



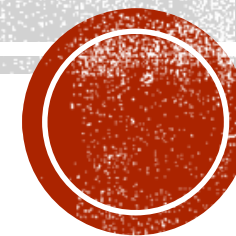
# THORACOSCOPIC ABLATION FOR PERSISTENT AND LONG-PERSISTENT ATRIAL FIBRILLATION 3 YEARS FOLLOW-UP

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Moscow 2018



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Paulus Kirchhof , Stefano Benussi , Dipak Kotecha, Anders Ahlsson, Dan Atar, Barbara Casadei, Manuel Castella, Hans-Christoph Diener, Hein Heidbuchel, Jeroen Hendriks ... [Show more](#)

European Heart Journal, Volume 37, Issue 38, 7 October 2016, Pages 2893–2962,  
<https://doi.org/10.1093/eurheartj/ehw210>

Published: 27 August 2016

A correction has been published:

[European Heart Journal, Volume 39, Issue 13, 1 April 2018, Pages 1109, https://doi.org/10.1093/eurheartj/ehx039](#)

### 11.3. 11.3.3.1 Outcome of catheter ablation for atrial fibrillation

The rhythm outcome after catheter ablation of AF is difficult to predict in individual patients. Most patients require more than one procedure to achieve symptom control.<sup>713,726,728</sup> In general, better rhythm outcome and lower procedure-related complications can be expected in younger patients with a short history of AF and frequent, short AF episodes in the absence of significant structural heart disease.<sup>745</sup> Catheter ablation is more effective than antiarrhythmic drug therapy in maintaining sinus rhythm.<sup>746,1039</sup> Sinus rhythm without severely symptomatic recurrences of AF is found in up to 70% of patients with paroxysmal AF, and around 50% in persistent AF. Very late recurrence of AF after years of sinus rhythm is not uncommon and may reflect disease progression, with important implications for continuation of AF therapies.

## Summary table

Recommendations for rhythm control of AF	
Rhythm control therapy is indicated for symptom improvement in patients with AF.	I
Cardioversion of AF (either electrical or pharmacological) is recommended in symptomatic patients with persistent or long-standing persistent AF as part of rhythm control therapy.	I
In patients with no history of ischaemic or structural heart disease, flecainide, propafenone, or vernakalant are recommended for pharmacological cardioversion of new-onset AF.	I
In patients with ischaemic and/or structural heart disease, amiodarone is recommended for cardioversion of AF.	I
For cardioversion of AF/atrial flutter, effective anticoagulation is recommended for a minimum of 3 weeks before cardioversion.	I
Transoesophageal echocardiography (TOE) is recommended to exclude cardiac thrombus as an alternative to preprocedural anticoagulation when early cardioversion is planned.	I
The choice of antiarrhythmic drug needs to be carefully evaluated, taking into account the presence of comorbidities, cardiovascular risk and potential for serious proarrhythmia, extracardiac toxic effects, patient preferences, and symptom burden.	I
Dronedarone, flecainide, propafenone, or sotalol are recommended for prevention of recurrent symptomatic AF in patients with normal left ventricular function and without pathological left ventricular hypertrophy.	I
Dronedarone is recommended for prevention of recurrent symptomatic AF in patients with stable coronary artery disease, and without heart failure.	I
Amiodarone is recommended for prevention of recurrent symptomatic AF in patients with heart failure.	I
Antiarrhythmic drug therapy is not recommended in patients with prolonged QT interval (> 0.5 s) or with significant sinoatrial node disease or atrioventricular node dysfunction who do not have a functioning permanent pacemaker.	III (harm)
Catheter ablation of symptomatic paroxysmal AF is recommended to improve AF symptoms in patients who have symptomatic recurrences of AF on antiarrhythmic drug therapy (amiodarone, dronedarone, flecainide, propafenone, sotalol) and who prefer further rhythm control therapy when performed by an electrophysiologist who has received appropriate training and is performing the procedure in an experienced centre.	I
ACE-Is or ARBs are not recommended for the secondary prevention of paroxysmal AF in patients with little or no underlying heart disease.	III (no benefit)





Format: Abstract

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Circulation. 2012 Jan 3;125(1):23-30. doi: 10.1161/CIRCULATIONAHA.111.074047. Epub 2011 Nov 14.

## Atrial fibrillation catheter ablation versus surgical ablation treatment (FAST): a 2-center randomized clinical trial.

Boersma LV<sup>1</sup>, Castella M, van Boven W, Berrueto A, Yilmaz A, Nadal M, Sandoval E, Calvo N, Brugada J, Kelder J, Wijffels M, Mont L.

### Author information

### Abstract

**BACKGROUND:** Catheter ablation (CA) and minimally invasive surgical ablation (SA) have become accepted therapy for antiarrhythmic drug-refractory atrial fibrillation. This study describes the first randomized clinical trial comparing their efficacy and safety during a 12-month follow-up.

**METHODS AND RESULTS:** One hundred twenty-four patients with antiarrhythmic drug-refractory atrial fibrillation with left atrial dilatation and hypertension (42 patients, 33%) or failed prior CA (82 patients, 67%) were randomized to CA (63 patients) or SA (61 patients). CA consisted of linear antral pulmonary vein isolation and optional additional lines. SA consisted of bipolar radiofrequency isolation of the bilateral pulmonary vein, ganglionated plexi ablation, and left atrial appendage excision with optional additional lines. Follow-up at 6 and 12 months was performed by ECG and 7-day Holter recording. The primary end point, freedom from left atrial arrhythmia >30 seconds without antiarrhythmic drugs after 12 months, was 36.5% for CA and 65.6% for SA ( $P=0.0022$ ). There was no difference in effect for subgroups, which was consistent at both sites. The primary safety end point of significant adverse events during the 12-month follow-up was significantly higher for SA than for CA ( $n=21$  [34.4%] versus  $n=10$  [15.9%];  $P=0.027$ ), driven mainly by procedural complications such as pneumothorax, major bleeding, and the need for pacemaker. In the CA group, 1 patient died at 1 month of subarachnoid hemorrhage.

**CONCLUSION:** In atrial fibrillation patients with dilated left atrium and hypertension or failed prior atrial fibrillation CA, SA is superior to CA in achieving freedom from left atrial arrhythmias after 12 months of follow-up, although the procedural adverse event rate is significantly higher for SA than for CA.

**CLINICAL TRIAL REGISTRATION:** URL: <http://clinicaltrials.gov>. Unique identifier: [NCT00662701](https://clinicaltrials.gov/ct2/show/study/NCT00662701).

