

# Nové možnosti léčby komorových tachykardií

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# System Affera (Medtronic)



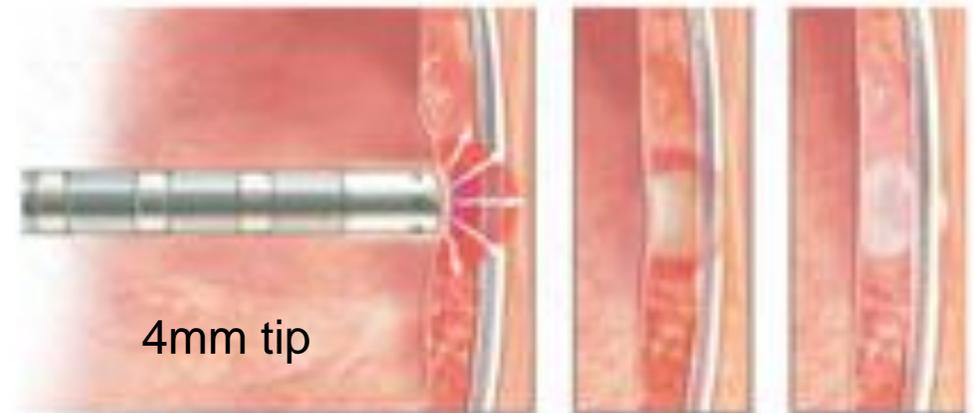
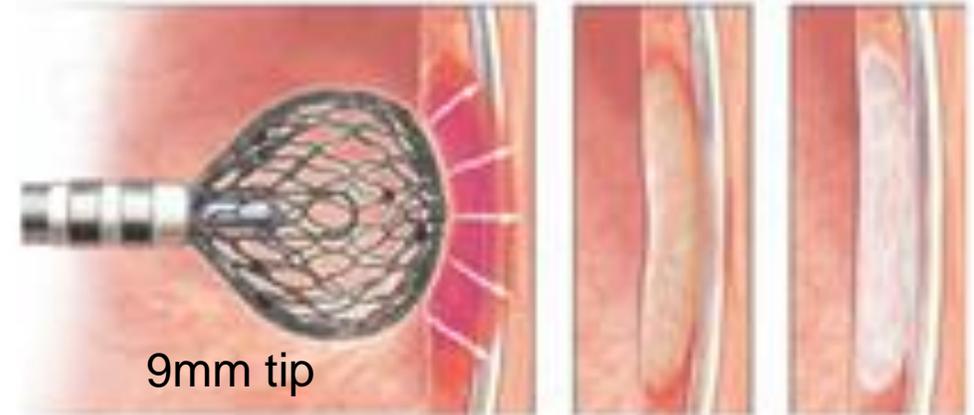
**HexaPulse™ PF generator**  
Unipolar, biphasic PF energy delivery

**HexaMap™ CIU**  
Magnetic navigation and map acquisition with intracardiac electrogram display, recording, and pacing

**HexaFlow™ irrigation pump**  
Responsive irrigation and bubble detection

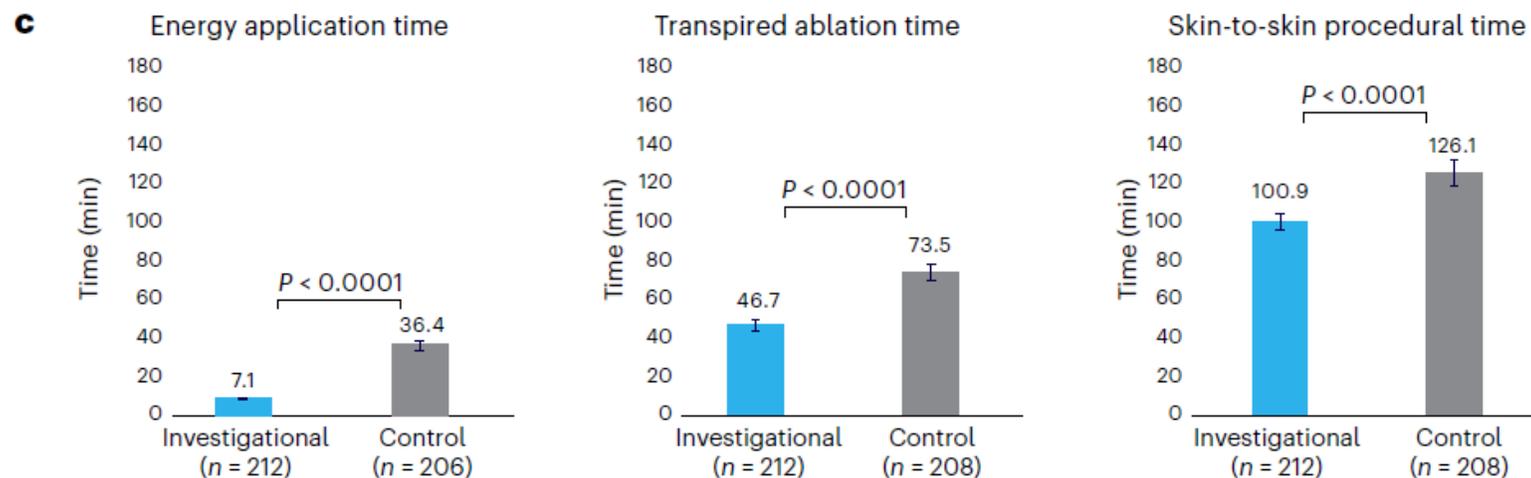
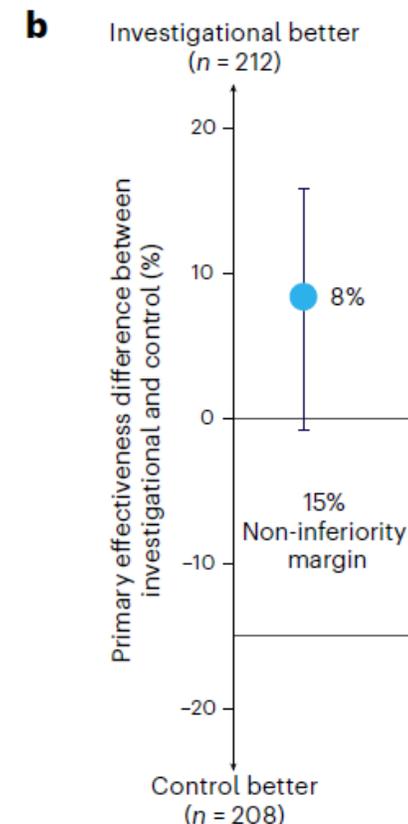
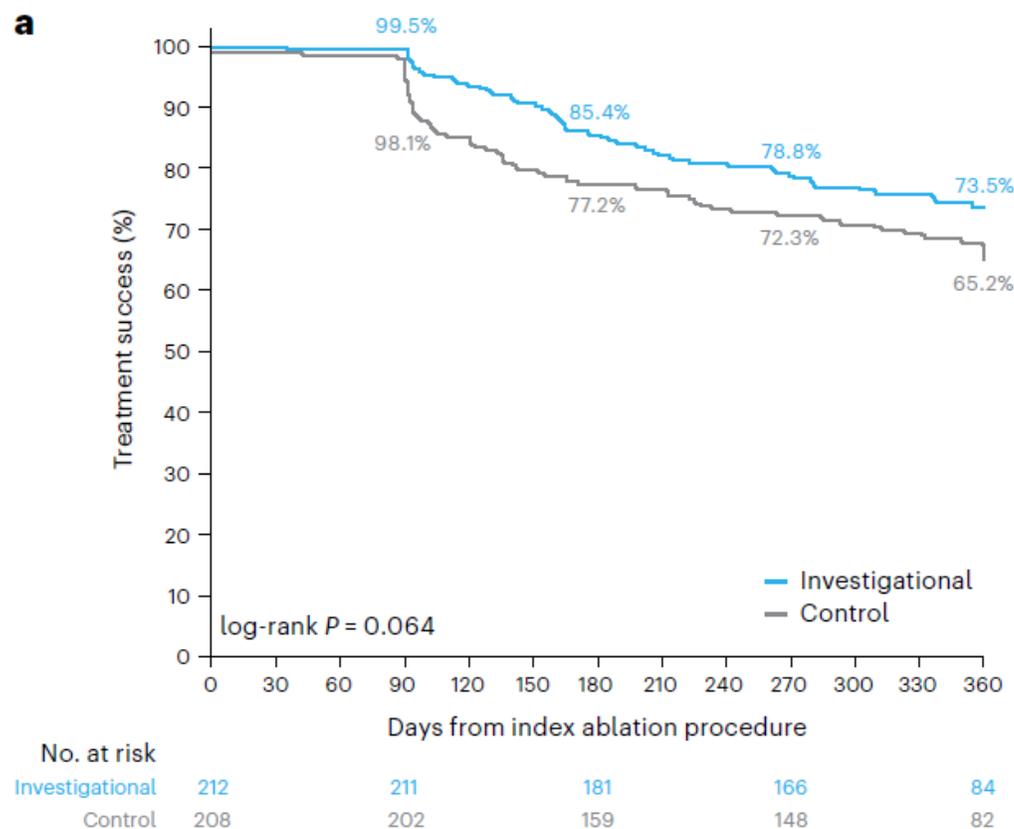


