

VYUŽITÍ ZOBRAZOVACÍCH METOD PŘI PFA

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LF UP Olomouc

ZSF JU v Českých Budějovicích



FAKULTNÍ NEMOCNICE®
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Lékařská
fakulta
Univerzita Palackého
v Olomouci



KOMPLEXNÍ
KARDIOVASKULÁRNÍ CENTRUM
FAKULTNÍ NEMOCNICE OLOMOUC



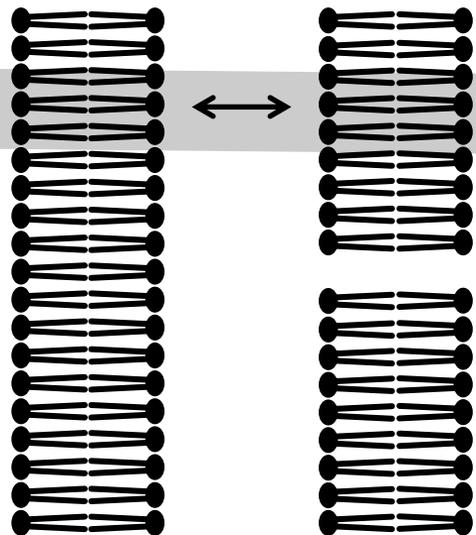
Zdravotně
sociální fakulta
Faculty of Health
and Social Sciences

Jihočeská univerzita
v Českých Budějovicích
University of South Bohemia
in České Budějovice

PFA – nový zdroj energie

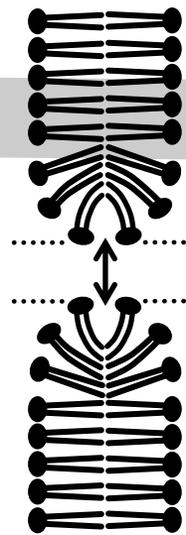
1

Short-lived electrical field



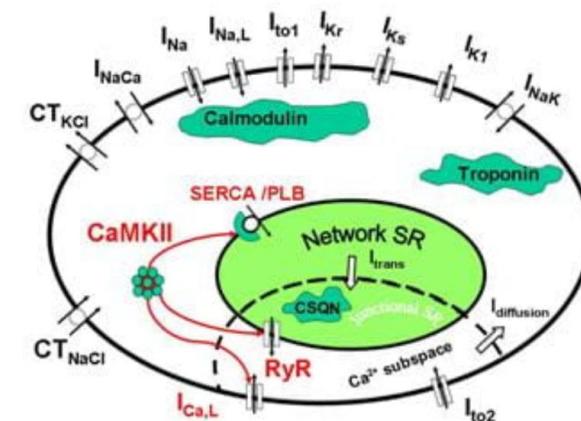
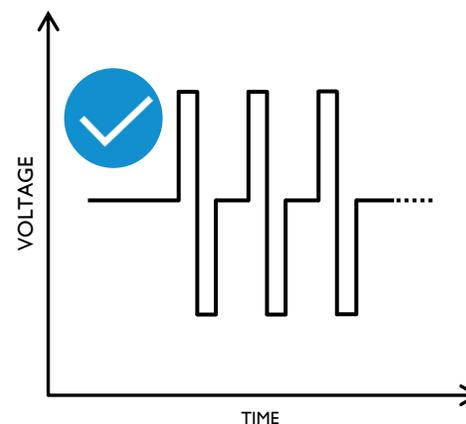
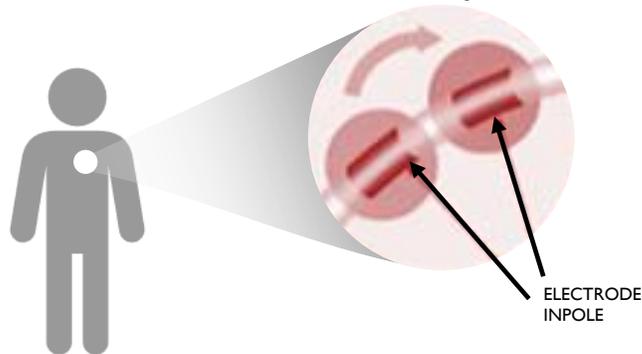
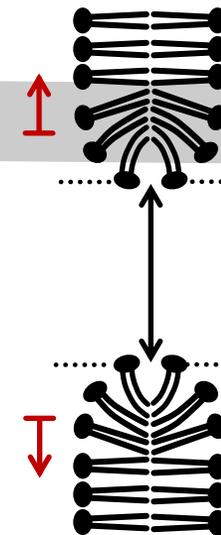
2

Continuous exposition to electrical field



3

Cell destruction



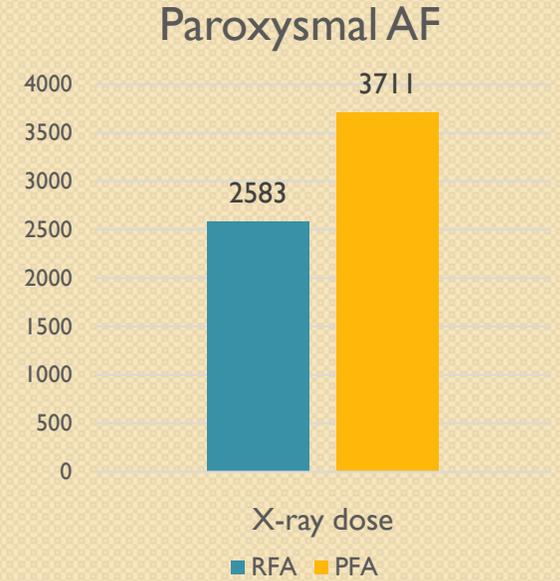
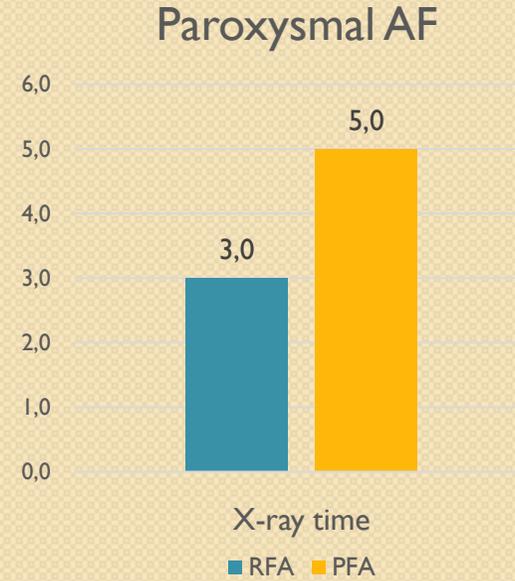
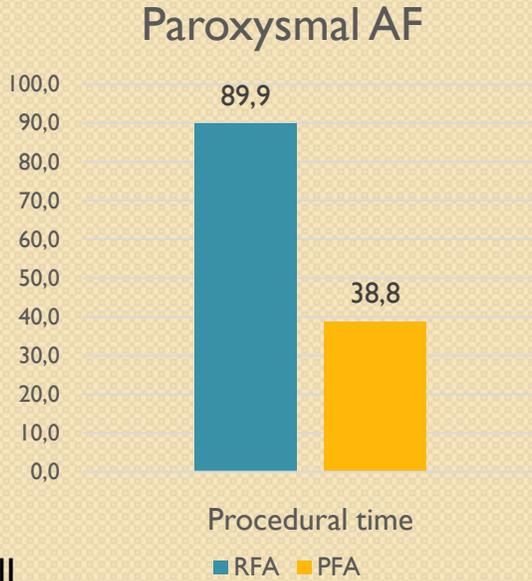
Nové výzvy

- **Kontakt s tkání stále důležitý**, ale ztratili jsme možnost (prozatím) jej spolehlivě měřit
- EAM není potřeba, **jsme zpět u skiaskopické navigace** (vyšší skia dávky)
- Výkony dominantně **v CA**, analgosedace nestačí
- Krátké výkony, nutnost **lepší organizace práce** na sále

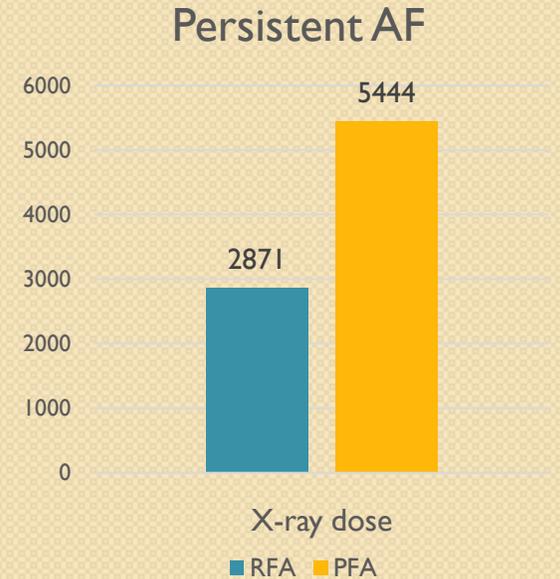
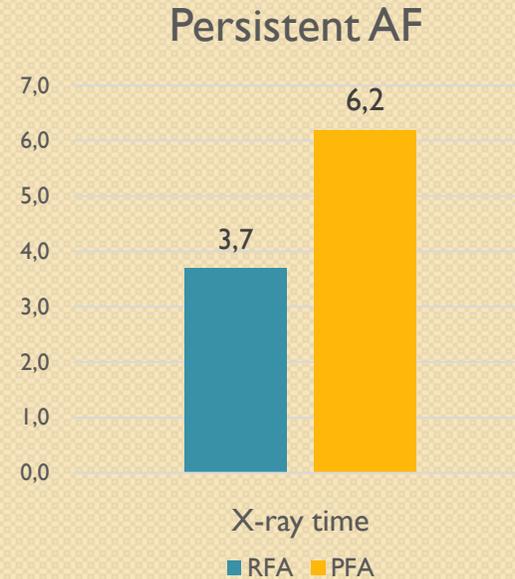
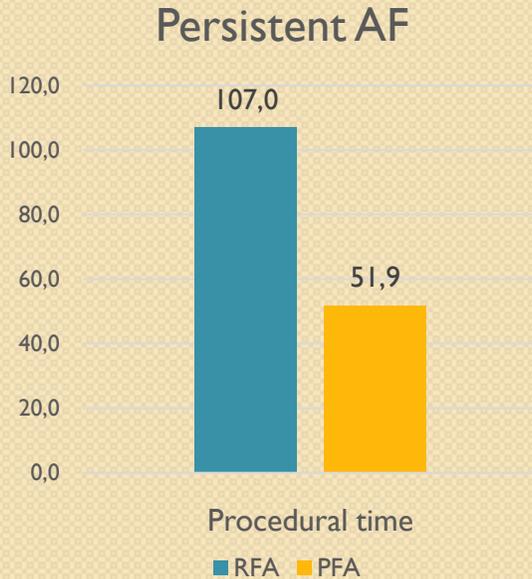
Data z NCB – zkrácení proc. času, zvýšení skia

N (RFA/PFA) 199/210 pts
8/2021-8/2022 / 2023

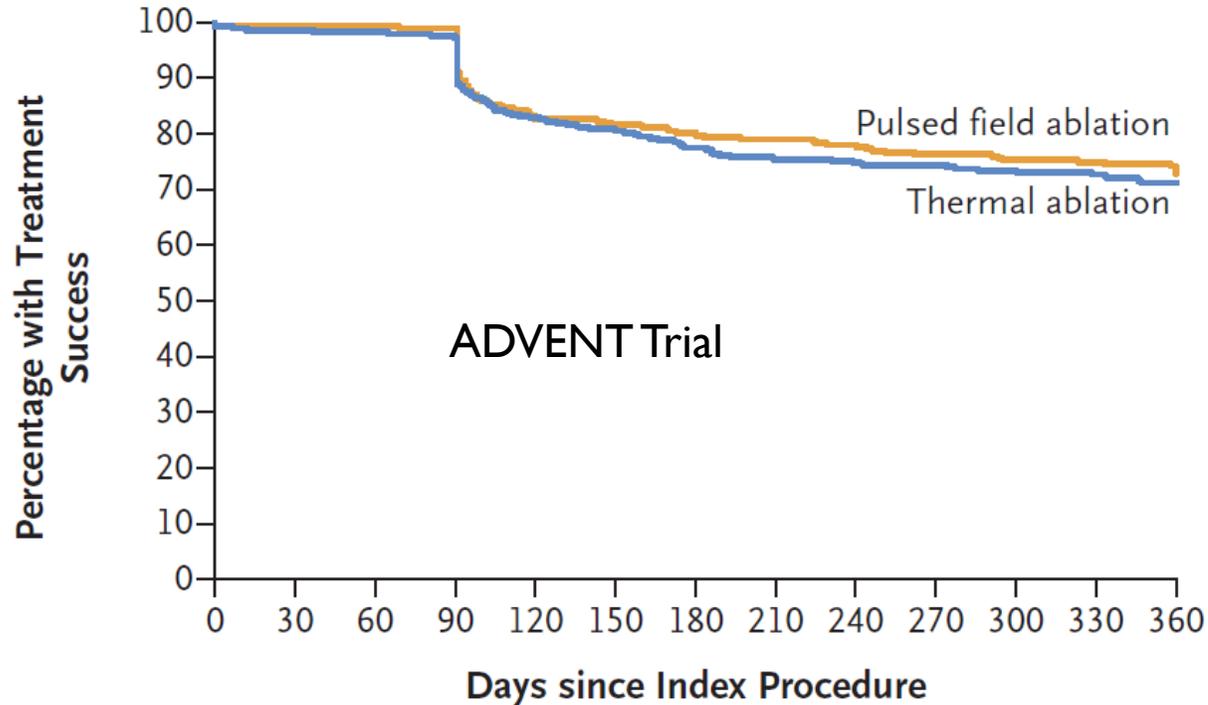
P < 0.001 for all



N (RFA/PFA) 144/312 pts
8/2021-8/2022 / 2023



Dostáváme se někam dál? (MF)



73% vs. 71%!!!

No. at Risk

Pulsed field ablation	301	298	238	228	176
Thermal ablation	296	292	228	219	150

Treatment Success (%)

Pulsed field ablation	99.3	99.0	79.7	76.4	73.1
Thermal ablation	98.7	97.3	77.5	74.5	71.3

Naše data z NCB

ICE/TEE vedené procedury!

První PFA pro paroxysmální FiS, jen PVI

Rekurence FiS/AT

17%

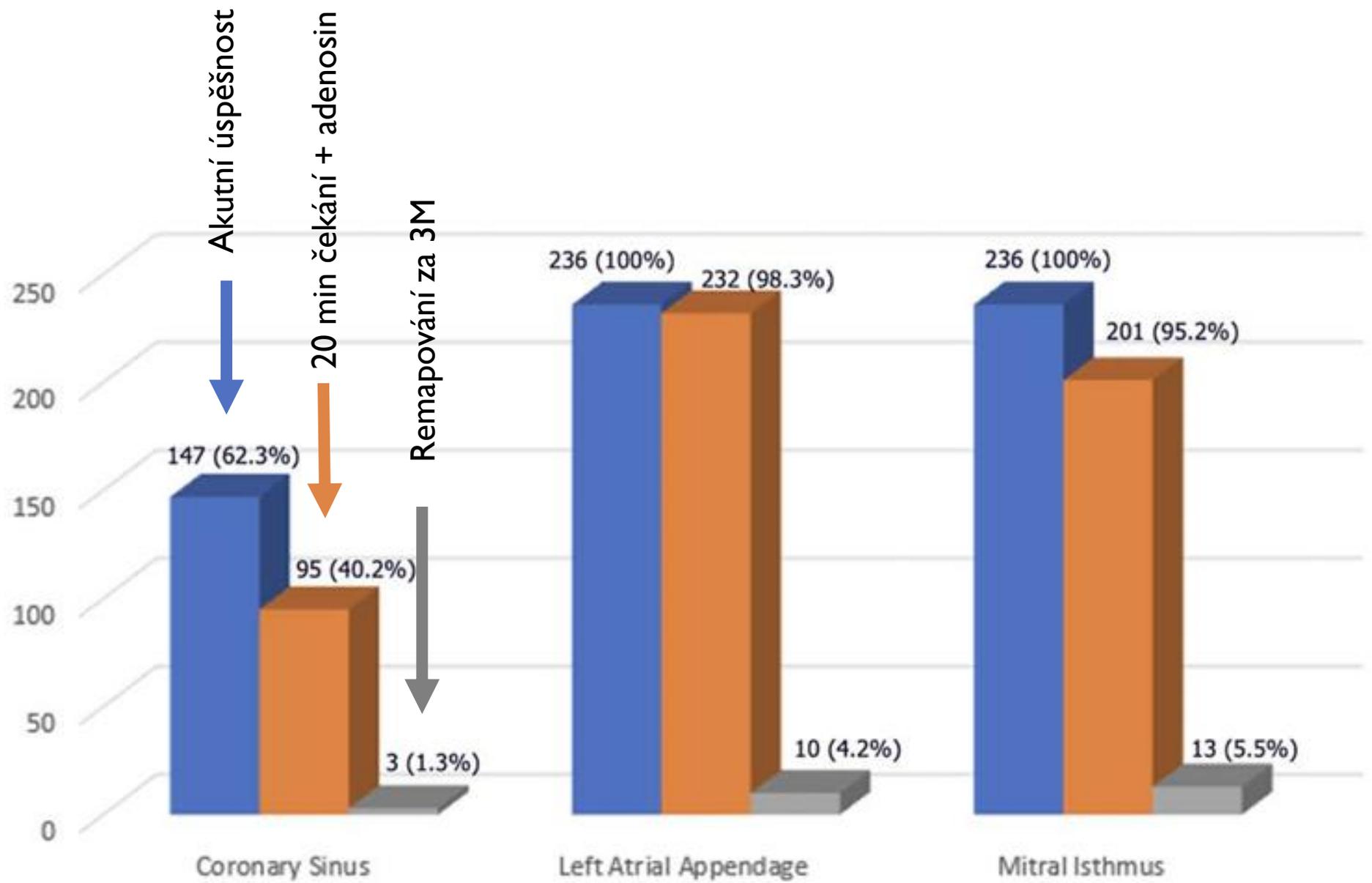
12M sledování 294 pacientů

Věk 64±6 let

2x 7D EKG Holter + EKG při symptomech

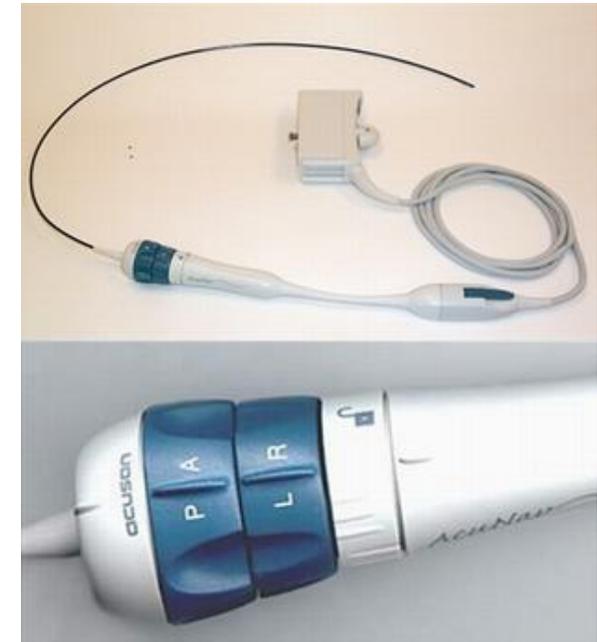
Bez recidivy FiS

83%



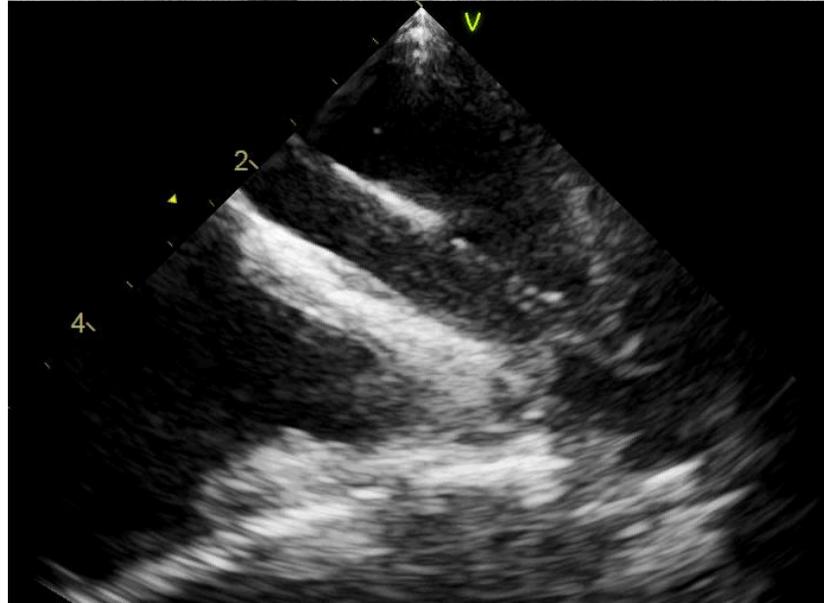
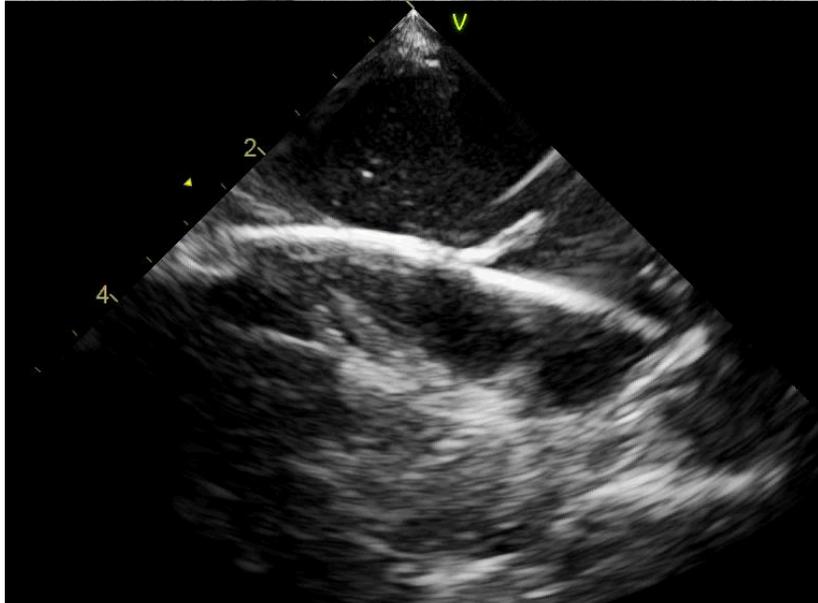
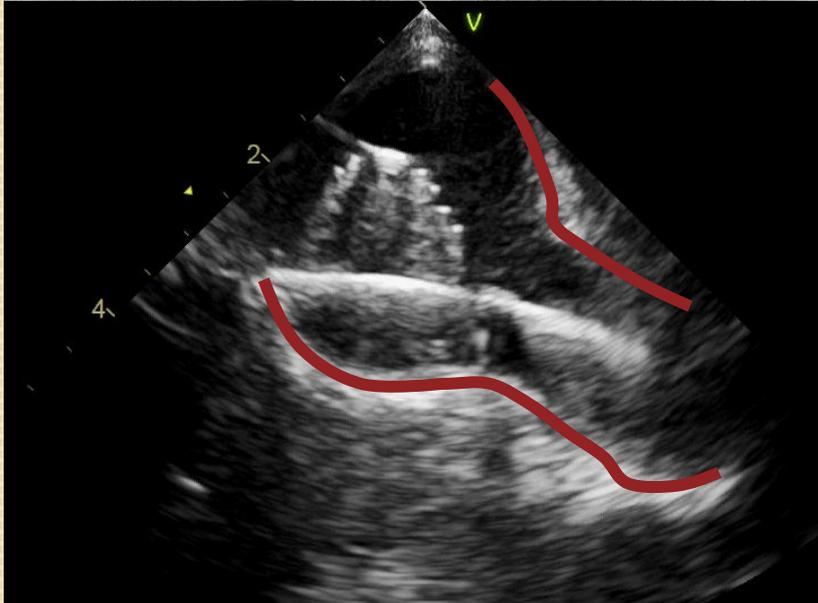
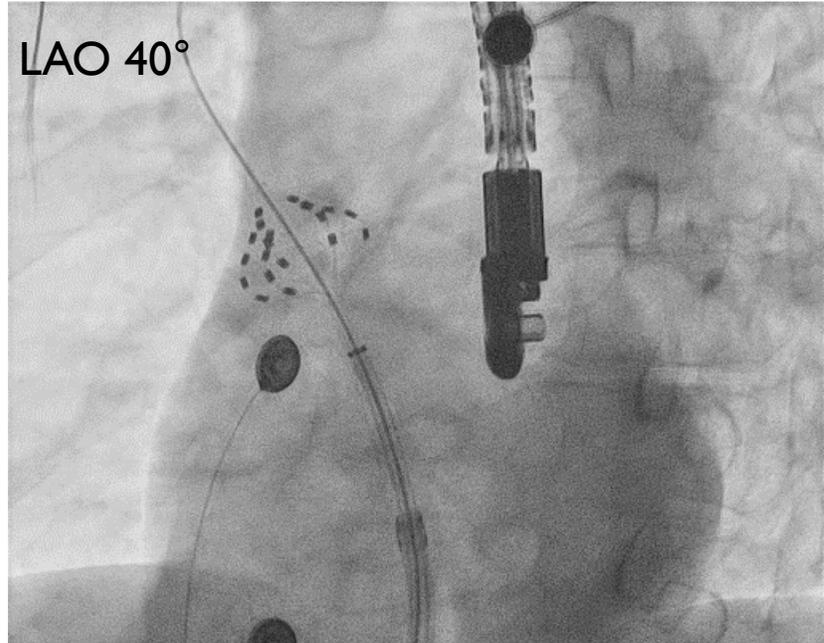
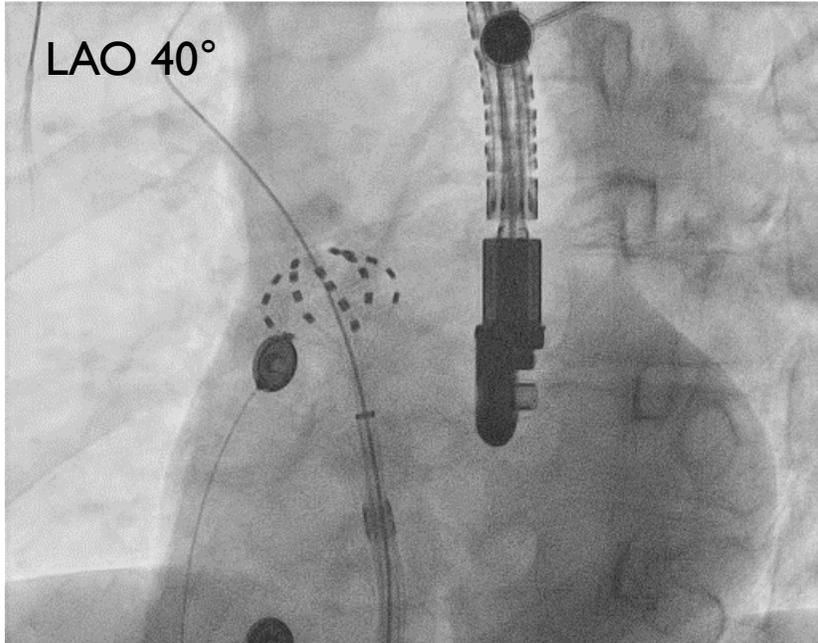
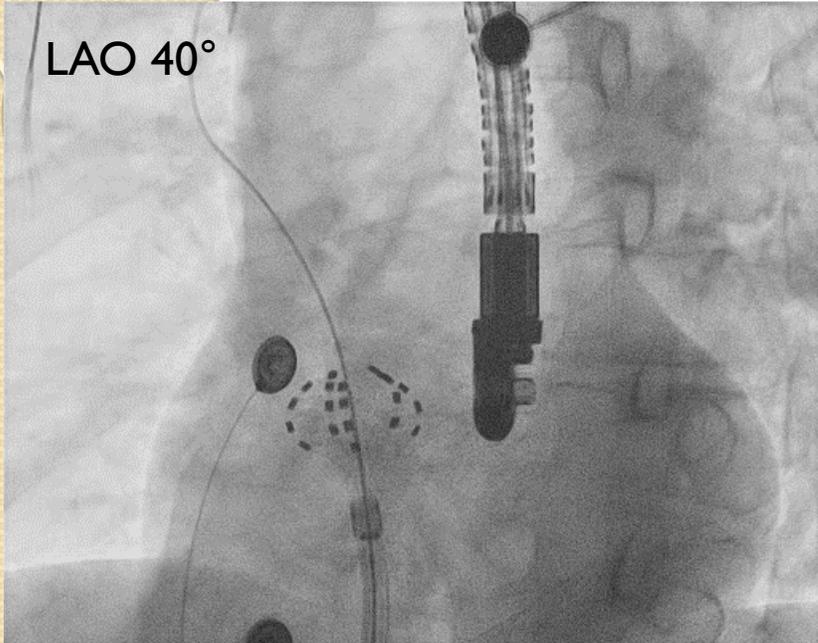
ICE imaging je drahý, pokud...

