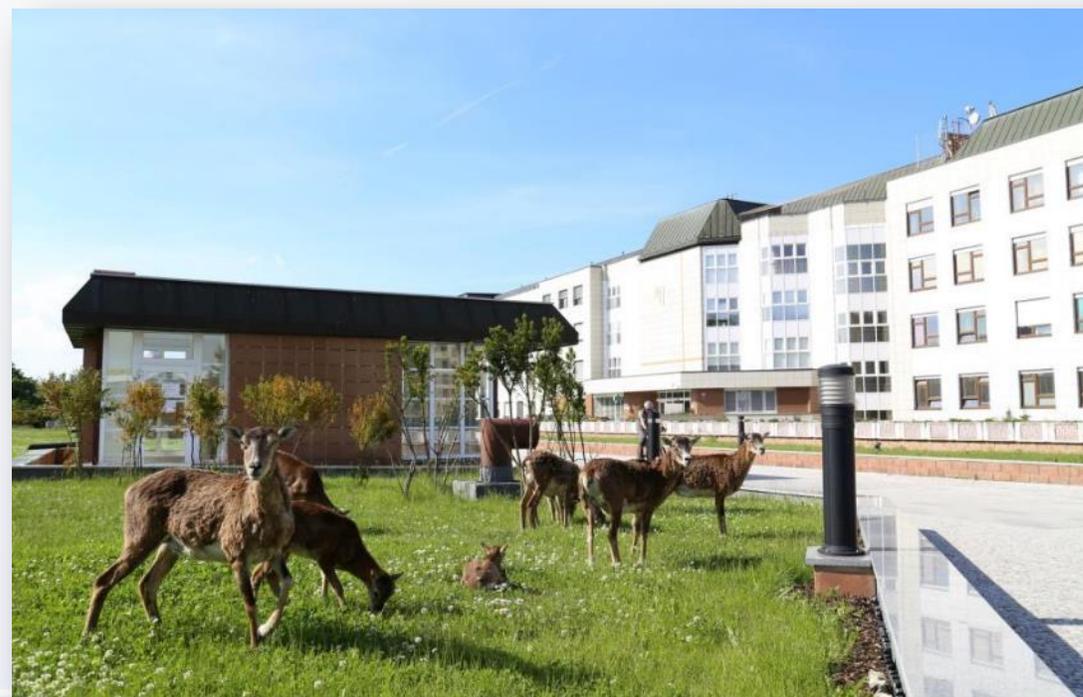


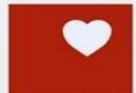
Specifické přístupy k složitým lokalizacím KT

P. Peichl



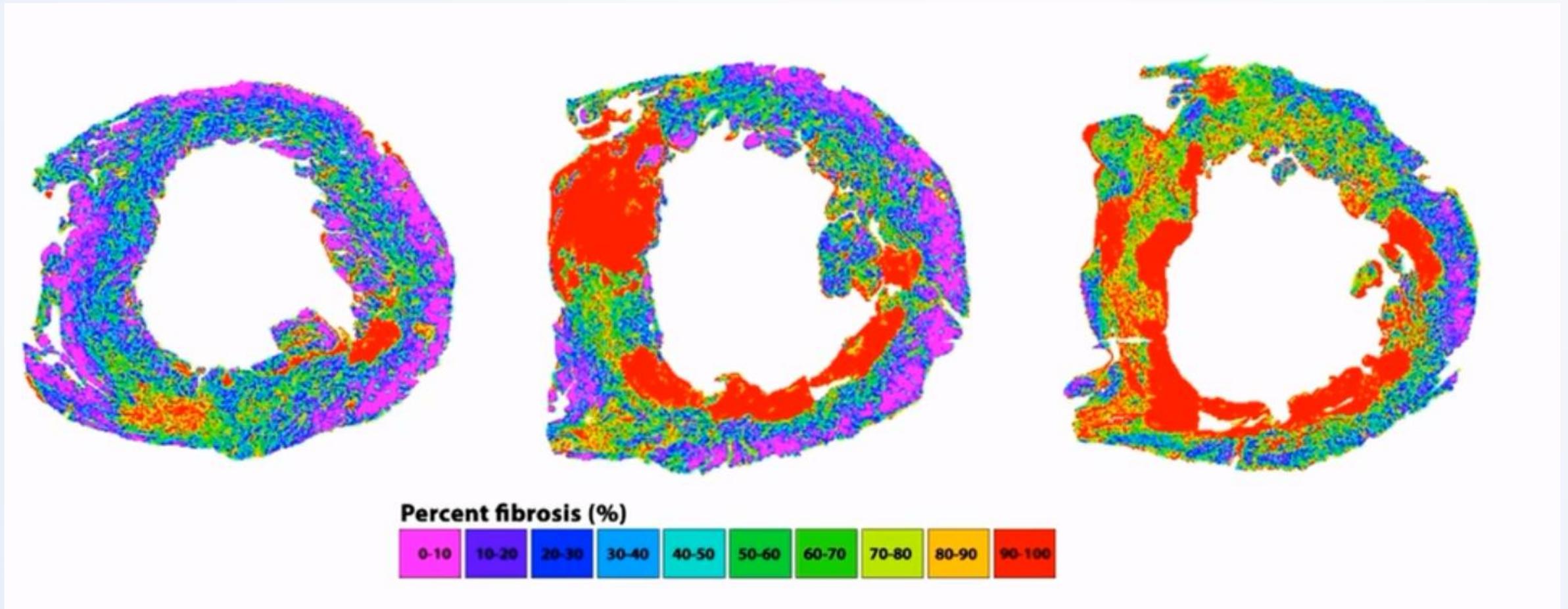
Why VT ablation can fail?

- Failure to map the ablation target
 - Extensive scar or absence of identifiable target
- **Failure to reach the target**
 - **Deep substrate inaccessible by conventional tools**
- Procedure associated risks are high
 - Risk of hemodynamic decompensation due to frailty and comorbidities



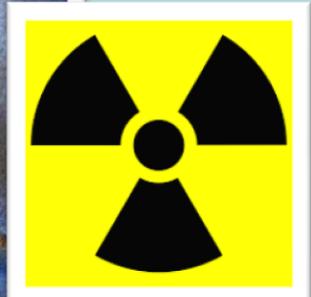
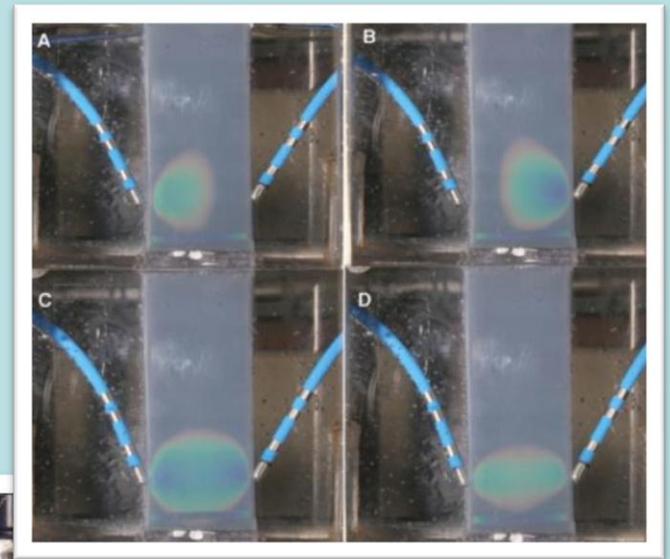
Arrhythmogenic substrate in LMNA

Lessons from whole heart histology

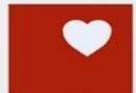


Bail out strategies

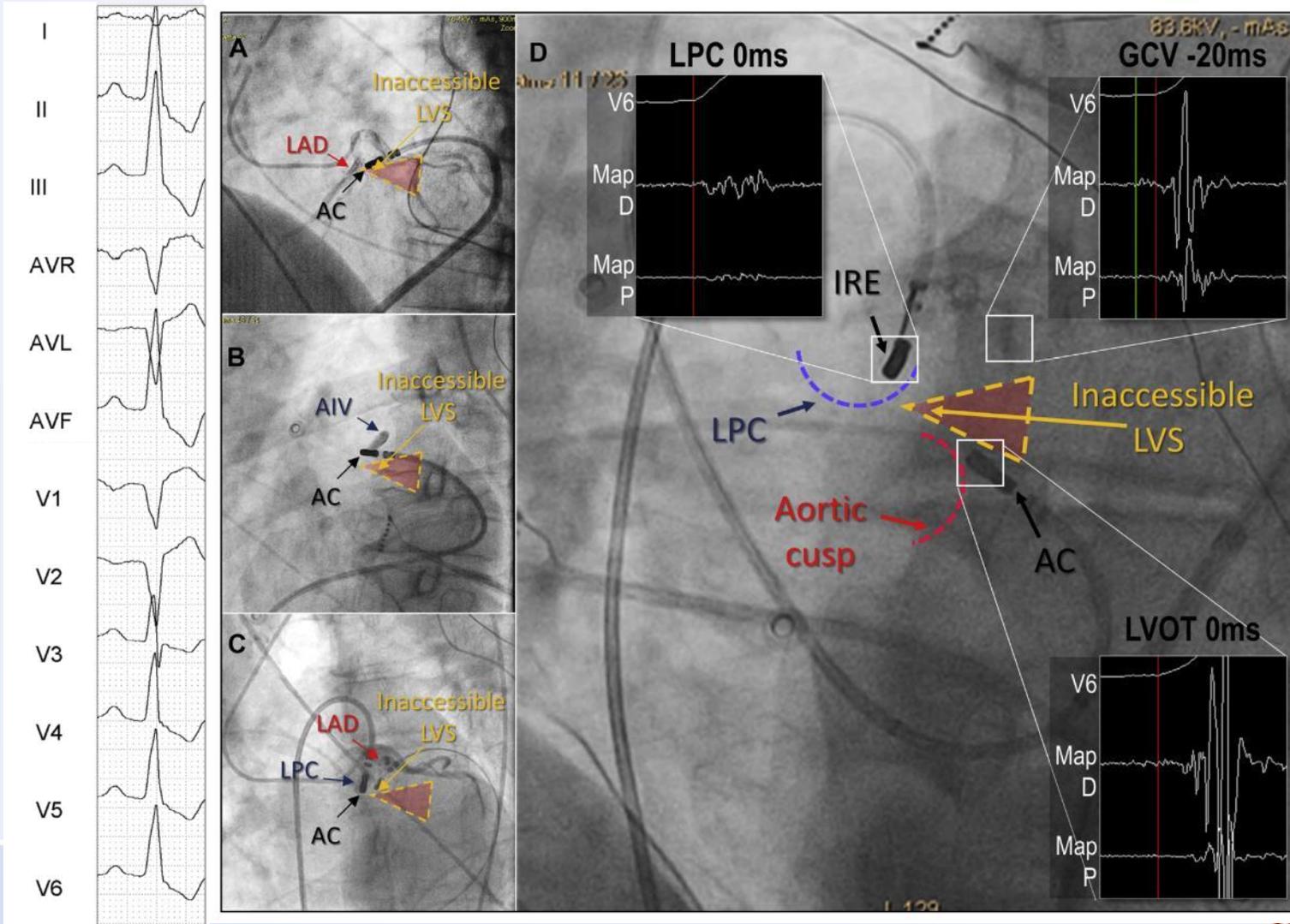
- Bipolar ablation
- Use of dextrose for irrigation
- Alcohol ablation
 - Venous (and arterial)
- Needle ablation
- Surgically facilitated access / ablation
- Radiotherapy
- Pulsed field ablation using large foot-print
- Ultra low cryo ablation
- Autonomic modulation
- Heart transplant