Remote and foot pedal



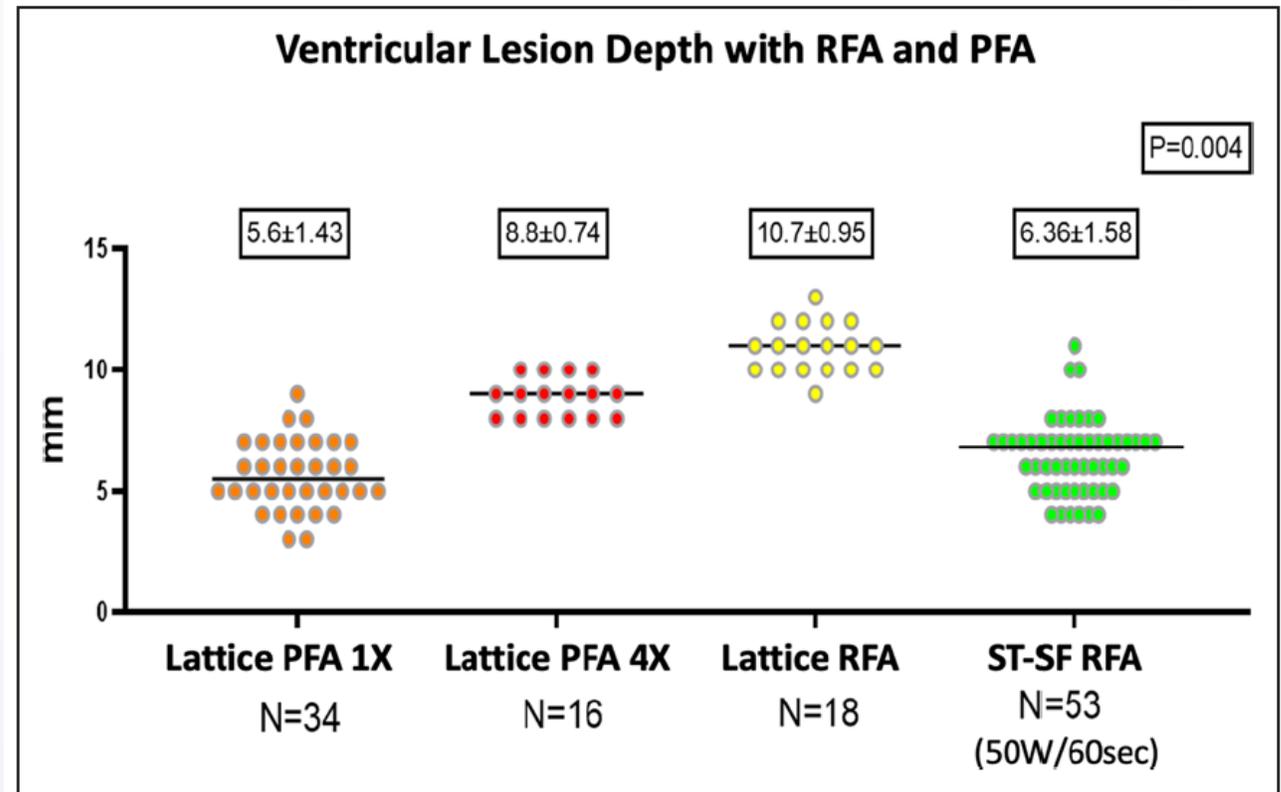
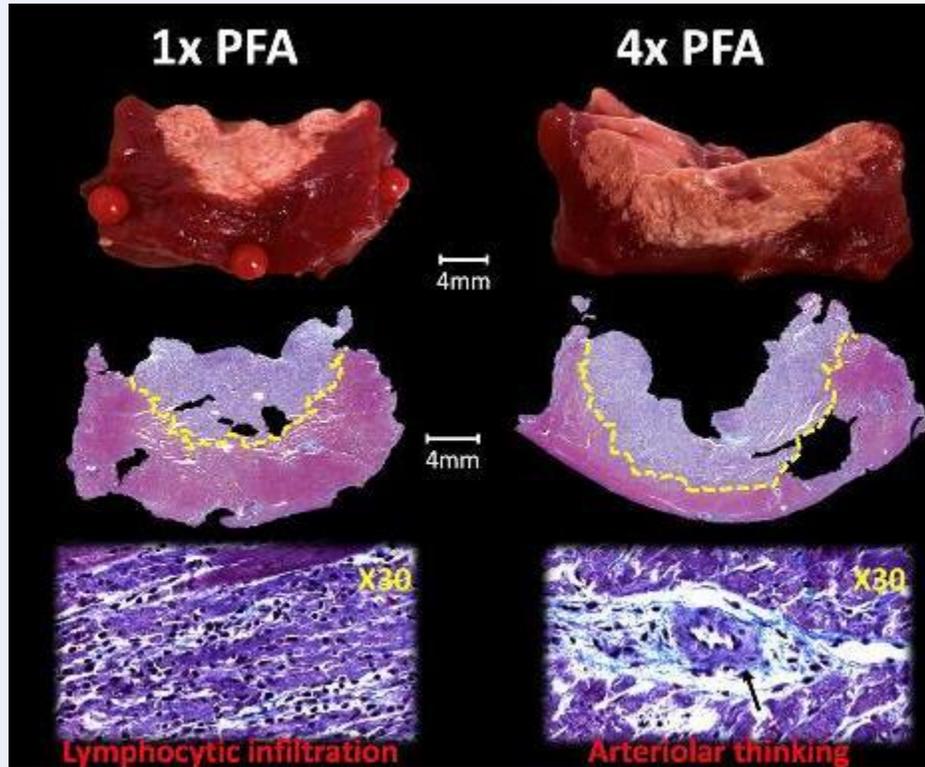
# Affera IDE Trial

- Prospective, multicenter, randomized interventional study for persistent AF
- **420pts in 1:1 in 35 sites randomized**
  - Affera + Sphere 9 PF/RF
  - CARTO3 + Thermocool STSF
- Complications
  - 3 vs 2 in investigation vs control arm
- Non-inferiority in primary endpoint ( $p < 0.0001$ )



# Pulse-field for VT ablation

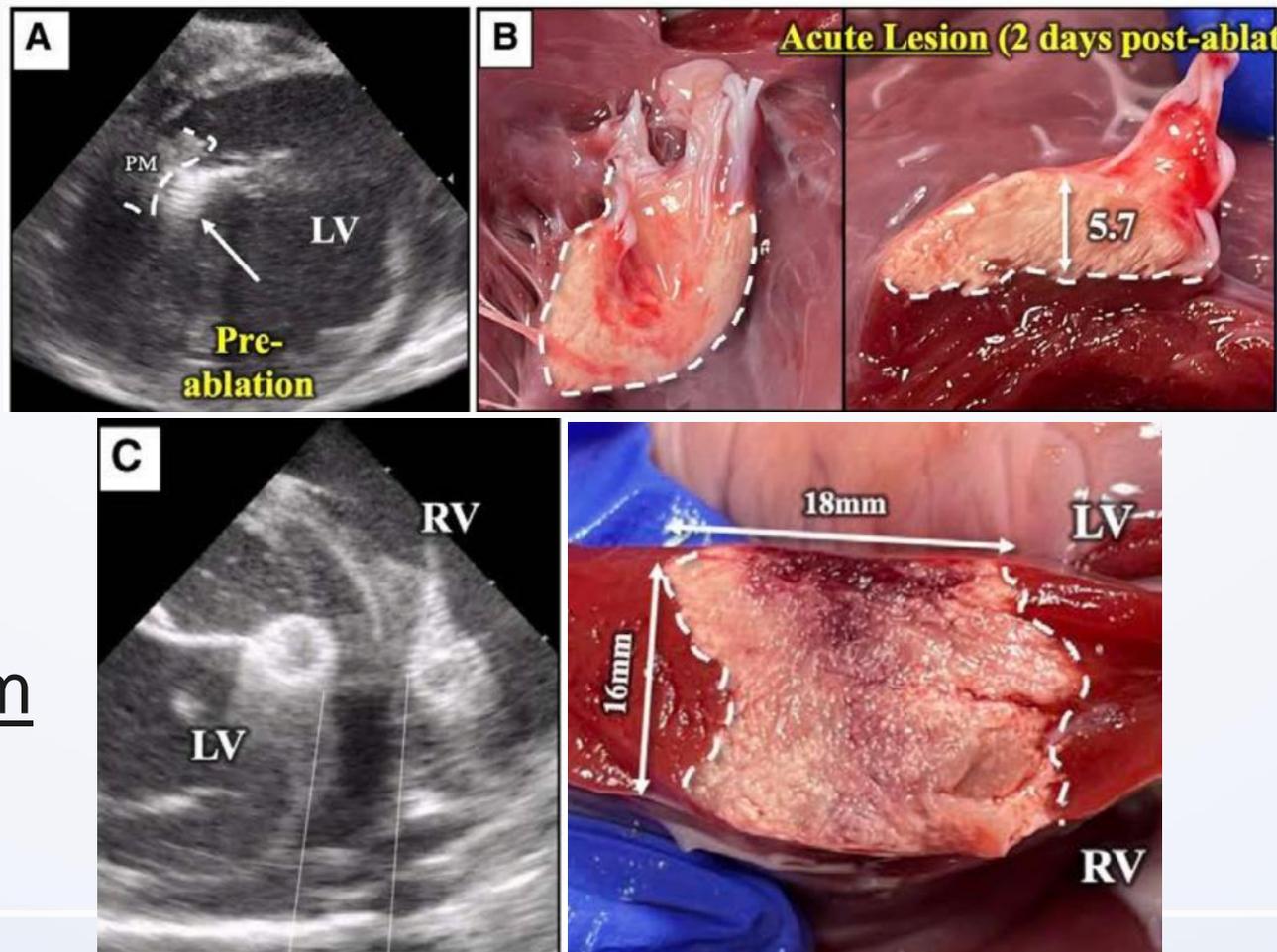
## Preclinical model



PFA produces discrete lesions with well demarcated borders between treated and untreated myocardium and lesion dimensions that are nearly similar to those achieved using radiofrequency energy.

# PF ablations on PAP muscles and deep septal lesions

- Swine model
- Ablation at „difficult“ locations
- Papillary muscles (n=13)
  - Lesion size 18x15x6mm
- Epicardial space
  - Lesion size 30x24x9mm
- Bipolar PF lesions on IV septum
  - Lesion size 30x21x14mm