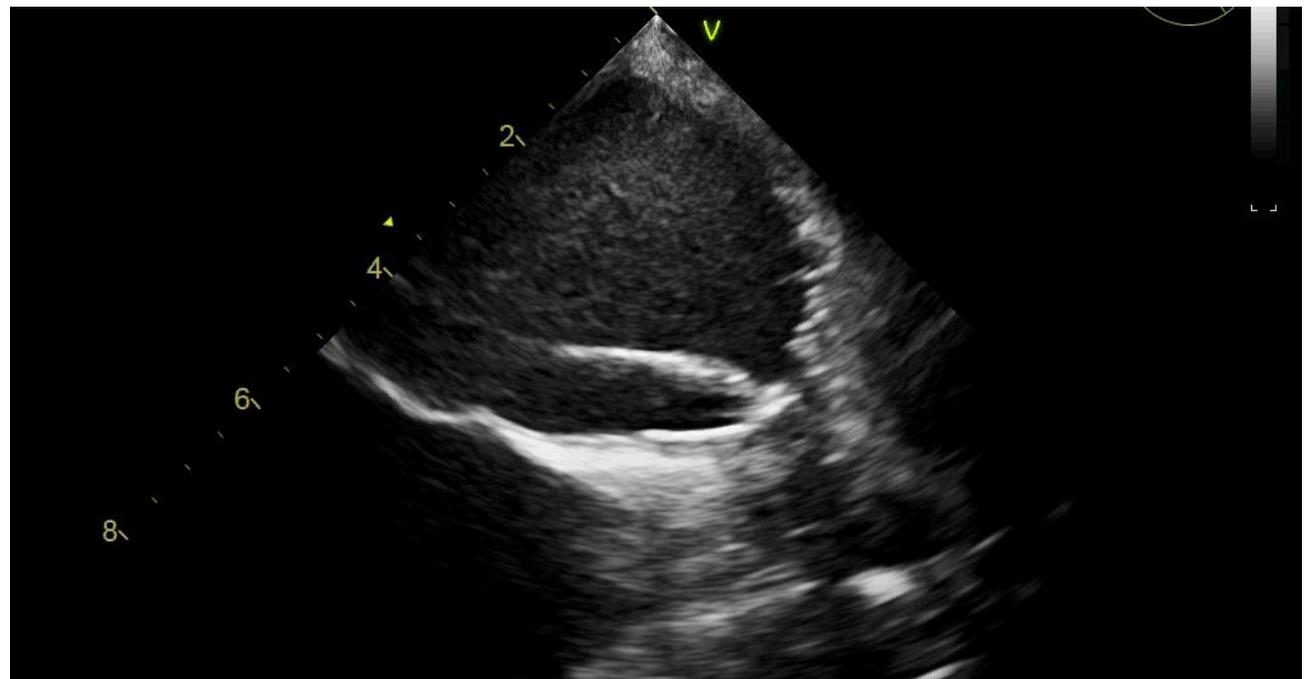
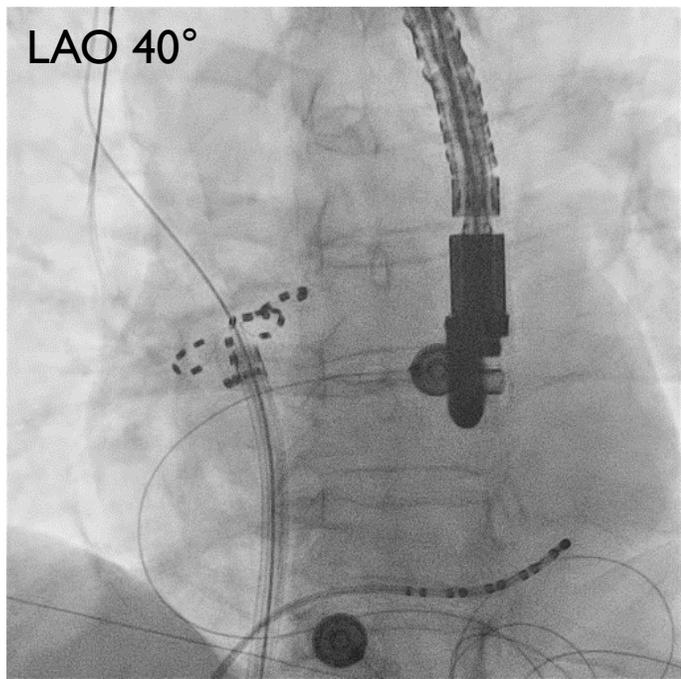
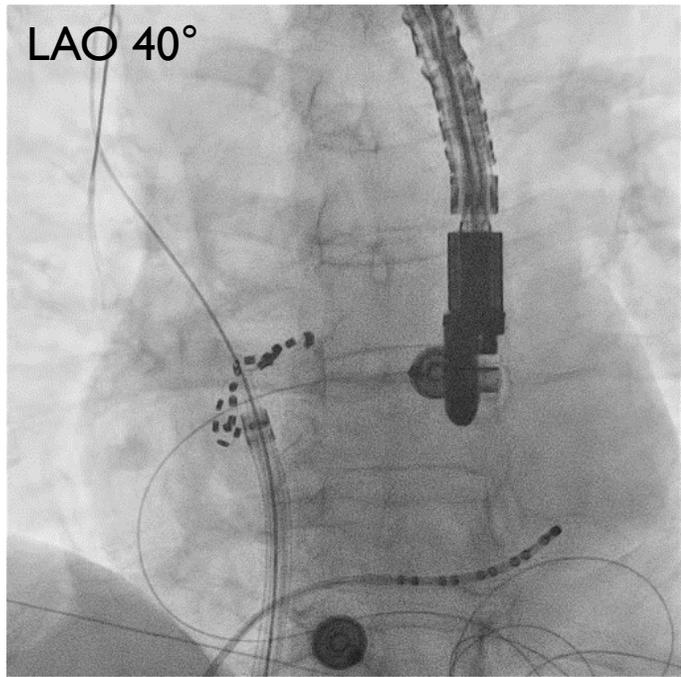
Device	Company	Description
ACUSON AcuNav Volume ICE Catheter	Siemens Healthineers	Side-looking, 64-element phased-array, 4 planes steerability, 8F and 10F, grayscale, color Doppler, tissue Doppler, compatible with ACUSON SC2000 PRIME Ultrasound System
ViewFlex Xtra ICE Catheter	Abbott Vascular	Side-looking, 64-element phased-array, 4 planes steerability, 8F, compatible with the ViewMate Z and ViewMate II ultrasound consoles
CartoSound	Biosense Webster	Side-looking, 64-element phased-array, 4 planes steerability 10F device with integrated ultrasound array with the CARTO magnetic sensors in the tip, which permits integration of ICE and 3D electroanatomical maps
Foresight system ICE	Conavi Medical	Forward-looking ICE, provides color Doppler, pulsed wave Doppler, 2-D and 3-D measurements and electrocardiogram-gated 3D image acquisition



TEE imaging







KOMPLEXNÍ ABLACE

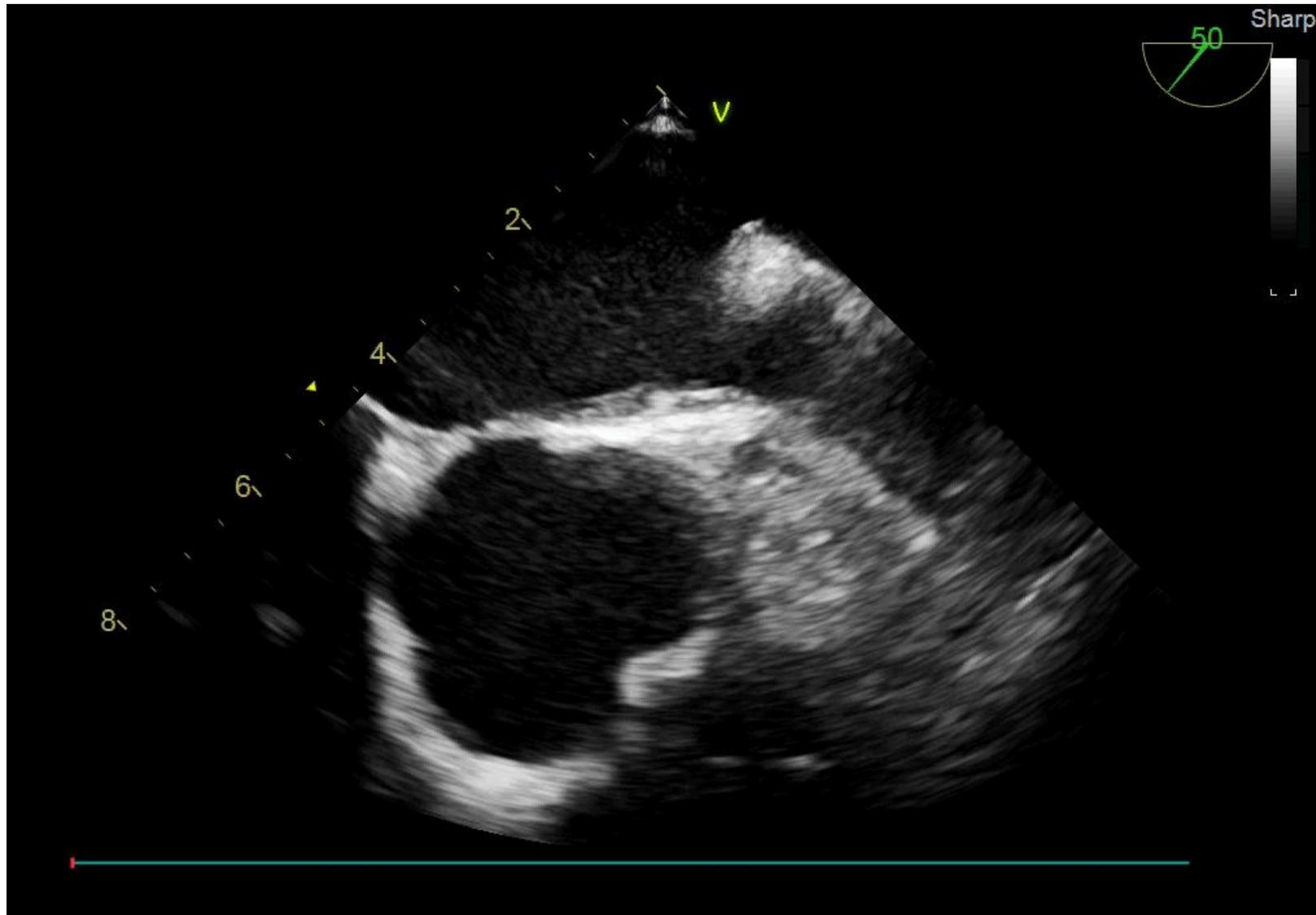
PVI

BOX

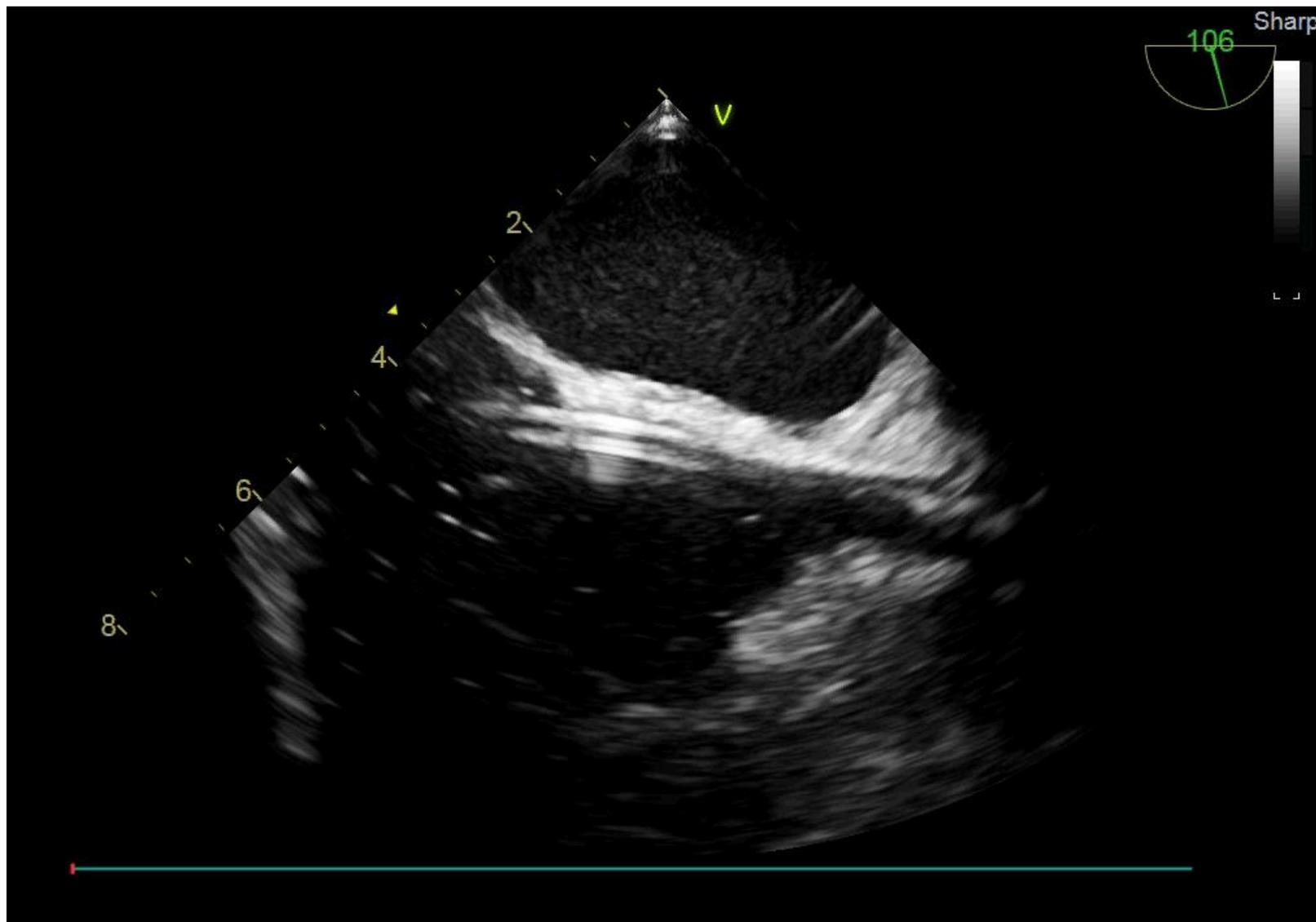
MI

CTI

Vyloučení trombu v LAA



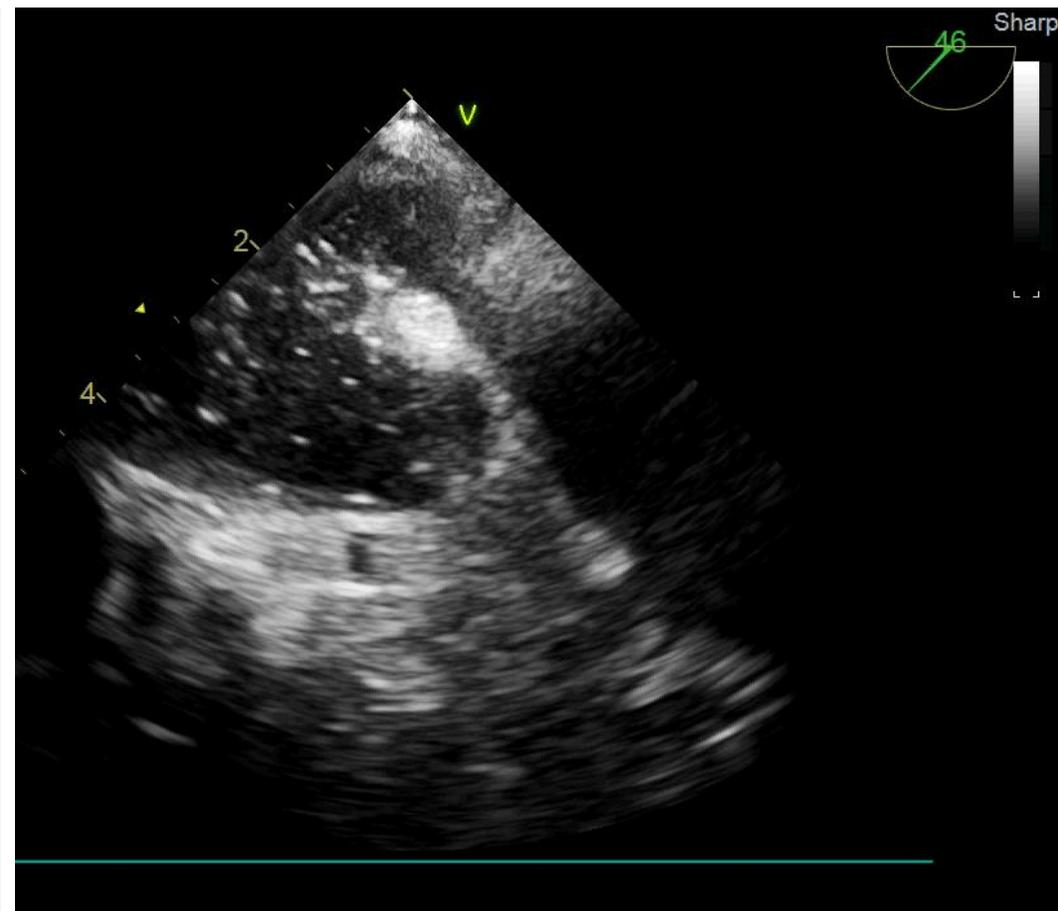
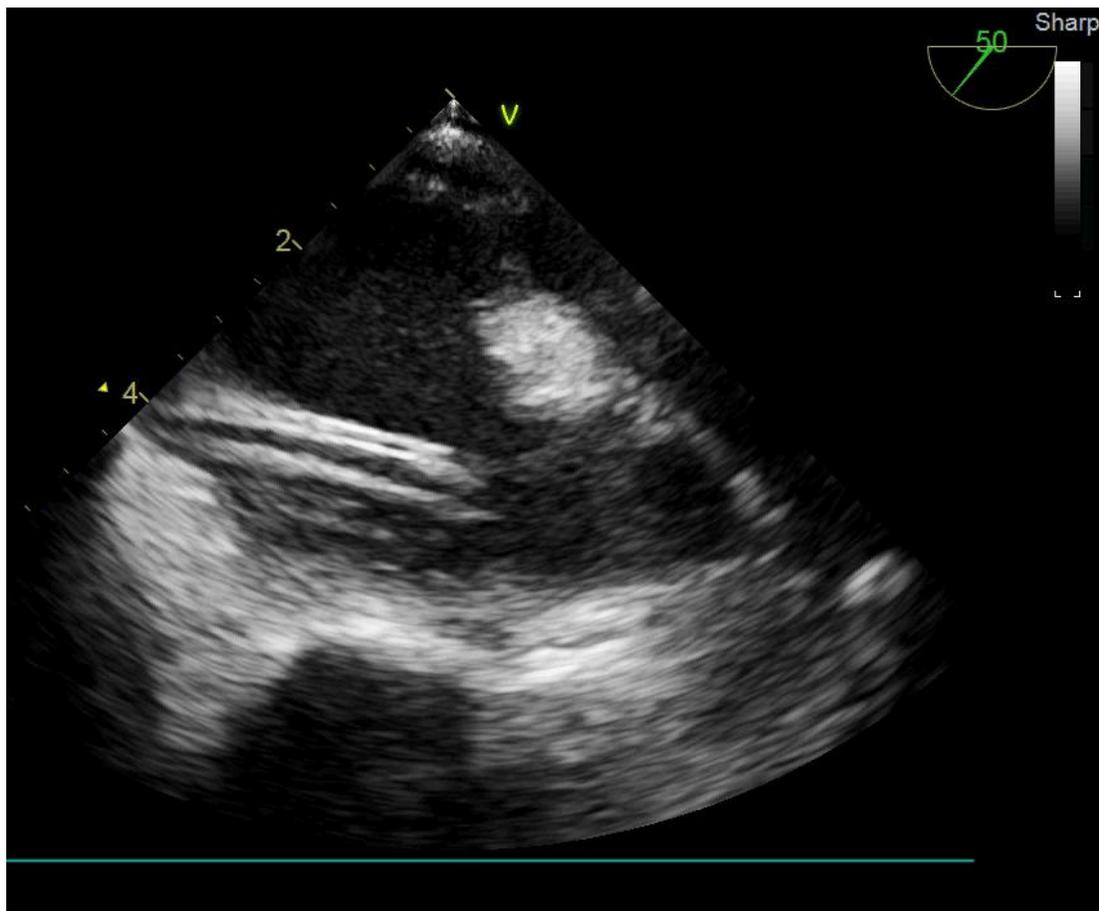
TS punkce