Bipolar RF ablation

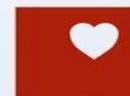


Bipolar ablation of summit ectopy



- 7 pts with failed previous VT ablation
- Bi-RFCA (power 36 ± 7 W; duration 333 ± 107 seconds) resulted in VA suppression in 5 of 7 patients. In 2 cases, Bi-RFCA was successfully performed using dextrose 5% water
- No complications occurred

INSTITUT KLINICKÉ A EXPERIMENTÁLNÍ MEDICÍNY
KLINIKA KARDIOLOGIE

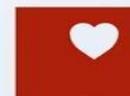


IKE
M

Alcohol ablation (venous)



INSTITUT KLINICKÉ A EXPERIMENTÁLNÍ MEDICÍNY
KLINIKA KARDIOLOGIE

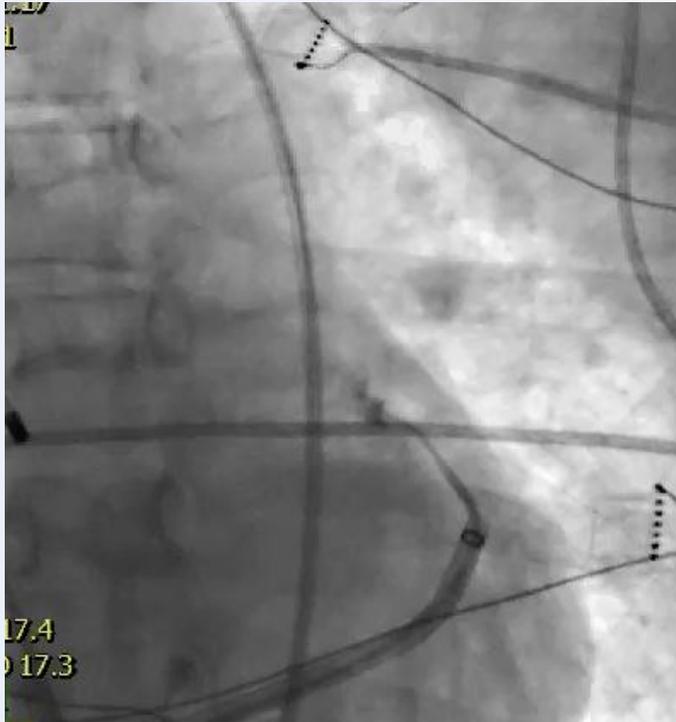


IKE
M

Alcohol transcatheter ablation

Venous application in the branch of coronary sinus

1. Venous angiogram

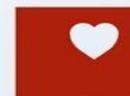


INSTITUT KLINICKÉ A EXPERIMENTÁLNÍ MEDICÍNY
KLINIKA KARDIOLOGIE



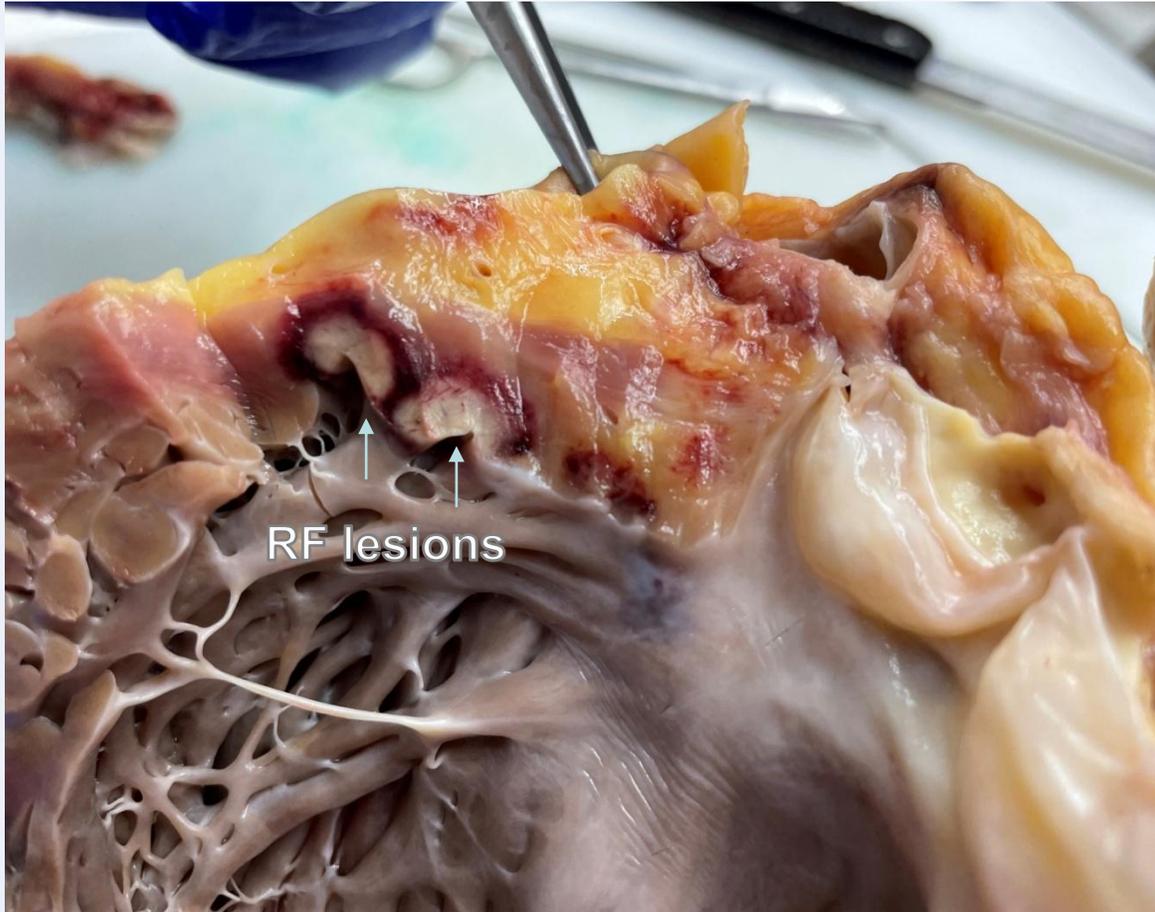
IKE
M

INSTITUT KLINICKÉ A EXPERIMENTÁLNÍ MEDICÍNY
KLINIKA KARDIOLOGIE



IKE
M

RF ablation vs alcohol ablation

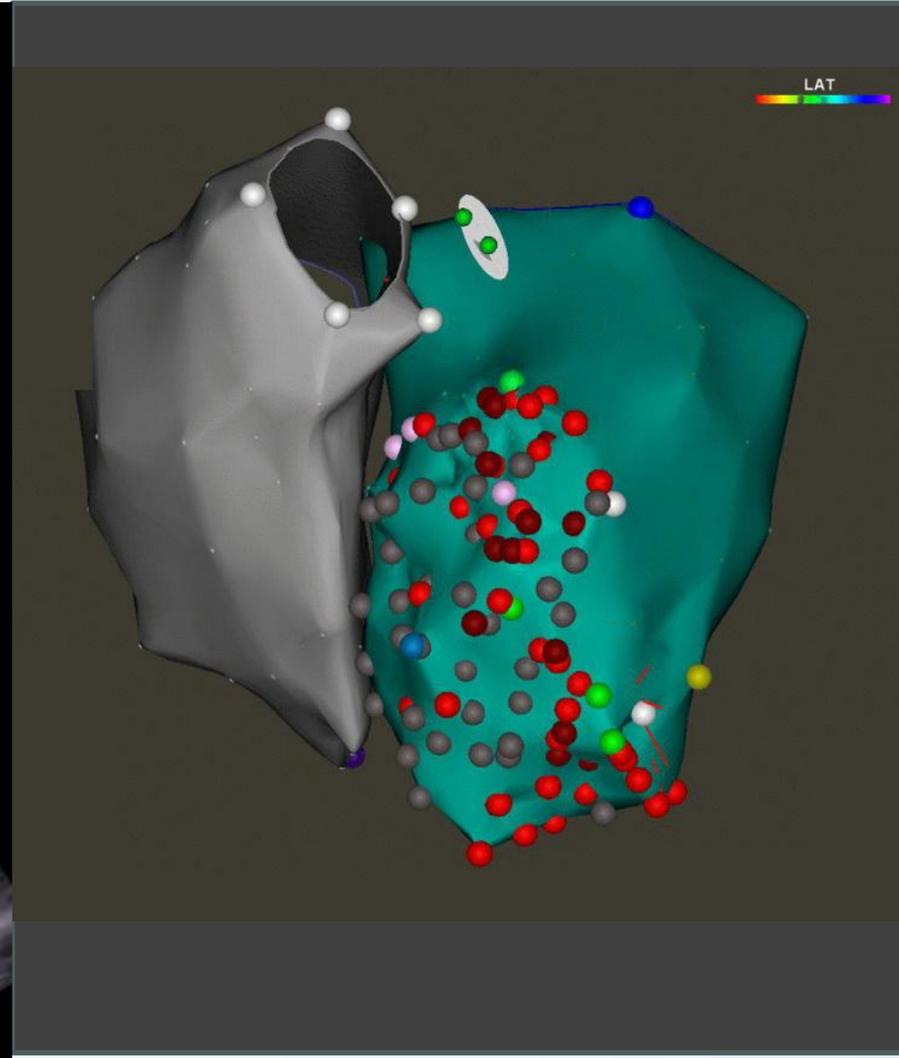
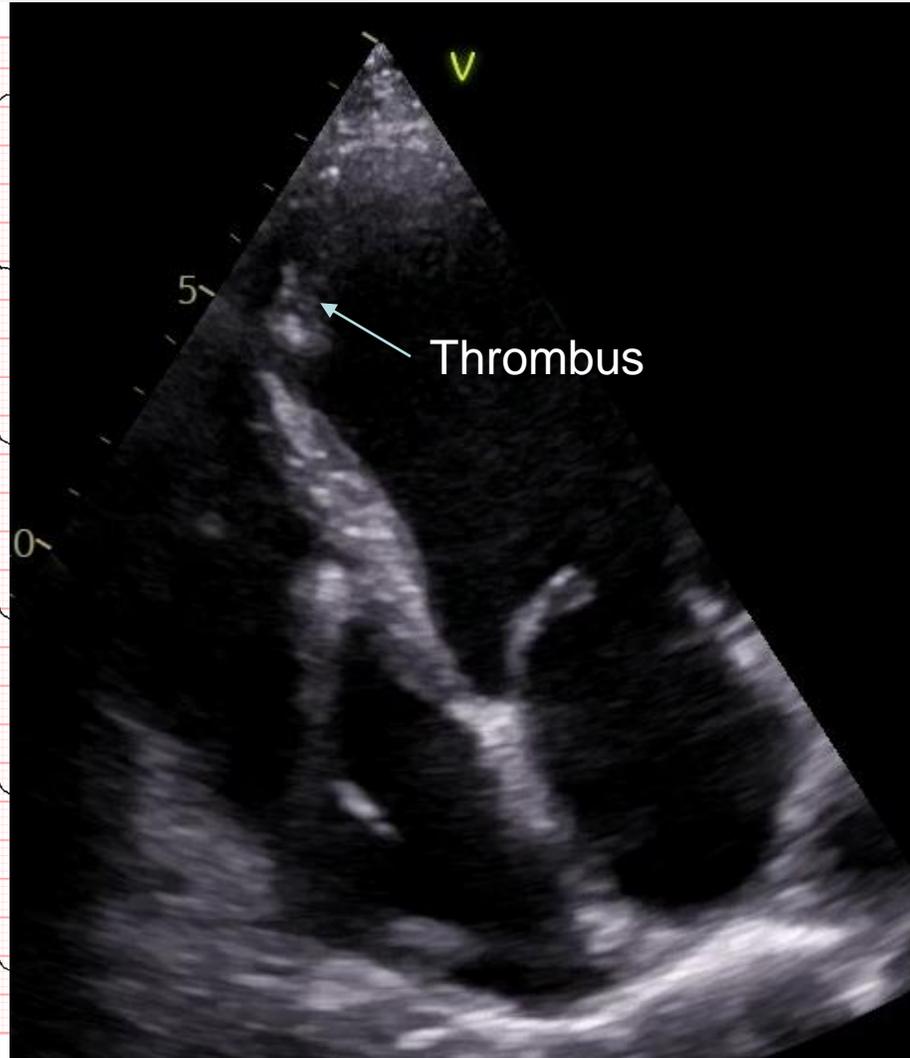
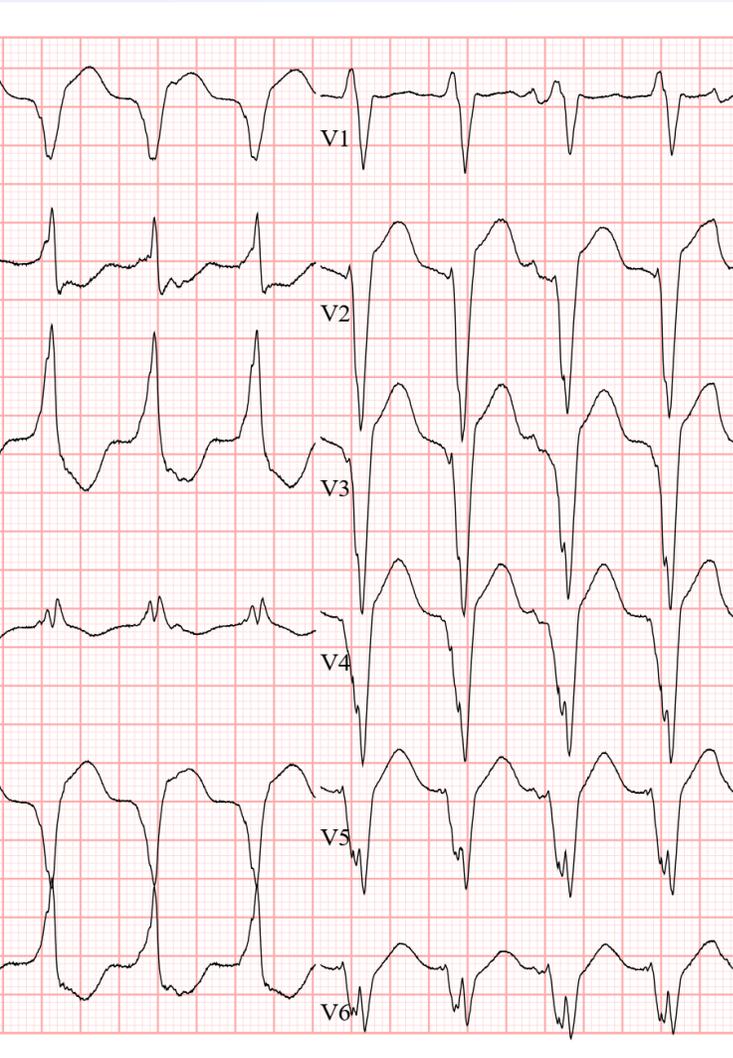