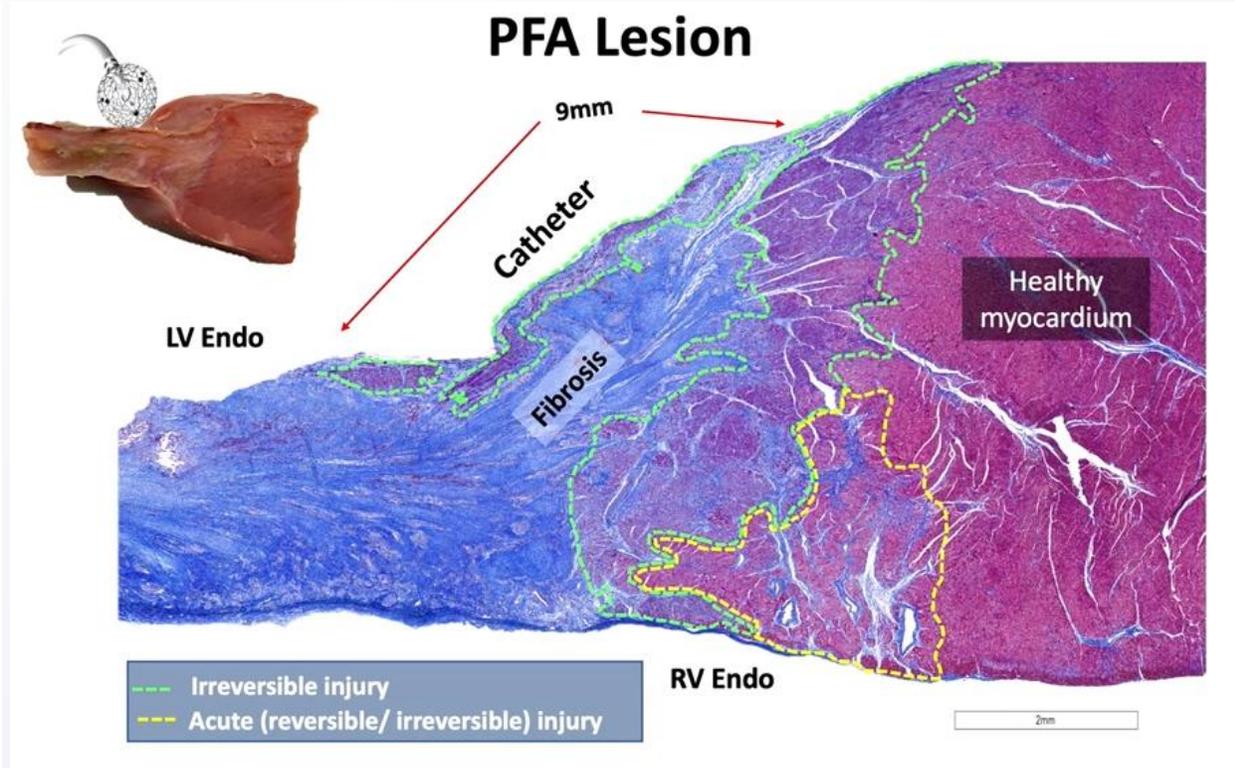
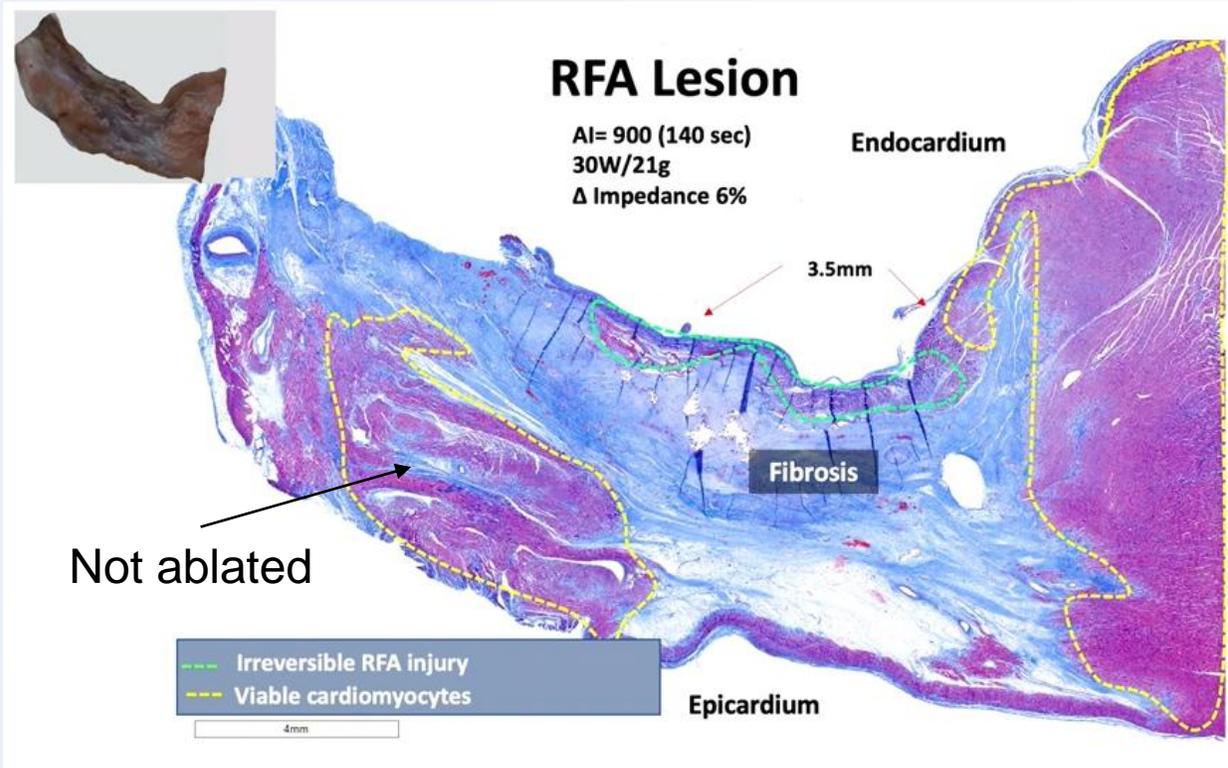


# What are the differences?

## RF vs PF for lesion creation

	<b>Radiofrequency</b>	<b>Pulsed-field</b>
<b>Thermal lesion</b>	<b>Yes</b>	<b>No</b>
<b>Factors for increasing lesion size</b>	<b>Power, time, CF</b>	<b>Repetition of applications (up to 4x per site)</b>
<b>Penetration through the preexisting scar</b>	<b>Limited</b>	<b>Better than RF</b>
<b>Risk of colateral damage</b>	<b>Well known</b>	<b>Myocardial stunning? Conduction system damage Spasm</b>
<b>Reversible lesion volume</b>	<b>Smaller</b>	<b>Larger Higher risk for recurrences? Potential for reversible pulses</b>

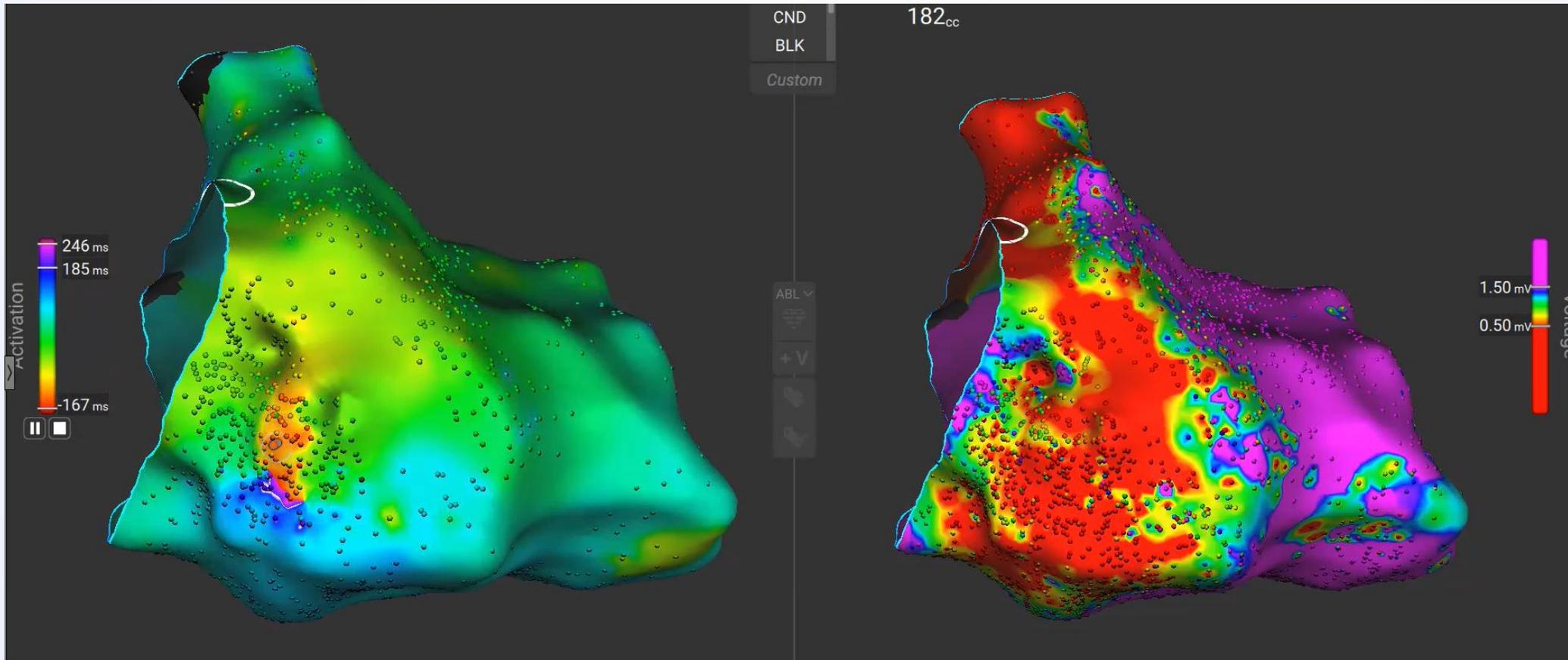
# Difference in PF penetration through the scar tissue