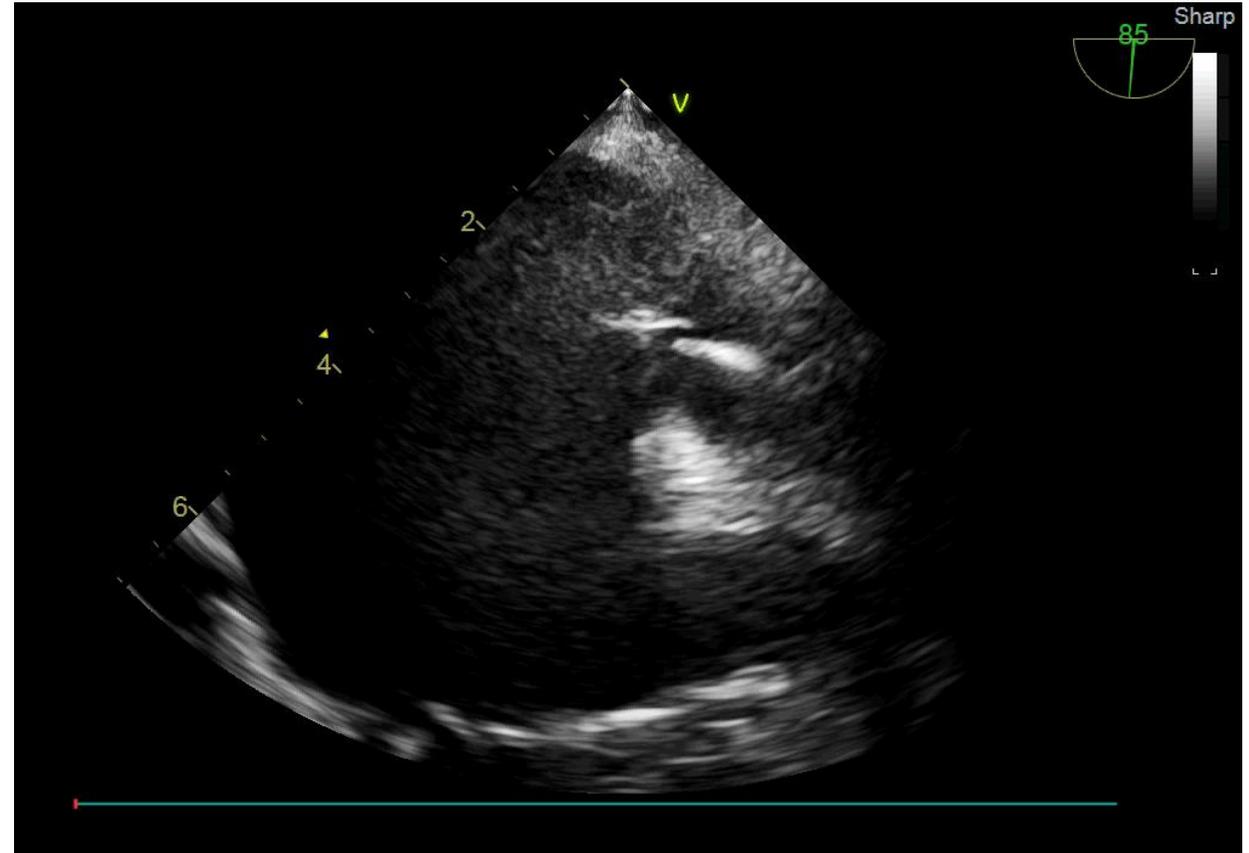
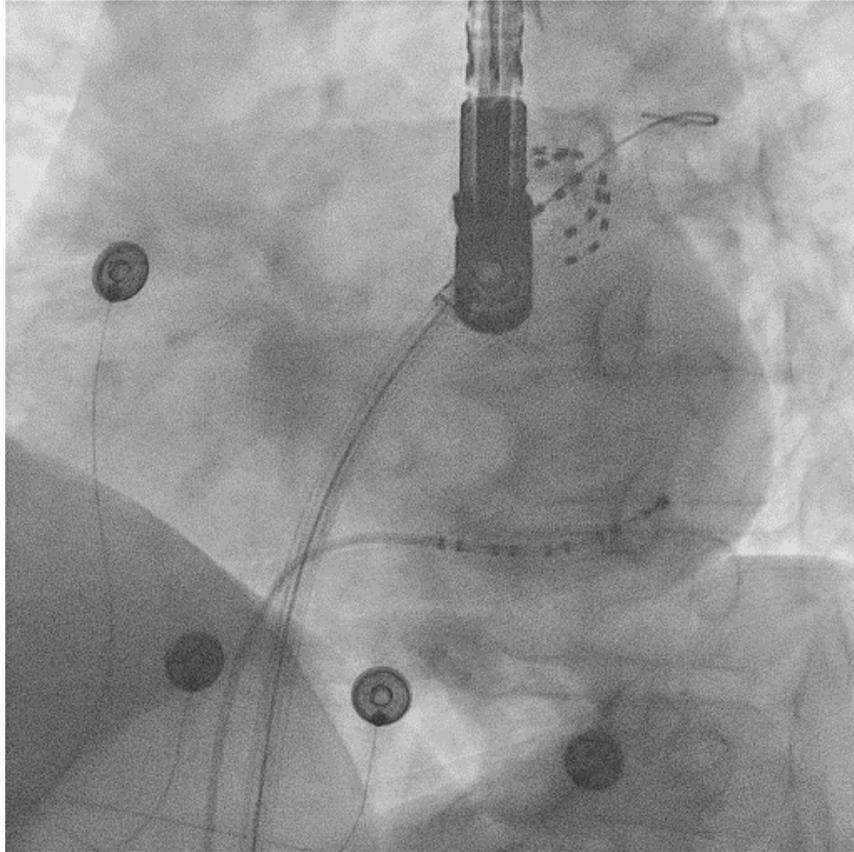
TS punkce



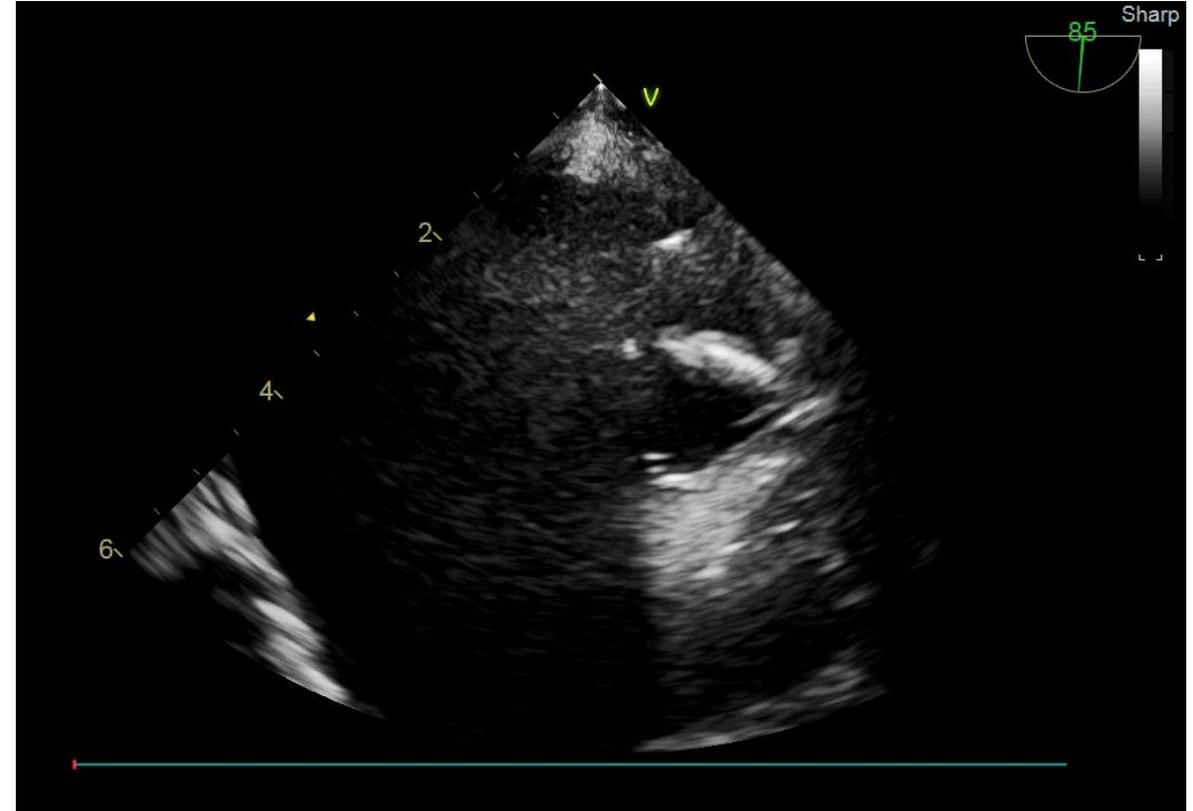
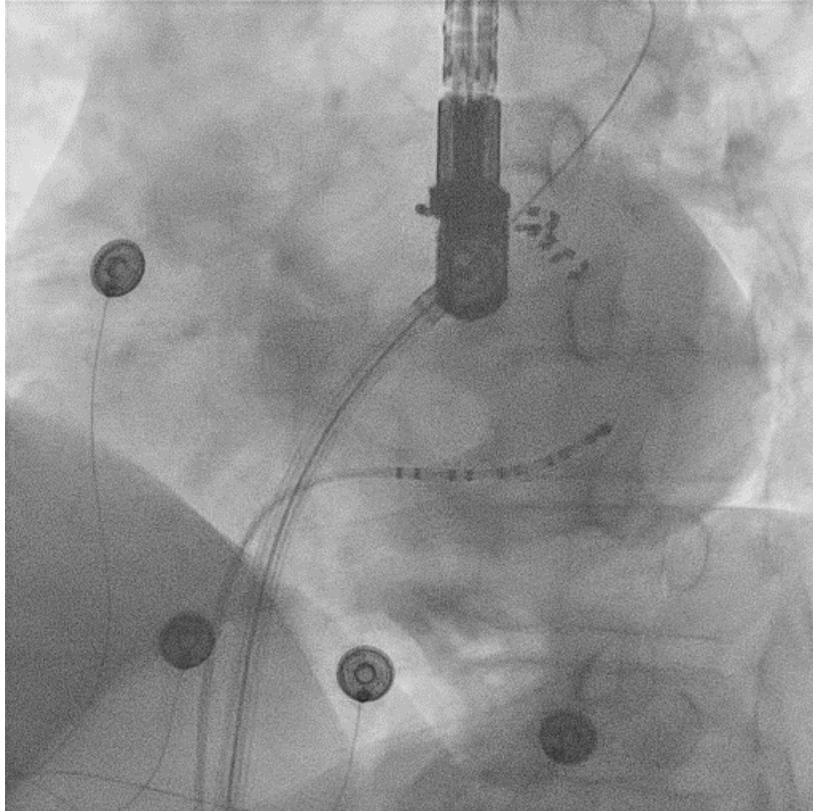
Navigace do LSPV



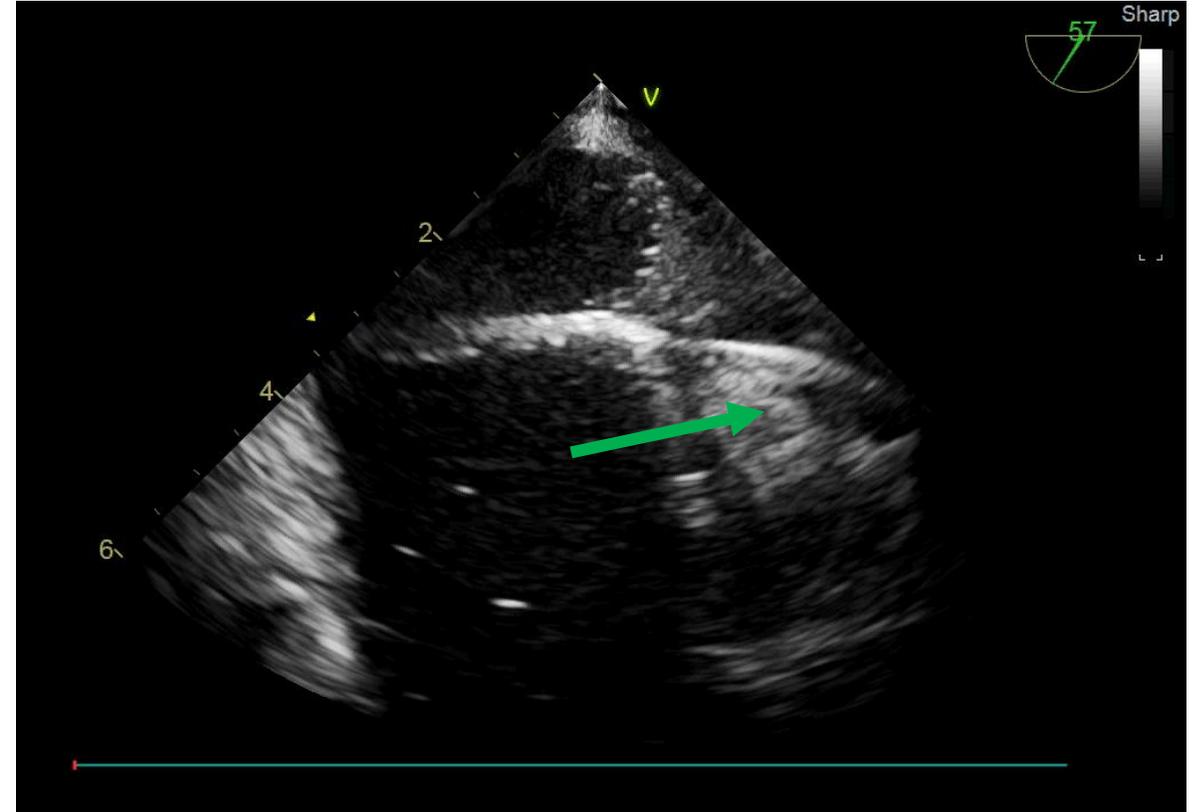
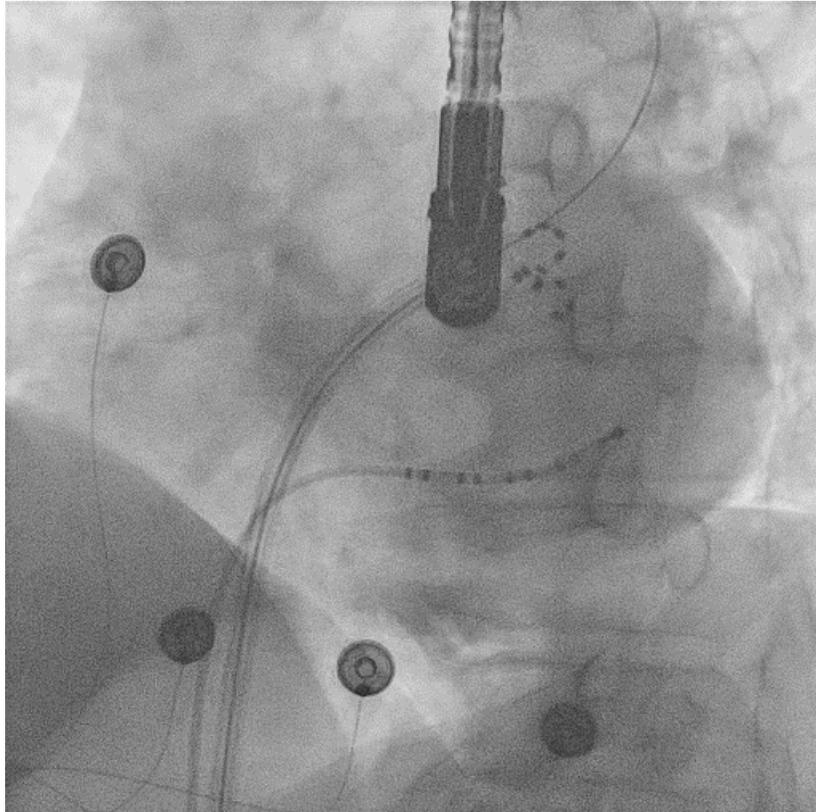
LSPV (basket)



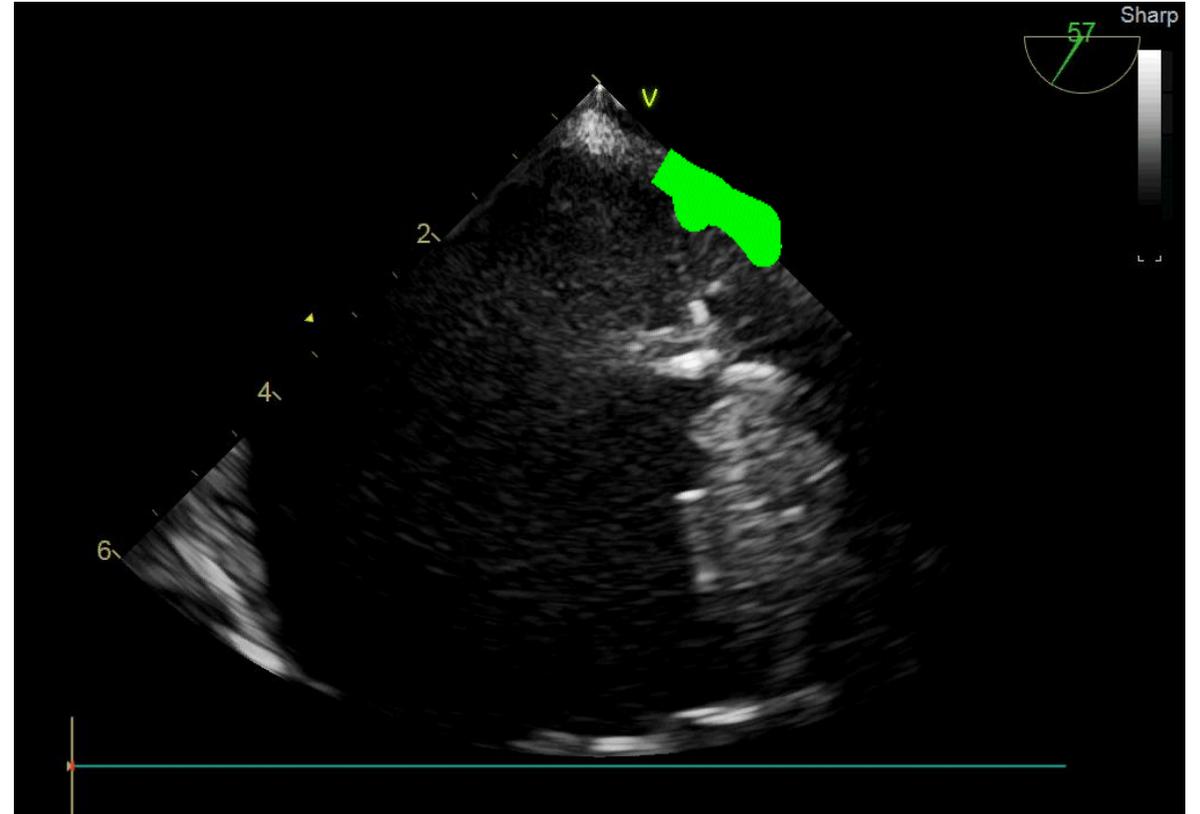
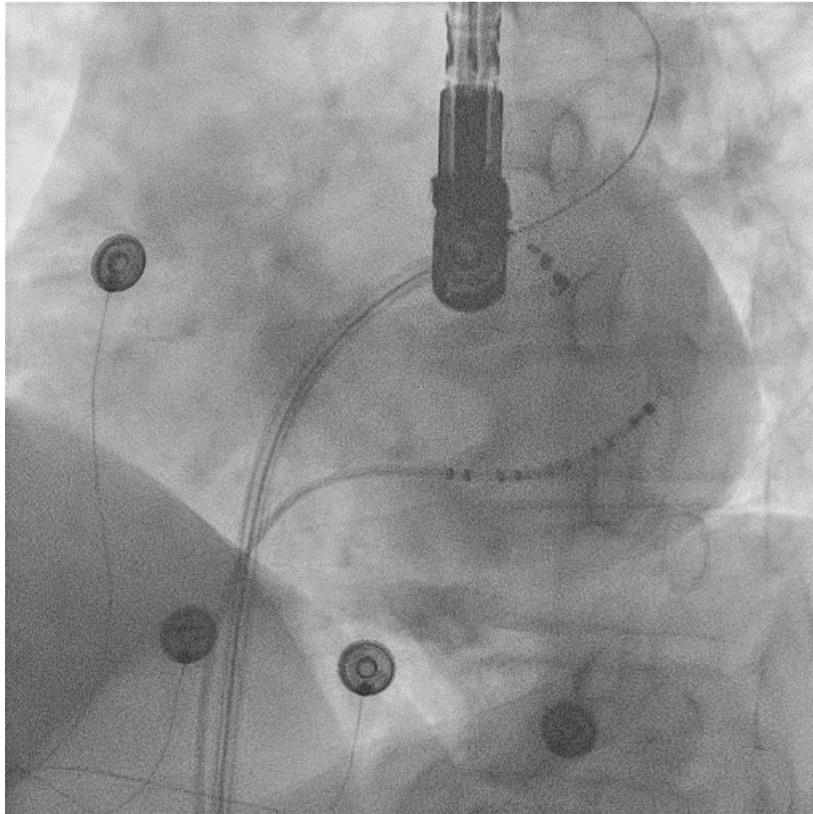
LSPV (flower)



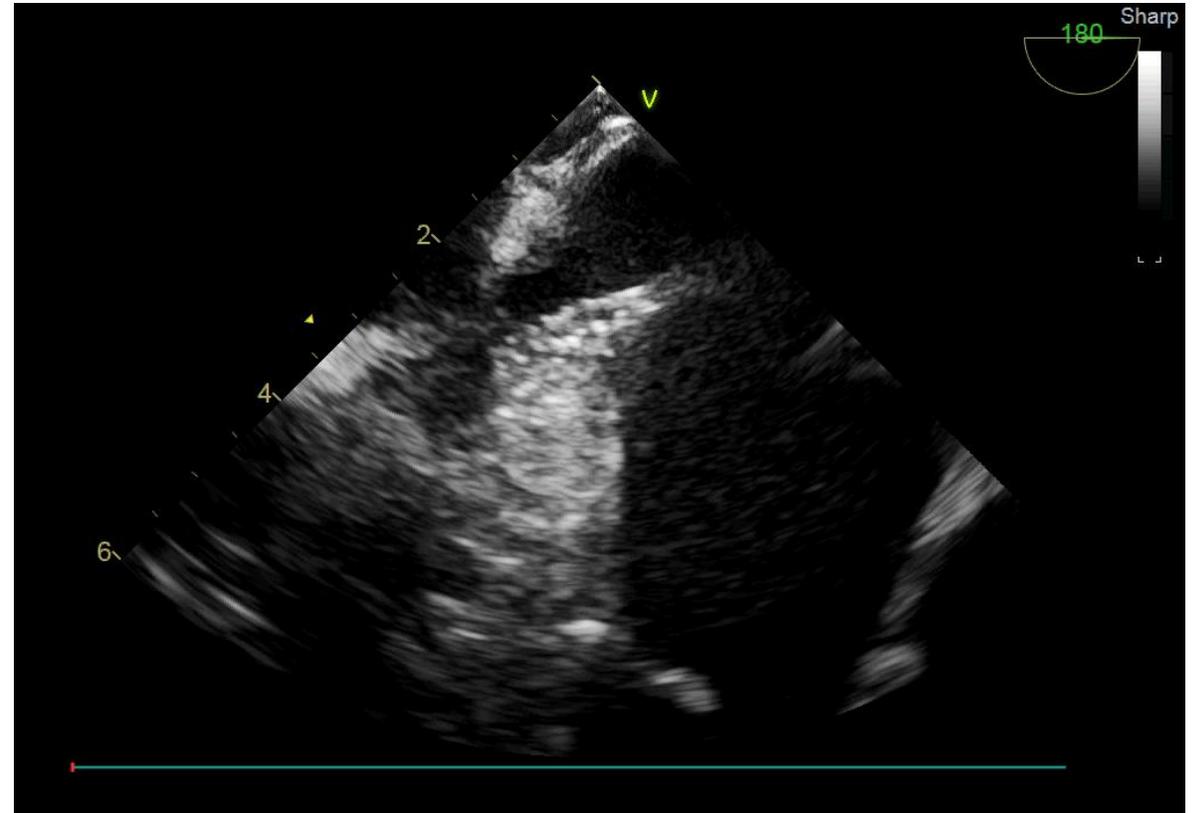
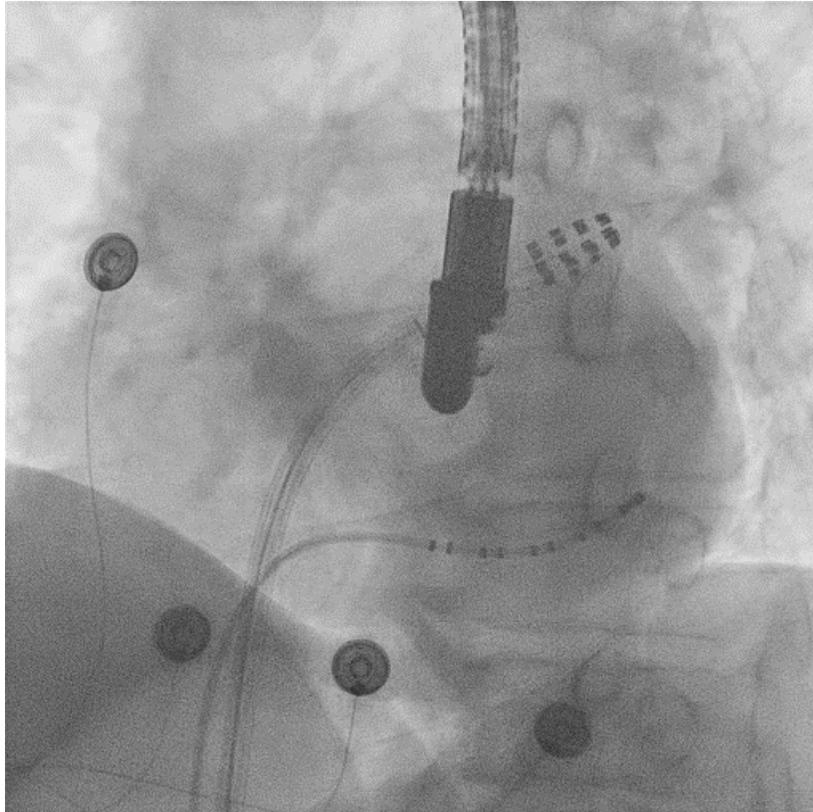
LSPV anterior bonus lesion