< Previous Article

November 2017 Volume 14, Issue 11, Pages 1596-1603

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## Catheter ablation vs electrophysiologically guided thoracoscopic surgical ablation in long-standing persistent atrial fibrillation: The CASA-AF Study

Shouvik K. Haldar, MRCP, MD (Res), David G. Jones, MRCP, MD (Res), Toufan Bahrami, PhD, FRCS, Anthony De Souza, MD, FRCS, Sandeep Panikkar, MBBS, MRCP, Charlie Butcher, MRCP, Habib Khan, MBBS, MRCP, Rashmi Yahday, MD, FRCS, Julian Jarman, MRCP, MD (Res), Lilian Mantziari, MD, PhD, Eva Nyktari, MD, Raad Mohiaddin, MD, FRCP, Wajid Hussain, MBChB, Vias Markides, MD, FRCP, Tom Wong, MD, FRCP

Heart Rhythm Centre, Royal Brompton & Harefield National Health Service Foundation Trust, Imperial College London, London, United Kingdom

### Background

Catheter ablation (CA) outcomes for long-standing persistent atrial fibrillation (LSPAF) remain suboptimal. Thoracoscopic surgical ablation (SA) provides an alternative approach in this difficult to treat cohort.

### Objective

To compare electrophysiological (EP) guided thoracoscopic SA with percutaneous CA as the first-line strategy in the treatment of LSPAF.

### Methods

Fifty-one patients with de novo symptomatic LSPAF were recruited. Twenty-six patients underwent electrophysiologically guided thoracoscopic SA. Conduction block was tested for all lesions intraoperatively by an independent electrophysiologist. In the CA group, 25 consecutive patients underwent stepwise left atrial (LA) ablation. The primary end point was single-procedure freedom from atrial fibrillation (AF) and atrial tachycardia (AT) lasting >30 seconds without antiarrhythmic drugs at 12 months.

### Results

Single- and multiprocedure freedom from AF/AT was higher in the SA group than in the CA group: 19 of 26 patients (73%) vs 8 of 25 patients (32%) ( $P = .003$ ) and 20 of 26 patients (77%) vs 15 of 25 patients (60%) ( $P = .19$ ), respectively. Testing of the SA lesion set by an electrophysiologist increased the success rate in achieving acute conduction block by 19%. In the SA group, complications were experienced by 7 of 26 patients (27%) vs 2 of 25 patients (8%) in the CA group ( $P = .07$ ).

### Conclusion

In LSPAF, meticulous electrophysiologically guided thoracoscopic SA as a first-line strategy may provide excellent single-procedure success rates as compared with those of CA, but there is an increased up-front risk of nonfatal complications.

*PERSISTENT AND LONG-PERSISTENT AF  
ON THE BACKGROUND OF A  
PRONOUNCED DILATATION LA,  
CATHETER ABLATION HAVE LOW  
EFFICACY*



# OBJECTIVE

The aim to evaluate the long-term results of epicardial thoracoscopic RFA in patients with persistent and long-persistent AF

# MATERIALS & METHODS

From Nov 2014 till Nov 2017

60 consecutive epicardial thoracoscopic RF Ablation procedures were performed, supplemented with the removal of the LA appendage for patients with lone AF



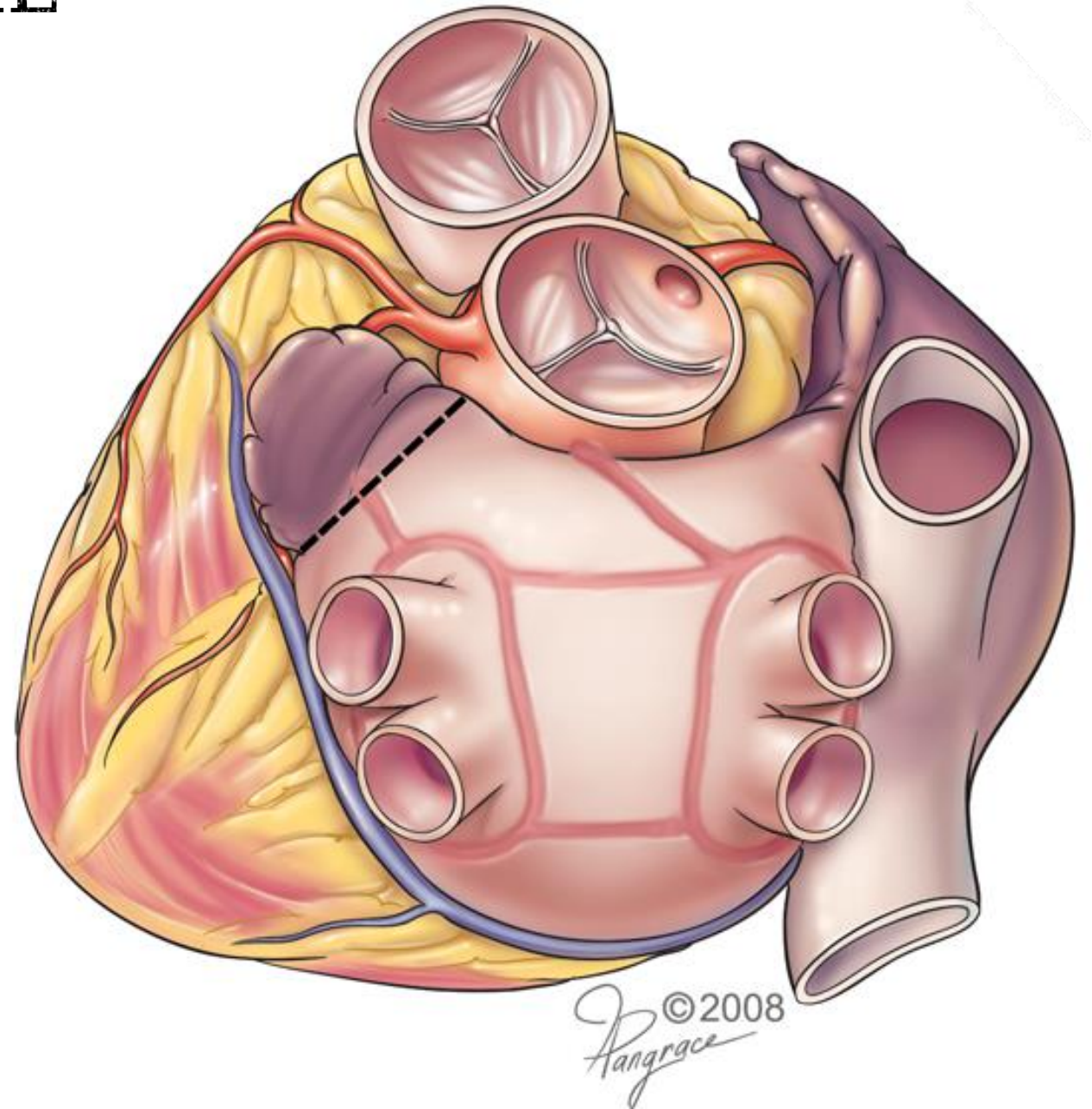
parameters	dates	
Male (sex)	49 (81.6%)	
Age (years)	60.3 (range 43 - 73)	
BMI (kg/m <sup>2</sup> )	29,94 (22-35,6)	
Hypertension	56 (93.3%)	
Atherosclerosis	18 (30%)	
Diabetes Miletus	6 (10%)	
HF (NYHA II-IV class)	38 (64%)	
Neurologic events	7 (11.7%)	
Cath. Ablation before	20 (33%)	
duration of arrhythmia (months)	64.5 (range 4 -180)	
duration of non-restoration (months)	14.7 (range 2 - 60)	
permanent pacemaker	4 (6.67%)	
LA ESV, ml / indexed ml/m <sup>2</sup>	97.3± 27.1 / 47.6	
LA (mm)	61.4± 6.9	
LV EDV, ml / indexed ml/m <sup>2</sup>	88.08± 22.9	
EF LV (%)	59,23	
MR 2+	9 (15%)	

