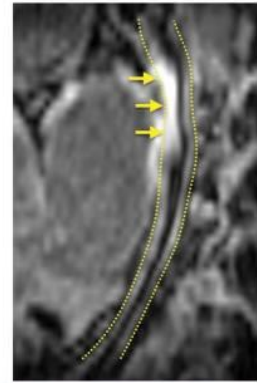
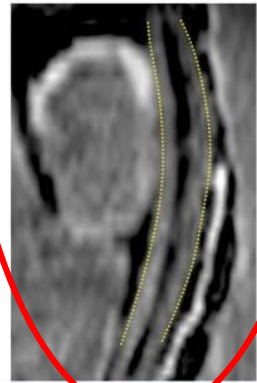
Normal Phrenic Nerve

Cardiomyocytes have low thresholds to PFA

Cardiomyocytes

Other tissue/cell types are more resistant to PFA and remained uninjured despite exposure to the field

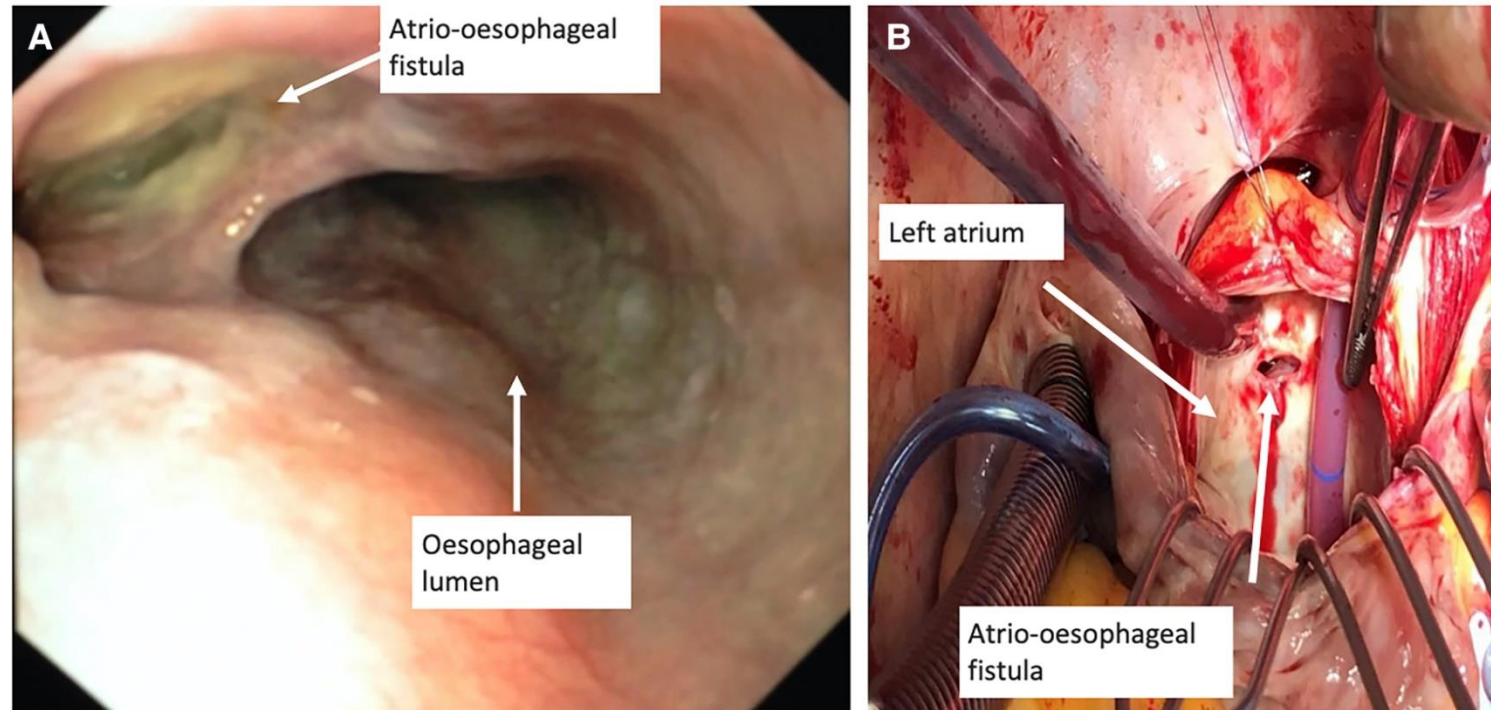
The diagram illustrates the mechanism of Pulsed Field Ablation (PFA). On the left, a normal esophagus and phrenic nerve are shown. On the right, a cross-section of the esophagus shows the effect of PFA on different tissue layers: the innermost layer (cardiomyocytes) is highly sensitive and shows significant injury (indicated by red), while the middle layer (esophageal smooth muscle) and the outermost layer (vascular smooth muscle) are more resistant and remain uninjured (indicated by green). A text box states: 'Cardiomyocytes have low thresholds to PFA' and 'Other tissue/cell types are more resistant to PFA and remained uninjured despite exposure to the field'.

