

# JAK SPRÁVNĚ VYŠETŘIT PACIENTA PŘED KATETRIZAČNÍM VÝKONEM NA MITRÁLNÍ CHLOPNI?



FN MOTOL

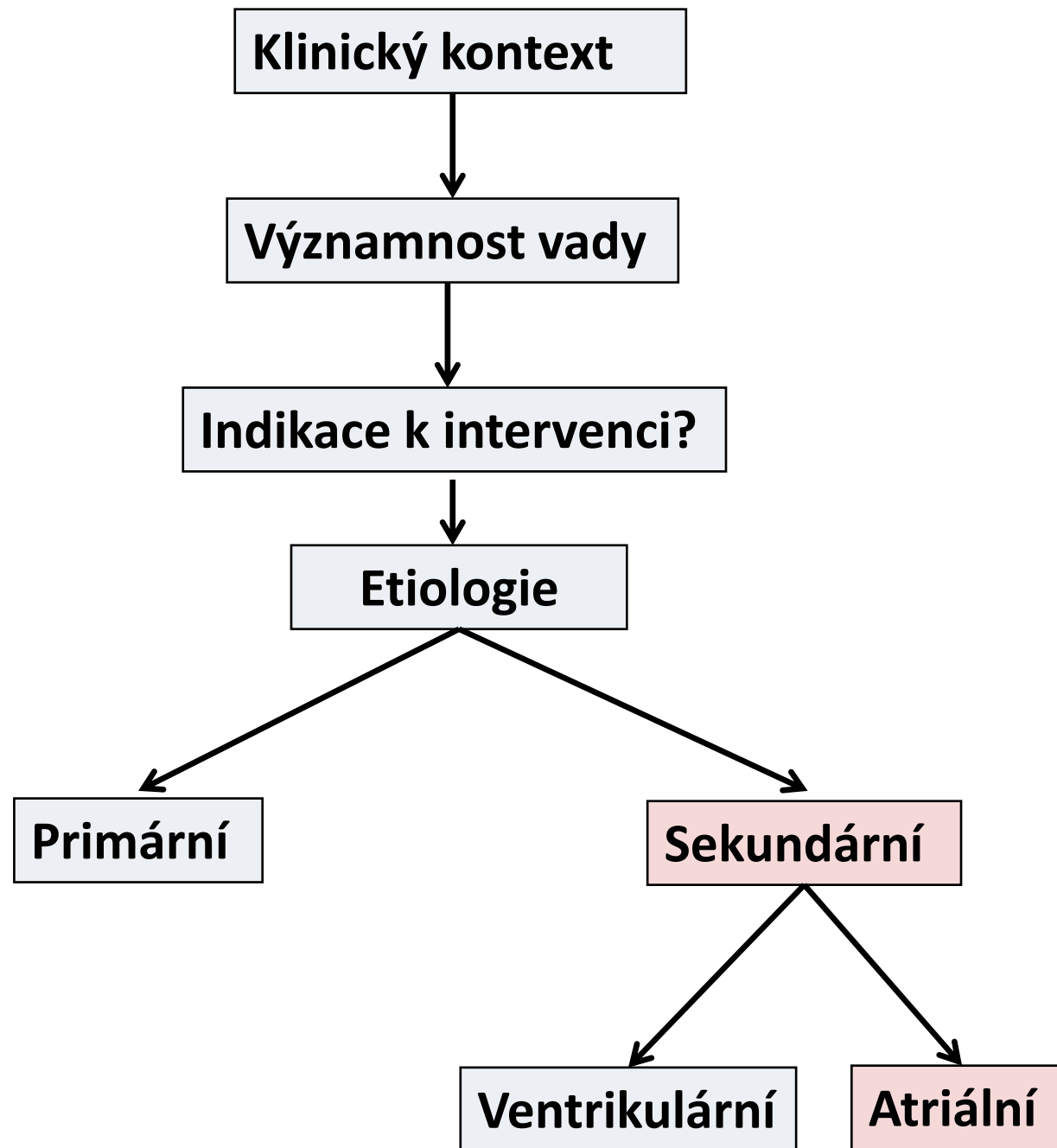


KARDIOLOGICKÁ  
KLINIKA



2. LF UK

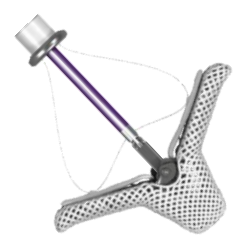
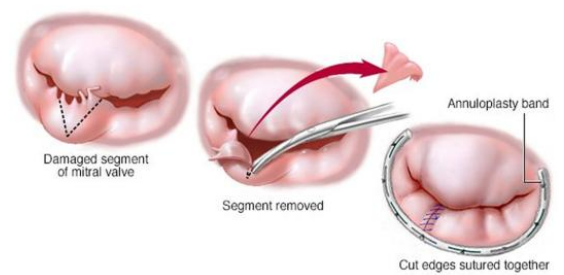
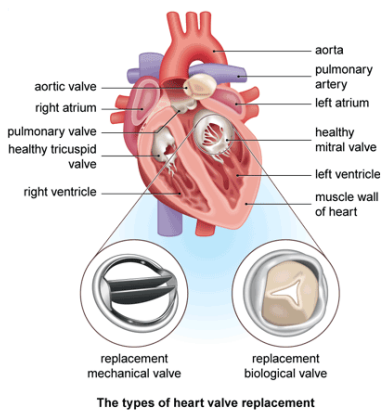
Martin Horváth