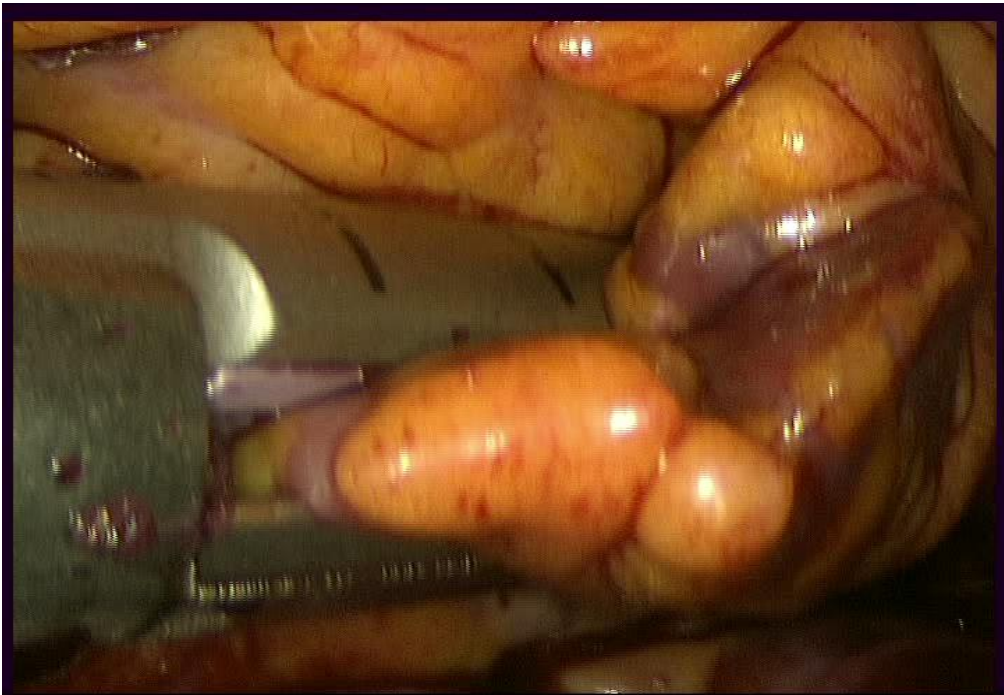
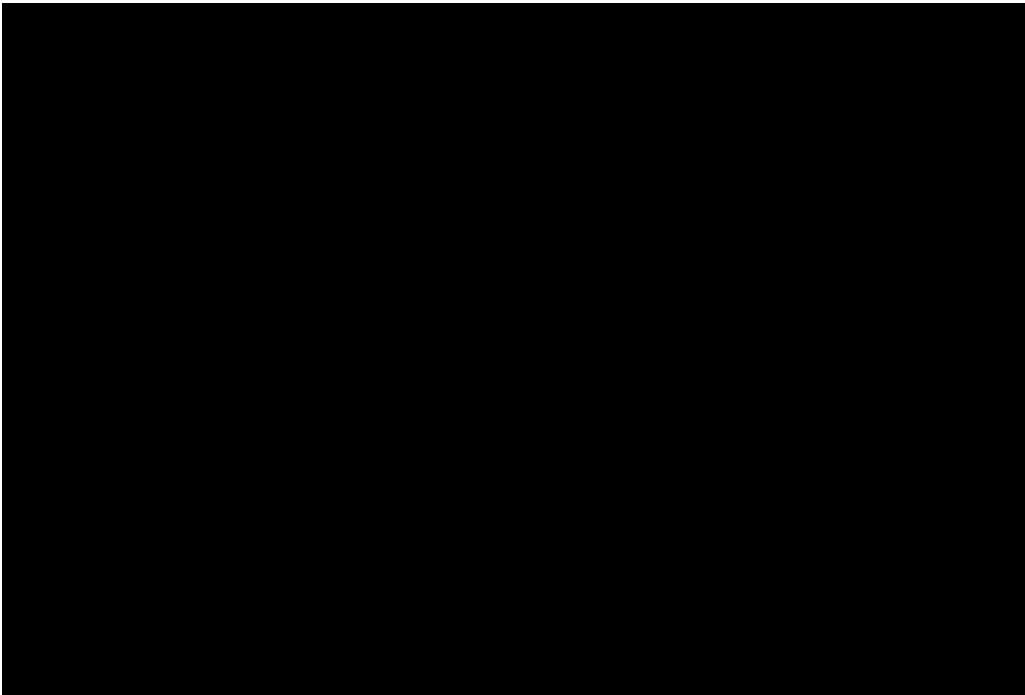
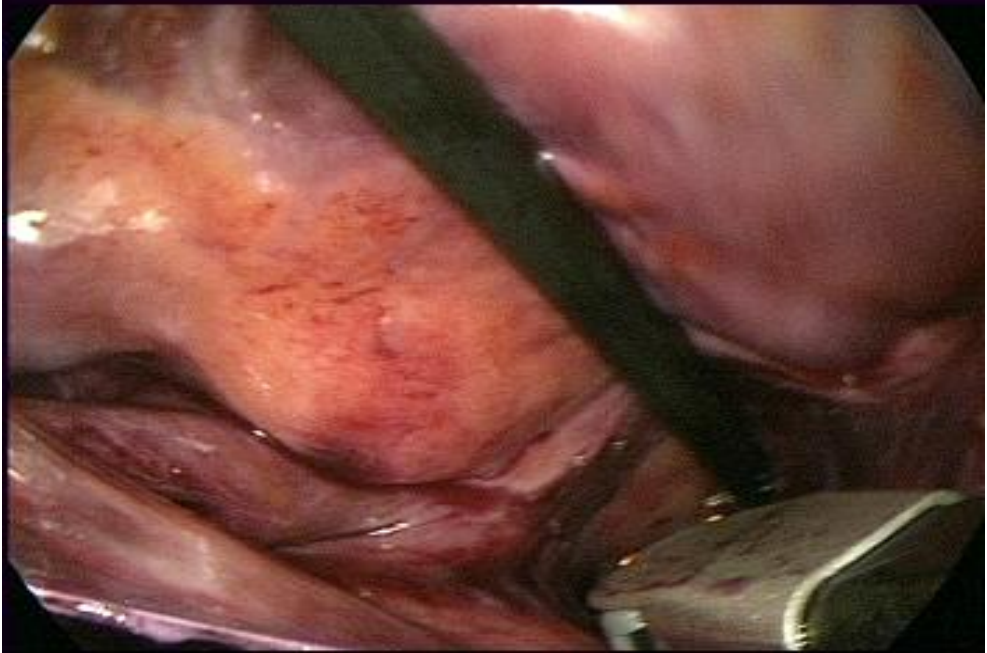