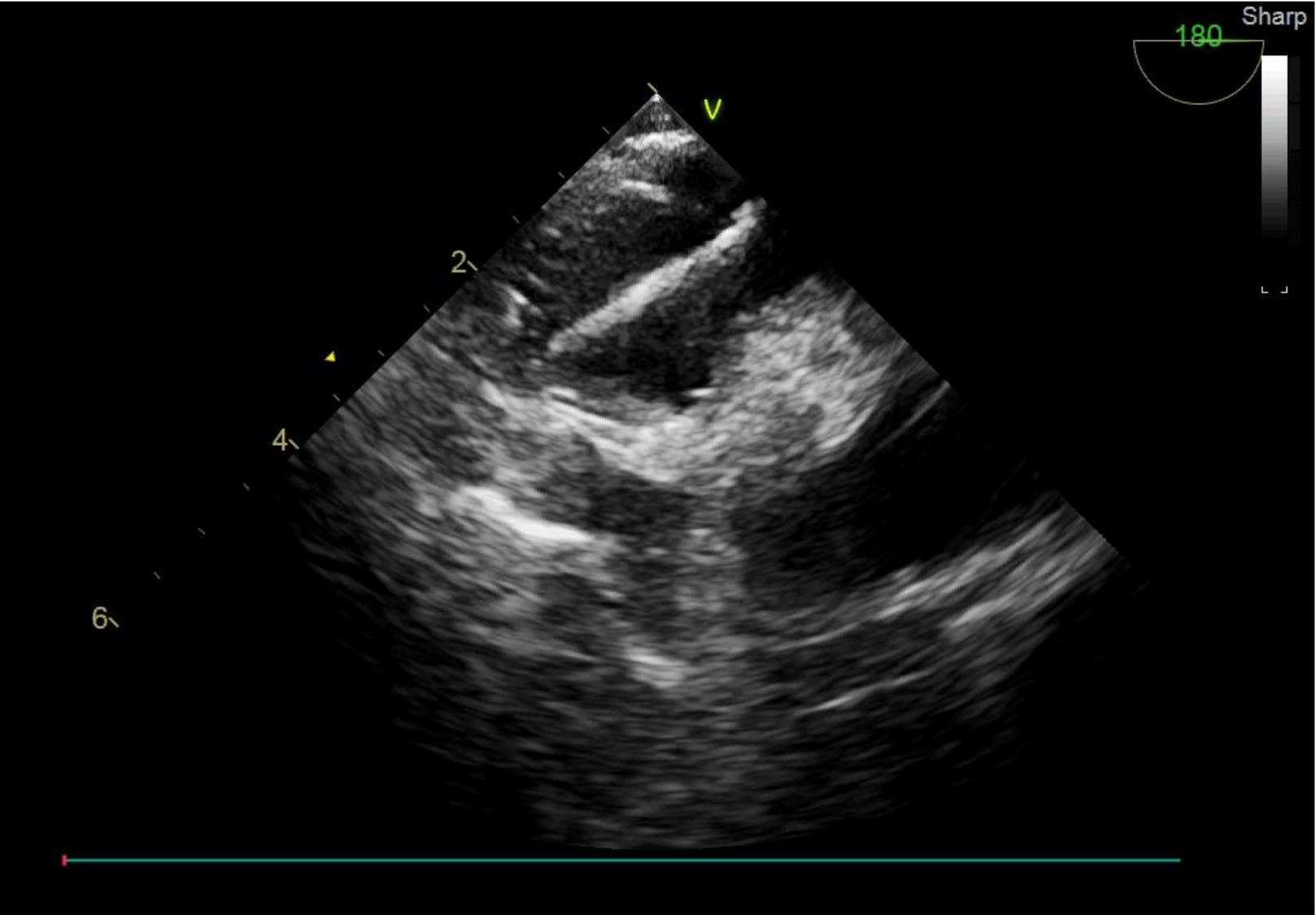
LSPV posterior „anchor“ lesion



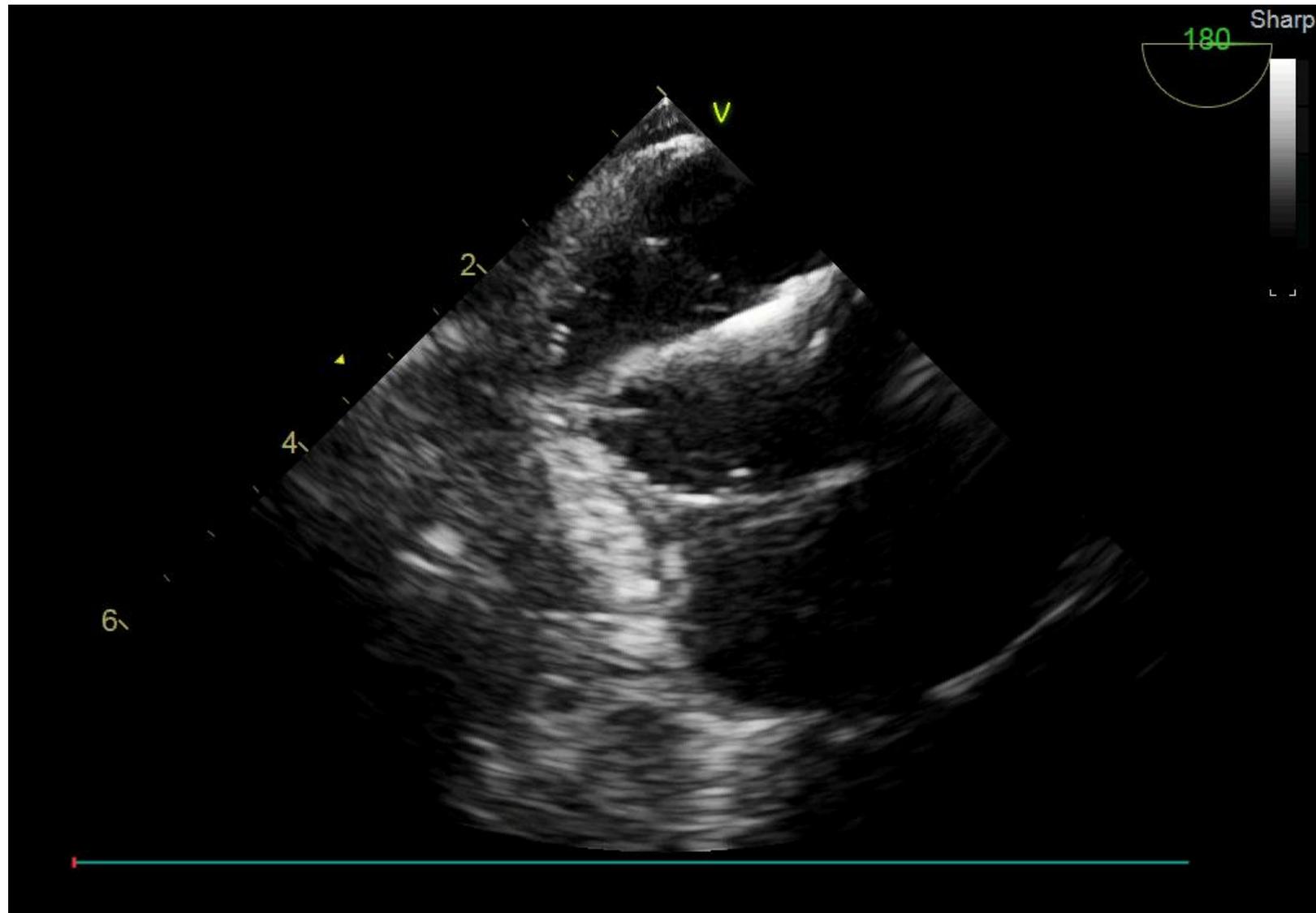
Manévrování do LIPV



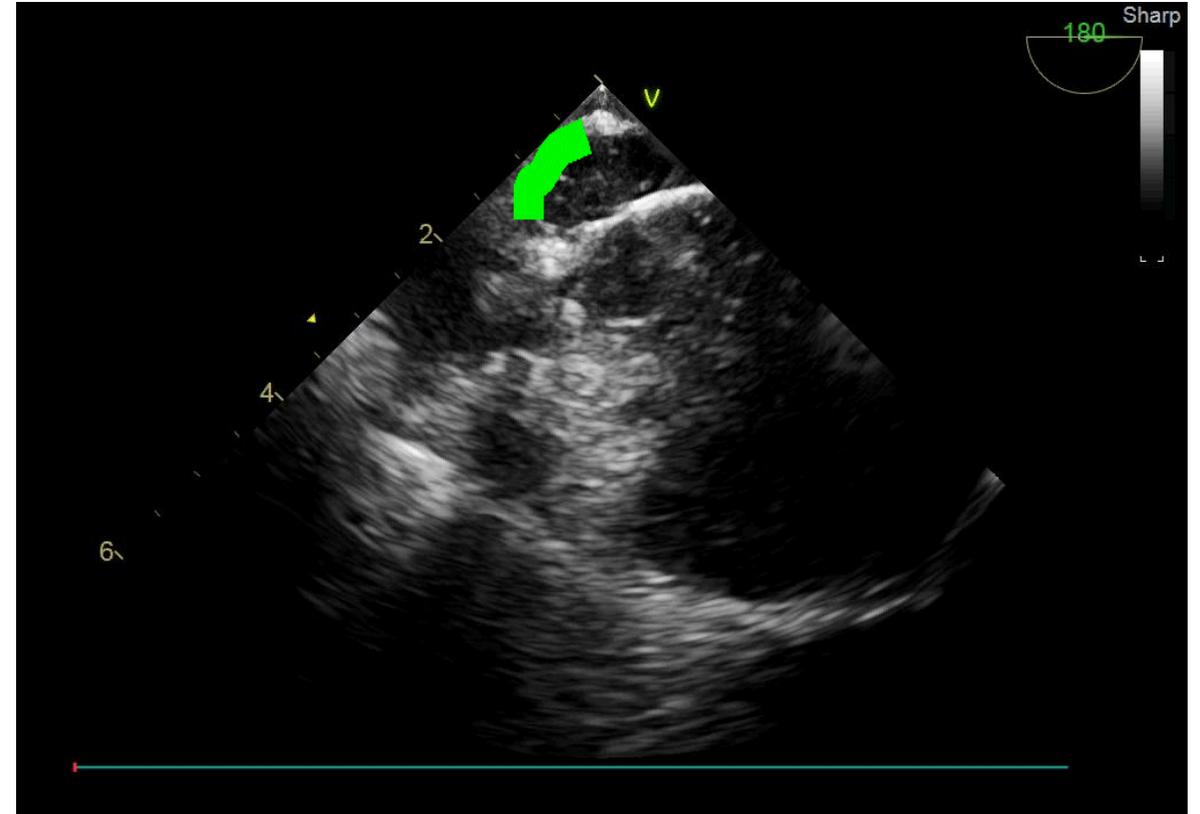
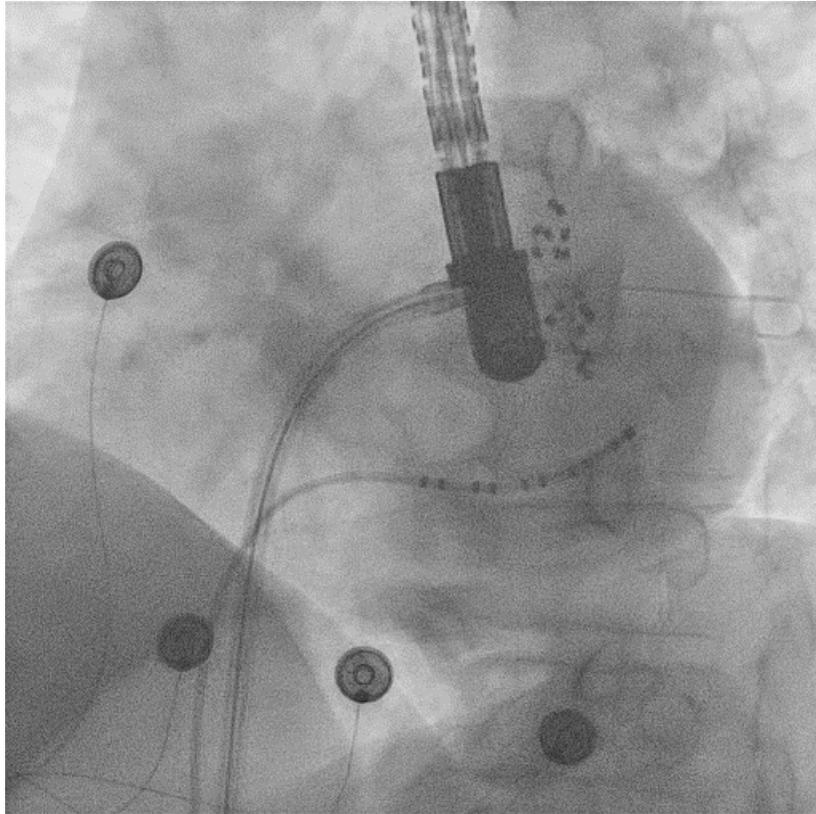
LIPV (basket)



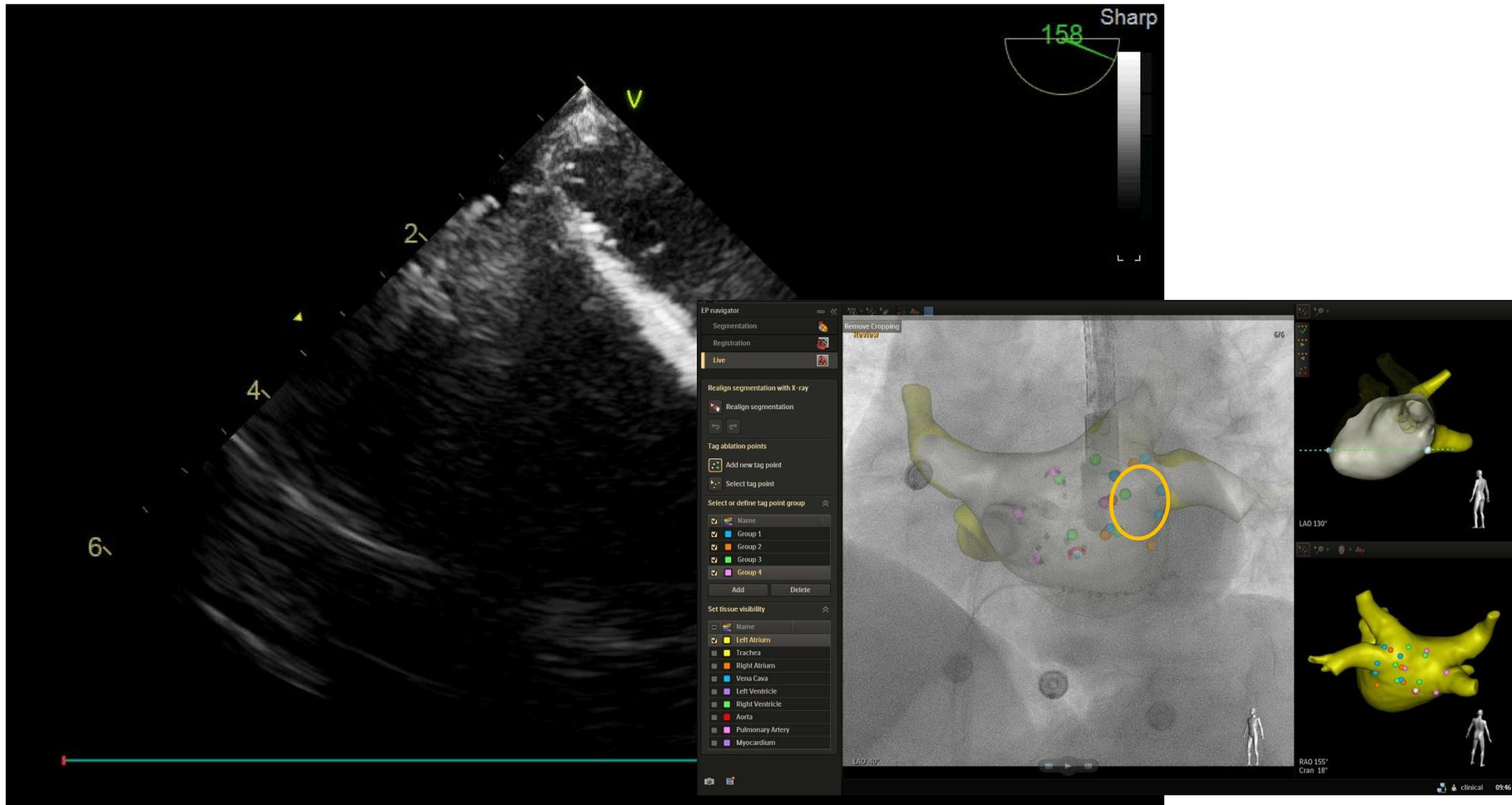
LIPV (flower)