Cryoballoon Ablation	Radiofrequency Ablation	Pulsed Field Ablation
		
		
<b>Acute Esophageal Injuries on LGE CMR</b>		

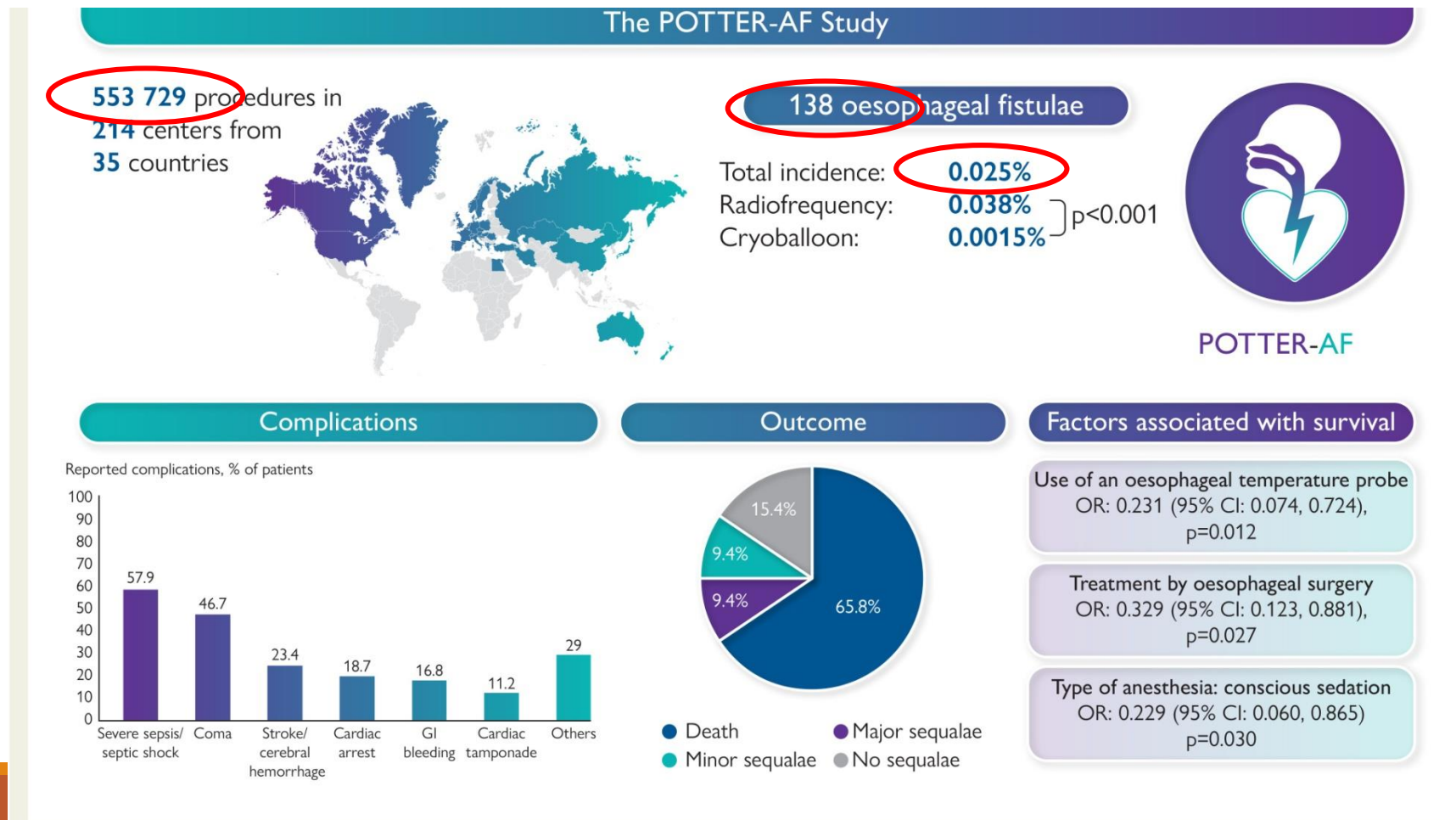
The figure compares three ablation techniques: Cryoballoon Ablation, Radiofrequency Ablation, and Pulsed Field Ablation. Each technique is shown with a schematic diagram of the catheter and electrode placement, and a corresponding LGE CMR image showing acute esophageal injuries. The Pulsed Field Ablation (PFA) column is circled in red. The LGE CMR images show the esophagus with yellow arrows pointing to areas of acute injury. A blue bar at the bottom of the images is labeled 'Acute Esophageal Injuries on LGE CMR'.