# Detailní mapování během běžící KT



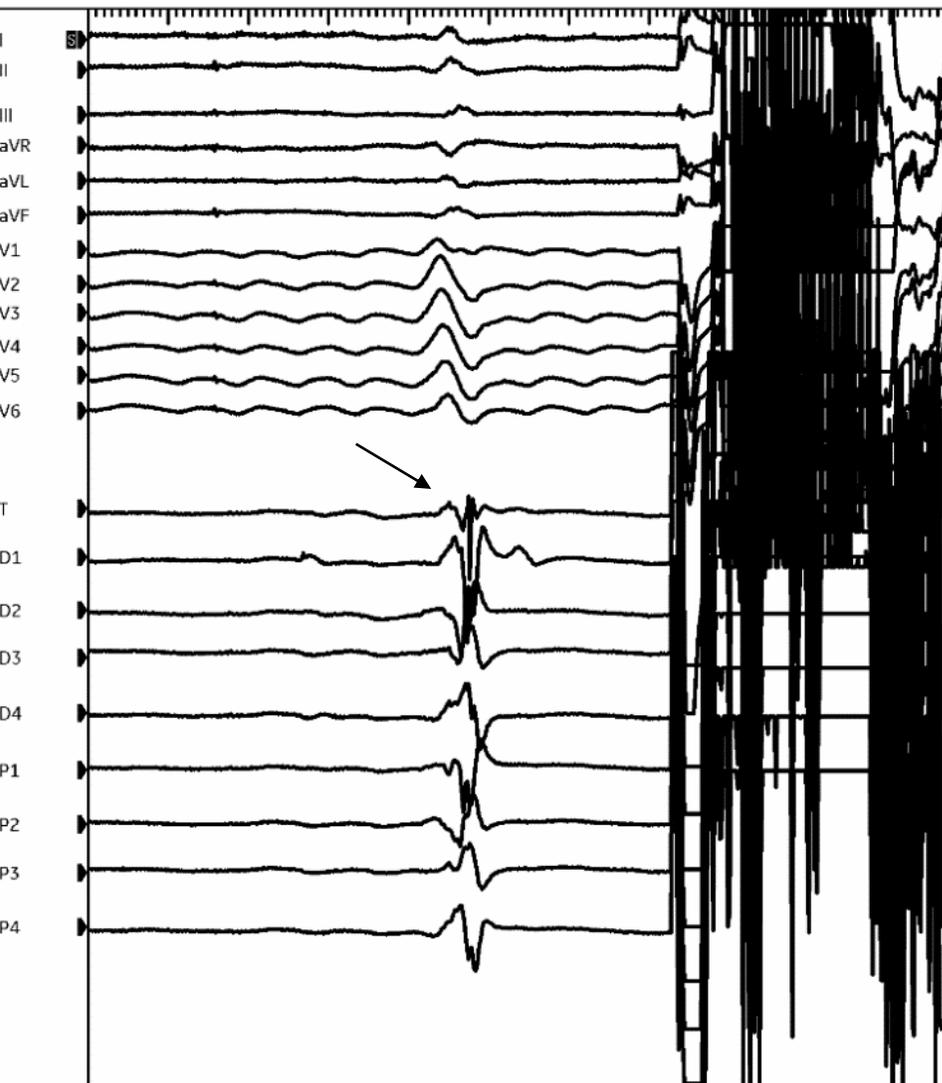
KT 150/min



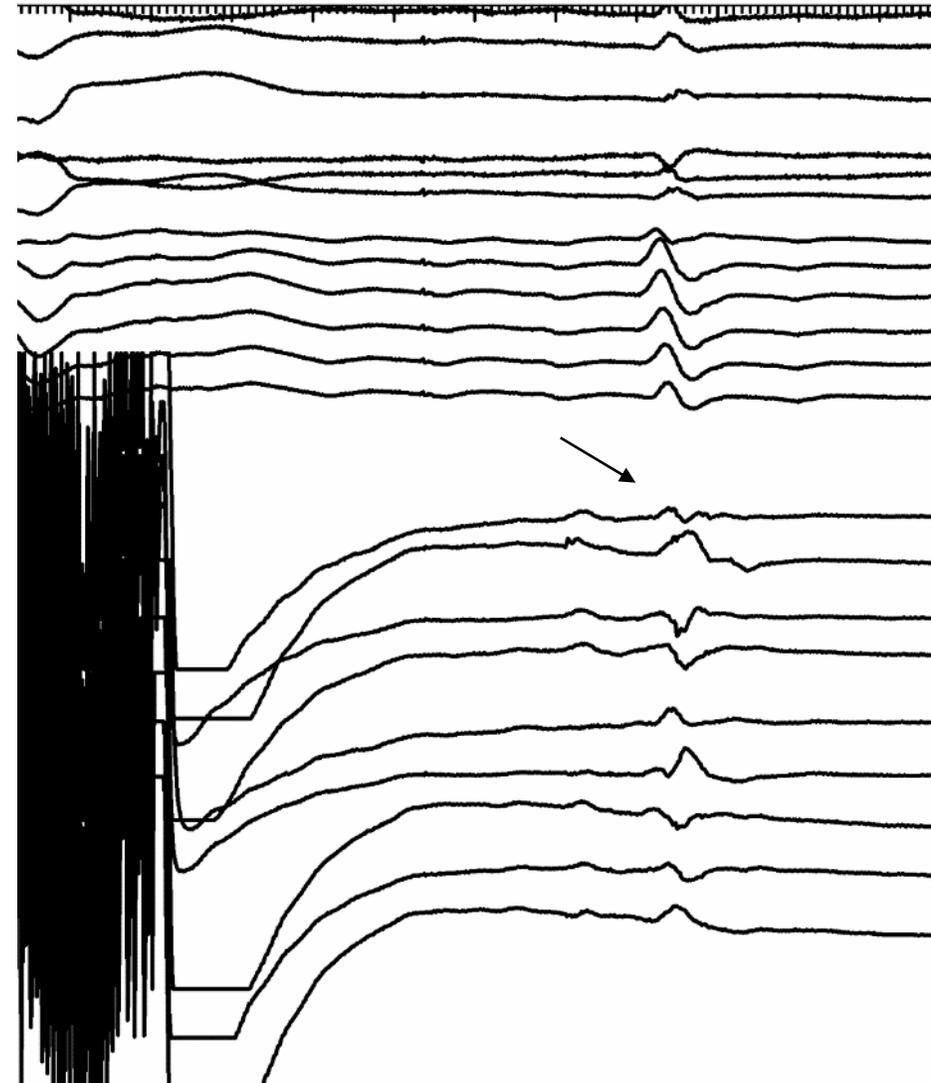
Aktivační mapa

Voltážová mapa

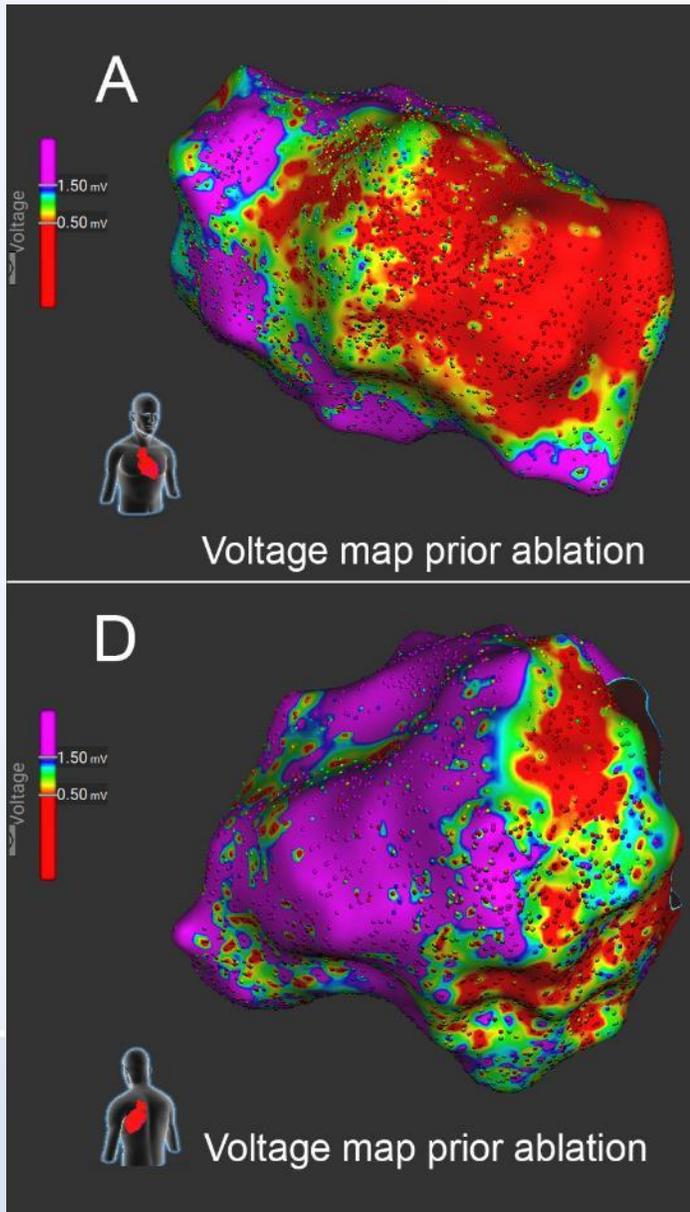
# PF ablation is very effective in eliminating local potentials...