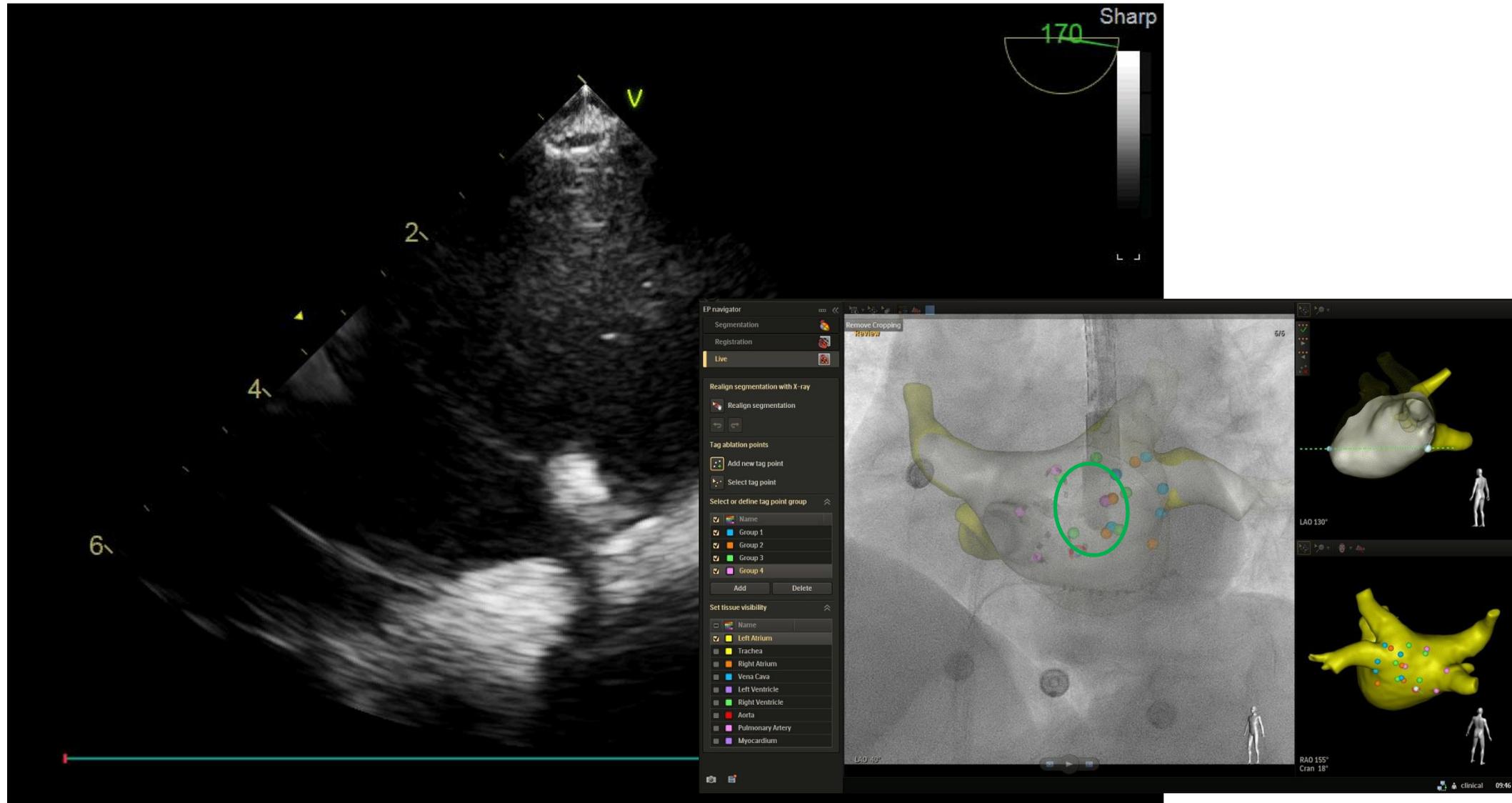
LIPV – posterior „anchor“ lesion



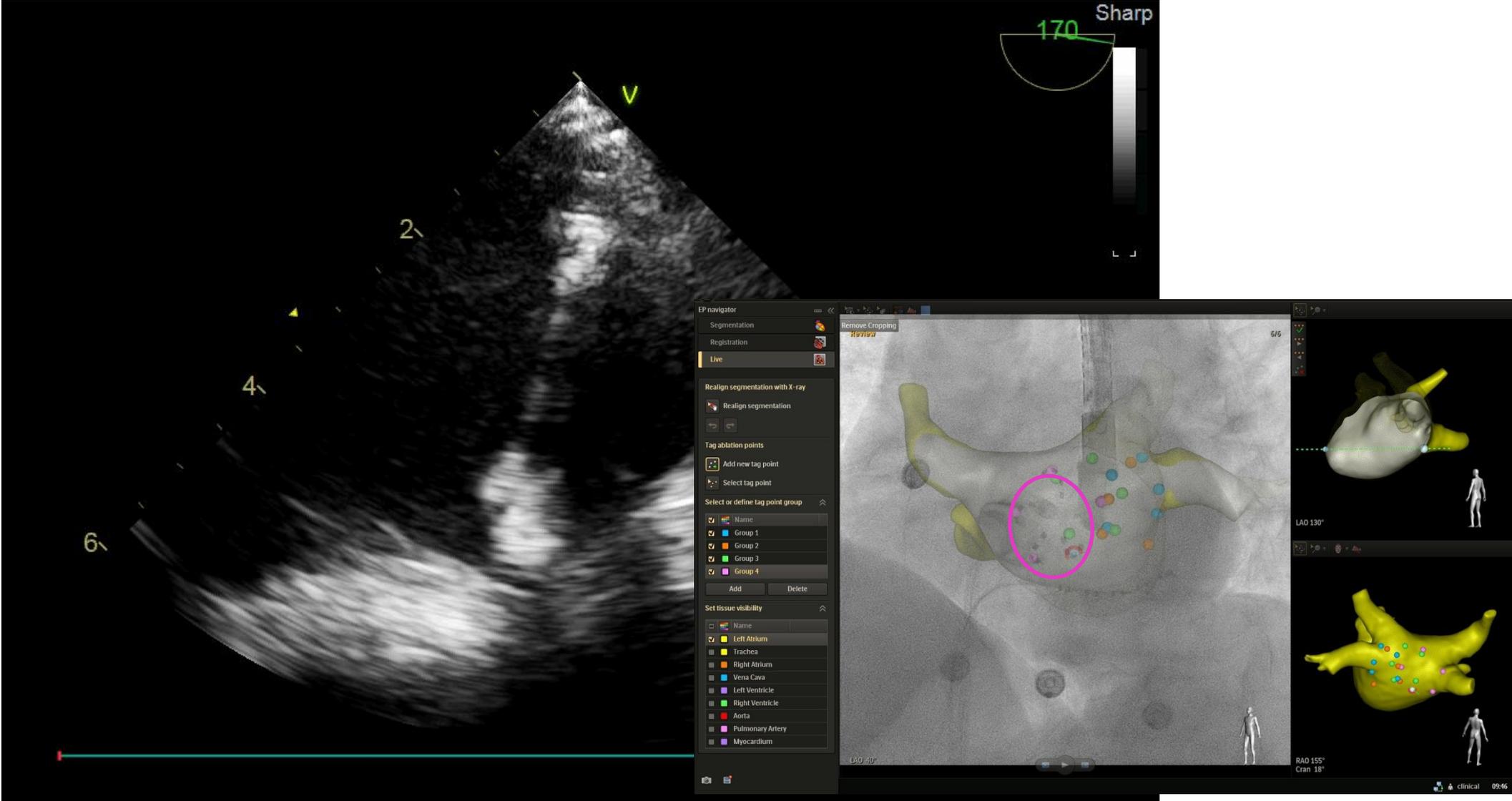
Ablace zadní stěny



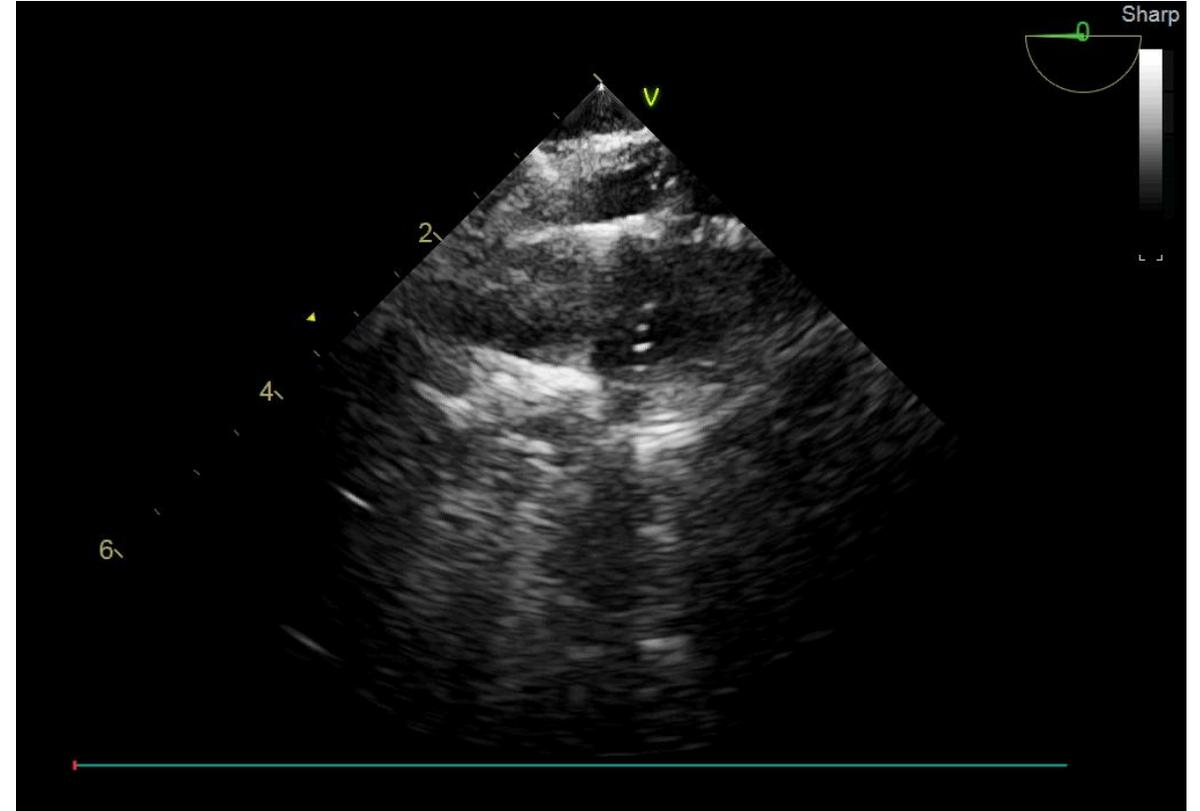
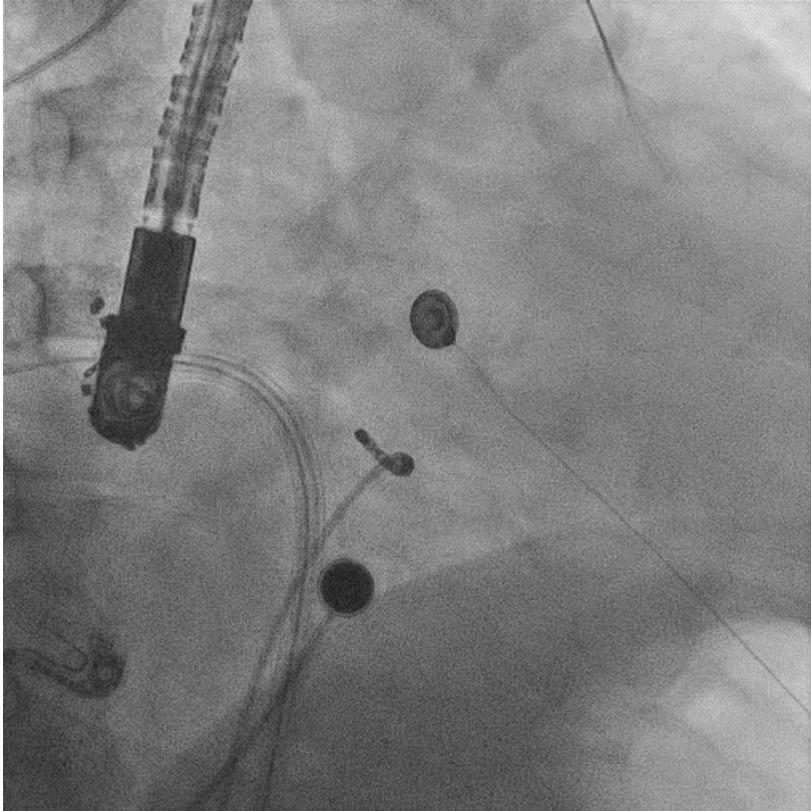
The whole inferior line is tracked on TOE



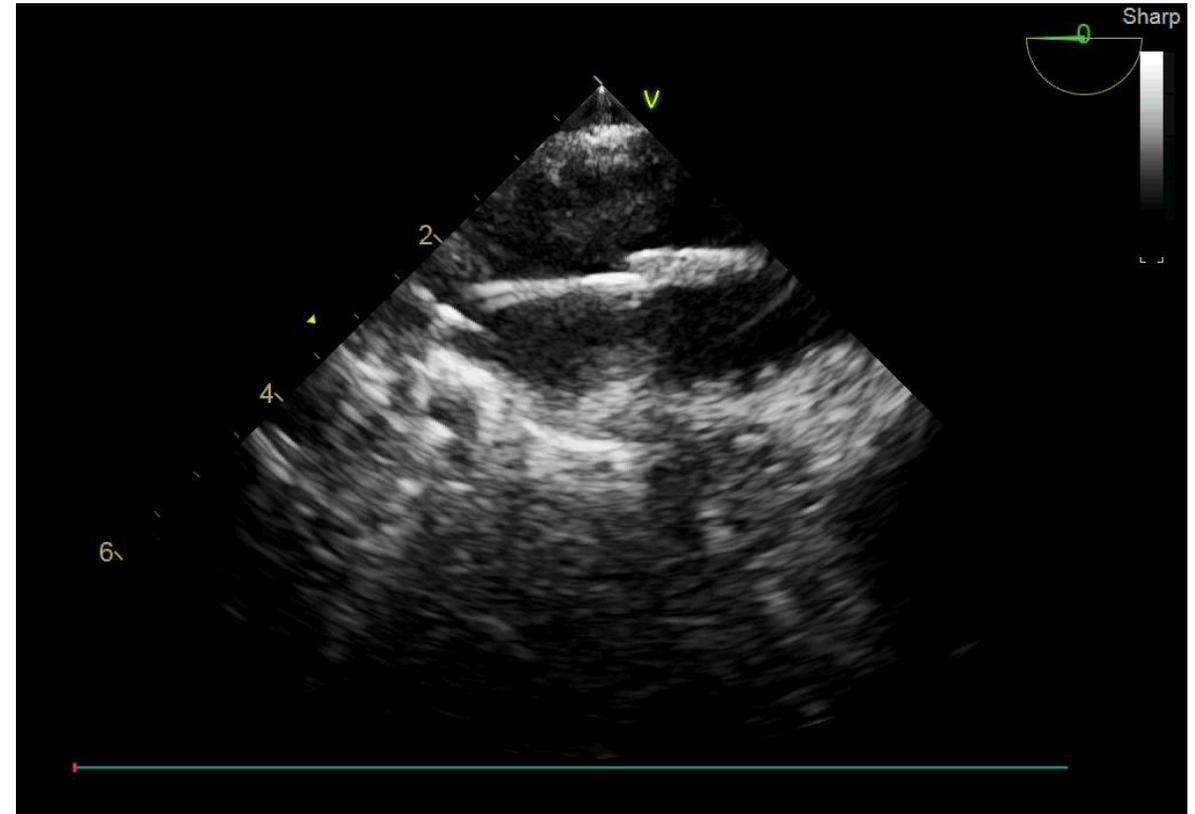
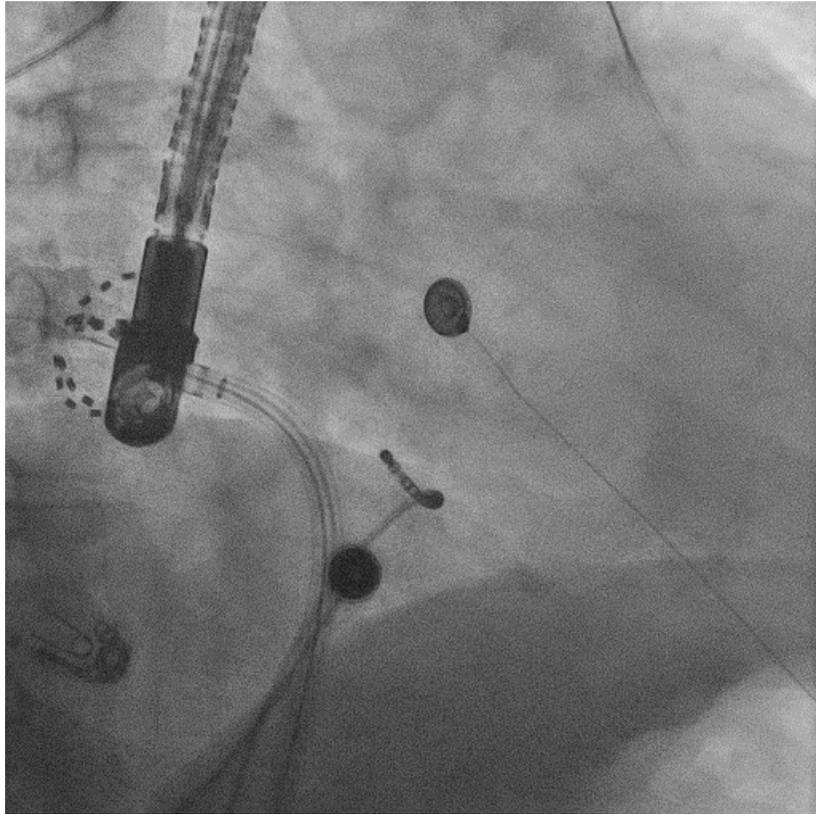
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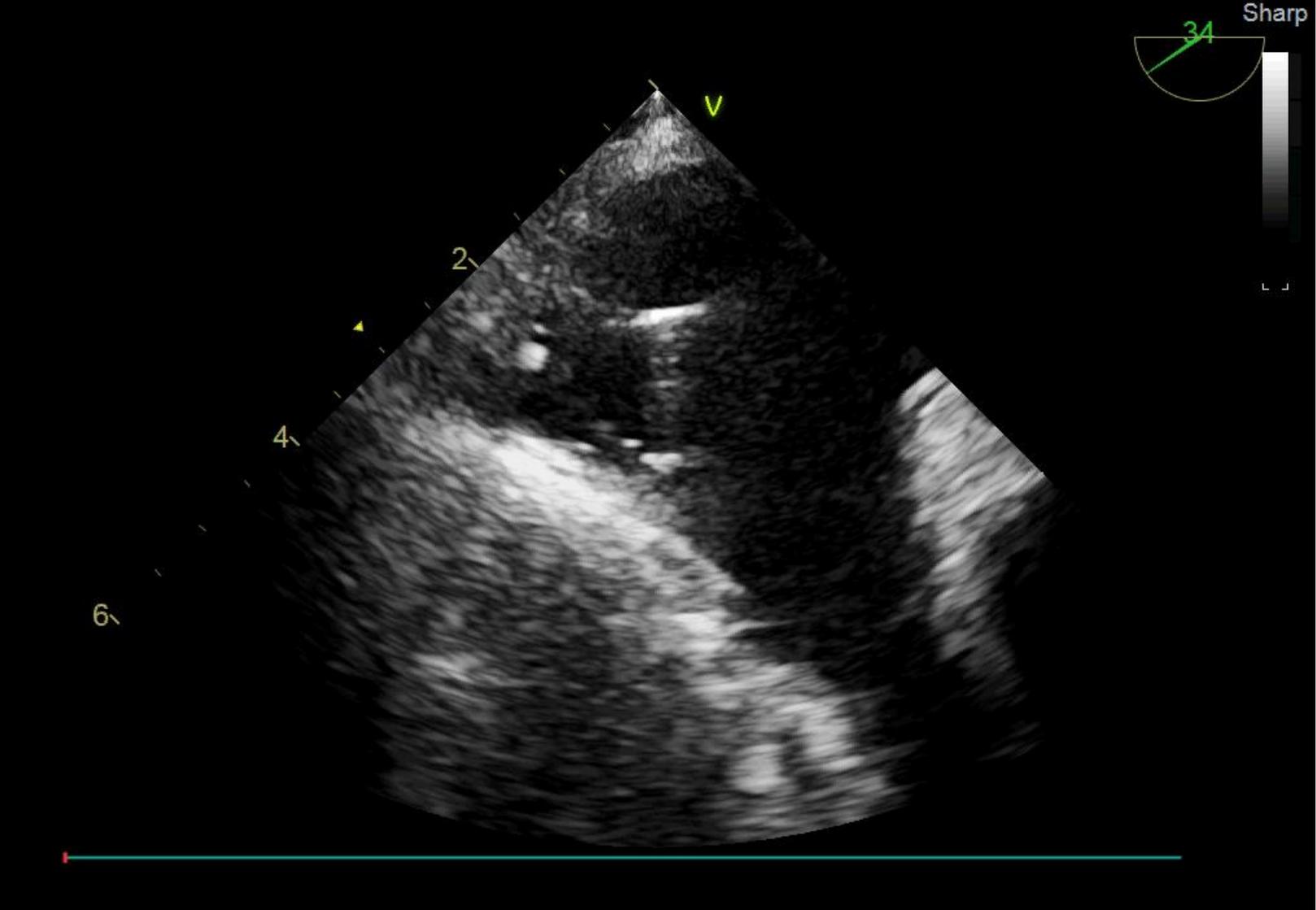
RIPV (flower)



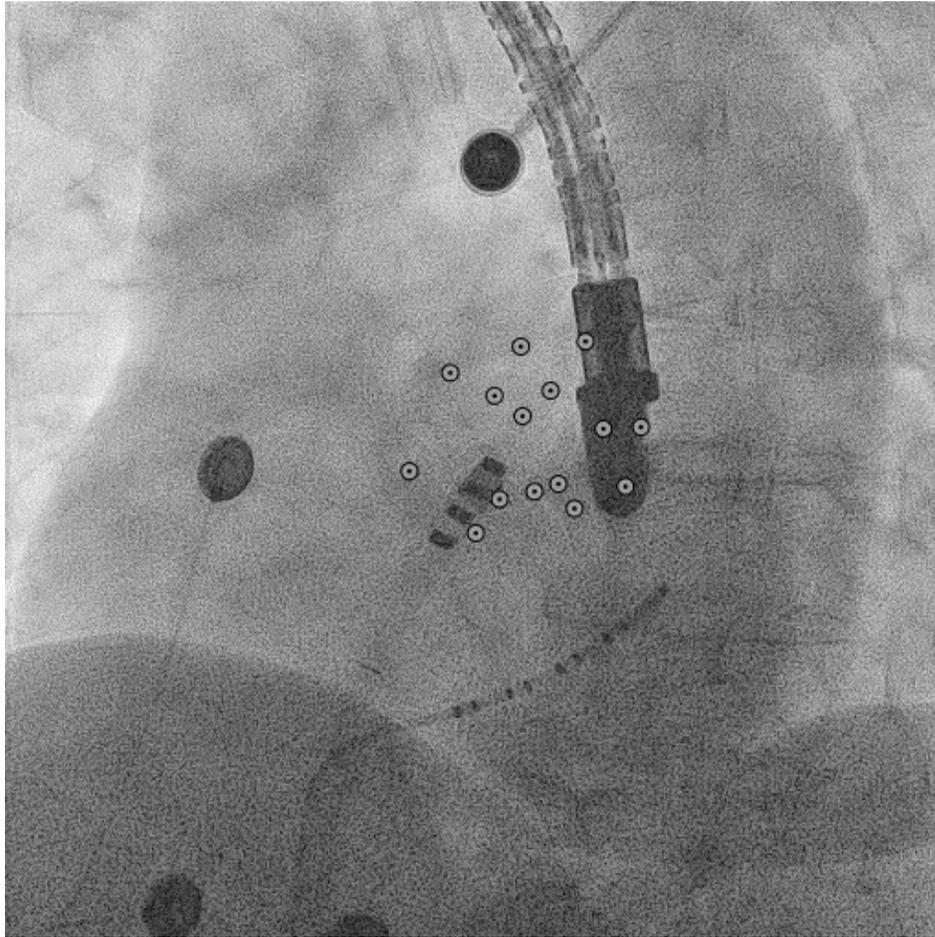
RIPV basket



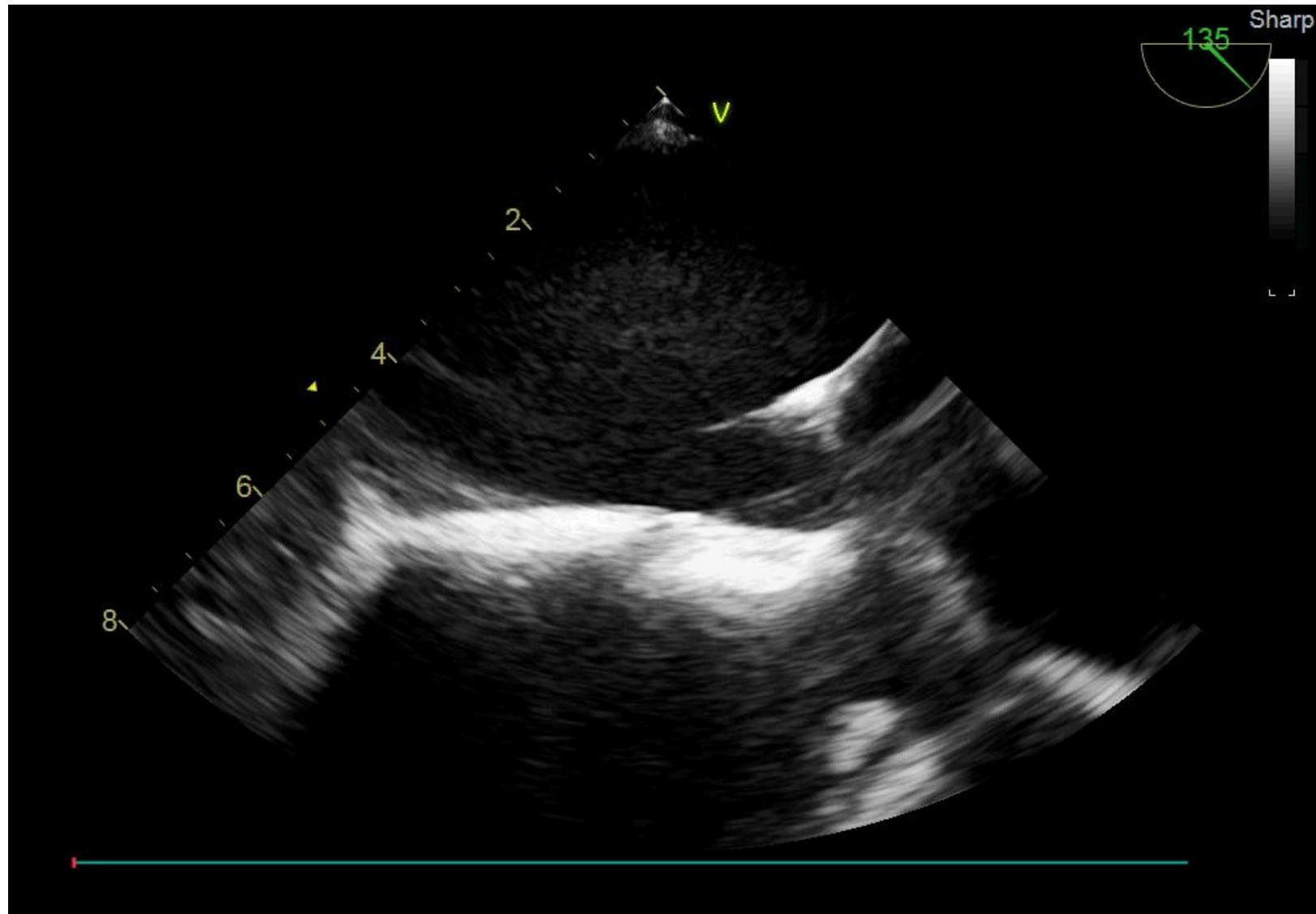
RIPV (basket, overheating)



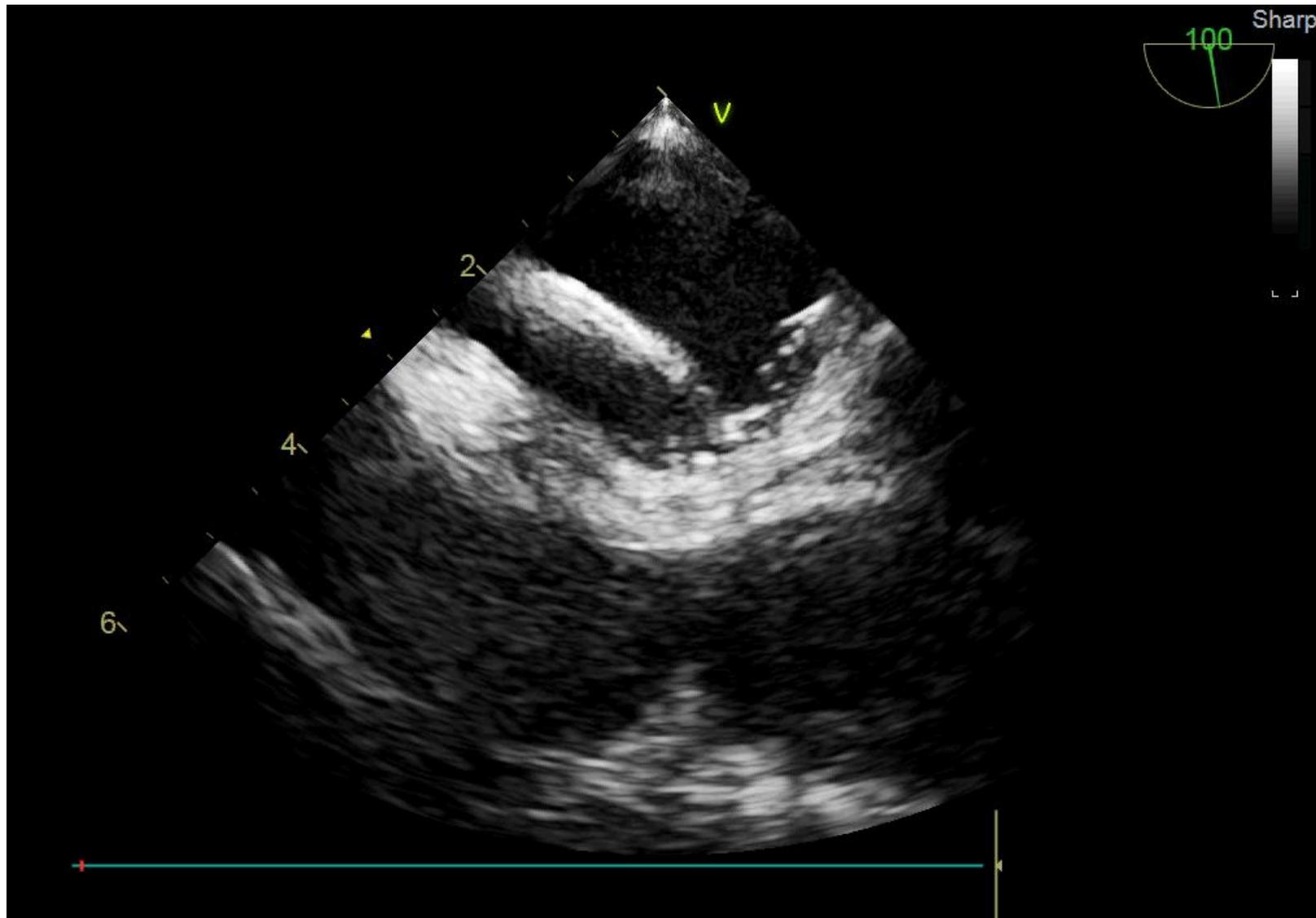
RSPV (podle RTG)