35 year old patient with LMNA and recurrent VT with repeated VT ablations in LV summit, **3days after ablation underwent HTx**

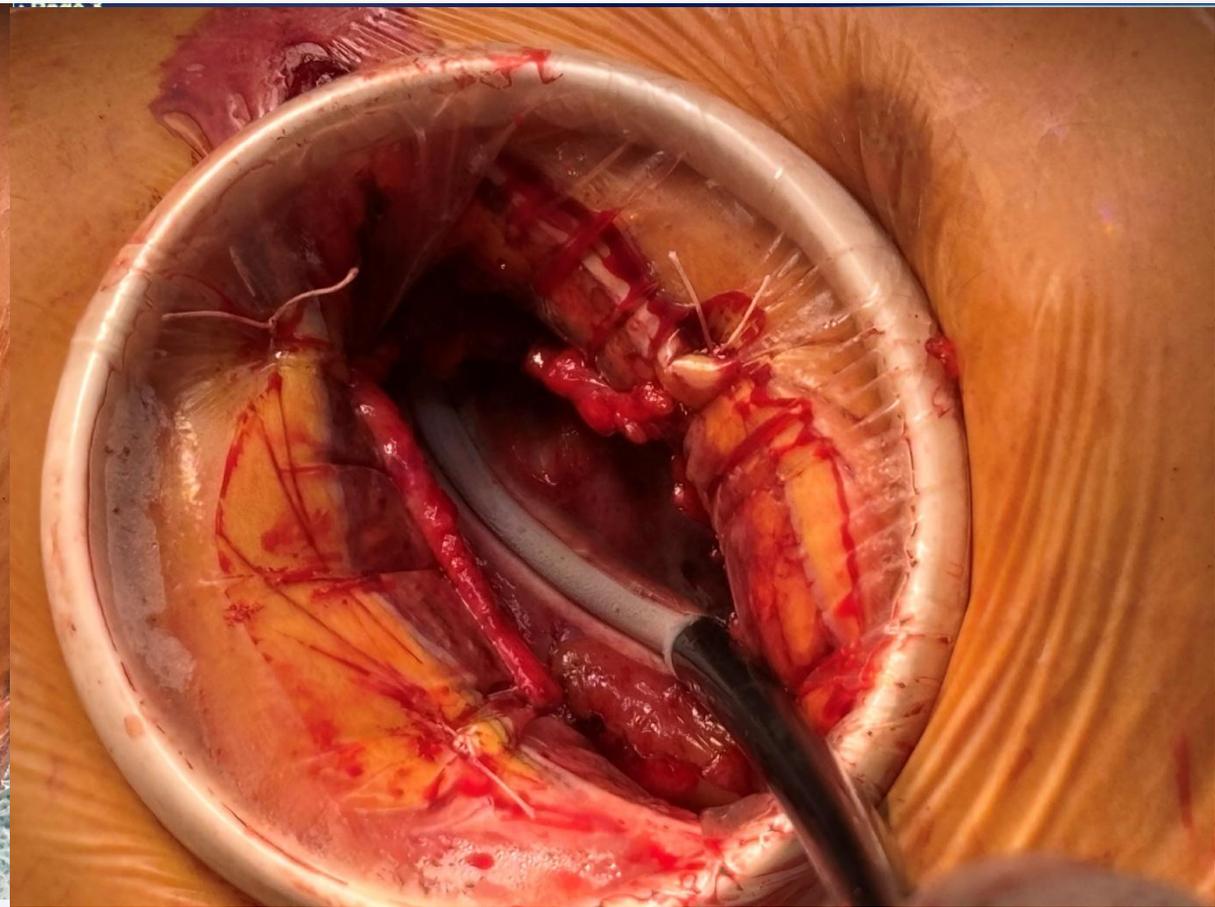
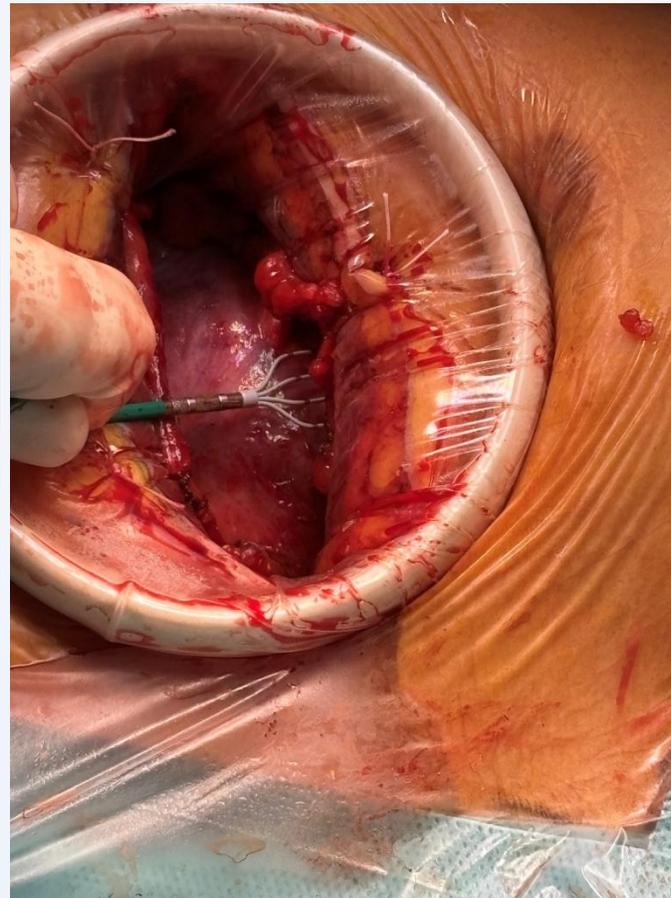
Surgically facilitated access