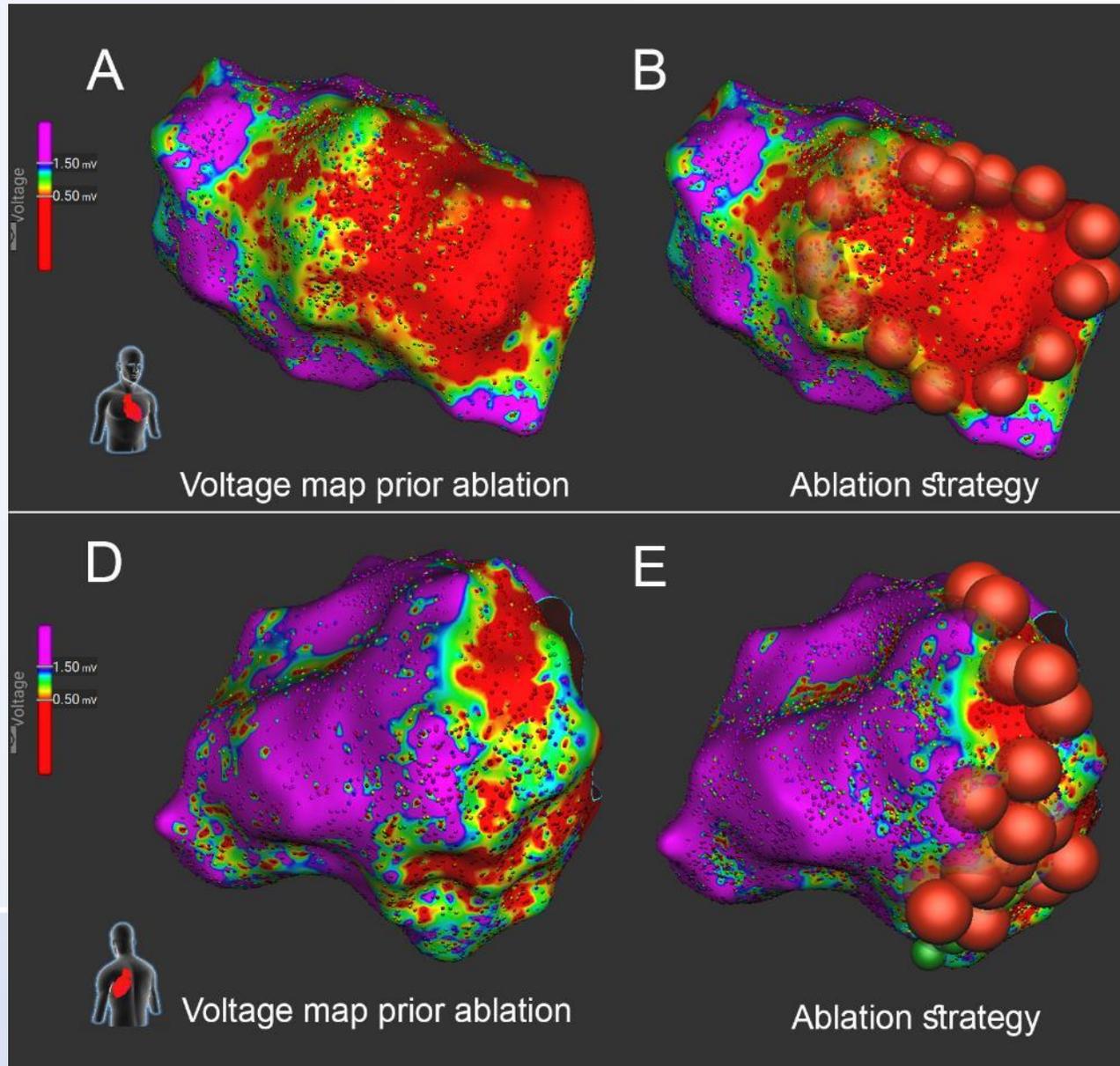
→  
5sec PF  
application



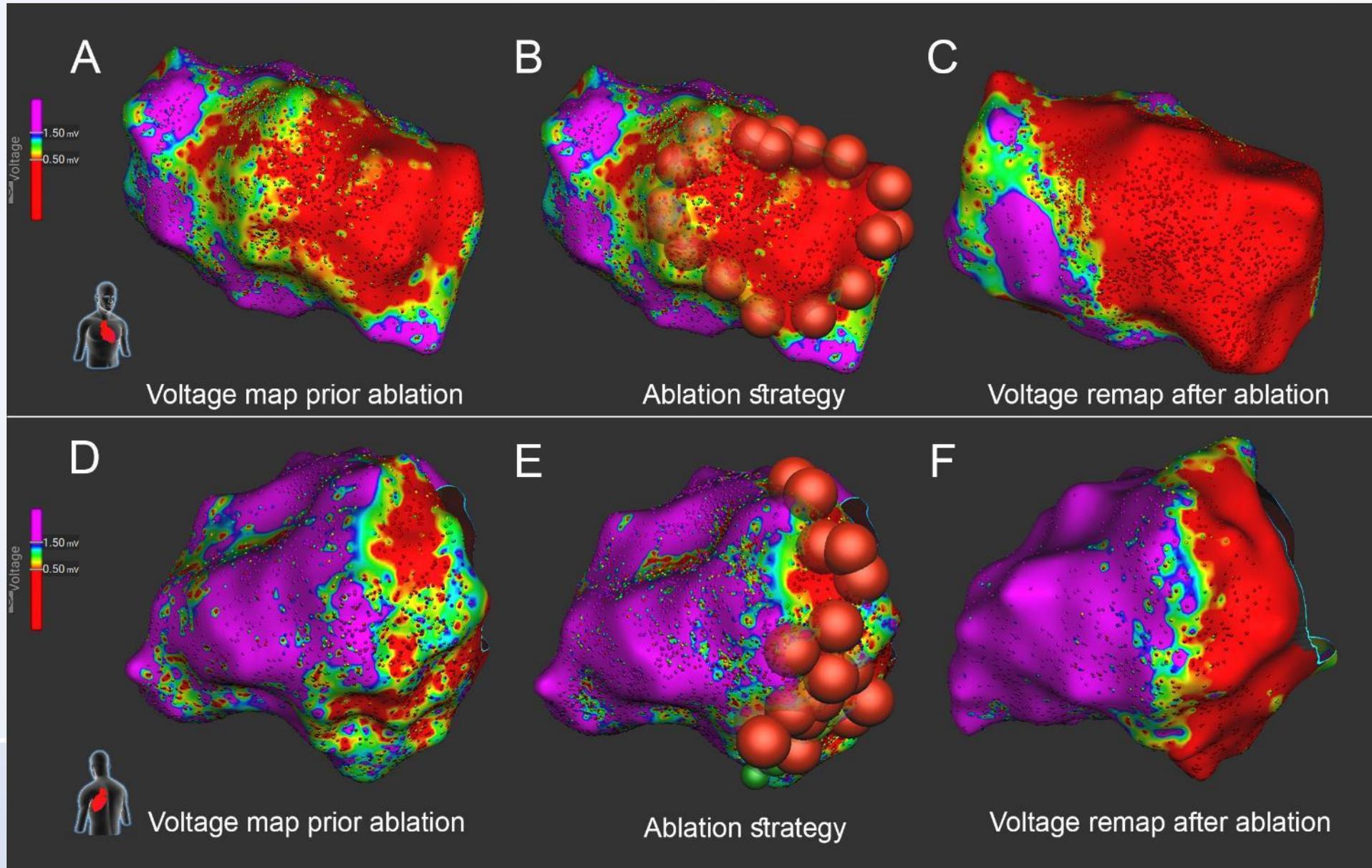
# Substrate modification by large tip



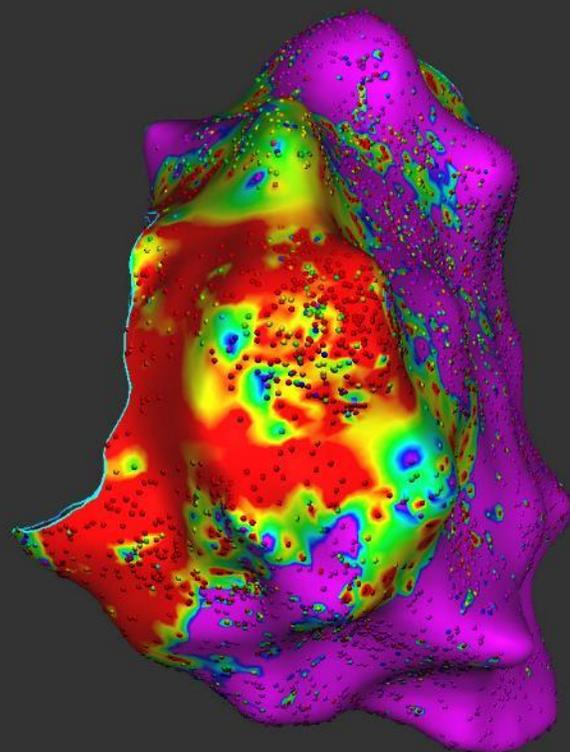
# Substrate modification by large tip



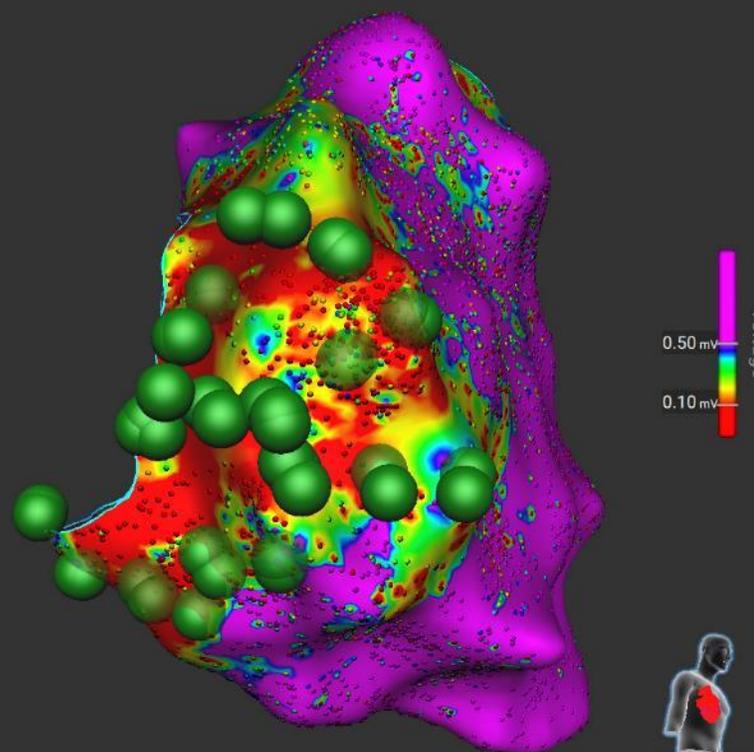
# Substrate modification by large tip



# Chronic changes after PF ablation

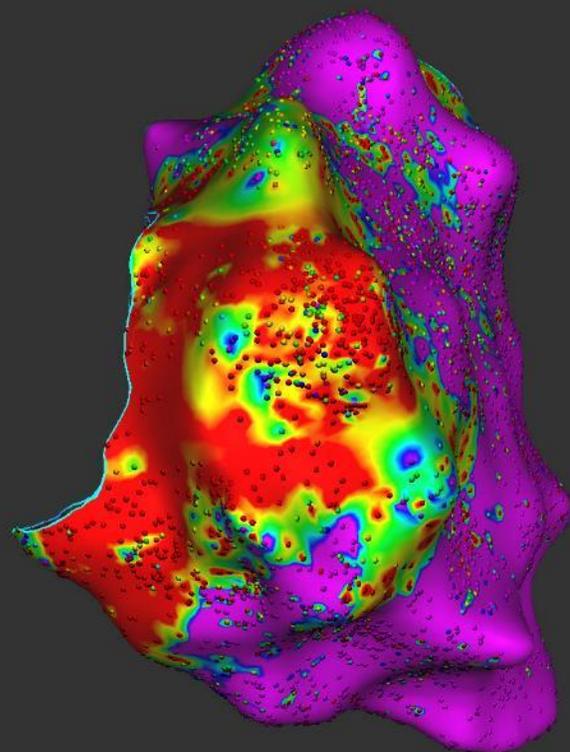


Voltage map prior ablation

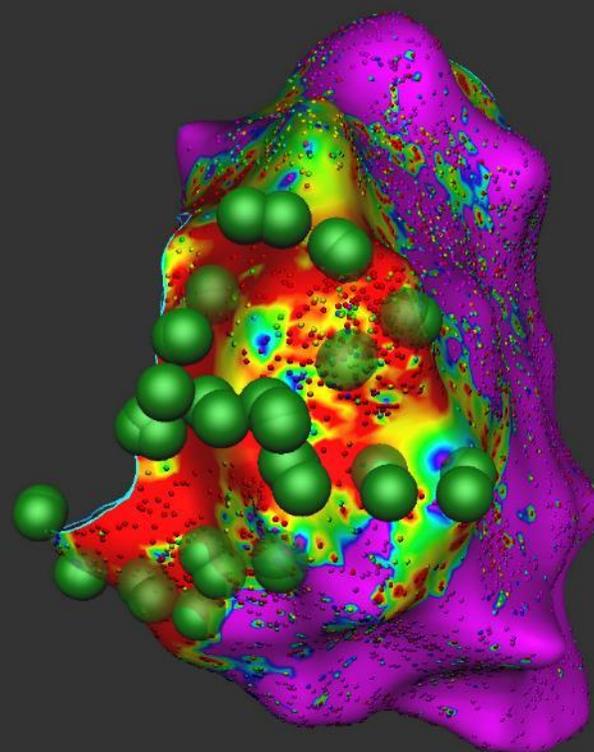


Voltage map with PF ablation sites

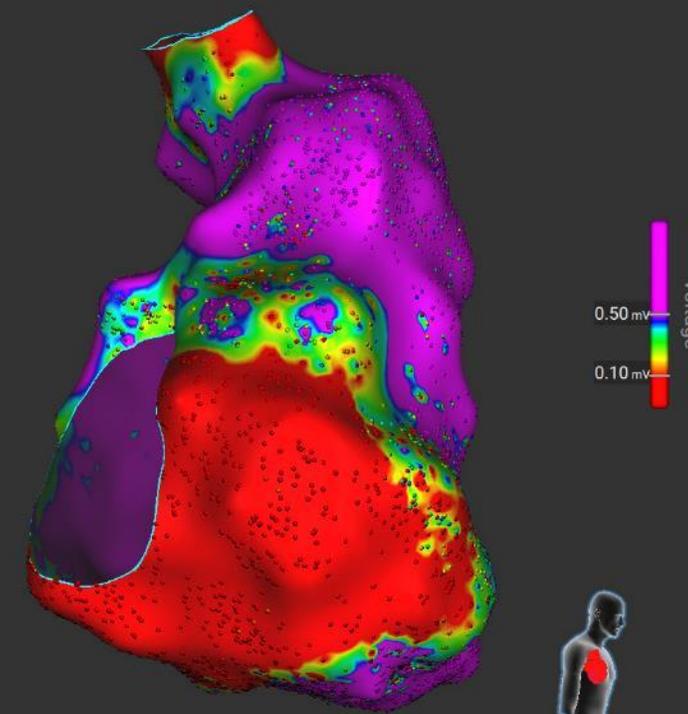