# TECHNIC PROCEDURE

- Pulmonary veins collectors were isolated by bipolar electrode (AtriCure Inc.).
- Inferior and superior transcollectors lines (box-lesion),
- Line to Mitral valve and
- Line to Appendage were made by monopolar electrode (AtriCure Inc.)
- Appendage was removed by endoscopic stapler (Covidian EndoGia)



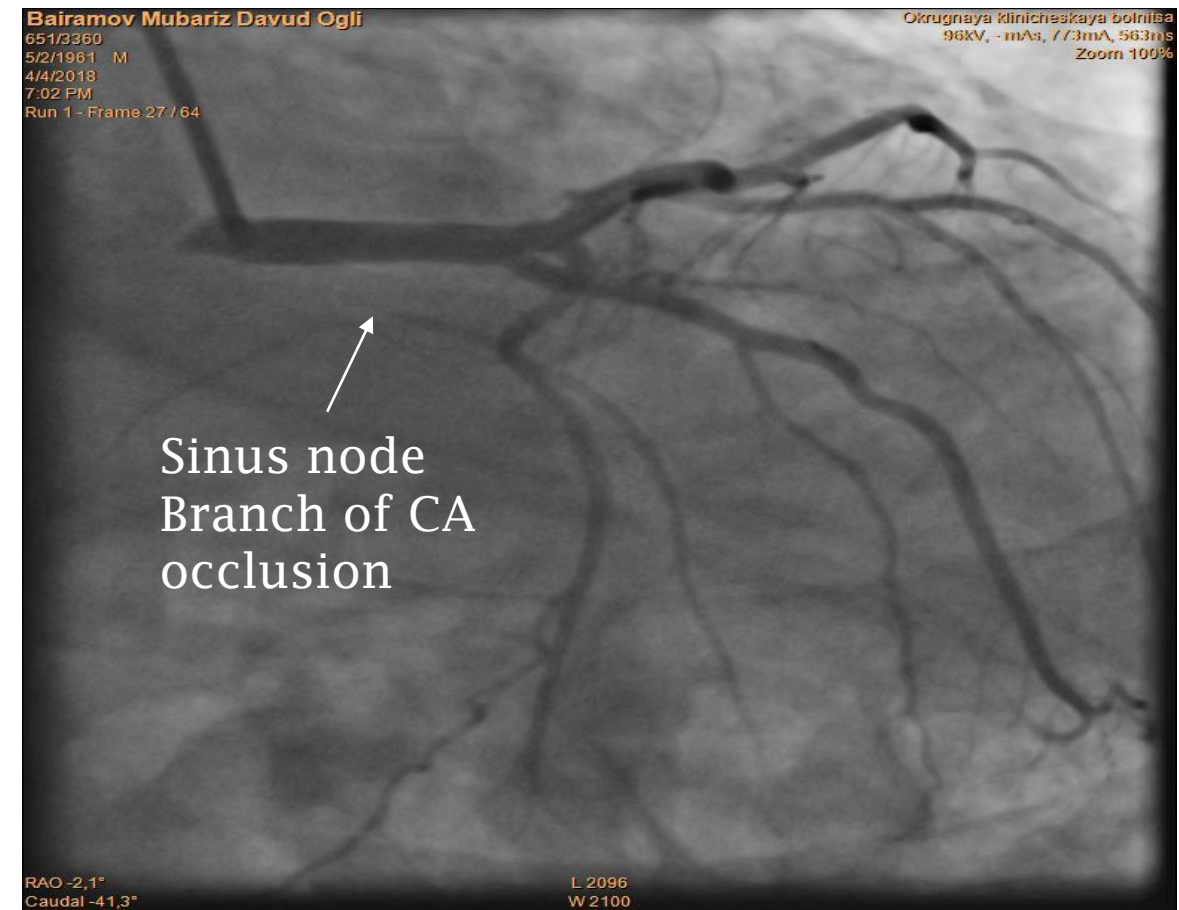
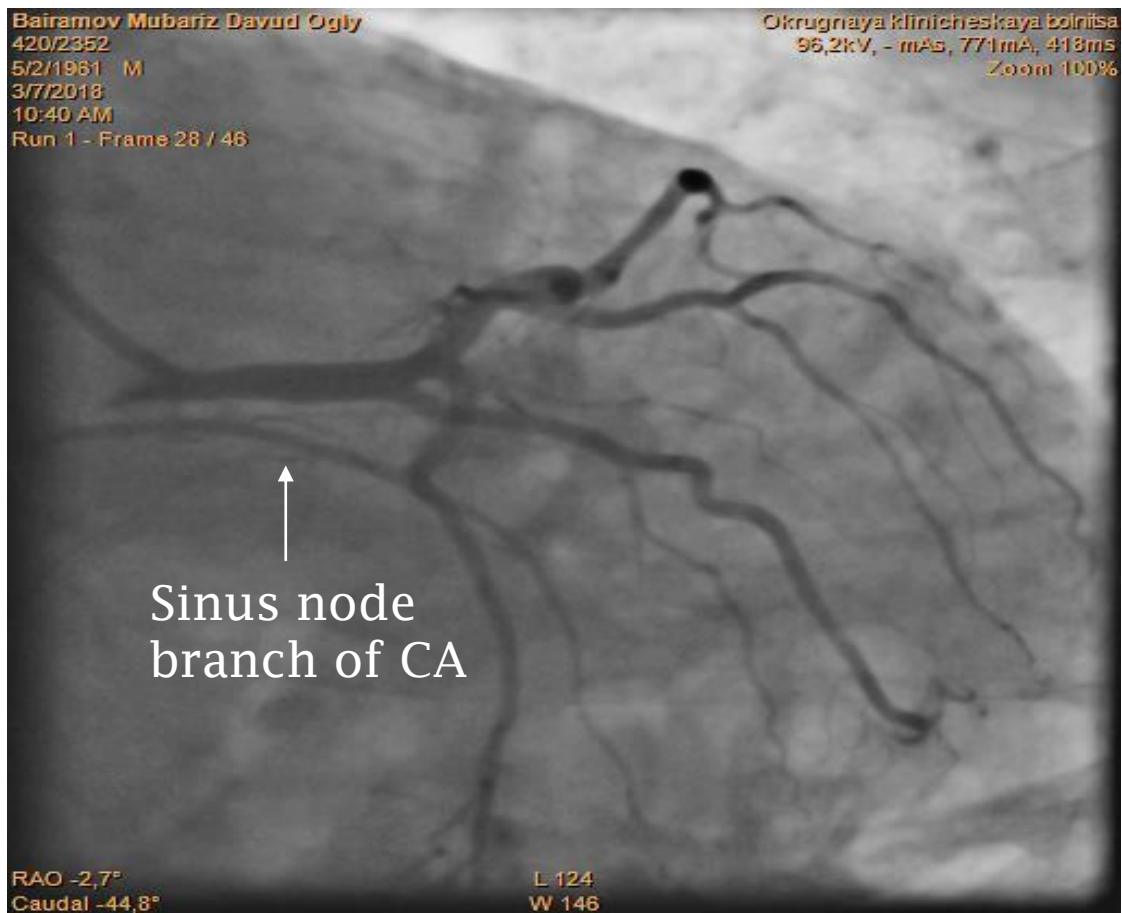