Surgically facilitated access and ablation in patient with previous CABG

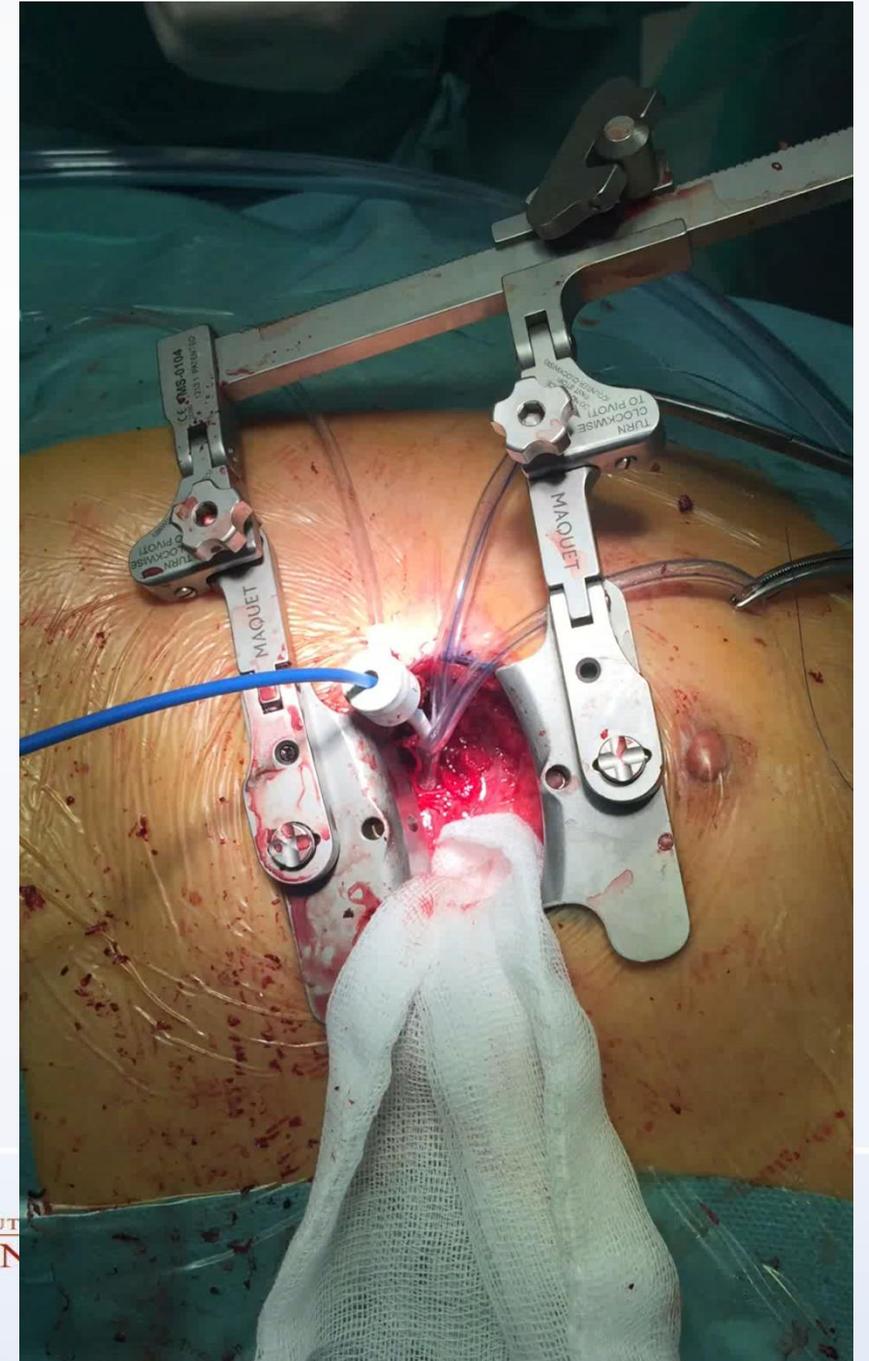
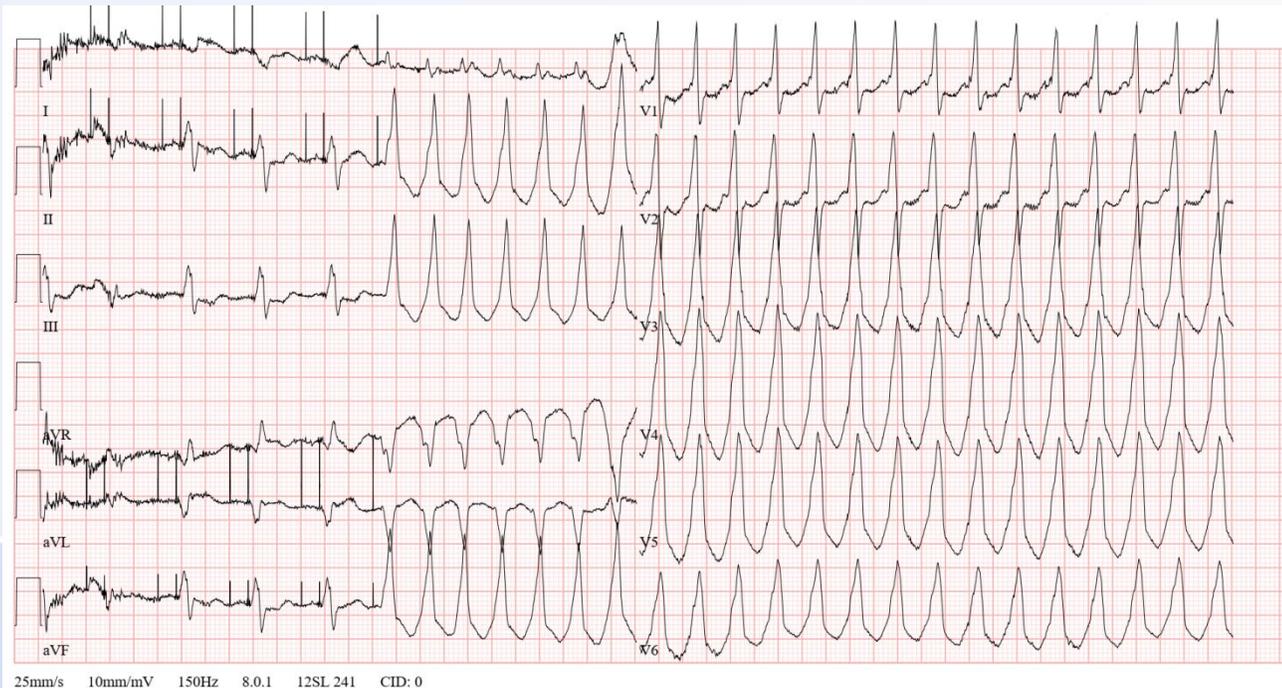


Surgically facilitated access and ablation

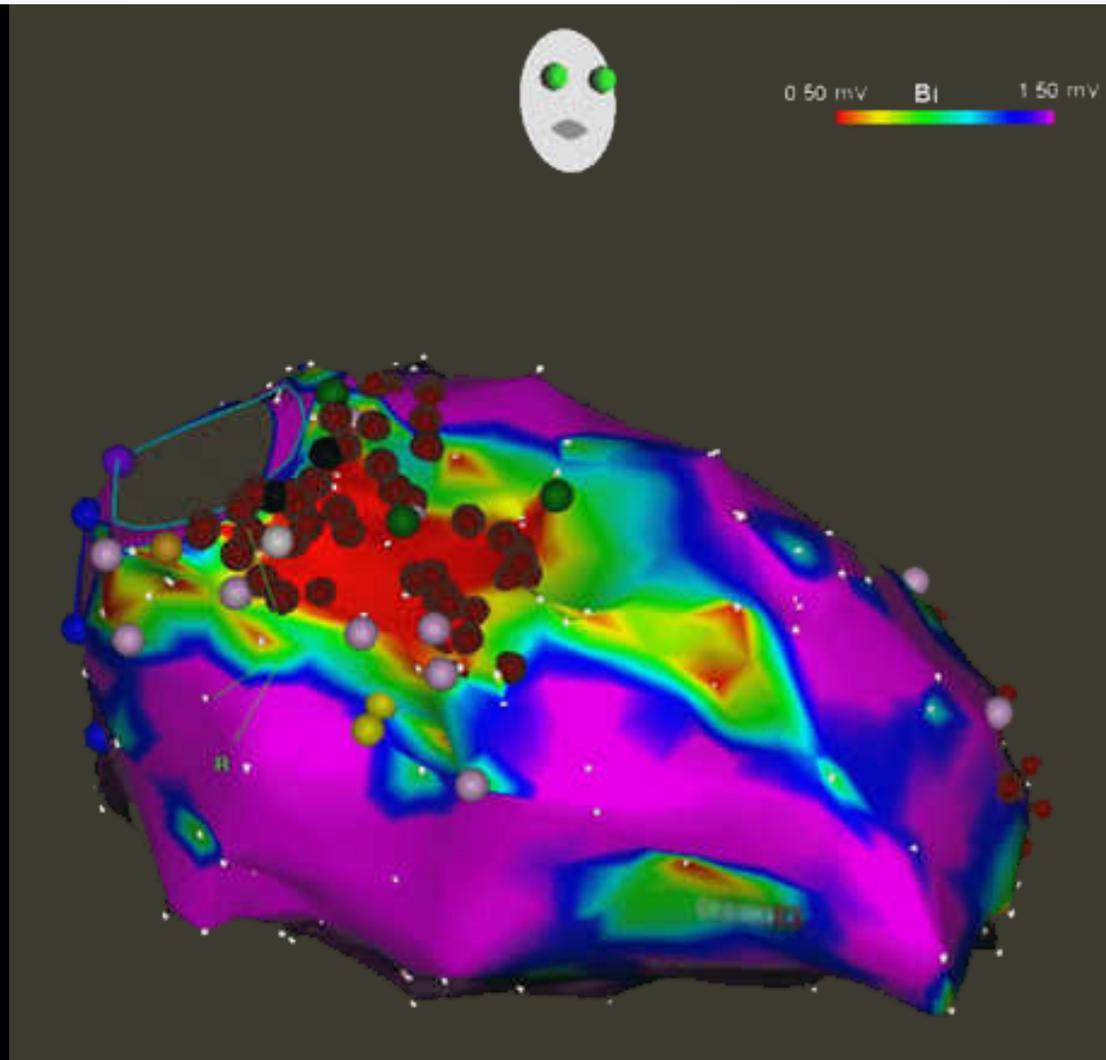
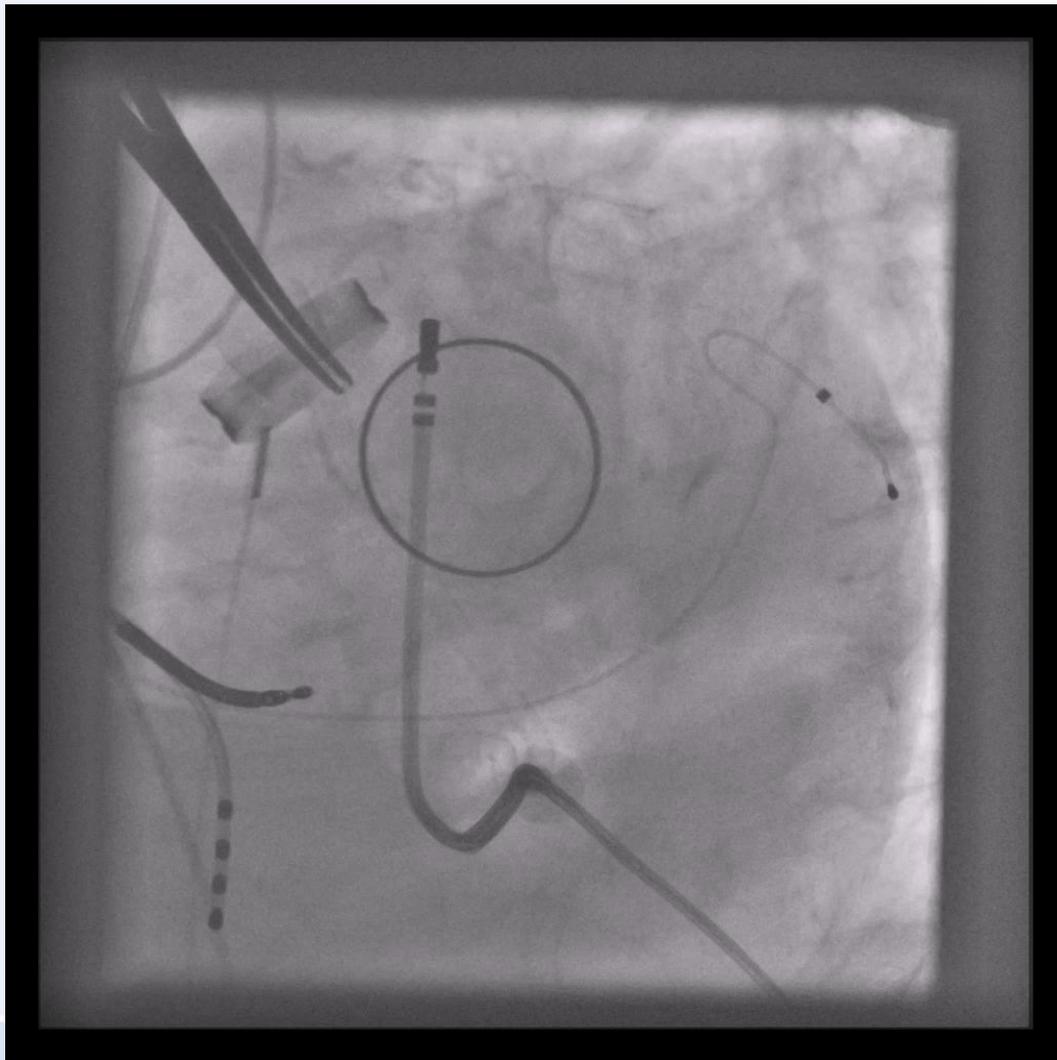