# Chronic changes after PF ablation



Voltage map prior ablation

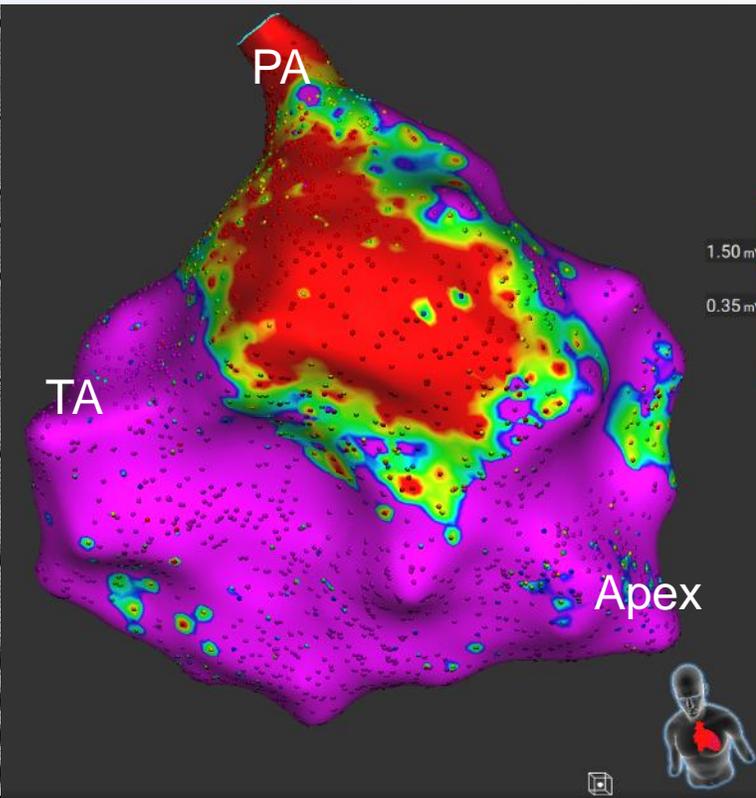
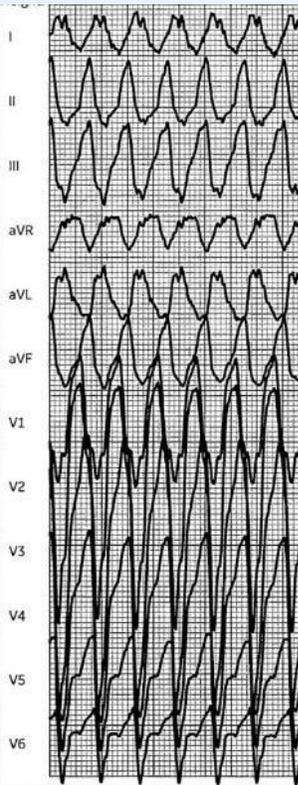


Voltage map with PF ablation sites



Remap after 3 months

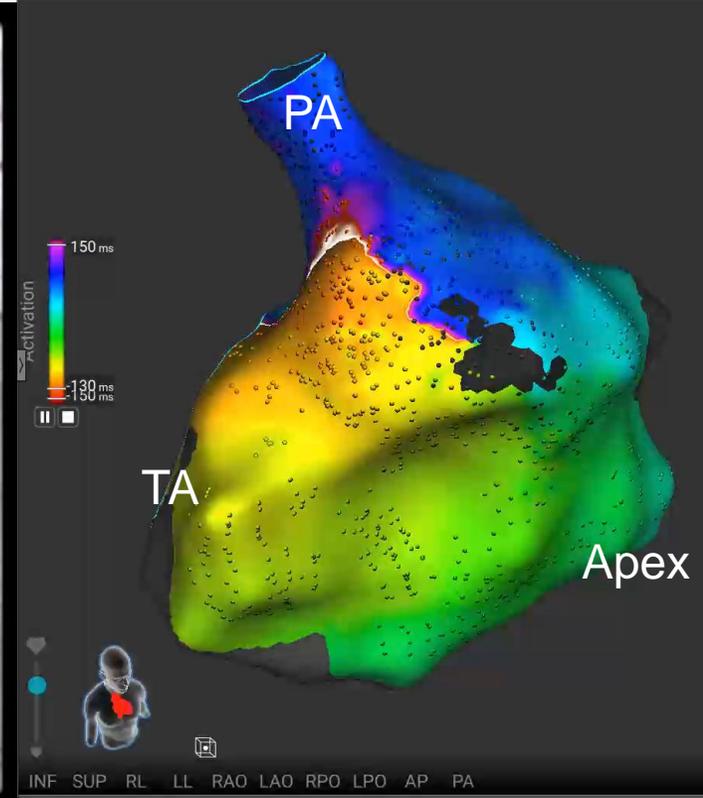
# GUCHD pt with VT after previously failed RF ablation (3rd procedure)



Voltage map with scar over RVOT

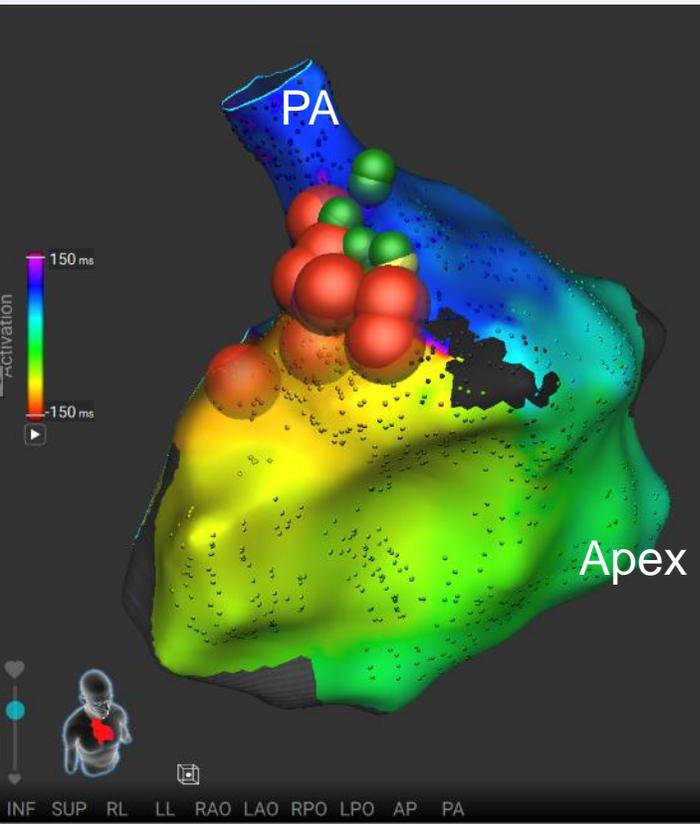


Transcatheter PV valve

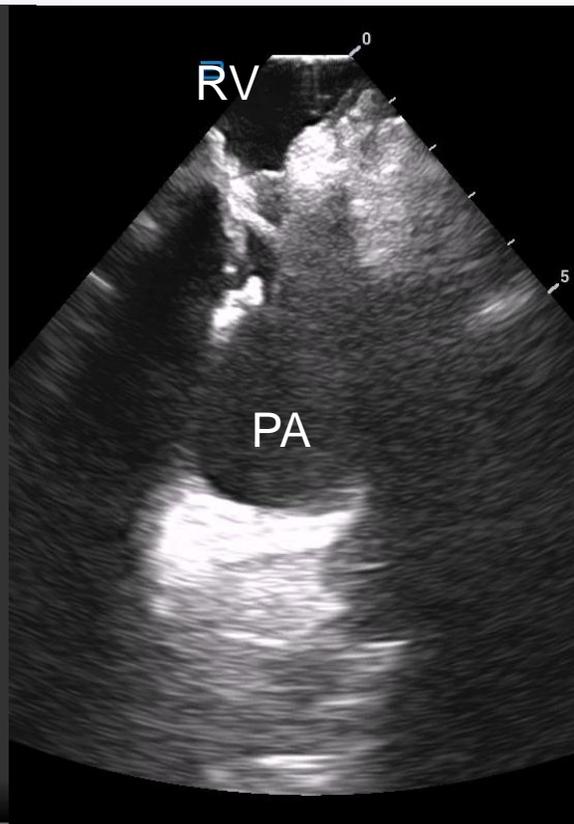


Activation during VT

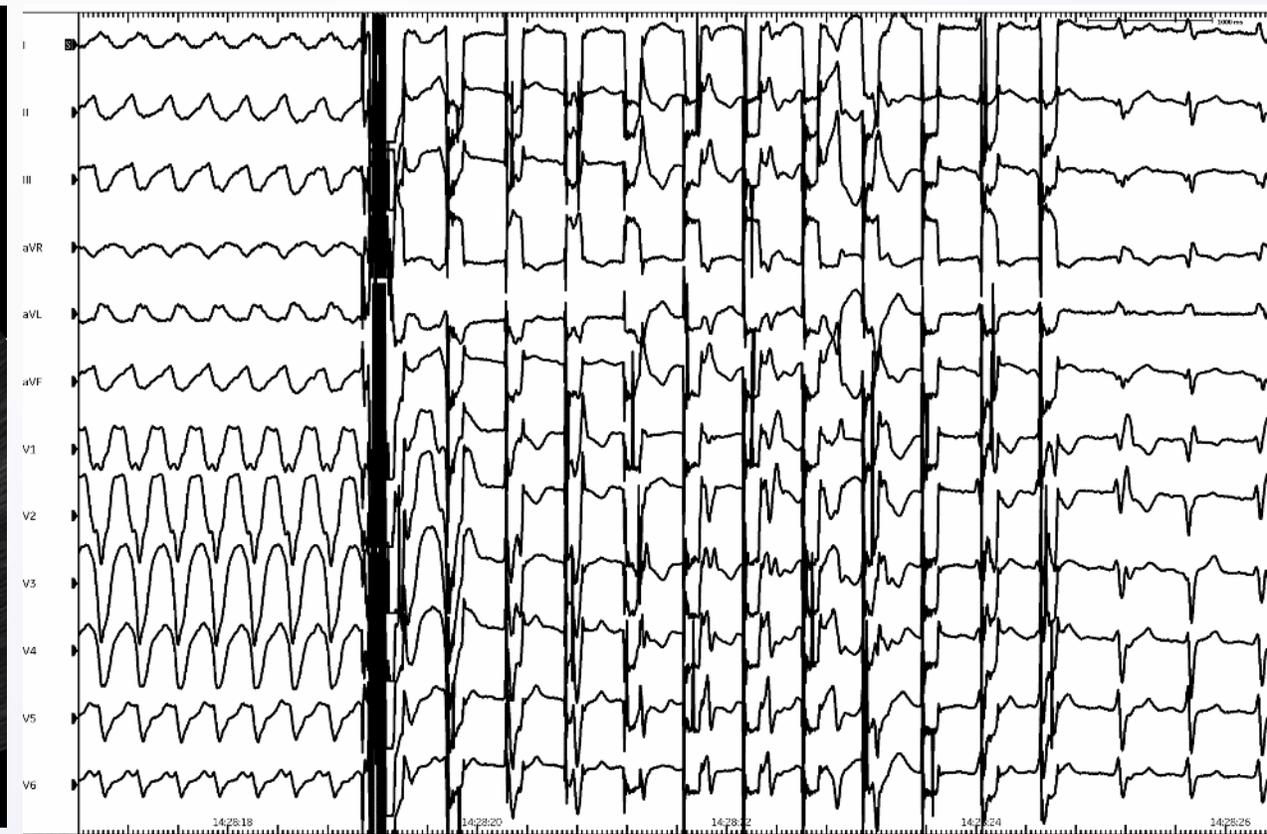
# VT termination only after multiple PF lesions