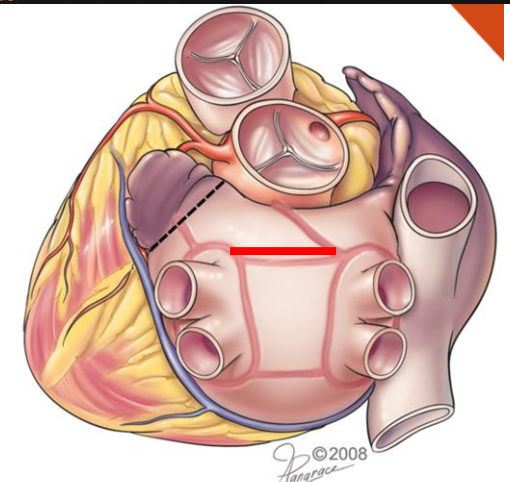
# COMPLICATIONS

types	%	coments
Deaths	0	
Conversion	0	
Stroke	1 (1,66%)	difficults in diagnostic, because left-side pericardium aplasia
Tamponade, pericarditis	0	
Hemothorax	1 (1,66%)	
Pleural effusion	2 (3,33%)	
Ventricular Fibrilation	1 (1,66%)	Ablation CA branch to SAN
Diaphragm paresis	1 (1,66%)	
New pacemaker	3+1 (6,67%)	





VENTRICLE FIBRILLATION  
DURING ABLATION SUPERIOR INTERCOLLECTOR LINE



# RESULTS

## Follow up:

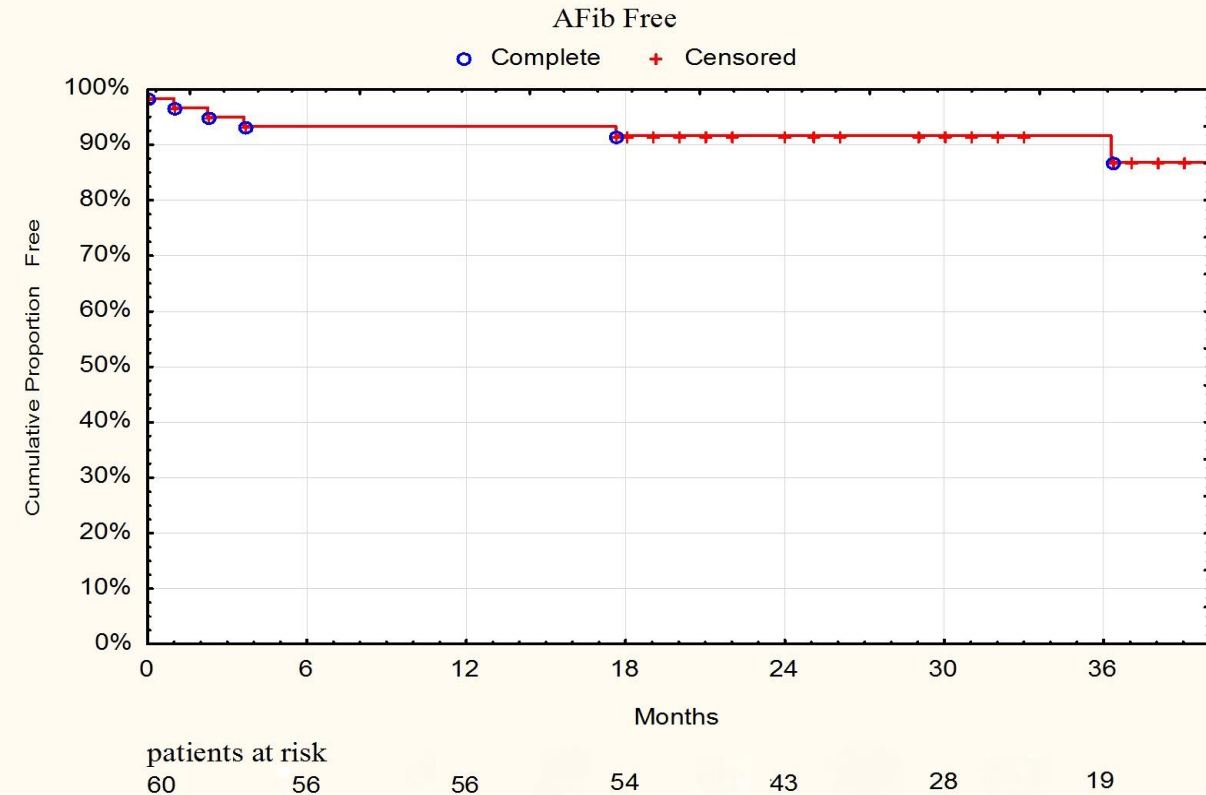
- 24h ECG monitoring in 6 months, 1 year and every year
- long-term results were tracked in 98,3%
- From 6 to 42 months ( Mediana 20,83 months)