Surgically assisted access

- 73-year-old male after CABG, AVR, MVR
- Recurrent VT despite medical treatment requiring intubation and deep sedation



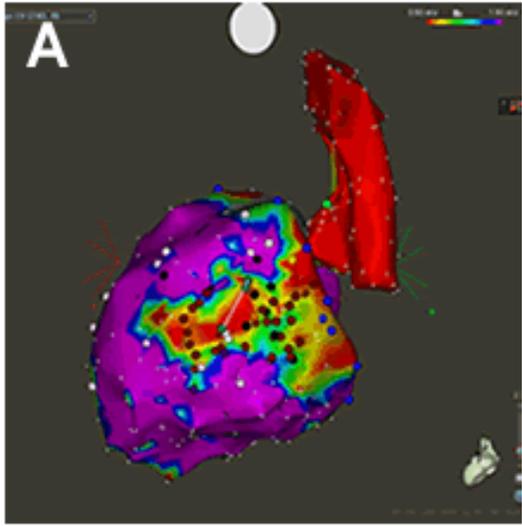
Direct LV access via apical puncture



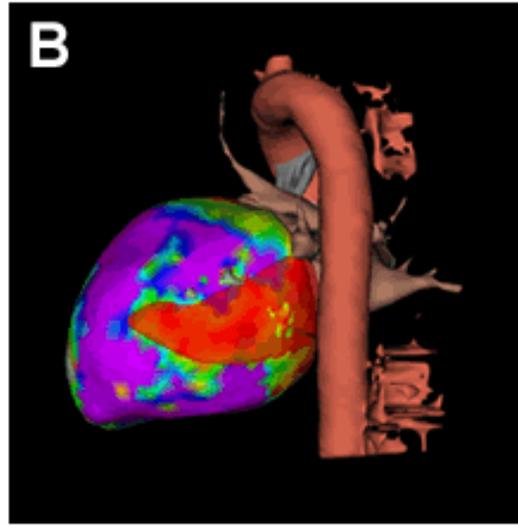
Stereotactic radiotherapy



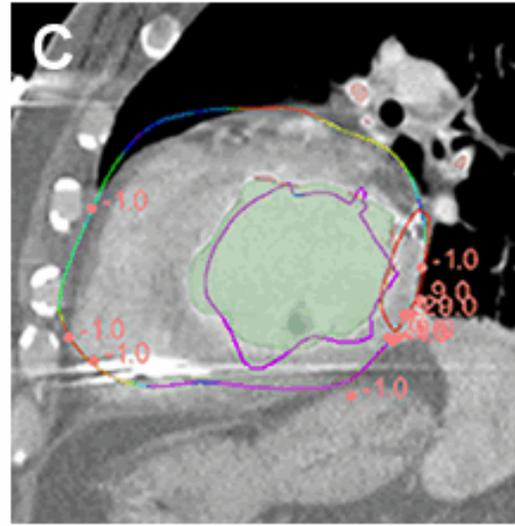
CARTO map with detected VT substrate



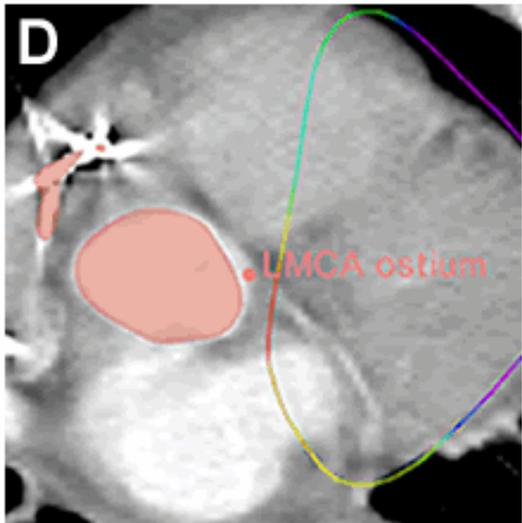
Registered CARTO and CT with highlighted ablation target



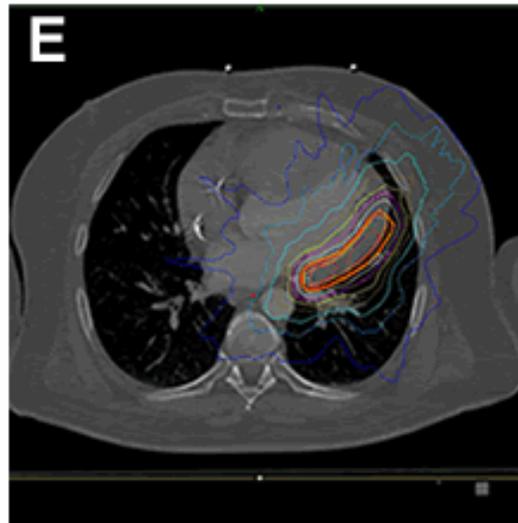
Endo/Epi contours and points of CARTO maps projected on CT



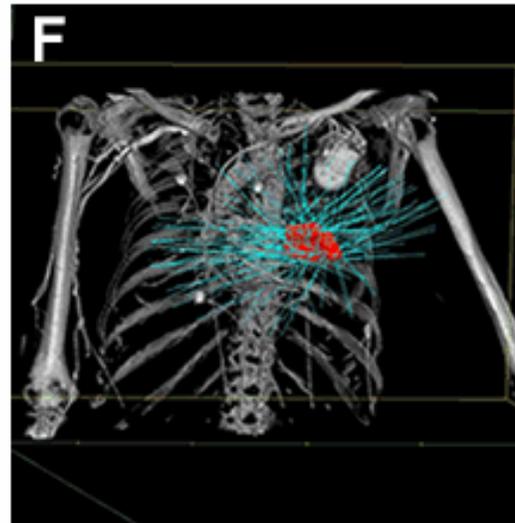
CARTO-detected LMCA tag projected on LMCA ostium on CT



Planned isodose contours around the ablation target

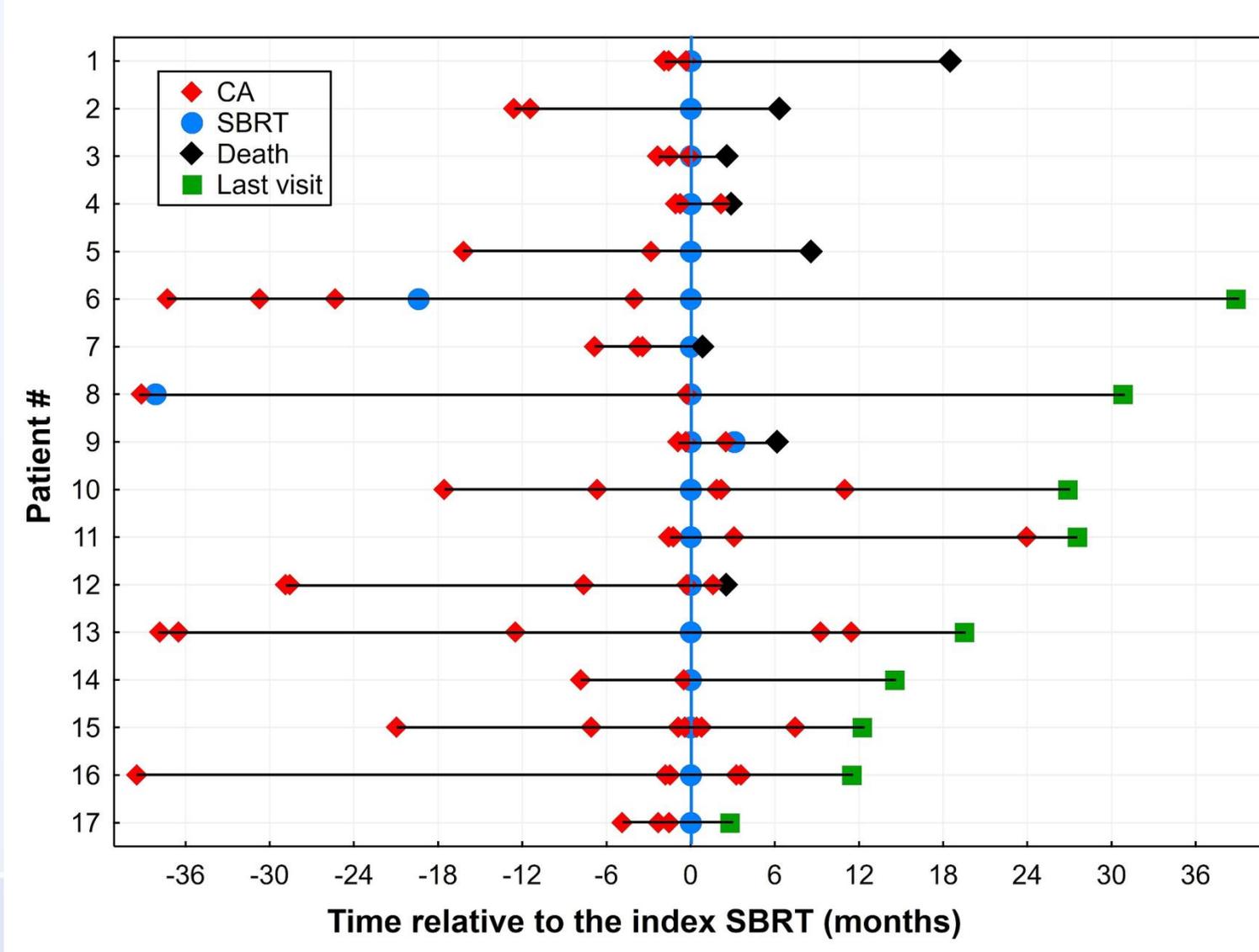


Ablation target with planned radiation beams



Direct co-registration of target volume as determined during mapping with CT scan using free, open-source software (slicer.org)