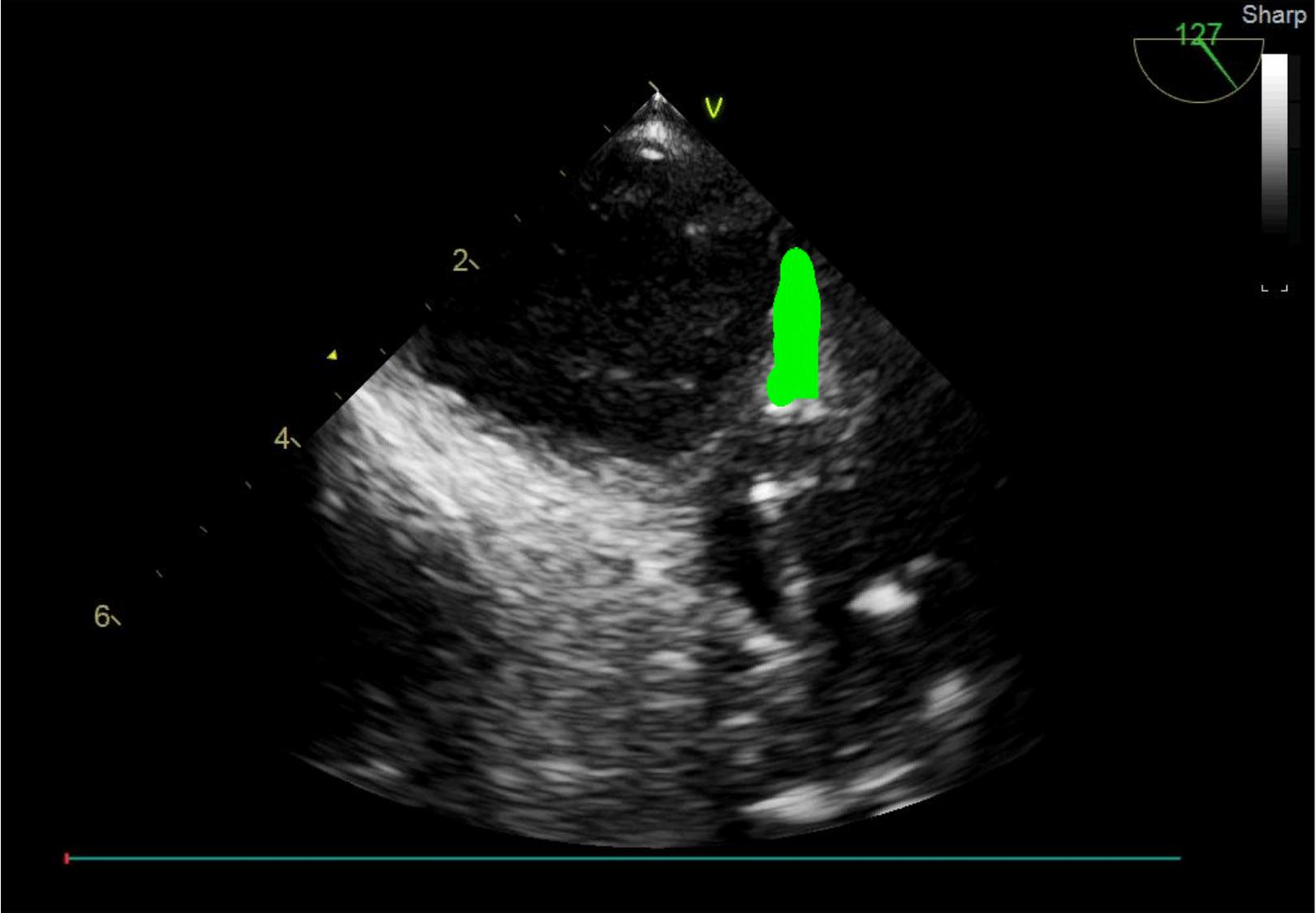
RSPV (podle TEE)



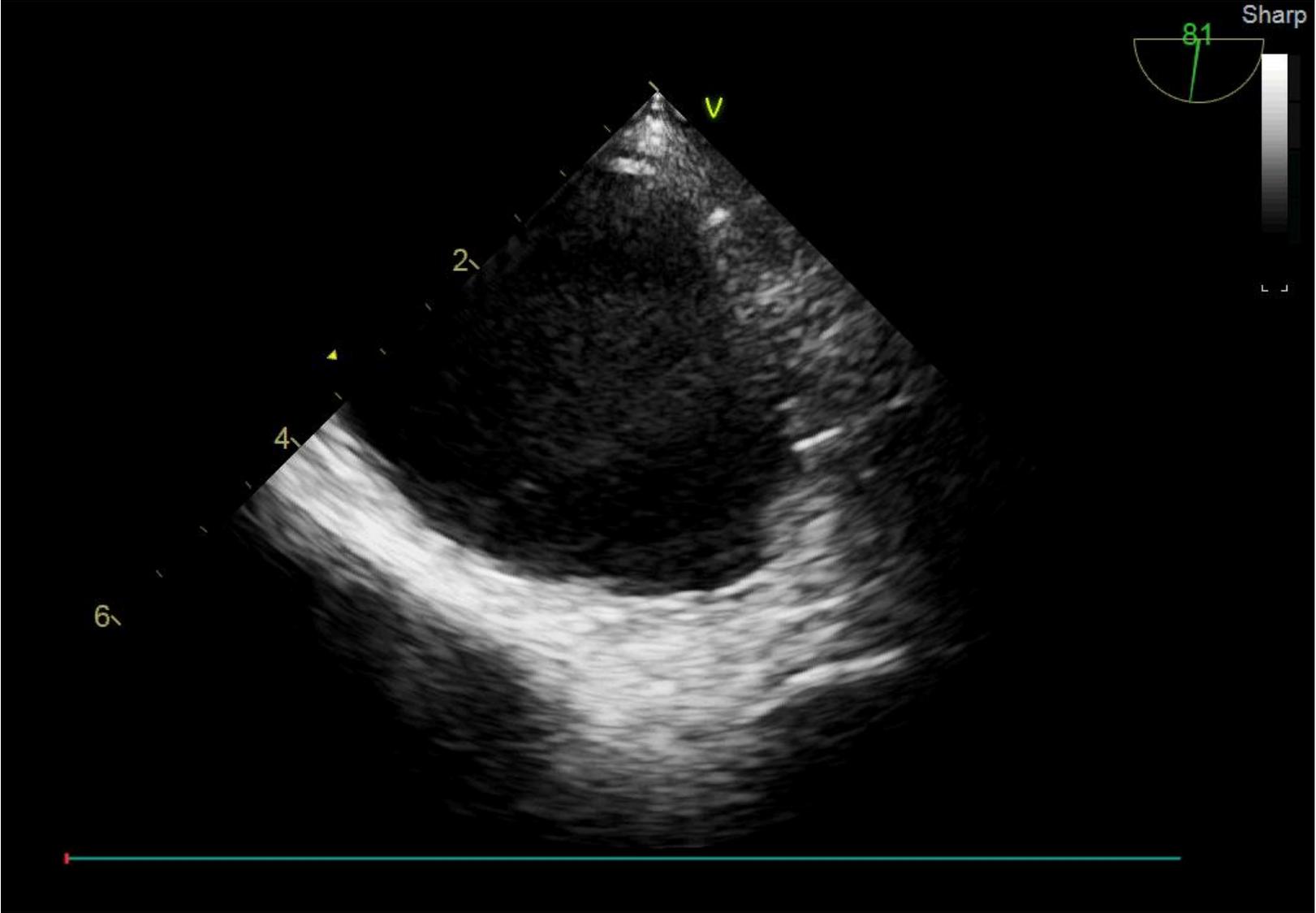
RSPV dislokace katétru dovnitř



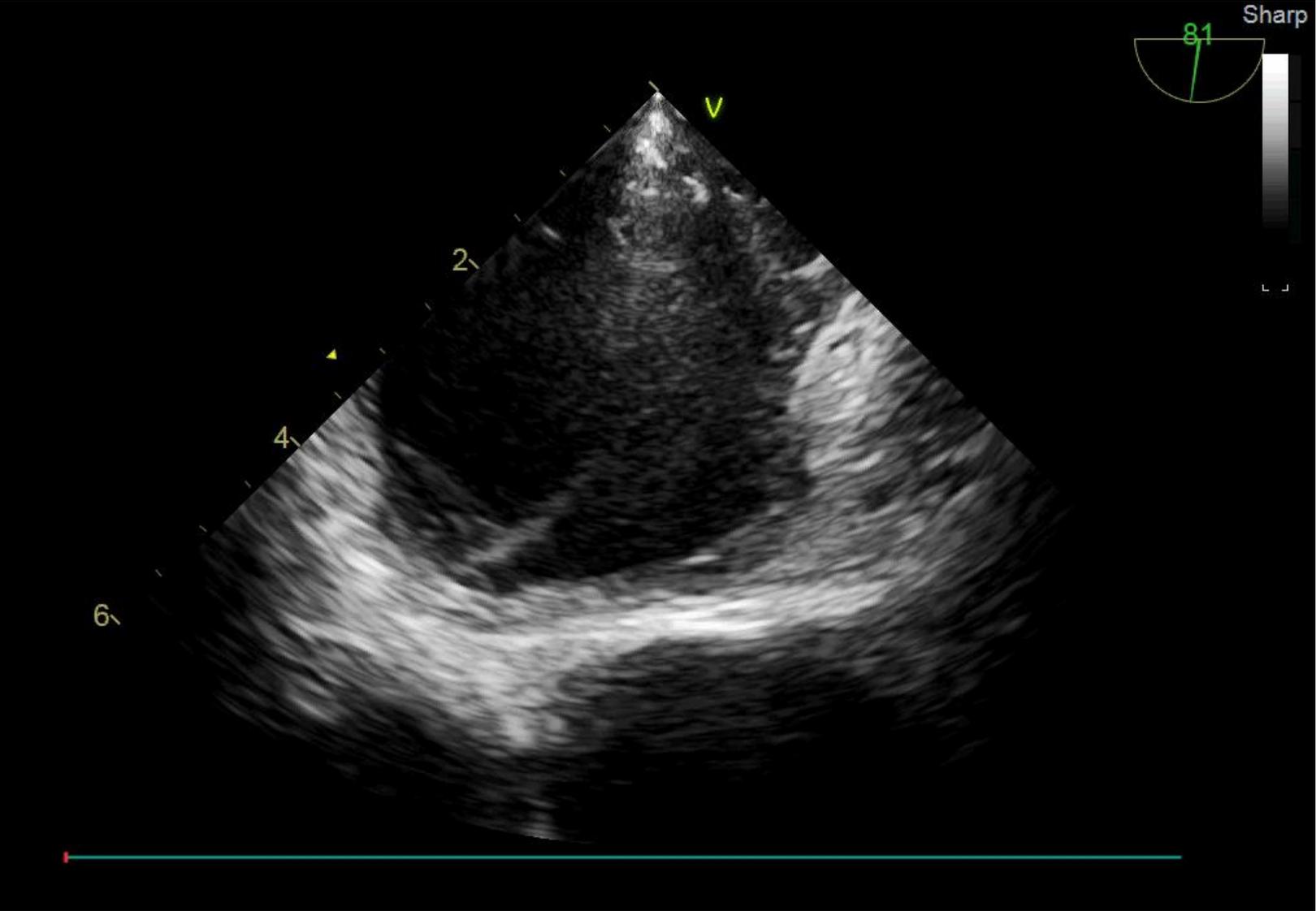
Roof line



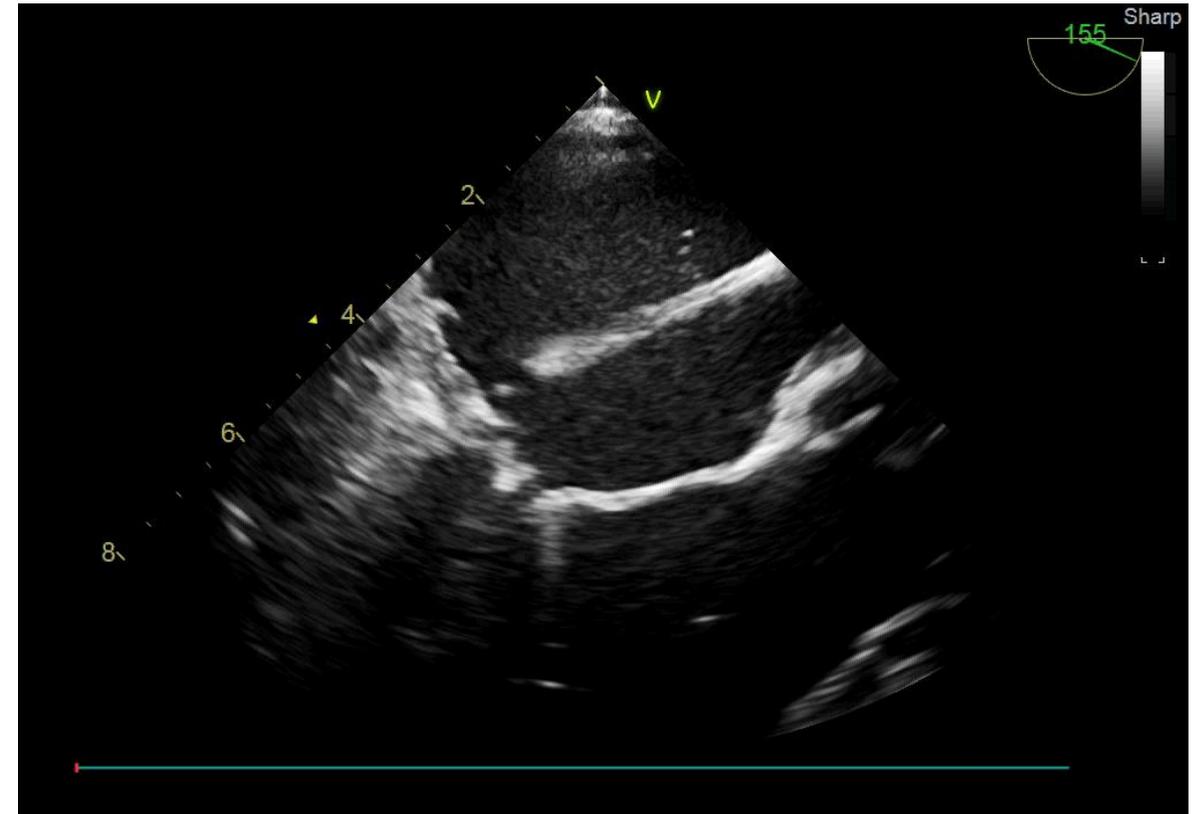
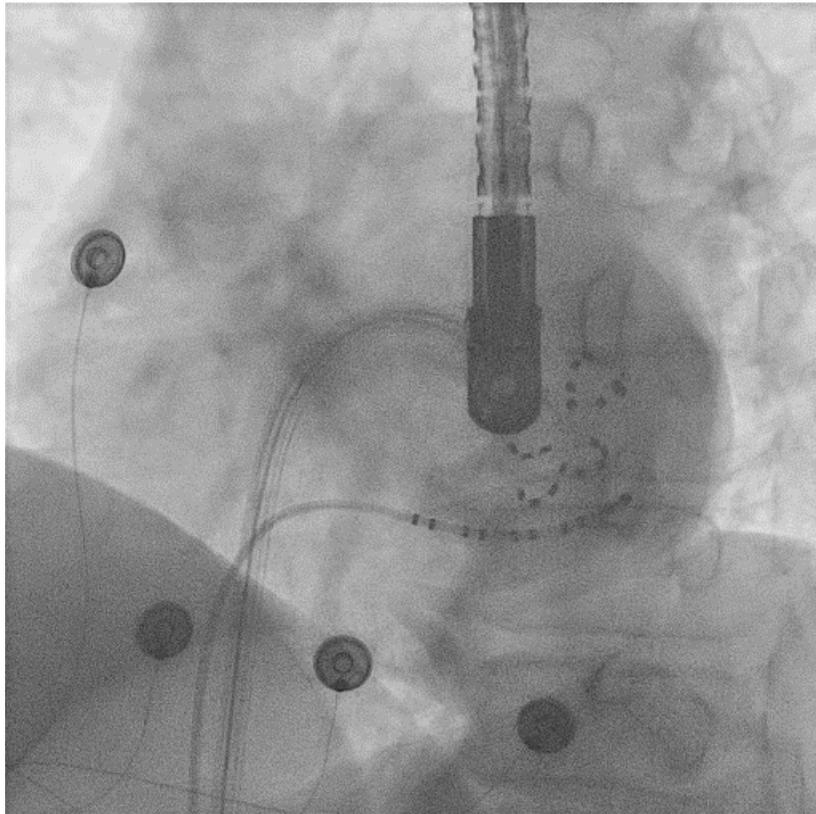
Roof line



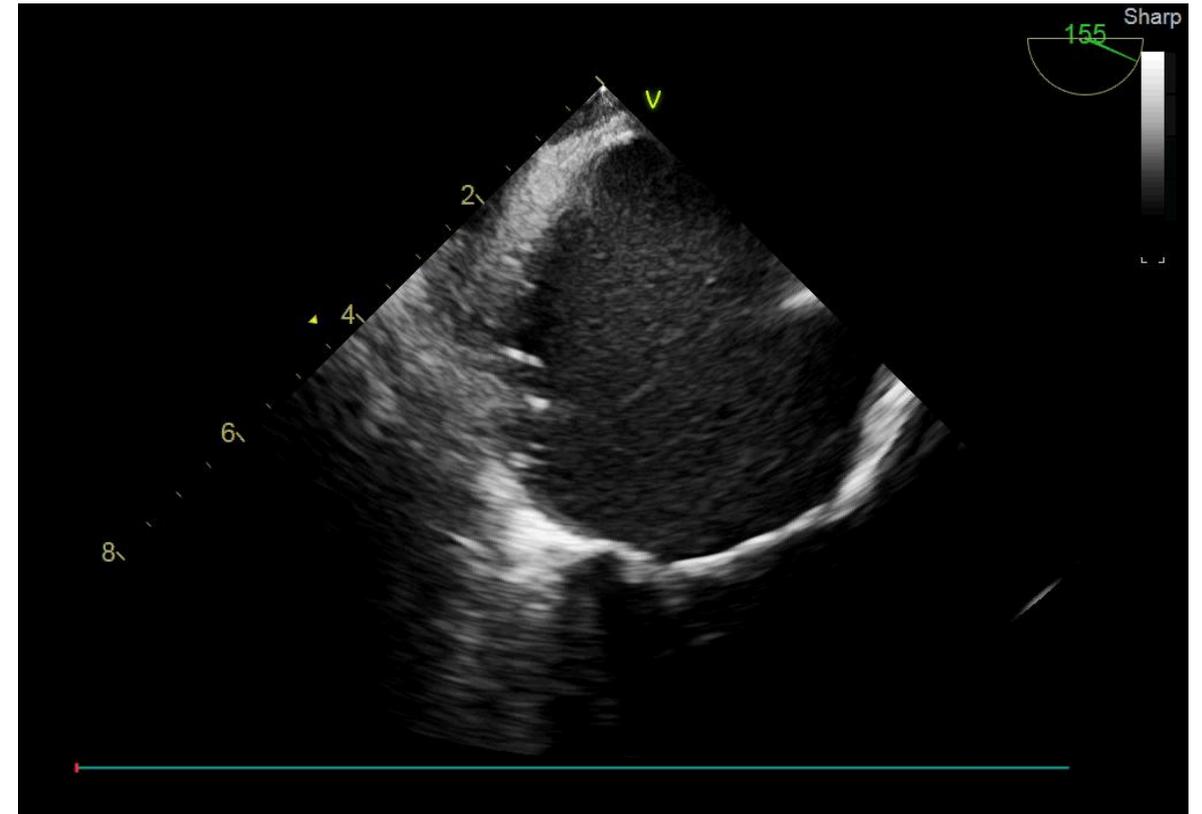
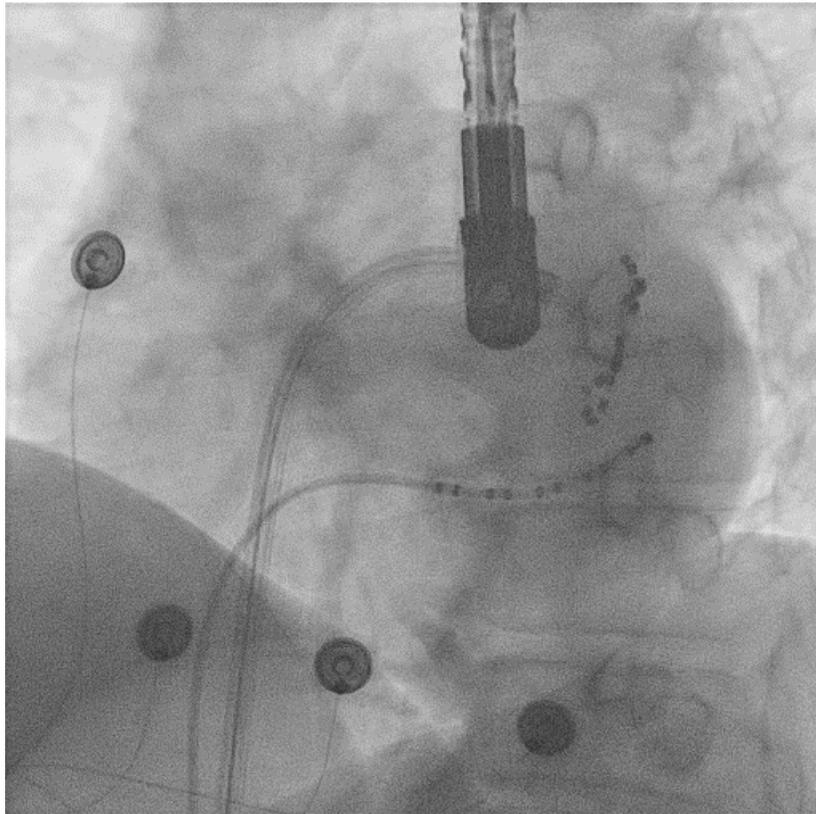
Roof line



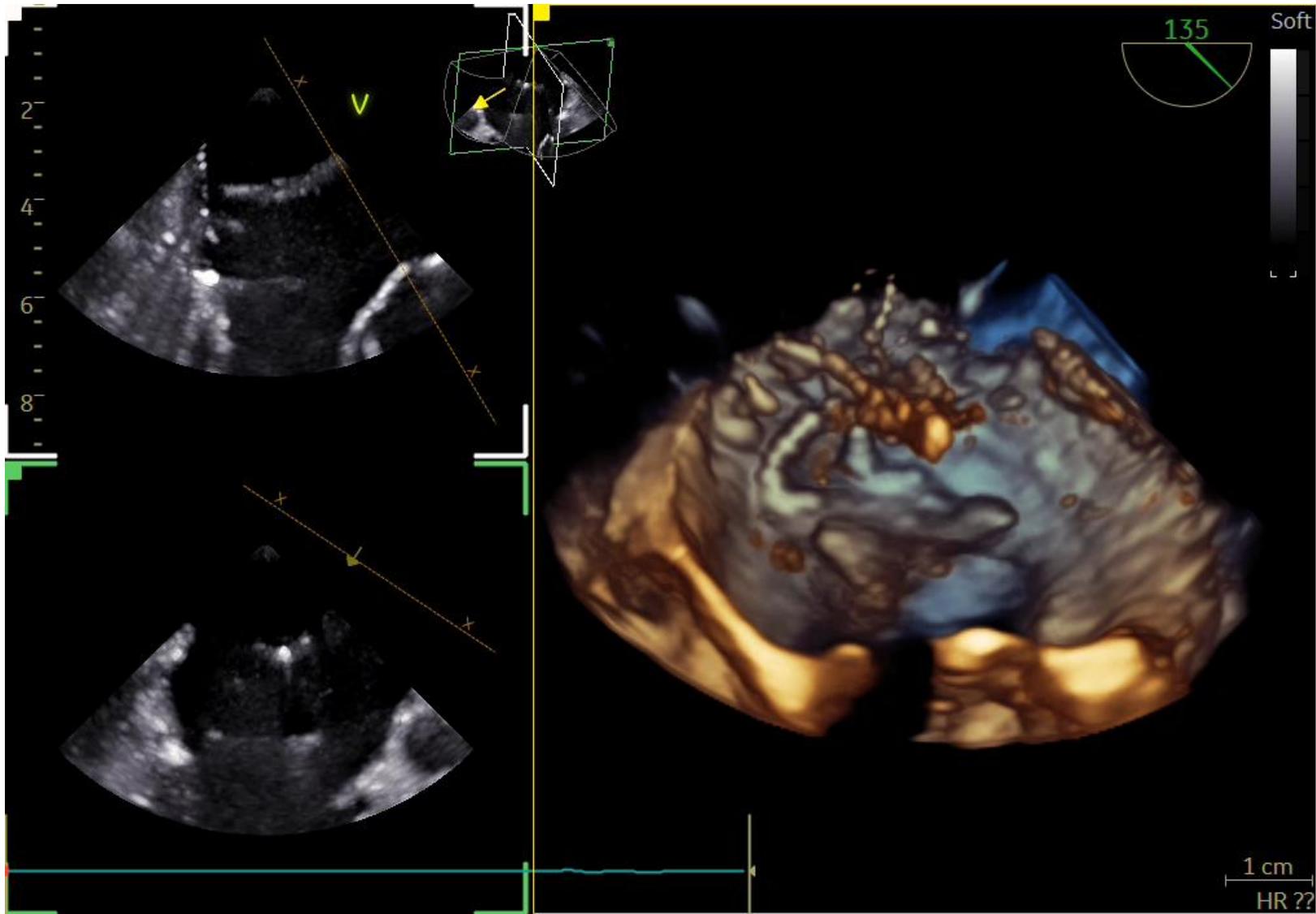
Mitrální isthmus (u MA)