1229 patient-months (102,4 patient-years)





# PRIMARY AIMS

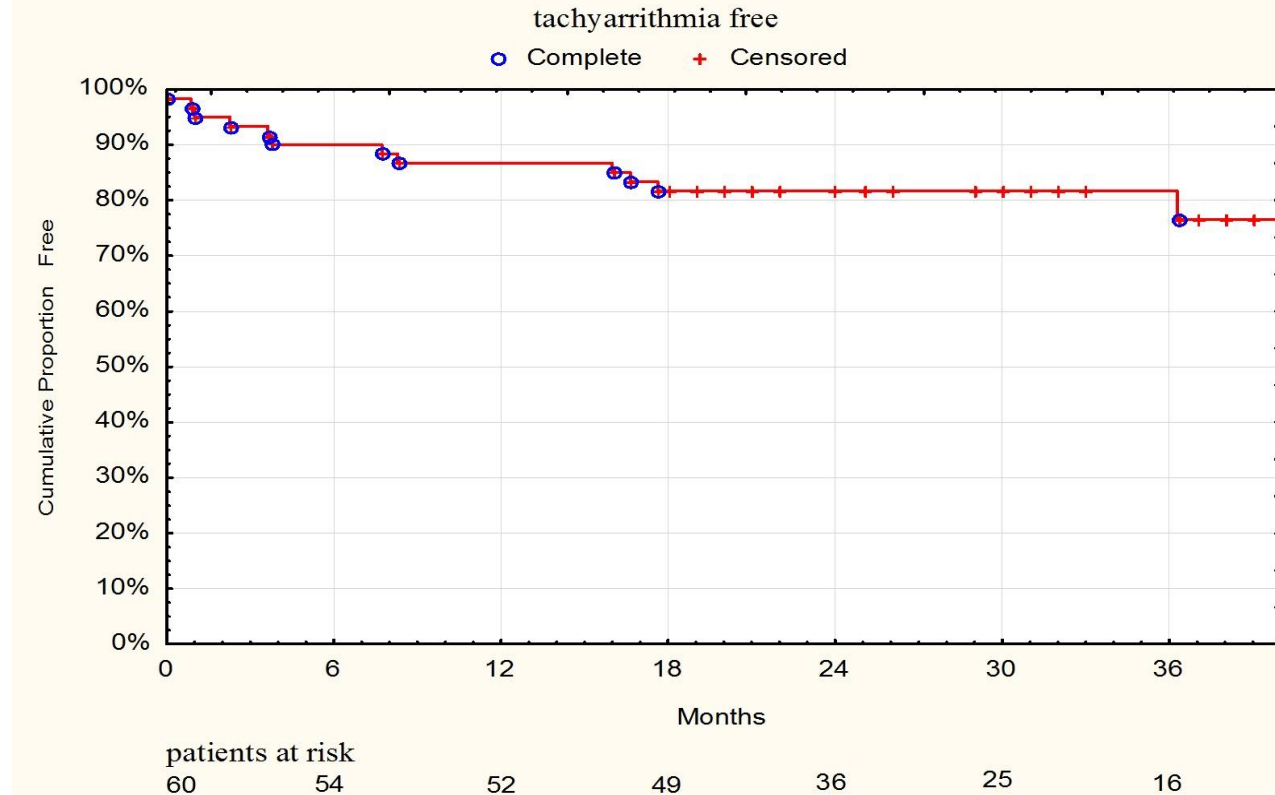


Freedom from AF was

after 6 months -  $93,33 \pm 6,4$  %

1 year -  $93,33 \pm 6,4$  %

- 2 years -  $91,67 \pm 7,1$  %
- 3 years -  $86,84 \pm 11,6$  %



Freedom from AF/AT was

after 6 month -  $90 \pm 7,7$  %

- 1 year -  $86,67 \pm 8,8$  %
- 2 years -  $81,67 \pm 10,0$  %
- 3 years -  $76,56 \pm 13,6$  %



# SECONDARY AIMS

Fatal cases and strokes were not recorded in long-term period

## Drugs

Freedom from AAT drugs after 6 months	86,67%
Freedom from OAC drugs after 6 months	81,67%

## Echo effects

	before	after	effect	95% Conf Int	<i>p</i>
ESV LA	97,37ml	79,02 ml	18,38	-3,7 ... +40,45	0,09
EF LV	59,23 %	58,61 %	0,62	-7,82 ... +9,06	0,87