Ablation in the „channel“



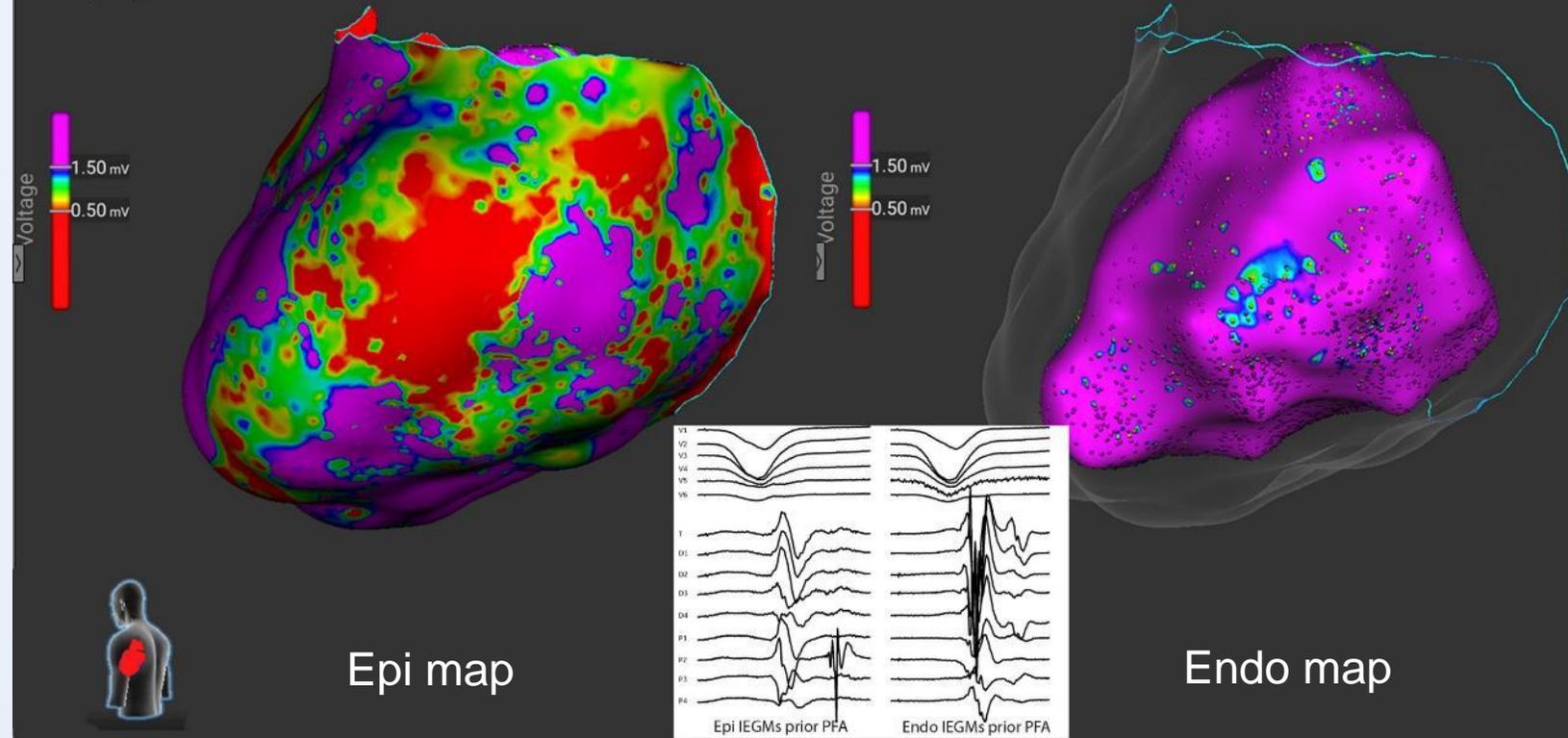
Sphere under the TPV



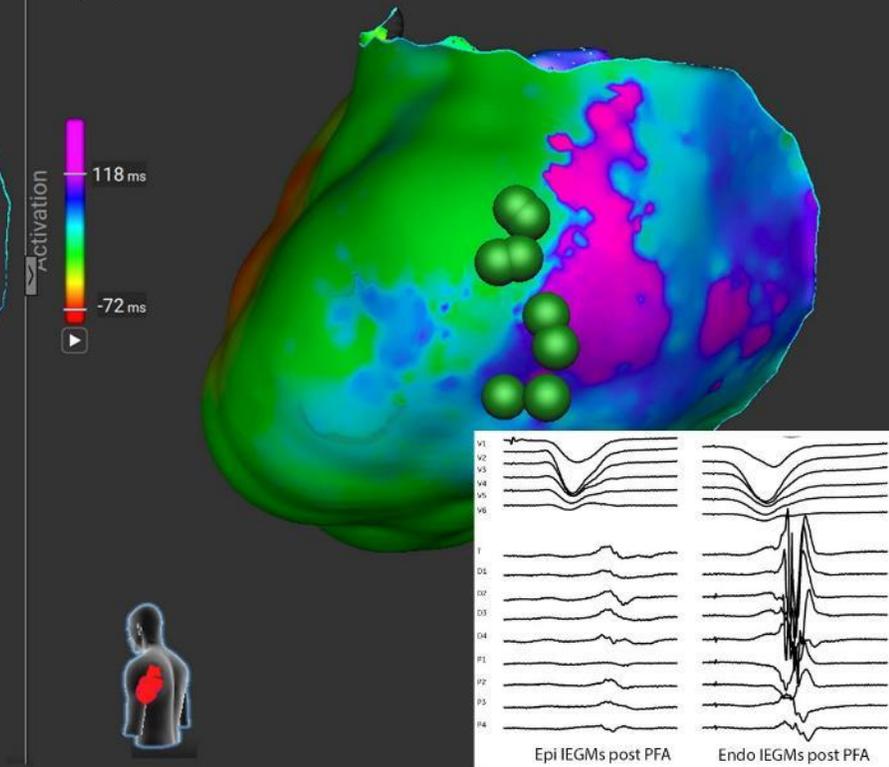
Termination with 3rd PF application

# Epicardial mapping/ablation in NICMP

A



B



# Spasm after epi PF ablations (but no phrenic nerve pulsy)

A

Prior epi PF ablation

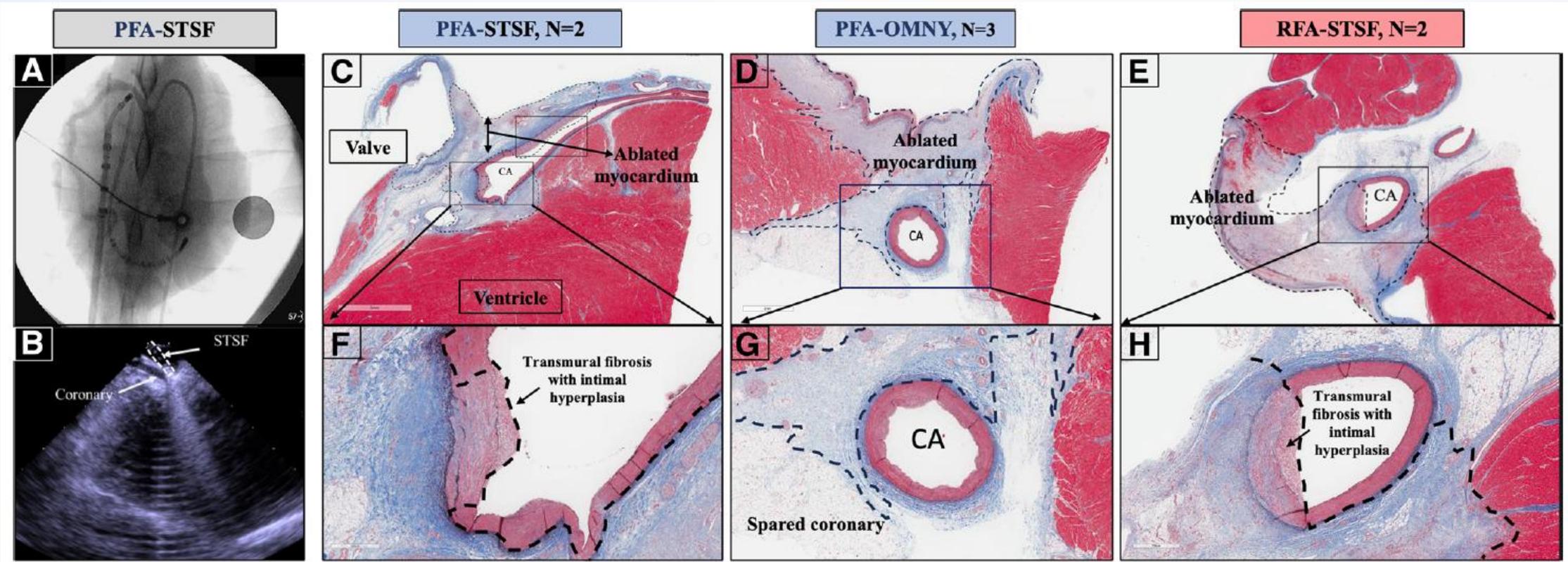
B

Spasm after PF application

C

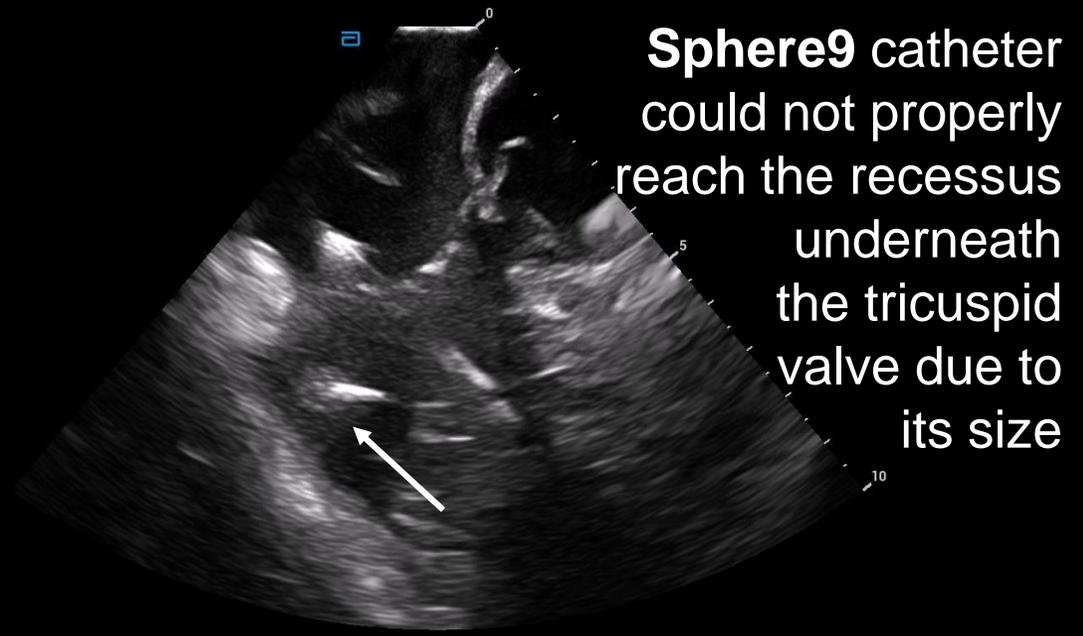
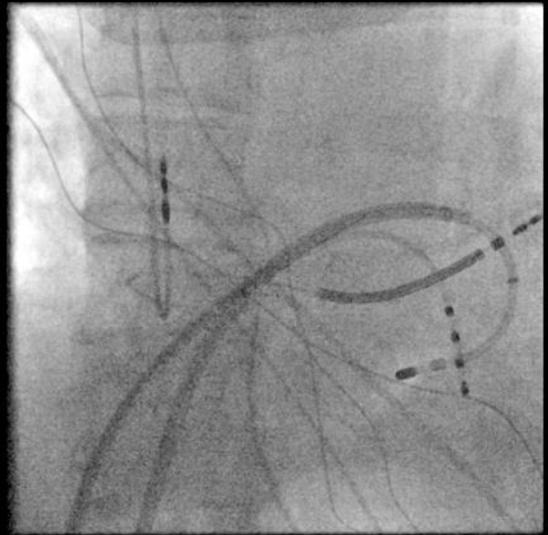
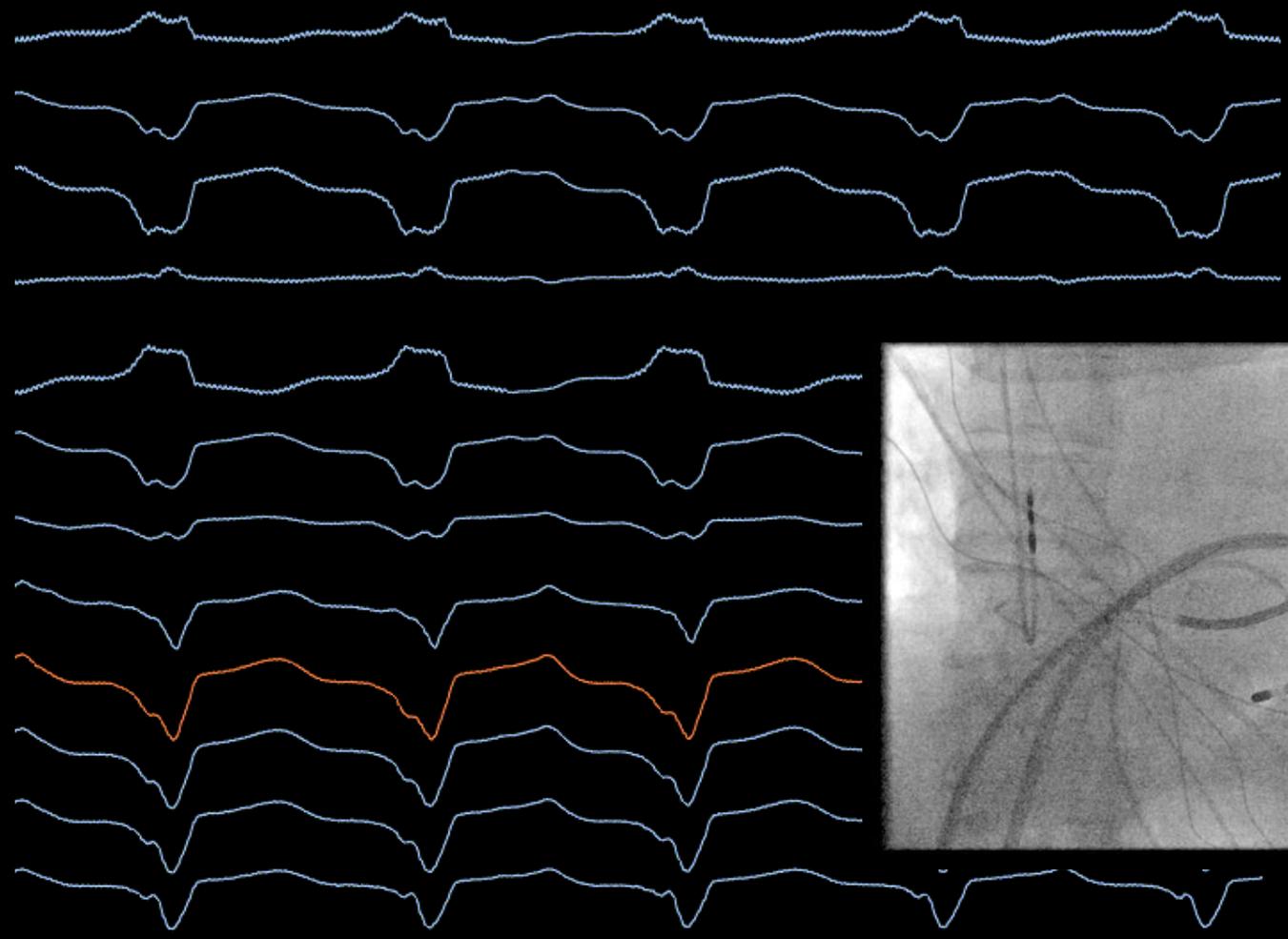
Resolution after nitrates

# PF ablation induced coronary injury

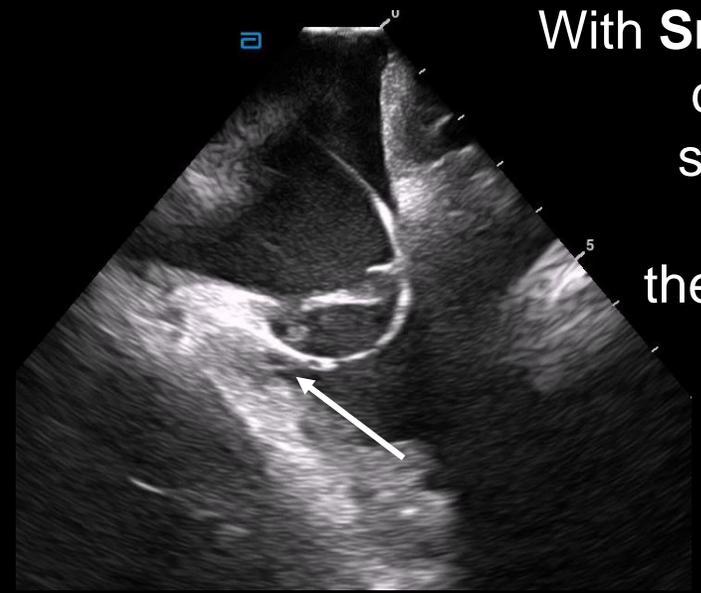


With RF less coronary narrowing/spasms (8% RF vs 23% PF); no VT or VF, ST elevations  
But more chronic histological coronary effects (42% RF vs 18% PF)

Despite acutely successful ablation, recurrence of very slow incessant VT 110 bpm was noted. Remapping with **CARTO** mapping system and 4mm tip located **middiastolic signal in recessus under the tricuspid valve**



**Sphere9** catheter could not properly reach the recessus underneath the tricuspid valve due to its size



With **SmartTouch** catheter we successfully reached the target site