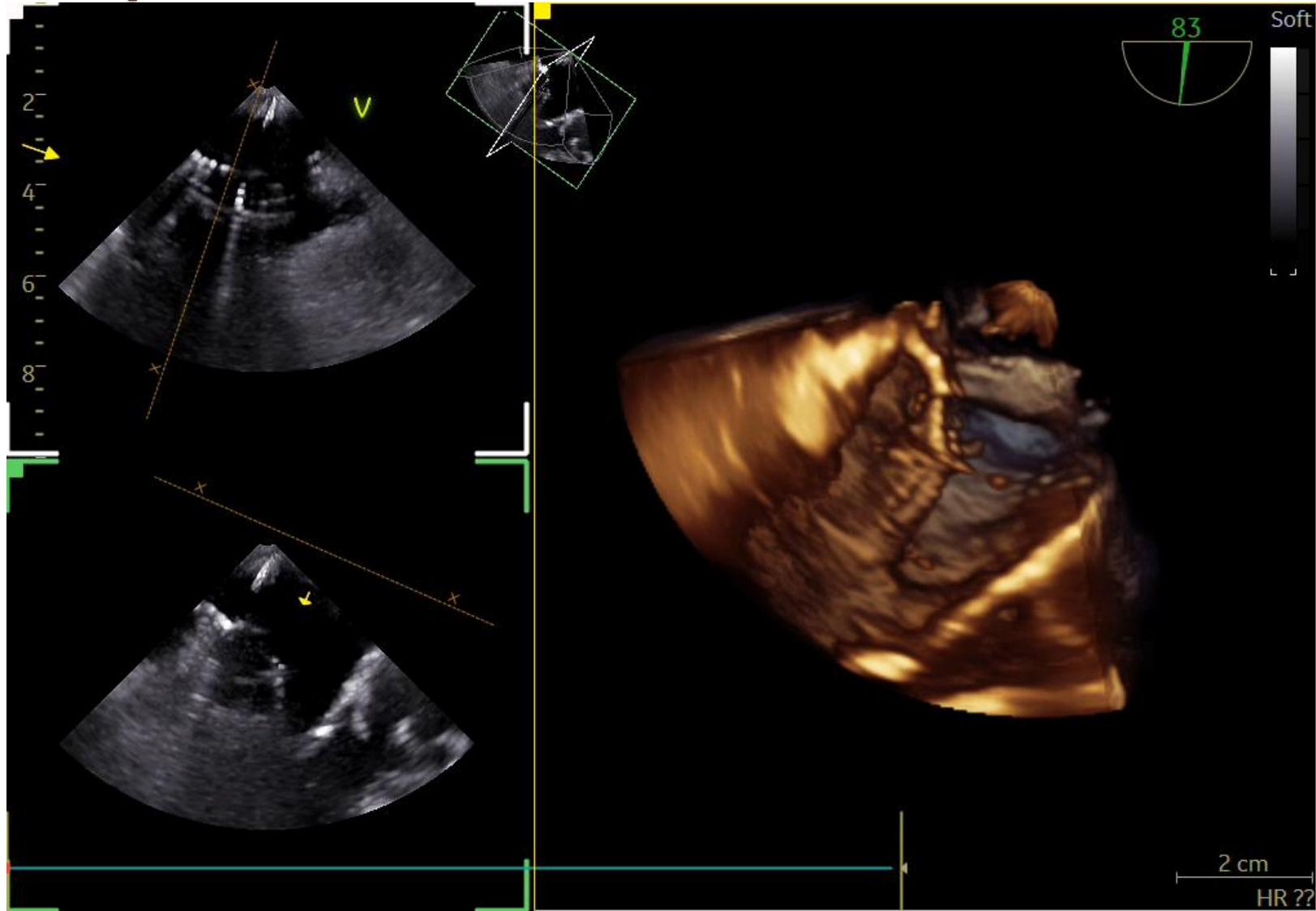
MI střed



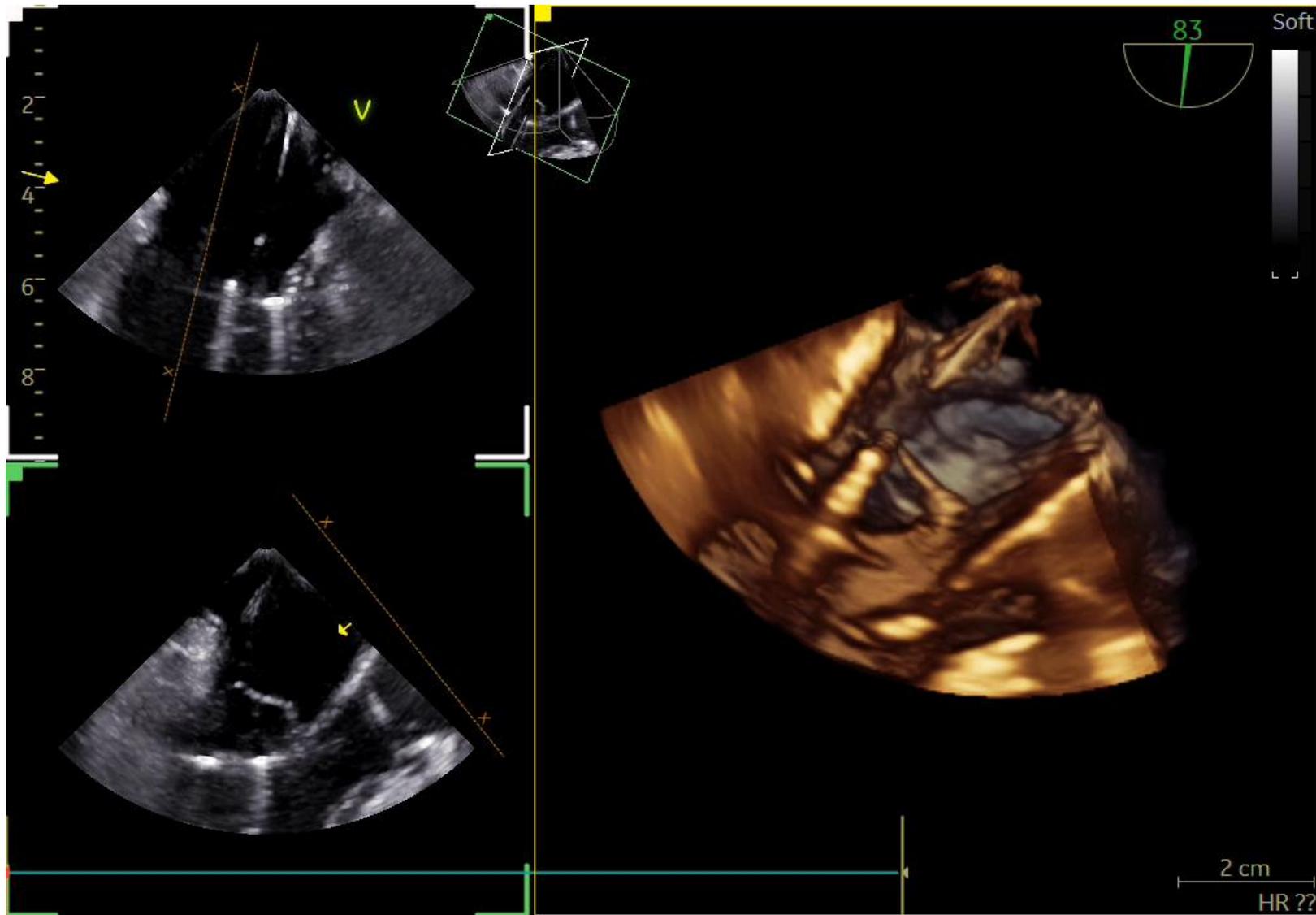
Příznivá anatomie



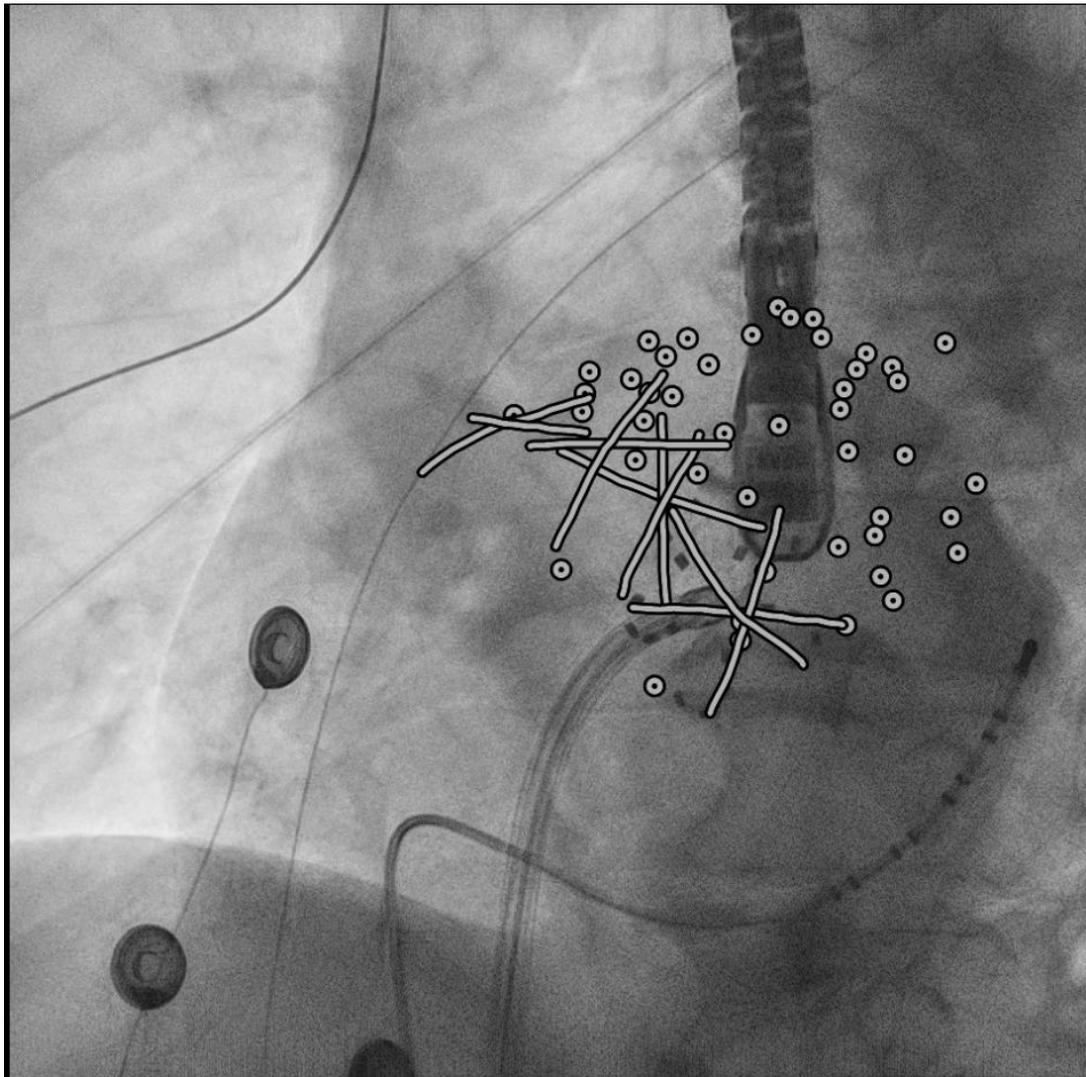
Nepříznivá anatomie



Nepříznivá anatomie



Anteriorní mitrální můstek



PHILIPS

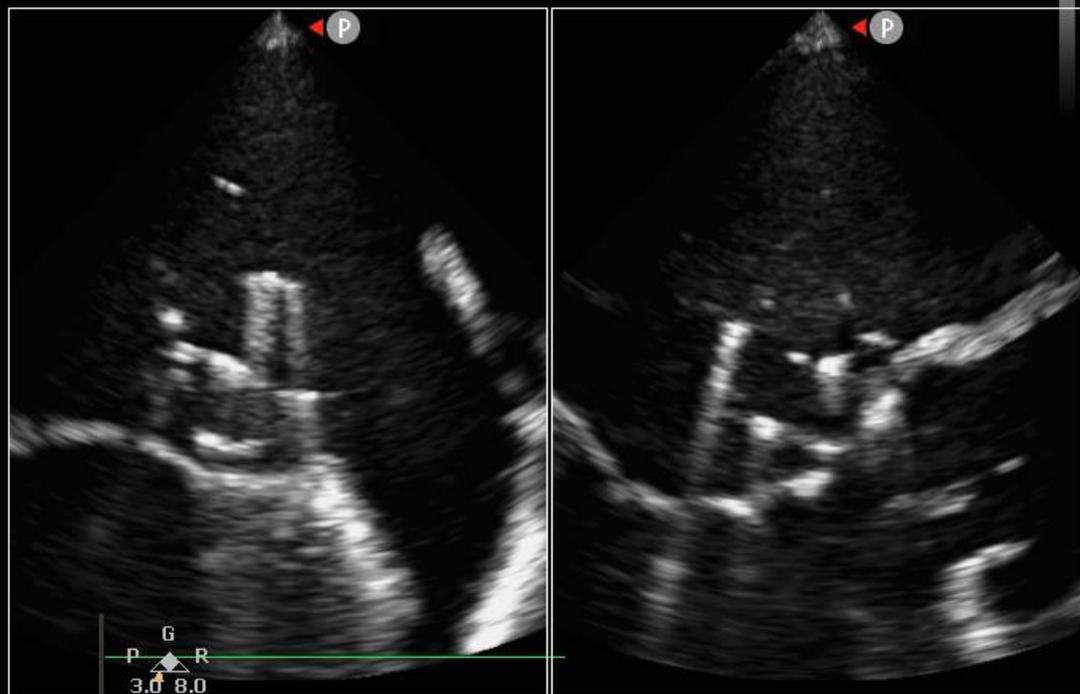
MI 0.6
TIS 0.1

TEE
X8-2t
23 Hz
8.0cm

Pat. T: 37.0 °C
TEE T: 39.4 °C
Seek Angle: 61°



2D
Gen
Gn 44
C 48
5/4/0
50 mm/s



PHILIPS

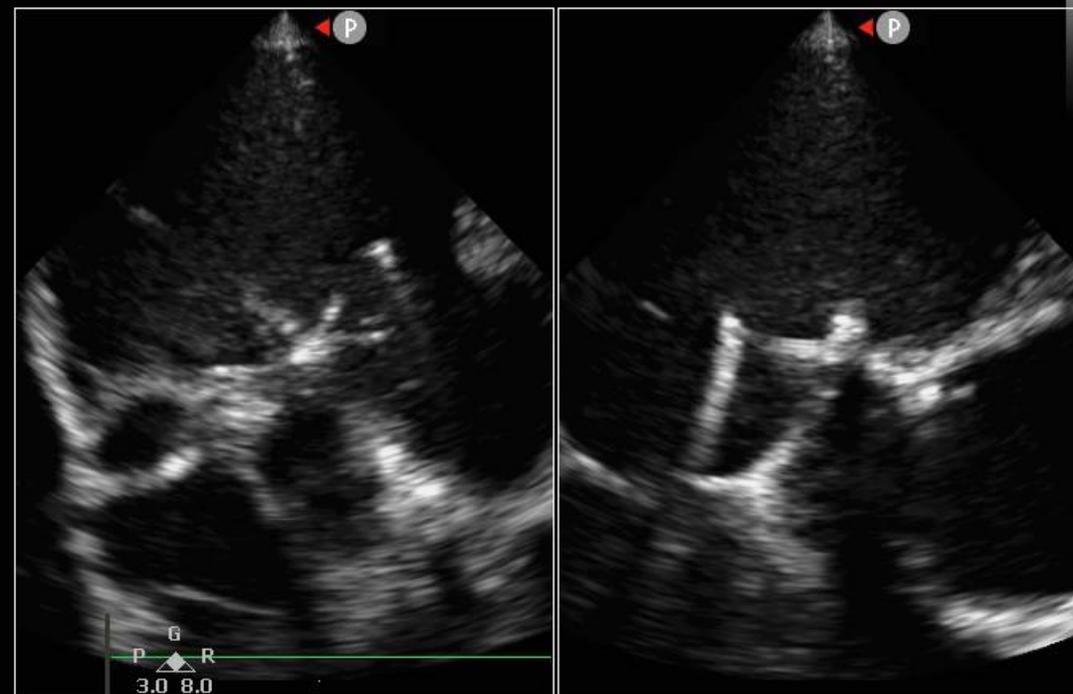
MI 0.6
TIS 0.1

TEE
X8-2t
23 Hz
8.0cm

Pat. T: 37.0 °C
TEE T: 39.5 °C
Seek Angle: 61°



2D
Gen
Gn 44
C 48
5/4/0
50 mm/s



PHILIPS

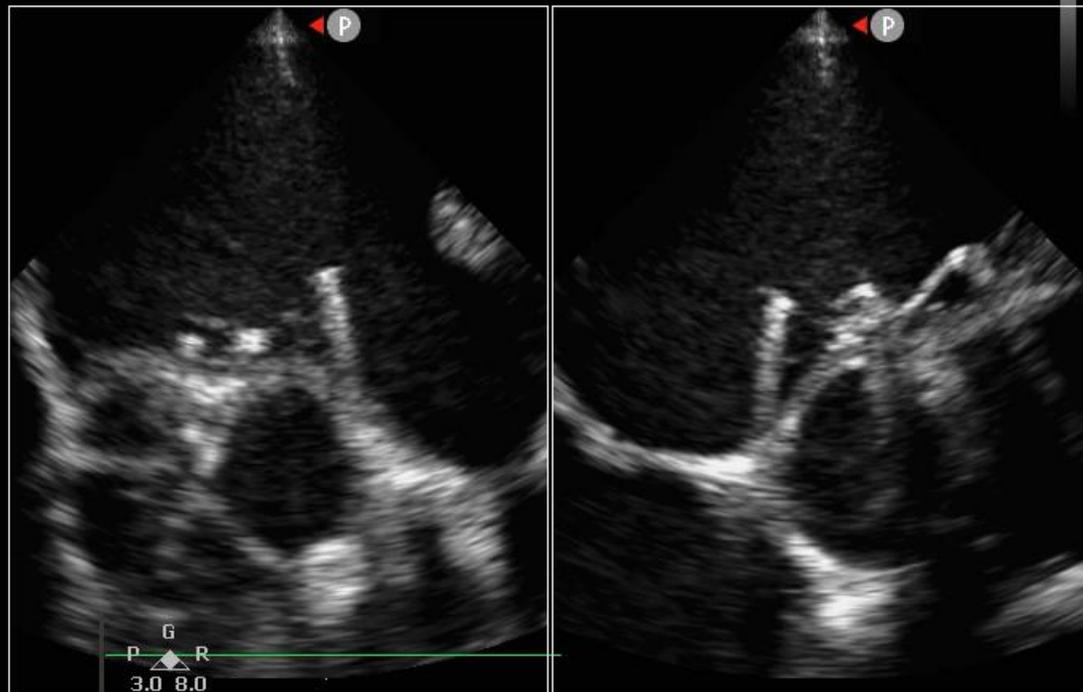
TEE
X8-2t
23 Hz
8.0cm

2D
Gen
Gn 44
C 48
5/4/0
50 mm/s

Pat. T: 37.0 °C
TEE T: 39.4 °C
Seek Angle: 61°



MI 0.6
TIS 0.1



PHILIPS

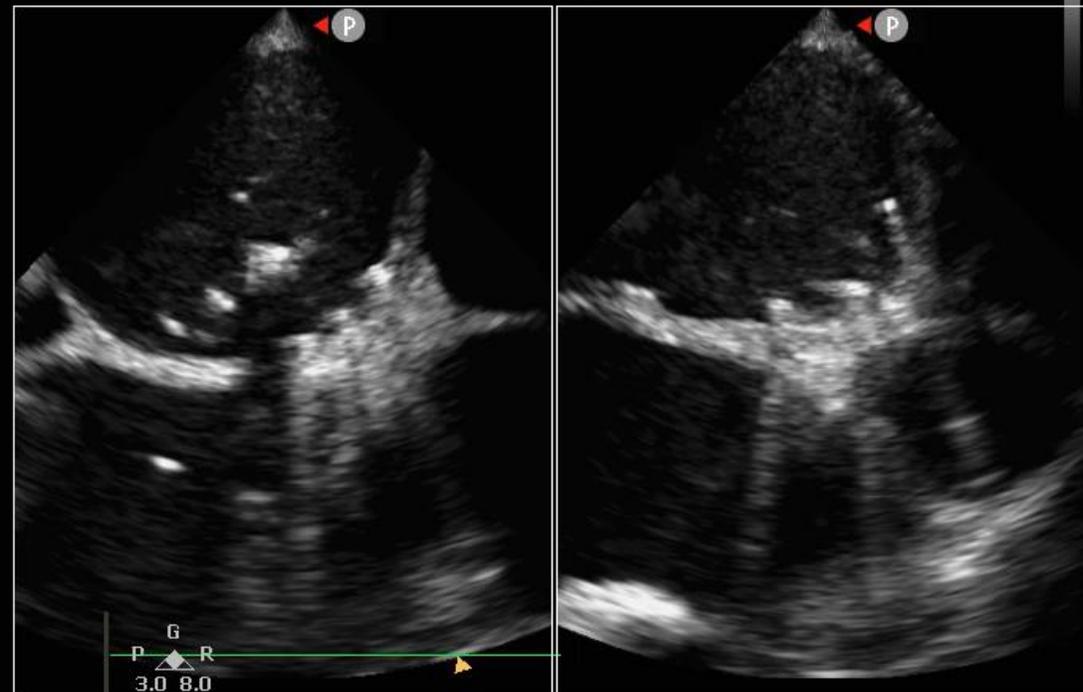
TEE
X8-2t
23 Hz
8.0cm

2D
Gen
Gn 44
C 48
5/4/0
50 mm/s

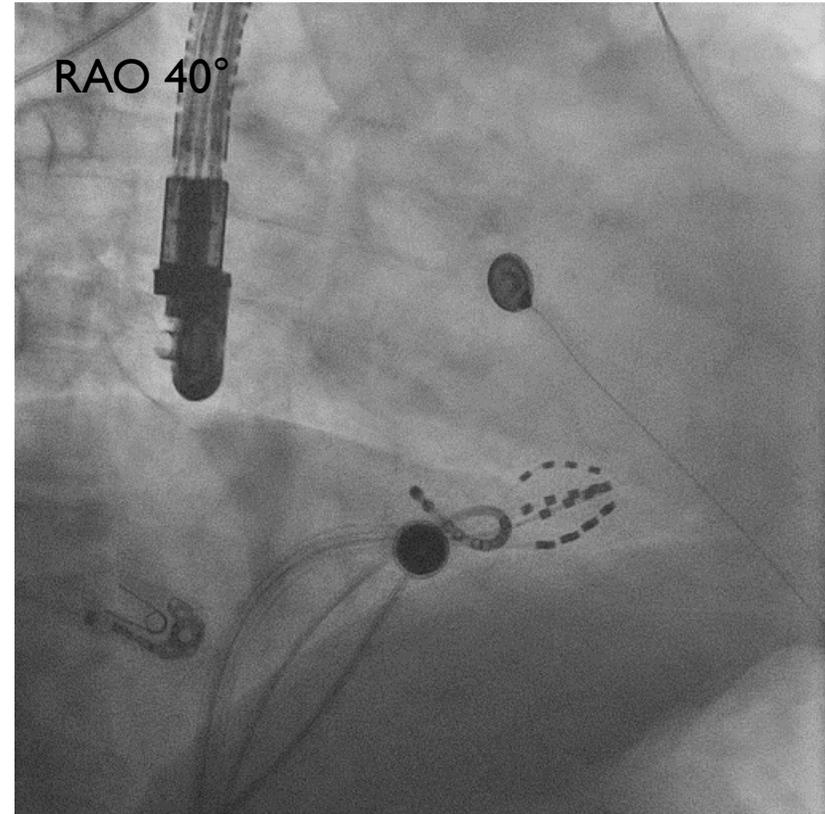
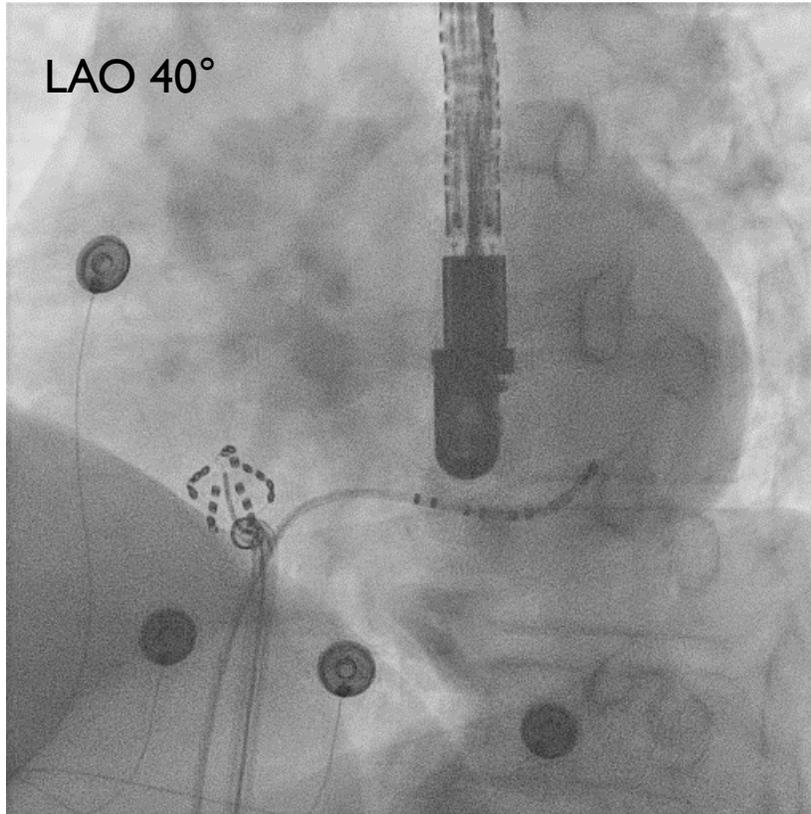
Pat. T: 37.0 °C
TEE T: 39.4 °C
Seek Angle: 61°