# CATHETERS INTERVENTION

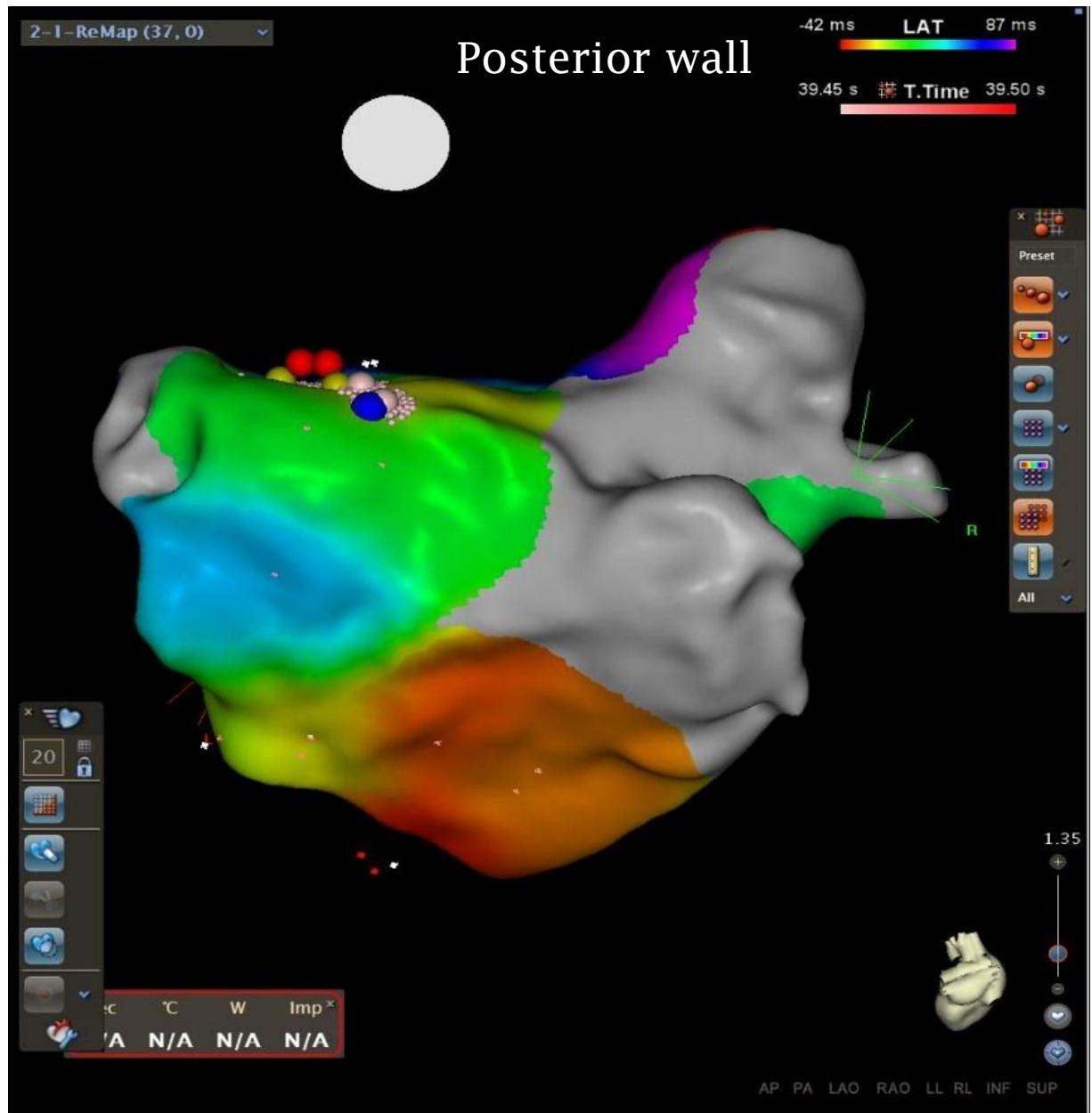
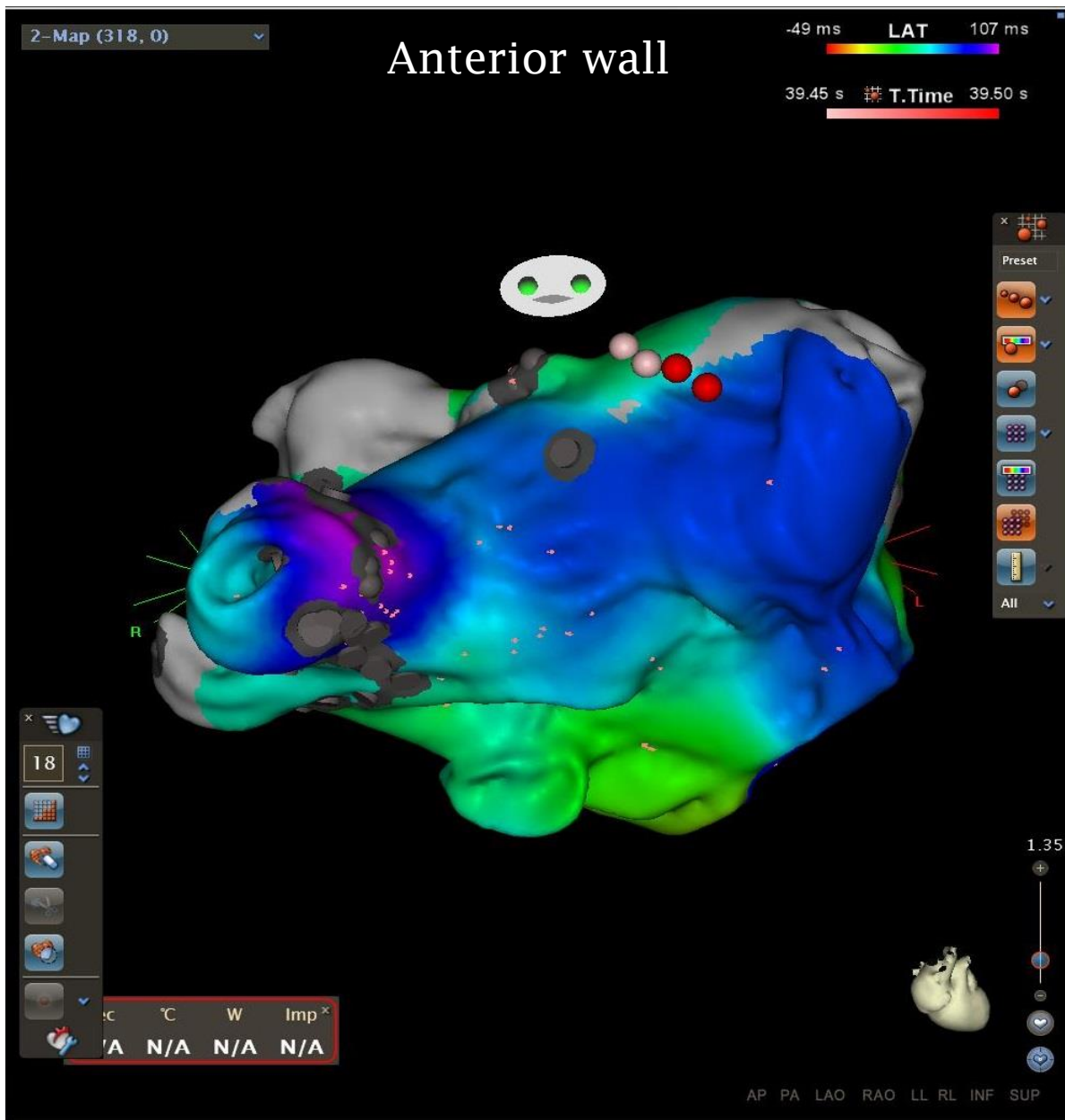
- 6 (10%) patients during follow up undergone Cath interventions:
- 4 had two or three interventions
- 2 had several locations in one session

## Gaps and triggers locations:

Superior left roof ( SLPV-appendage)	LA	5 (45,5%)
Anterior wall	LA	1 (9%)
Area CS	LA	2 (18,2%)
SRPV	LA	1 (9%)
Cava-tricuspid isthmus	RA	2 (18,2%)