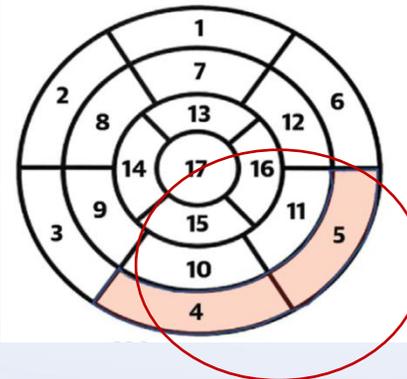
Efficacy on individual level n=36pts



Effect of STAR on mitral valve

8/36pts (25%) had progression of MiR

Irradiated Region	Segments	Risk (%)	Irradiated Region	Risk (%)	P Value
	Risk of Significant Mitral Valve Regurgitation (n = 32)				
Basal segments	# 1-6	7/19 (37)	Rest of segments	1/13 (8)	0.07
Basal inferior segments	# 3-5	6/12 (50)	Rest of segments	2/20 (10)	0.02
Basal inferolateral segments	# 4-5	6/10 (60)	Rest of segments	2/22 (10)	0.005
Risk of Significant Mitral Valve Regurgitation Requiring Valve Intervention (n = 32)					
Basal segments	# 1-6	3/19 (16)	Rest of segments	0/13 (0)	0.20
Basal inferior segments	# 3-5	3/12 (25)	Rest of segments	0/20 (0)	0.04
Basal inferolateral segments	# 4-5	3/10 (30)	Rest of segments	0/22 (0)	0.02



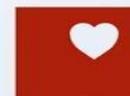
STAR at segment #4 or #5 (10 patients)

- Progression of mitral regurgitation (50%)
- Mitral valve intervention (30%)
- Esophago-pericardial fistula (10%)

Alternative energy sources / large foot-print catheters



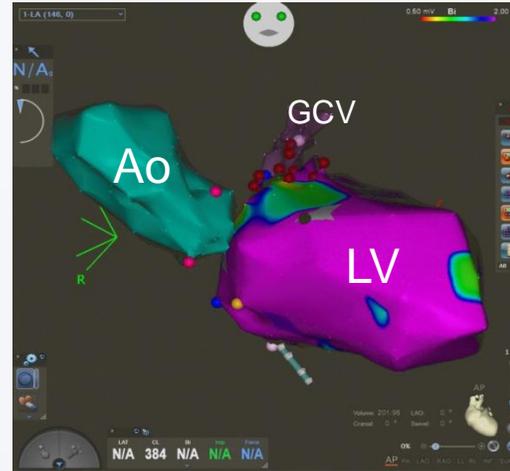
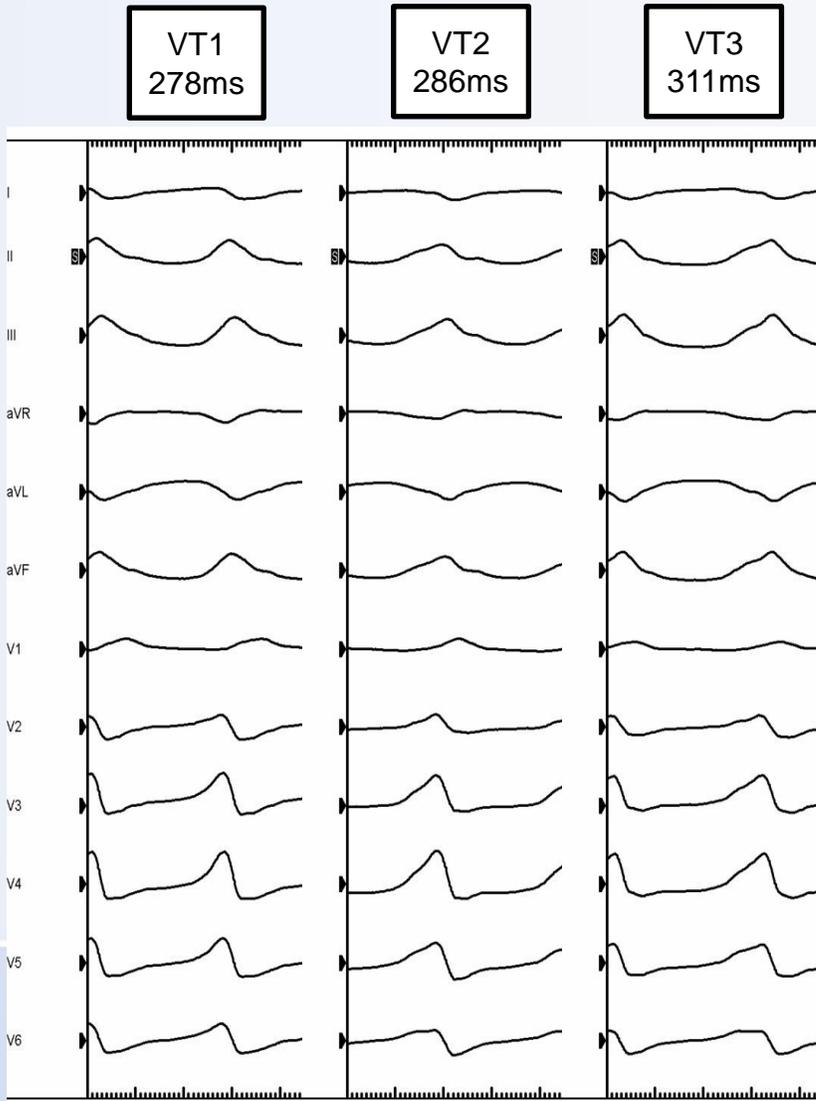
INSTITUT KLINICKÉ A EXPERIMENTÁLNÍ MEDICÍNY
KLINIKA KARDIOLOGIE



IKE
M

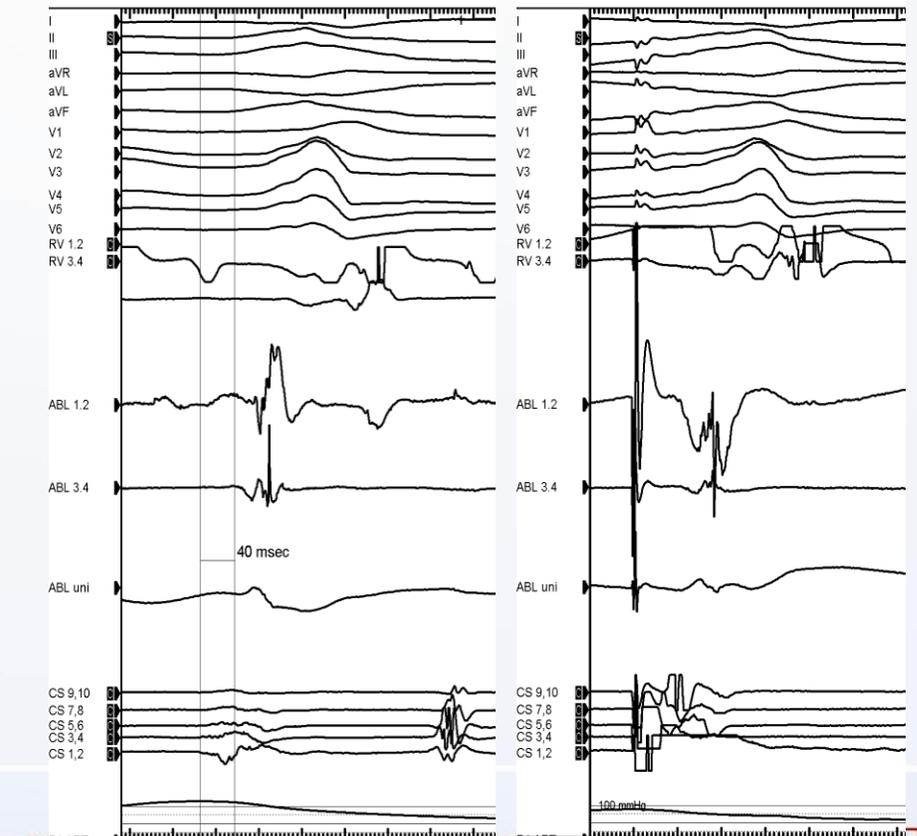
Illustrative case CENTAURI

Localized PF application in CS for summit VT



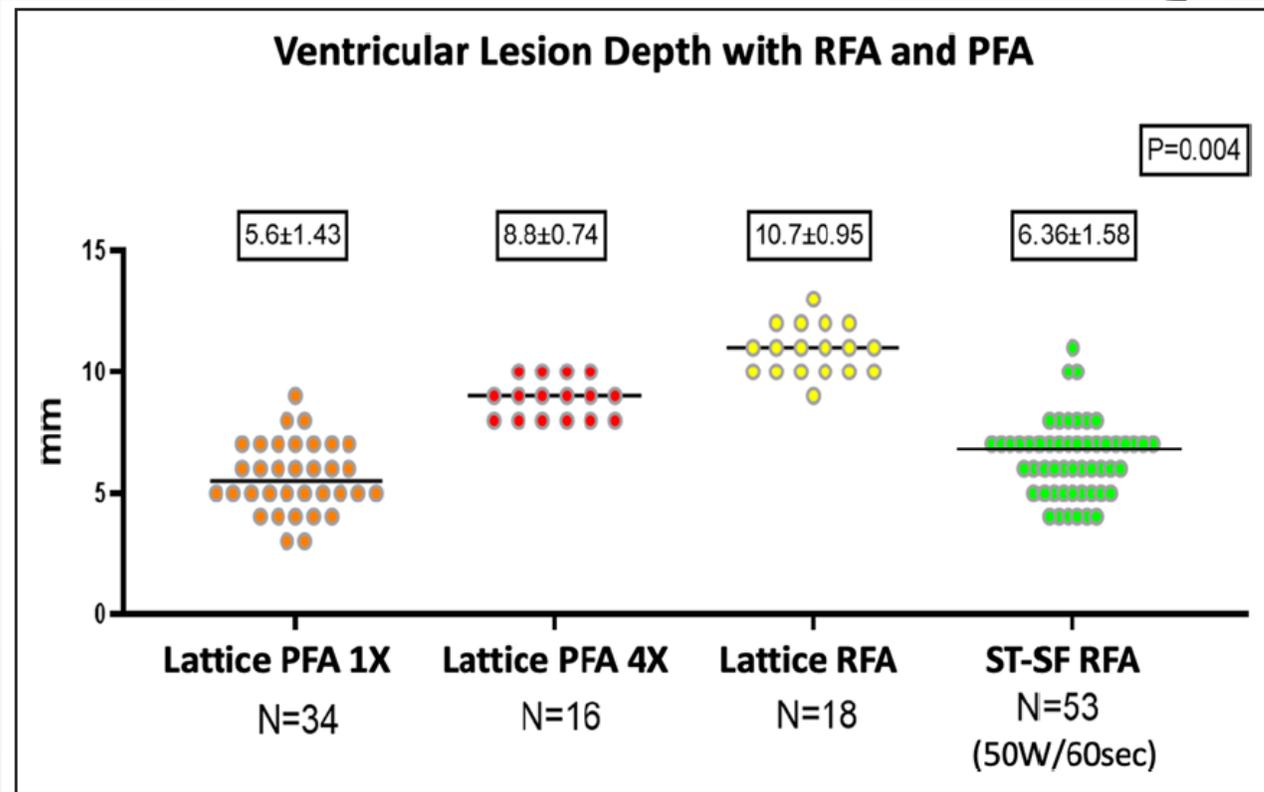
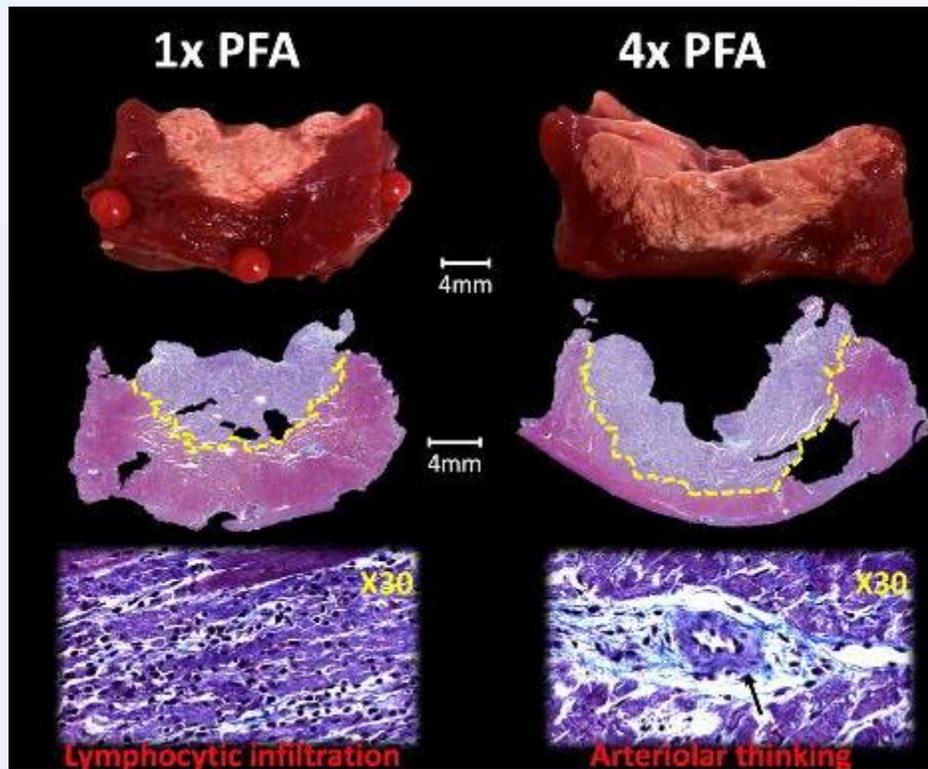
Prematurity GCV vs LVendo