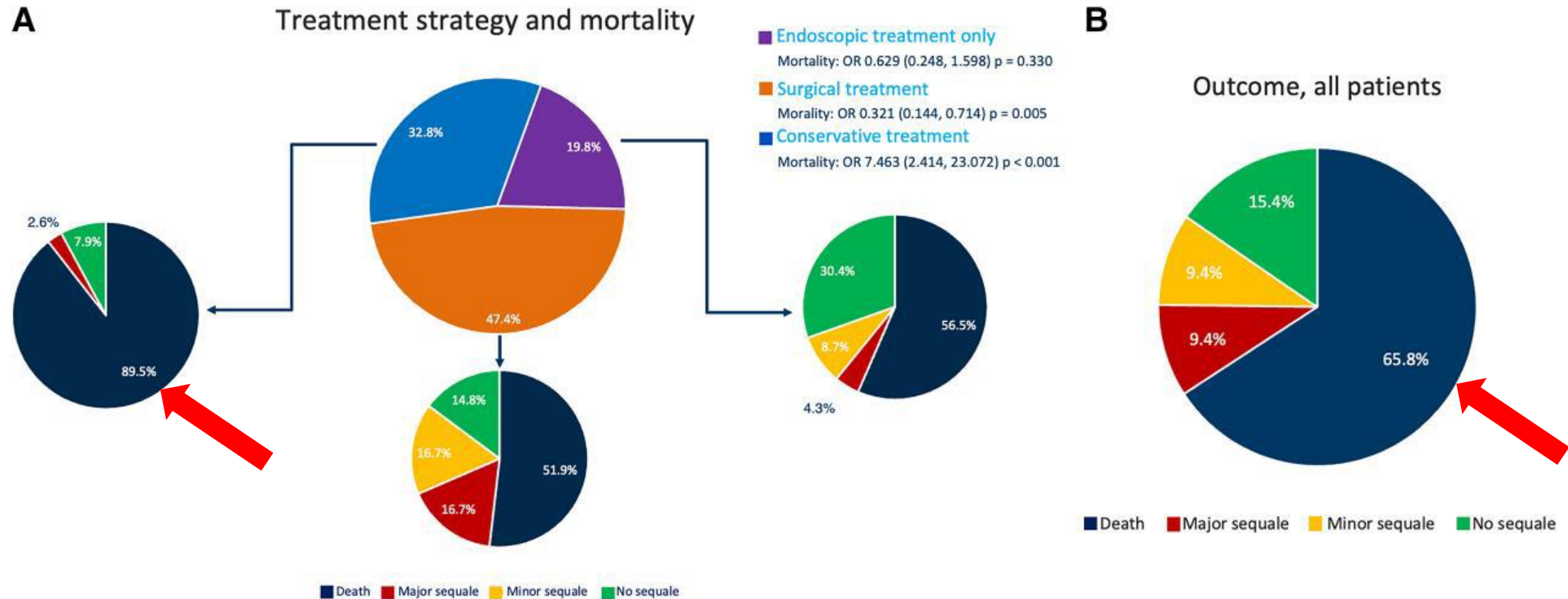
# La fistule atrio-oesophagienne



# A worldwide survey on incidence, management, and prognosis of oesophageal fistula formation following atrial fibrillation catheter ablation: the POTTER-AF study



# A worldwide survey on incidence, management, and prognosis of oesophageal fistula formation following atrial fibrillation catheter ablation: the POTTER-AF study



# Take home message

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- **Profil rare mais avènement des outils connectés.**
- **1<sup>e</sup> manifestation d'une cardiopathie structurelle ?**
- **L'ablation de FA reste le traitement de choix.**
- **Les nouvelles techniques d'ablation permettent un rapport efficacité/sécurité optimal.**