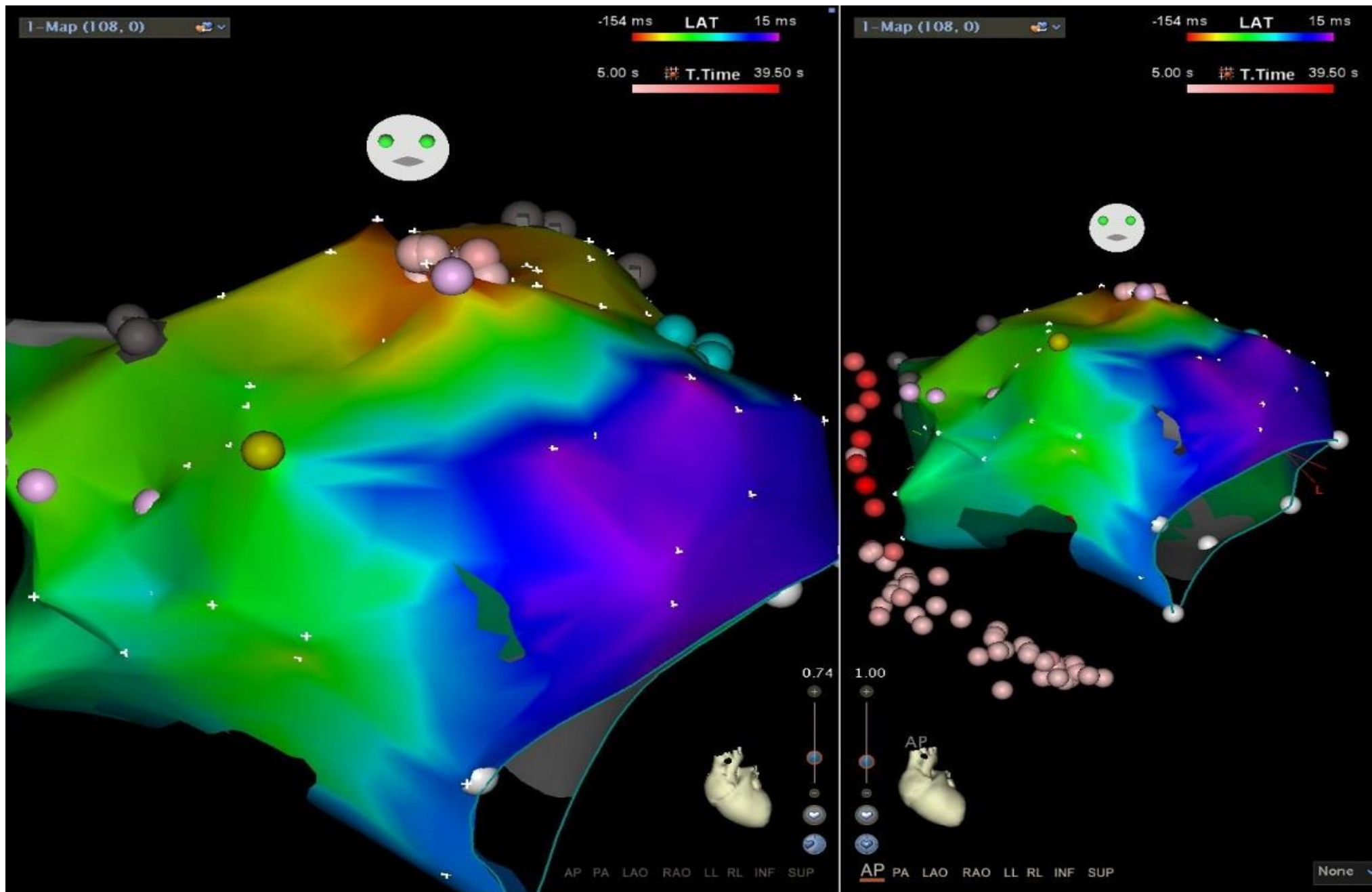






SLPV - Left appendage gap (1<sup>st</sup> case)

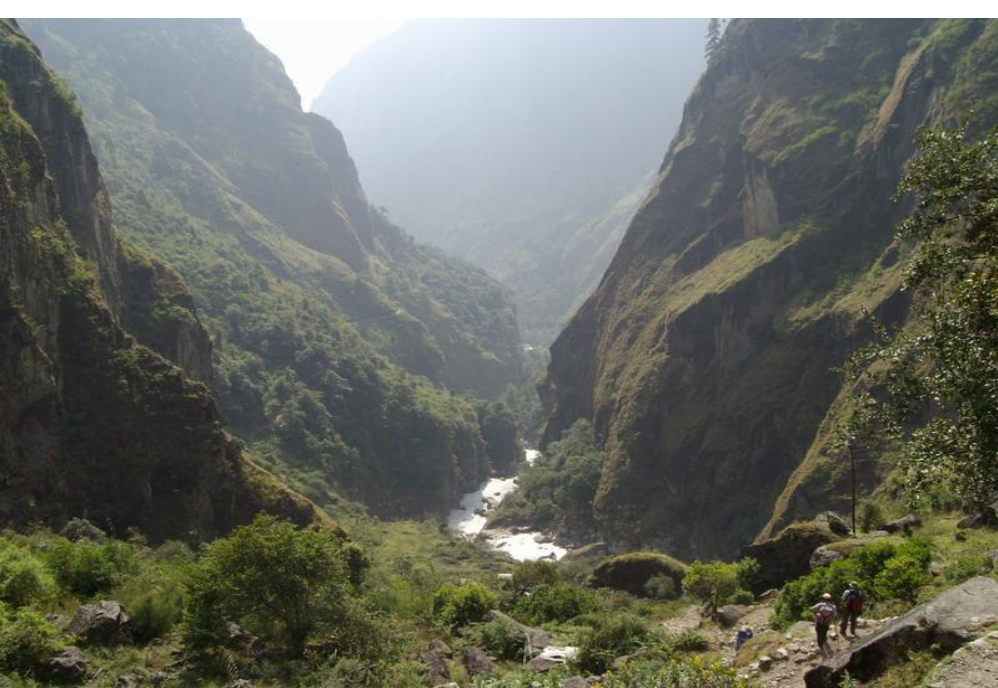




SLPV - Left appendage gap (2<sup>nd</sup> case)







Canyon (Revine) zone

For us



For  
Arrhythmologists

Ridge zone





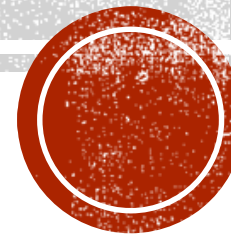
# CONCLUSIONS

- TTMaze provides encouraging long-term results for management in right rhythm control in patients with persistent forms of AF and dilated LA.
- The most precise impact during the procedure requires an area between the upper left PV and the appendage of LA.





THANK YOU FOR ATTENTION



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Khanty-Mansiysk, Russia