Pacing from GCV



Large foot-print catheters

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.

VA ablation using large-tip catheter

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%

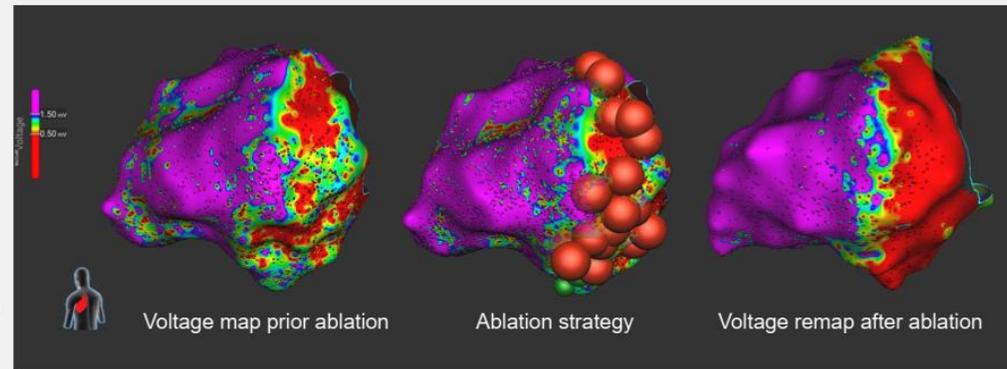
Mapping time

18.7 ± 6.6 min for LV with 4581 ± 2095 pts

Ablation

Rapid substrate modification with 12 ± 7 RF and 8 ± 9 PF applications per pt

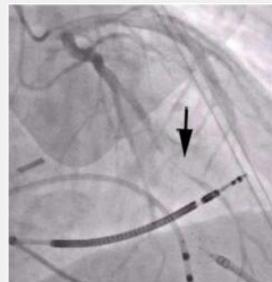
Results



Methods

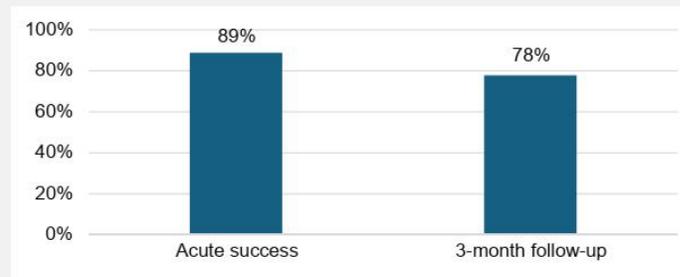
Use of “large footprint” lattice-tip focal catheter enabling: HD mapping and dual-energy ablation (RF & PF)

Safety issues

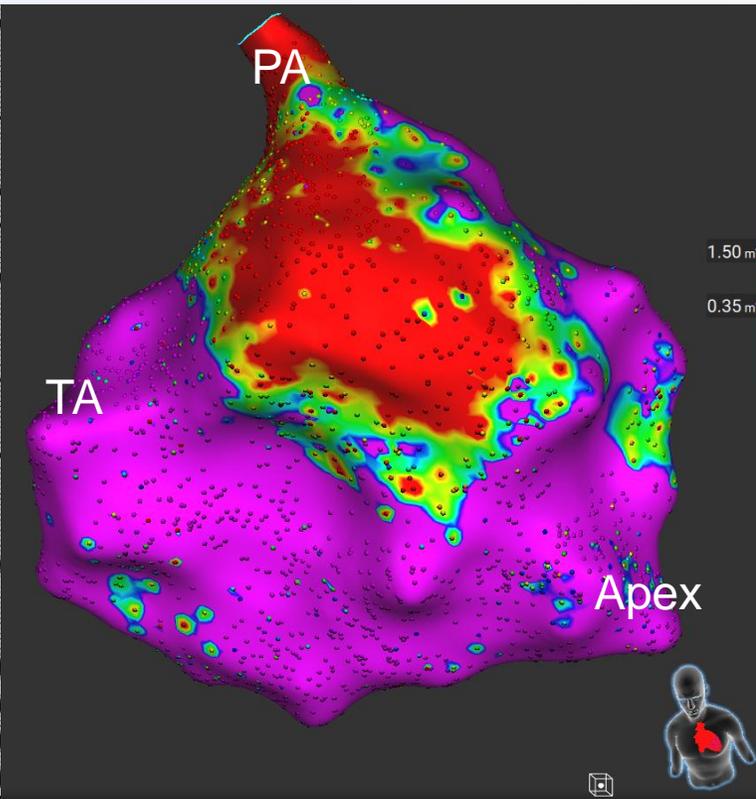
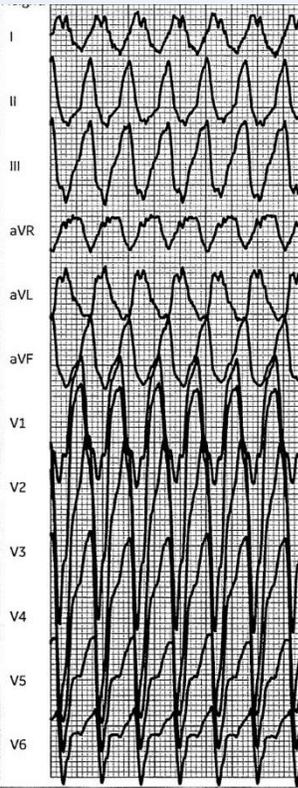


Coronary spasm after epicardial PF ablation resolving after nitrates, but no phrenic nerve pulsus

VT ablation outcome



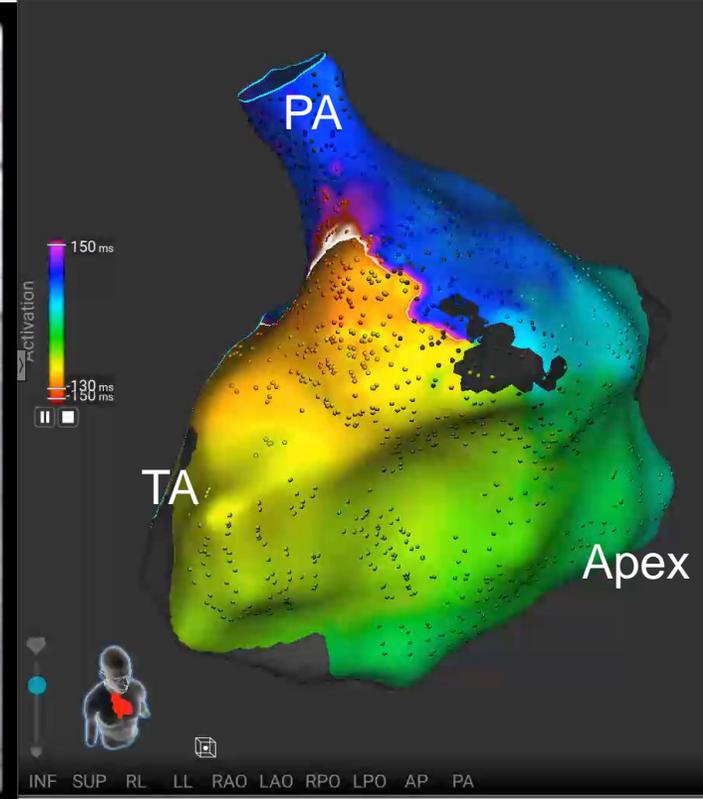
GUCHD pt with VT after previously failed RF ablation (the 3rd procedure)