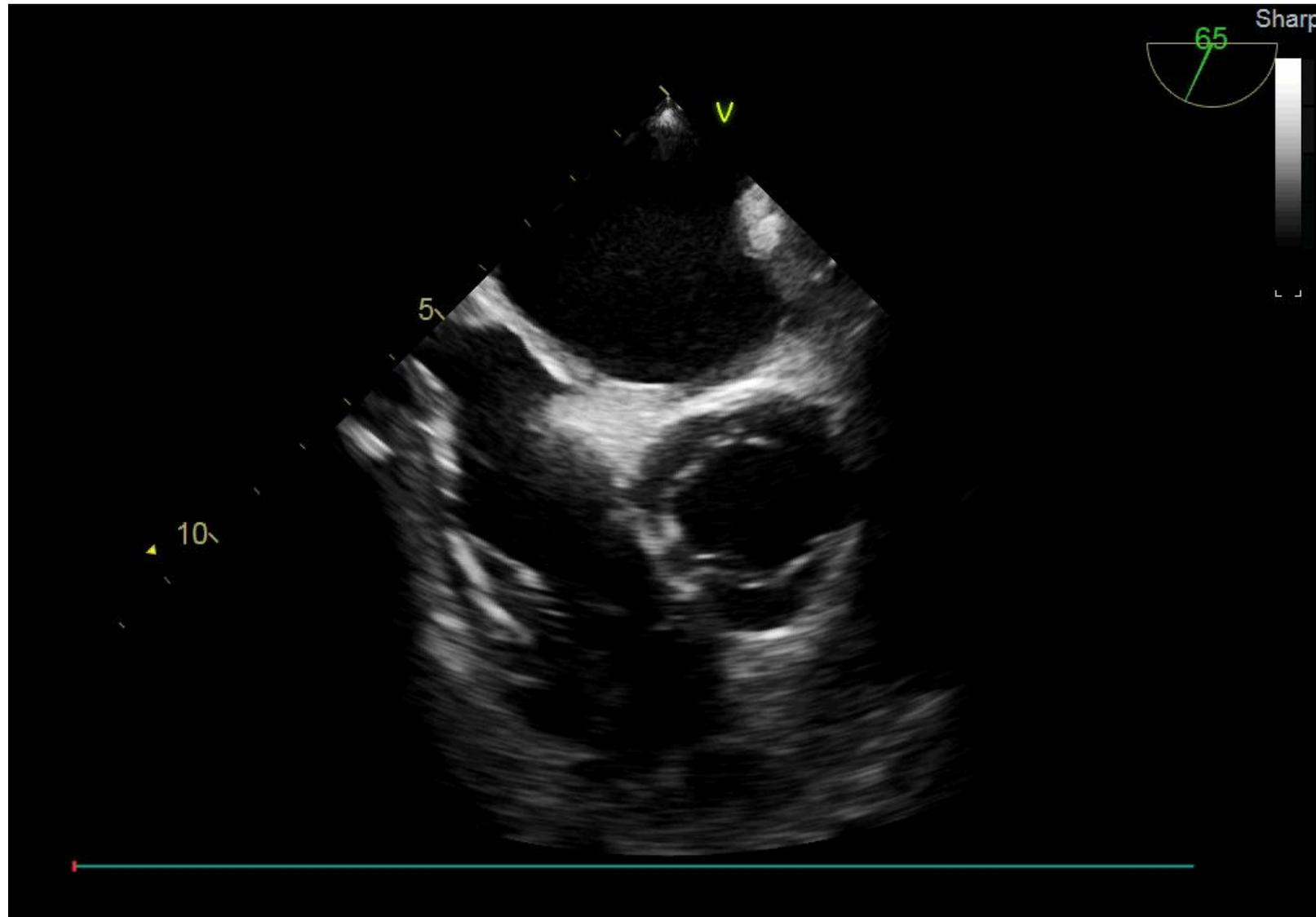
MI 0.6
TIS 0.1



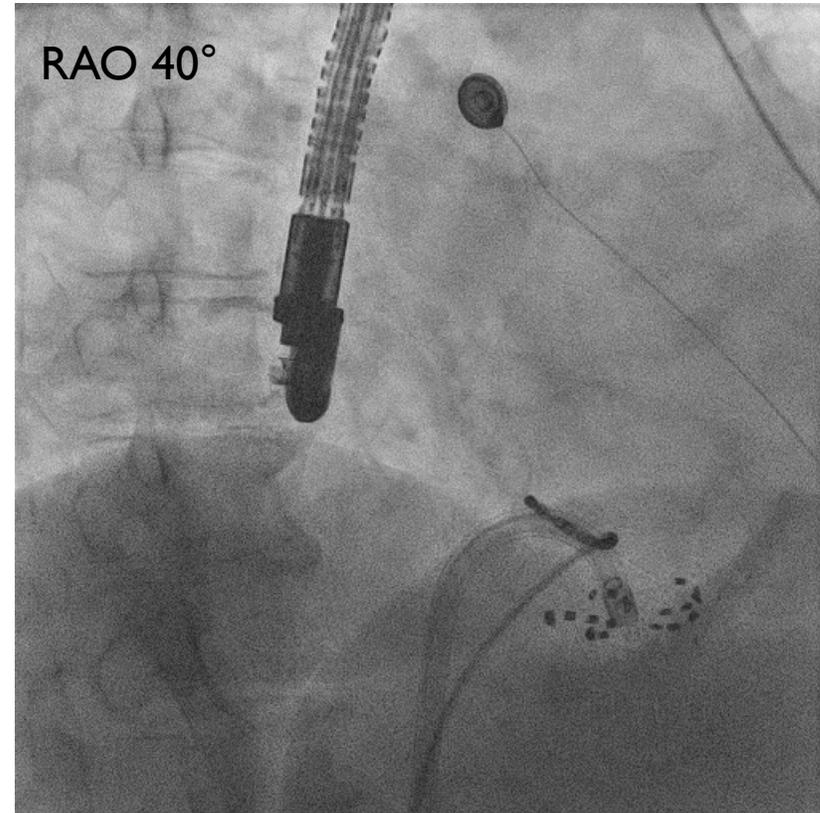
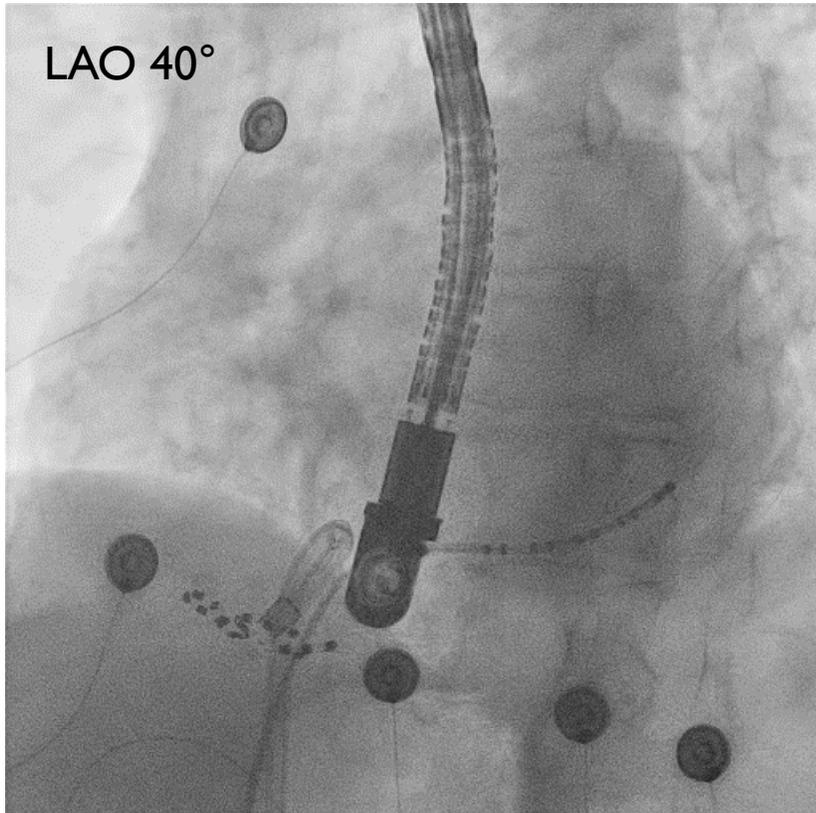
CTI



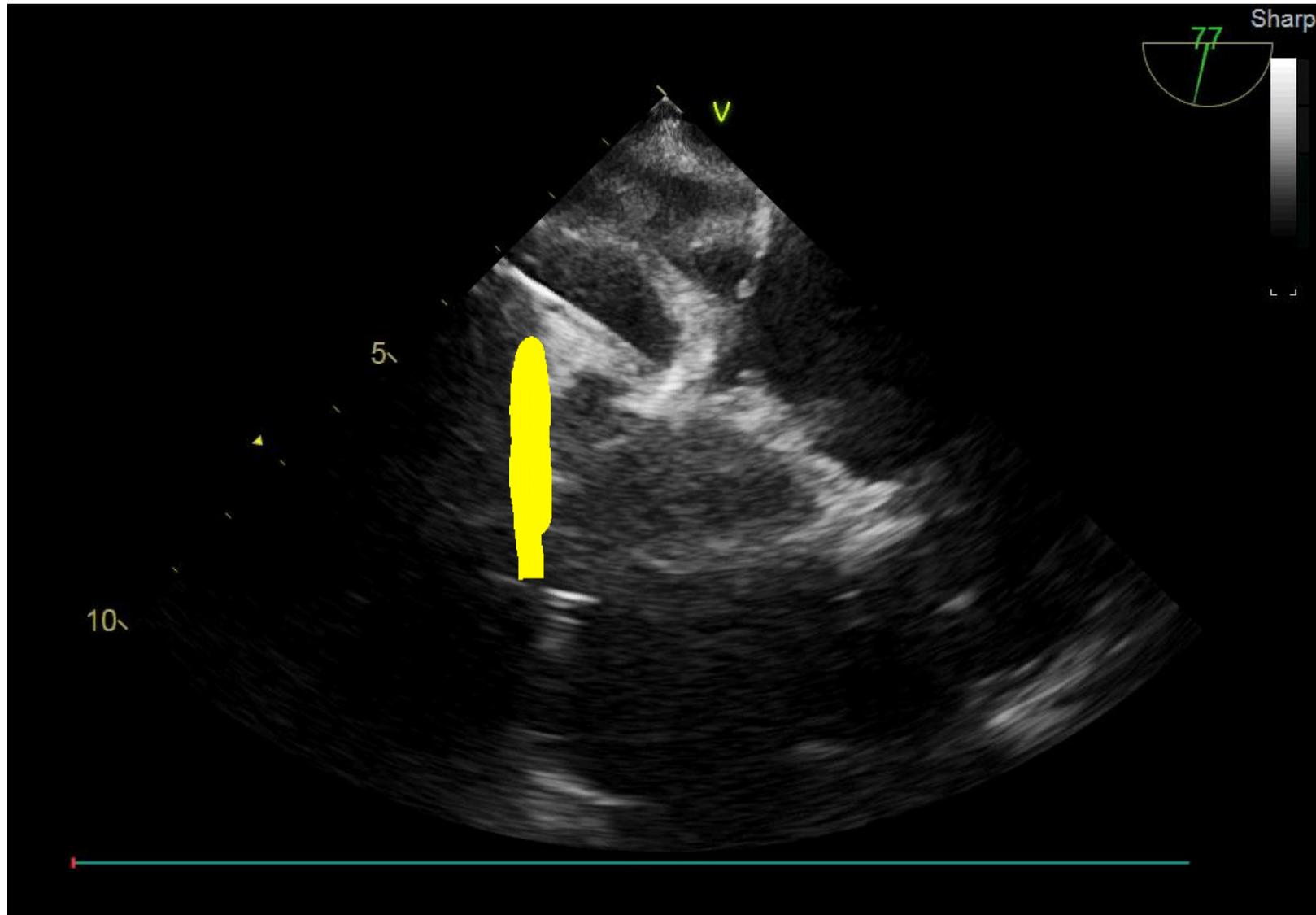
CTI (u TA)



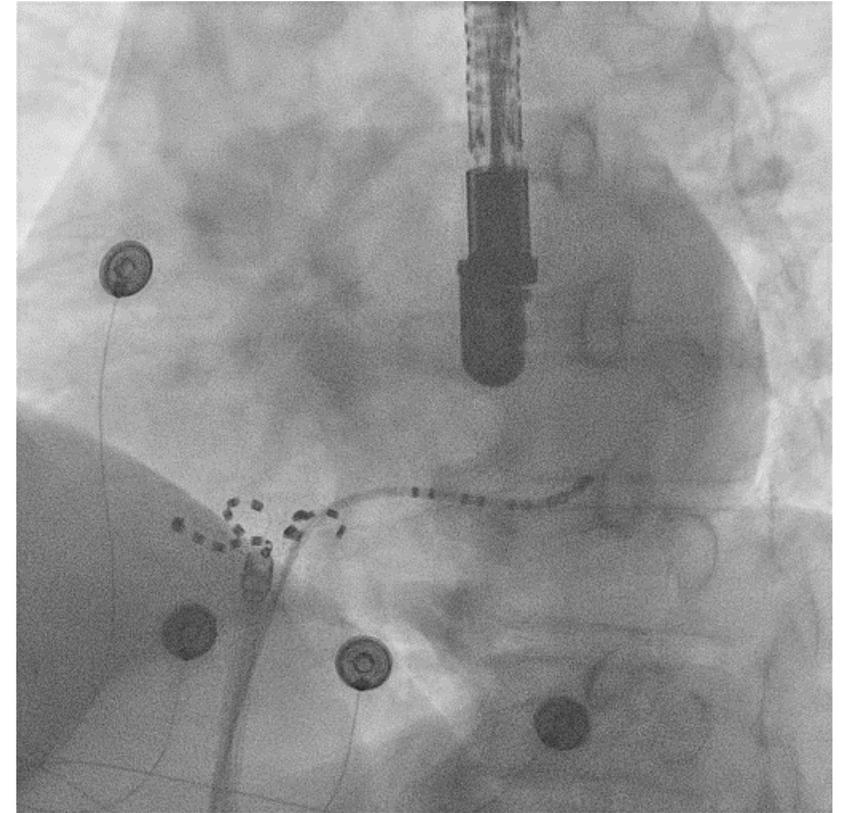
CTI – „stamping“



CTI – „stamping“



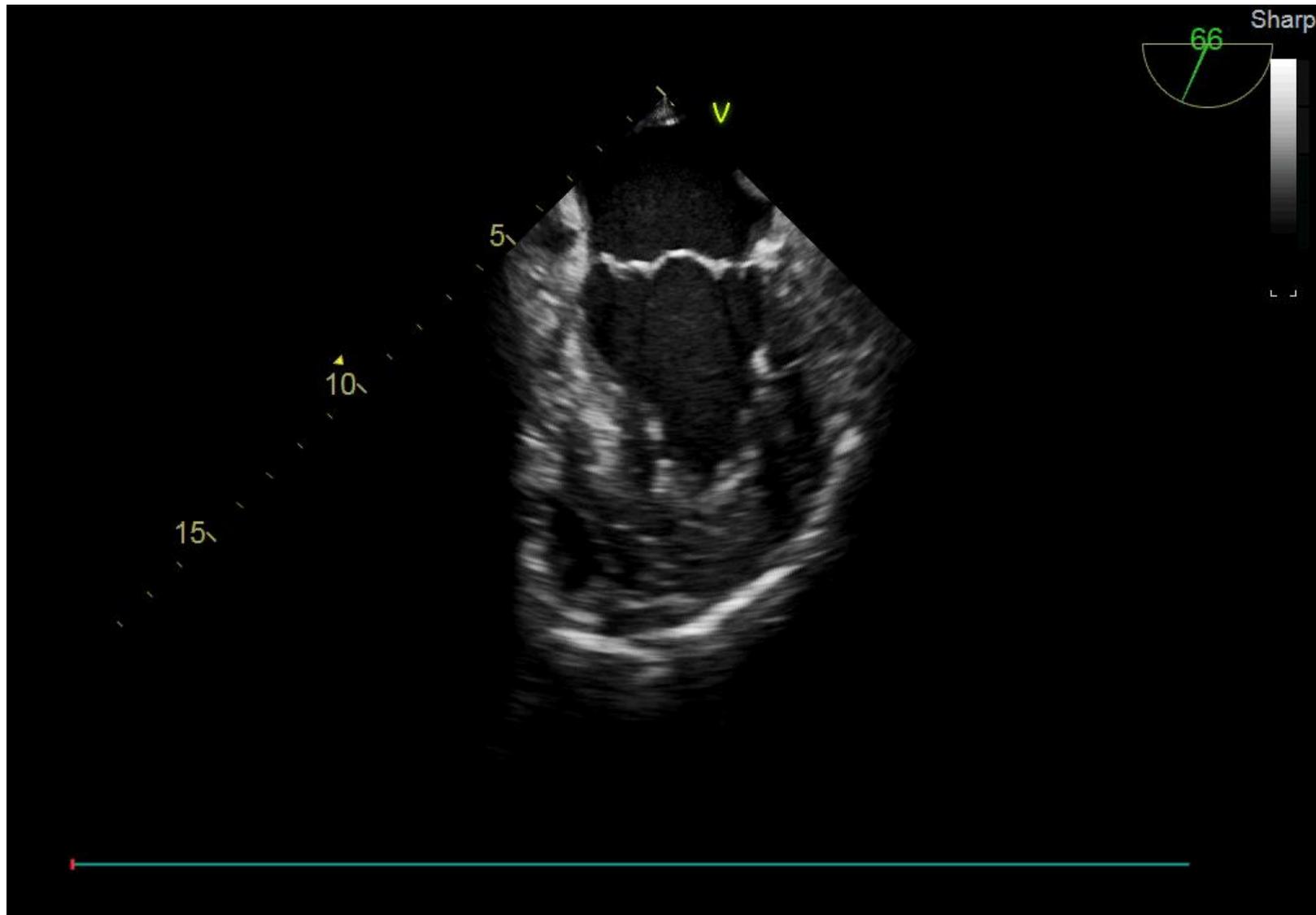
CTI „parachute“



CTI – verifikace bloku vedení



Kontrola na závěr



ICE

- Drahý
- Jeden operatér ovládá jak zobrazování, tak i abl. katétr
- Další venózní přístup (IIF)
- Něco je lépe viditelné (RIPV, CTI)

TEE

- Žádné materiálové náklady
- Echista na sále
- Volnější ruce pro operatéra
- Bolest v krku
- Něco je lépe viditelné (RSPV, MI)

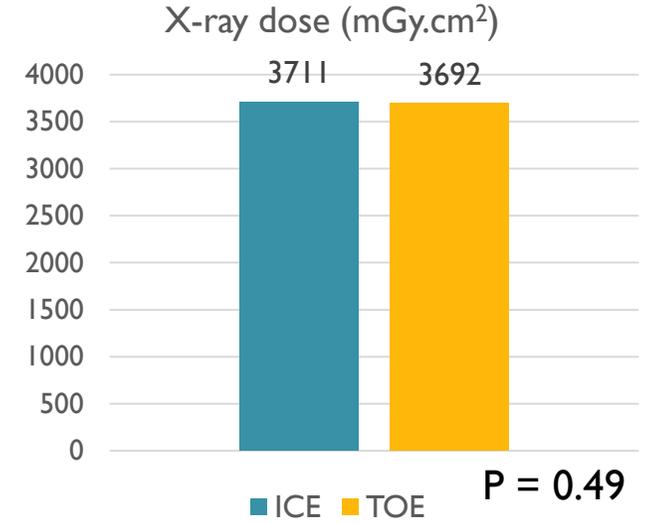
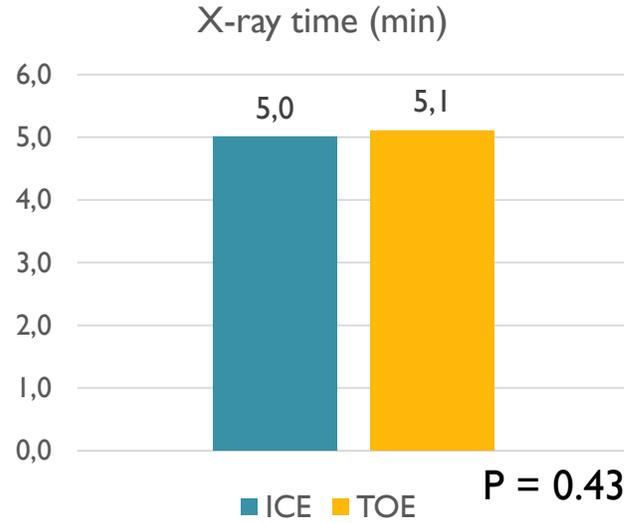
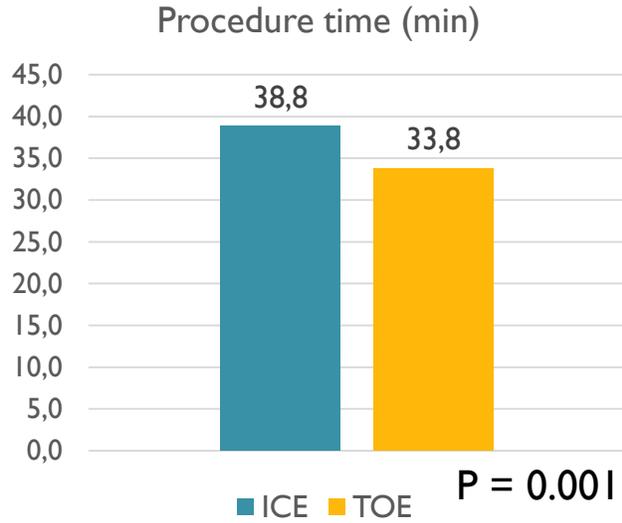
ICE a TEE srovnání

ICE vs. TEE

Dopady na procedurální charakteristiky

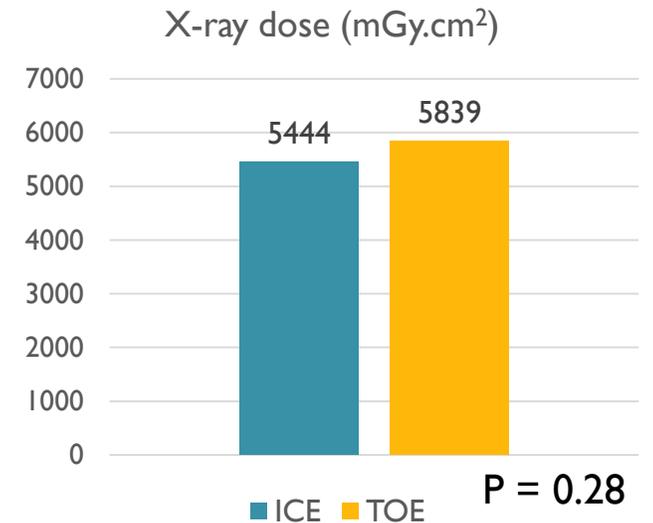
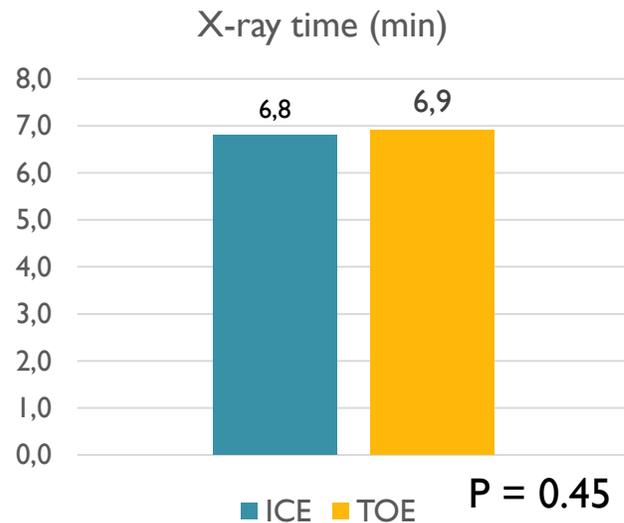
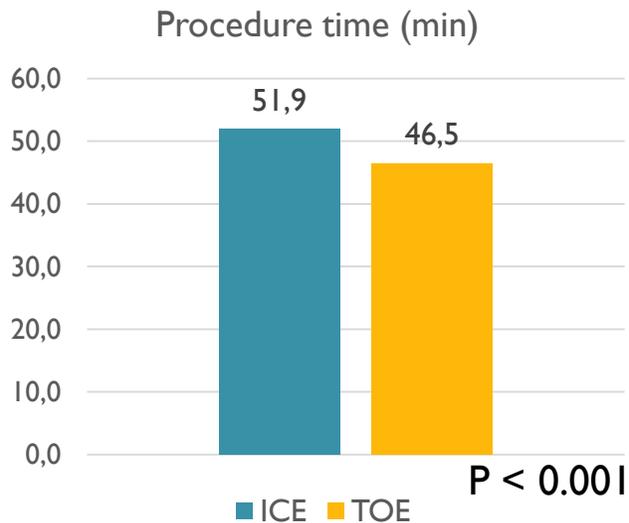
Paroxysmal AF

N=210 (2023)
N=97 (1-3/2024)



Persistent AF

N=312 (2023)
N=99 (1-3/2024)



Závěry

- Imagining hraje během PFA pro FiS důležitou roli
- ICE je vynikající, ale cena!
- TEE může bezpečně nahradit ICE, dokonce vede ke zkrácení doby výkonu bez nároku na větší skia zátěž