**Non-inducibility at the end and no recurrence since the procedure**

# Výsledky

## Mapping and ablation of ventricular tachycardia using dual-energy lattice-tip focal catheter: early feasibility and safety study



### Patient population

Prospective observational case series of 18 patients with VTs

- all but one with SHD
- mean LVEF  $34 \pm 10\%$
- 66% previously failed ablation
- electrical storm 22%

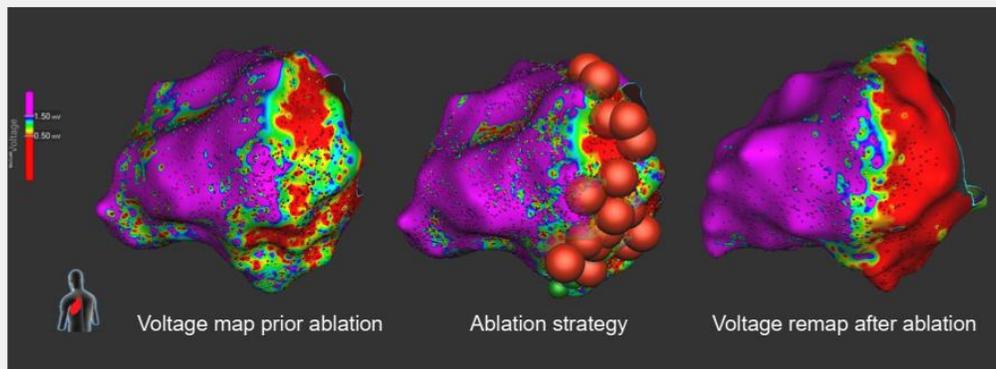
### Mapping time

$18.7 \pm 6.6$  min for LV with  $4581 \pm 2095$  pts

### Ablation

Rapid substrate modification with  $12 \pm 7$  RF and  $8 \pm 9$  PF applications per pt

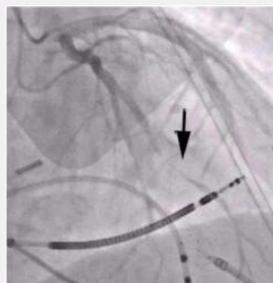
### Results



### Methods

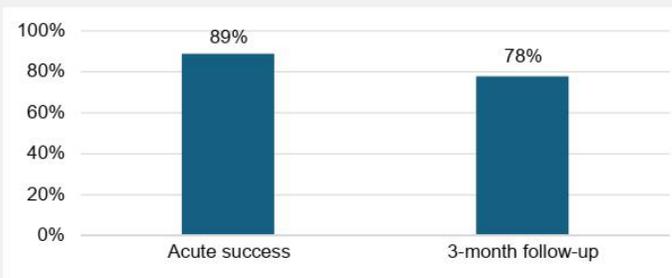
Use of “large footprint” lattice-tip focal catheter enabling: HD mapping and dual-energy ablation (RF & PF)

### Safety issues



Coronary spasm after epicardial PF ablation resolving after nitrates, but no phrenic nerve pulsus

### VT ablation outcome



# Závěry

- Mapování a ablace komorových tachykardií pomocí systému Affera umožňuje:
  - Rychlé denzní aktivační a voltážové 3D mapování
  - Efektivní terapii pomocí ablace s RF i PF energií
- Jedná se o novou generaci elektrofyzilogických mapovacích/ablačních systémů, které umožňuje léčbu i u pacientů, u kterých konvenční možnosti ablace selhaly