Voltage map with scar over RVOT

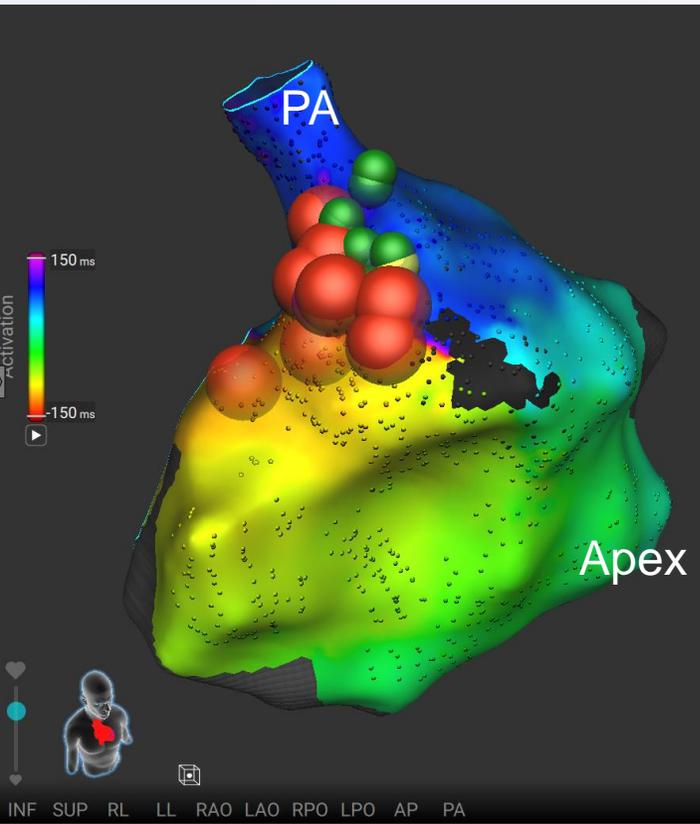


Transcatheter PV valve

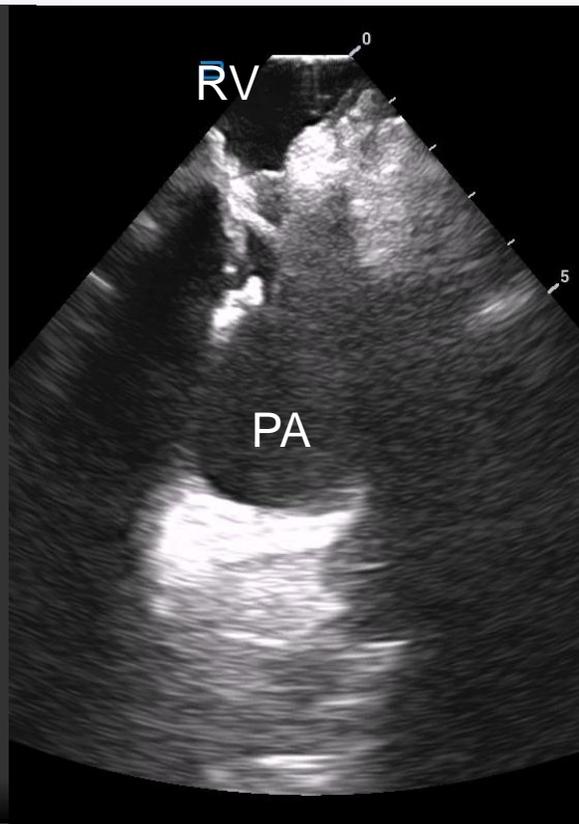


Activation during VT

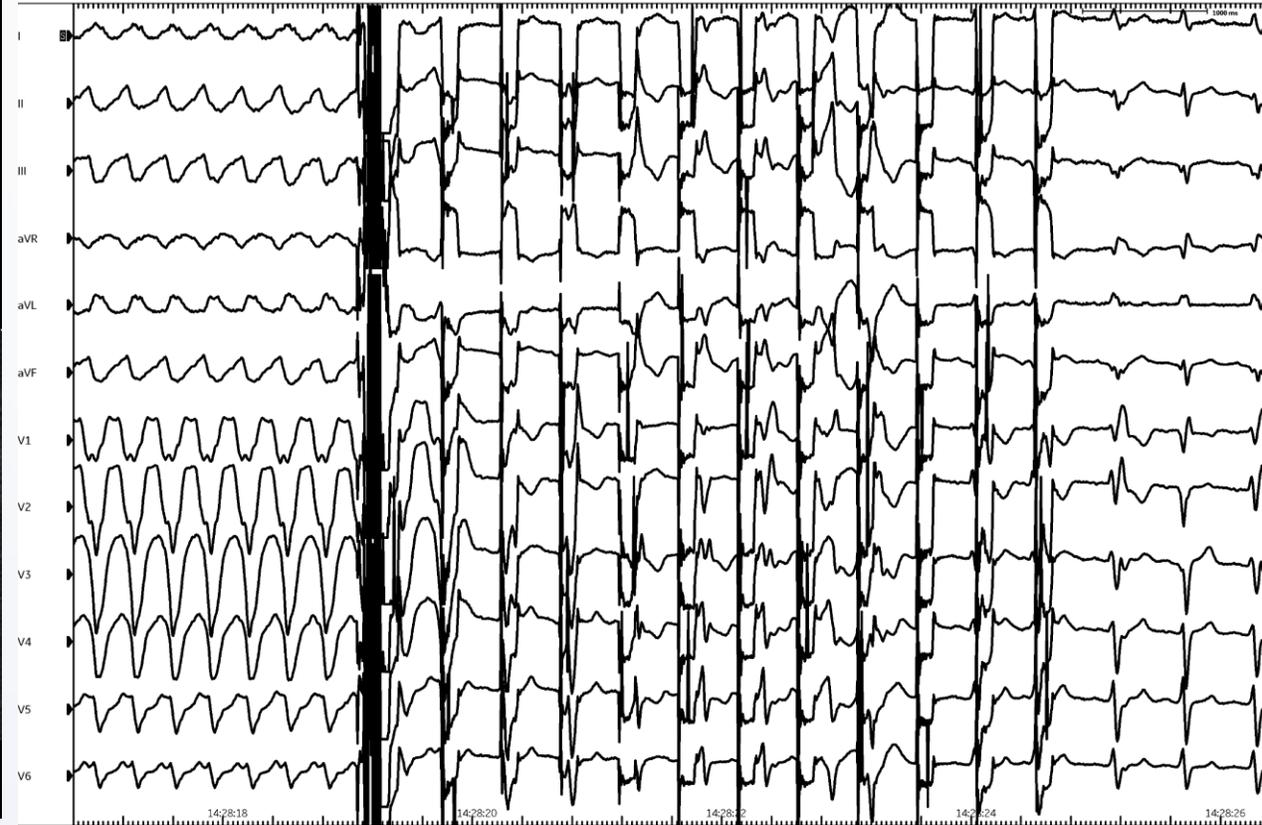
VT termination only after multiple PF+RF lesions



Ablation in the „channel“



Sphere under the TPV

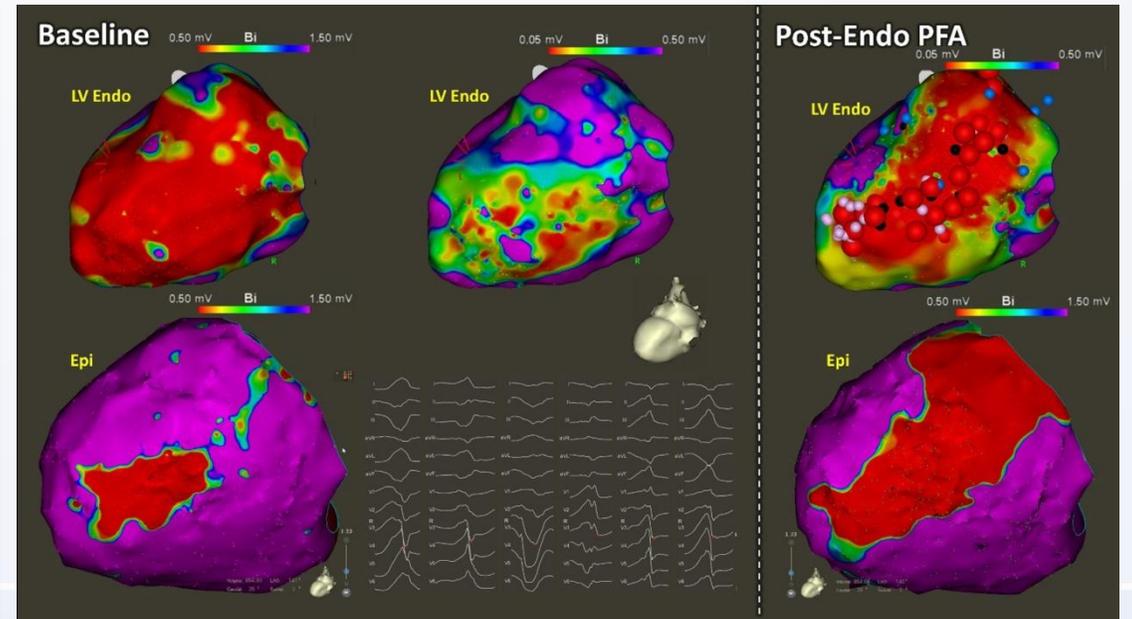
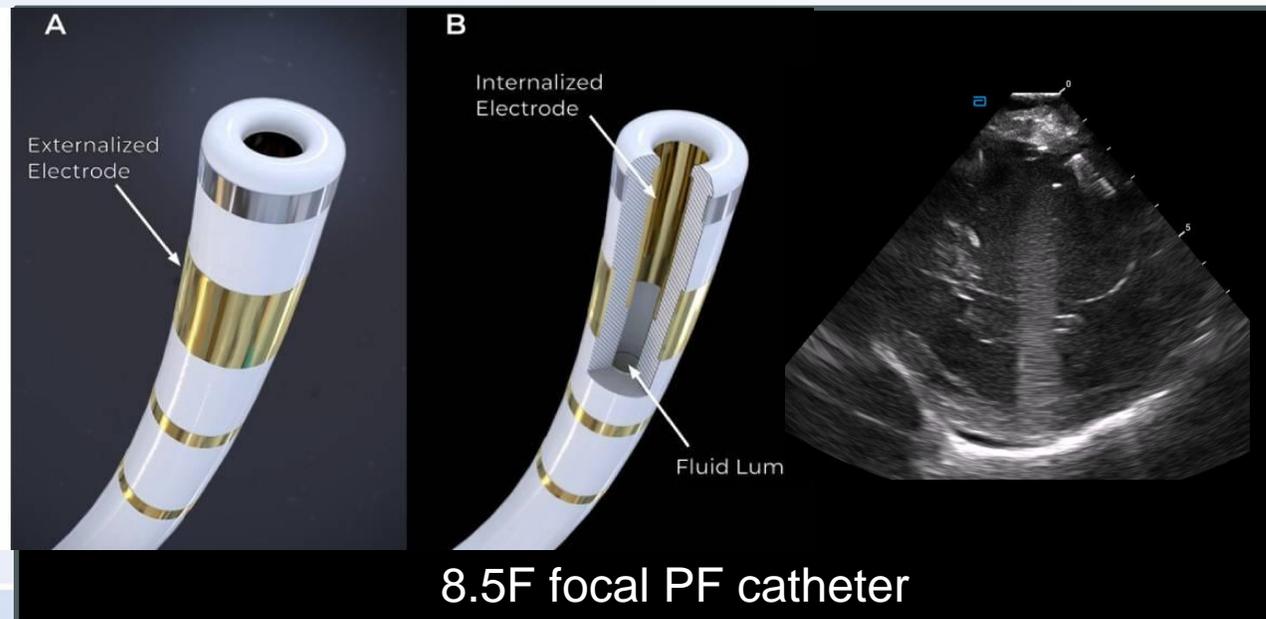


Termination with 3rd PF application

Larger lesions by focal PF catheter

FIELD medical

- 26pts in 2 centres
- Pulsed field ablations using 5 application per delivery with <200ms and 10kV each
- VT ablation required 21[IQR 14-24] lesions/pt, with a transpired ablation time of only 31 min [19-42]
- After ablation, VT free survival was 82%, decrease of VT burden by 98%; 3 SAEs



Conclusions

- Bail out ablation strategies may help in cases of deep, otherwise inaccessible substrate
- Each have specific aspects to consider – none fulfills „one fits all“
- Large footprint/pulsed field enabled catheter seemed to be able to produce large lesions, but more data regarding are required