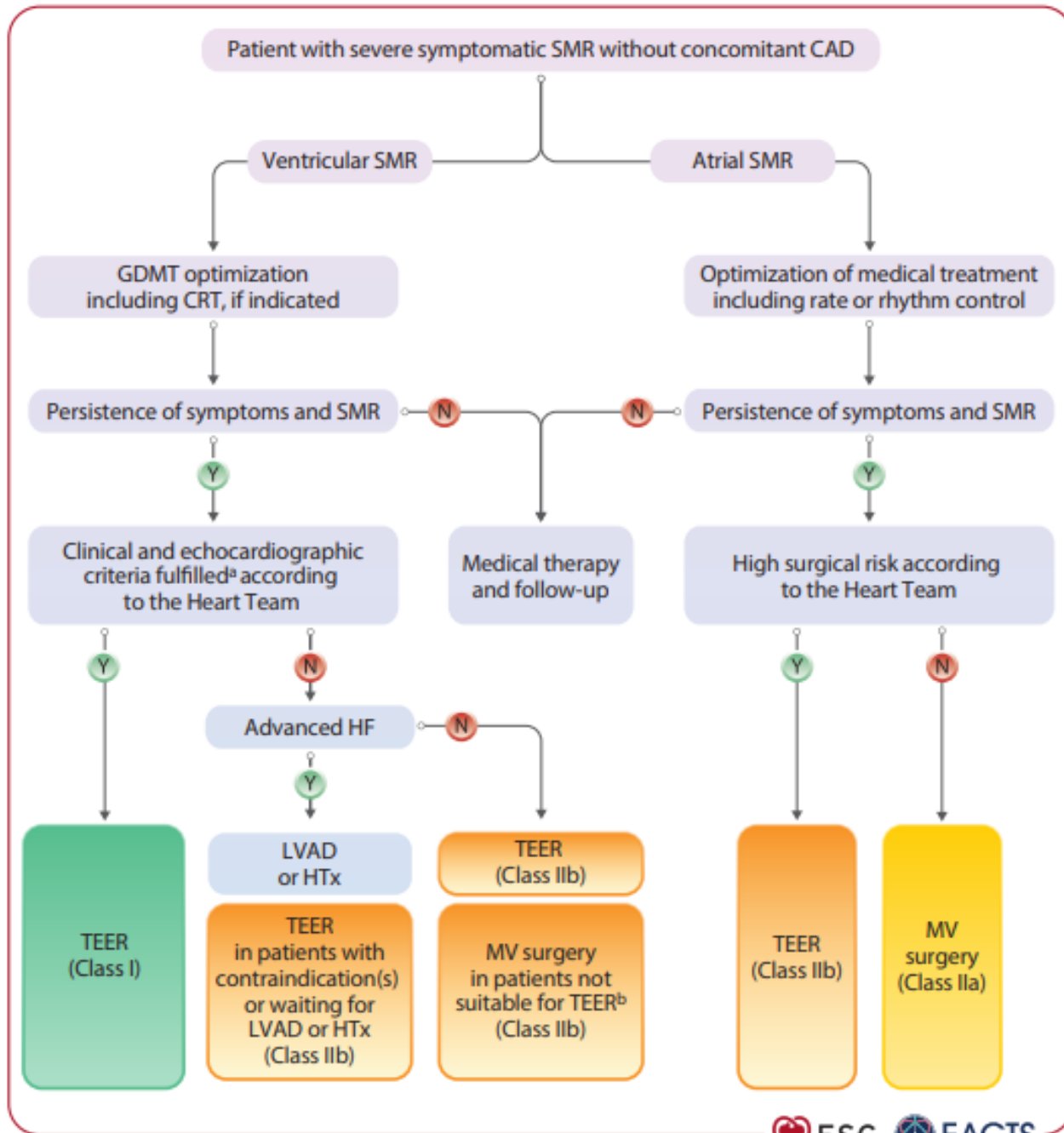
Operace

Intervence



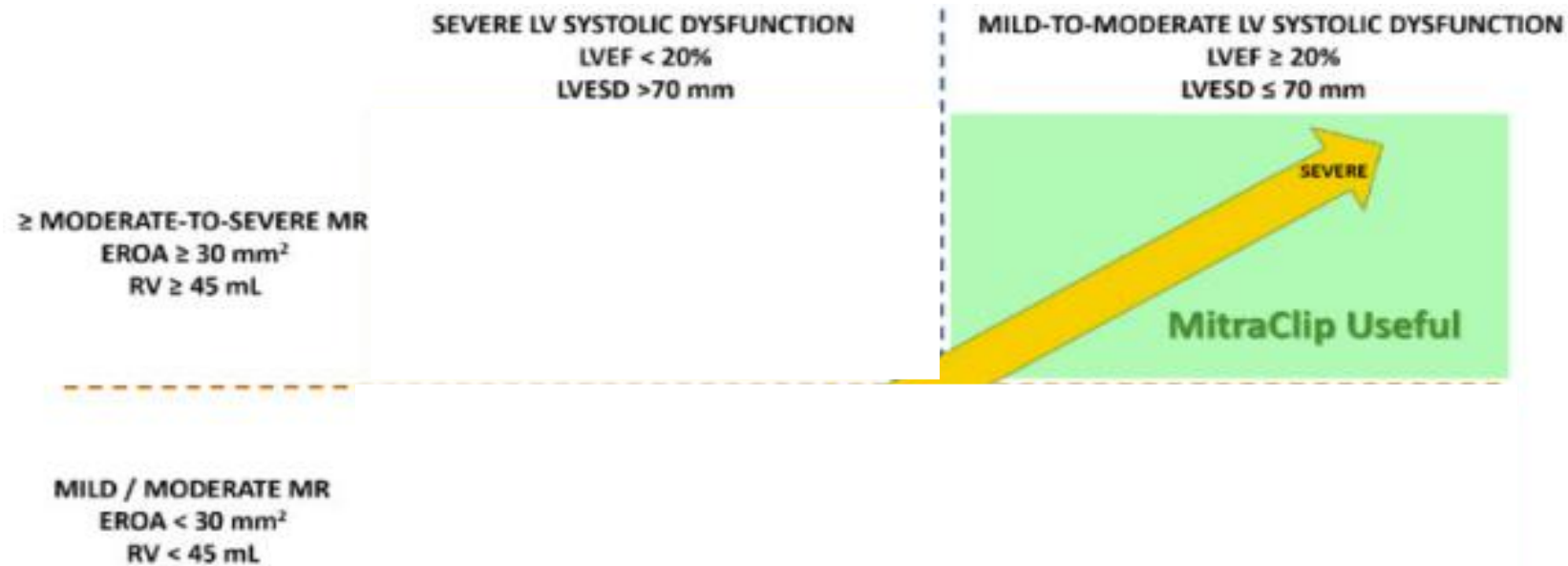
Anatomická vhodnost

Patient with severe primary mitral regurgitation



# Vhodný pacient

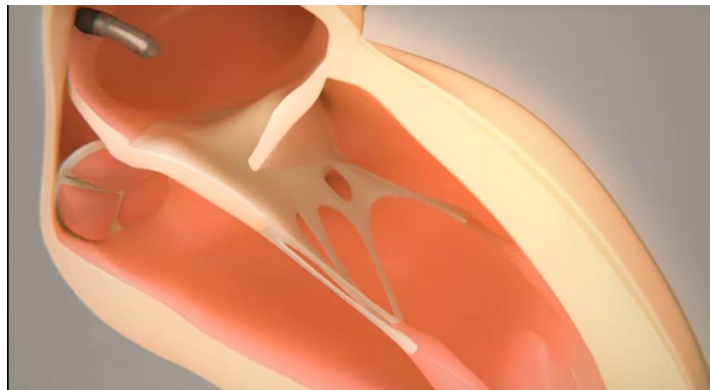
1. Těžká symptomatická primární MI u inoperabilního pacienta
2. Sekundární MI u pacienta s:
  - Symptomy přes optimální farmakoterapii a přístrojovou léčbu
  - Inoperabilní dle Heart team
  - Těžkou MI „inadekvátní“ k míře remodelace levé komory
  - Systolická dysfunkce levé komory s EF 20-50% a LVESD  $\leq$  70mm



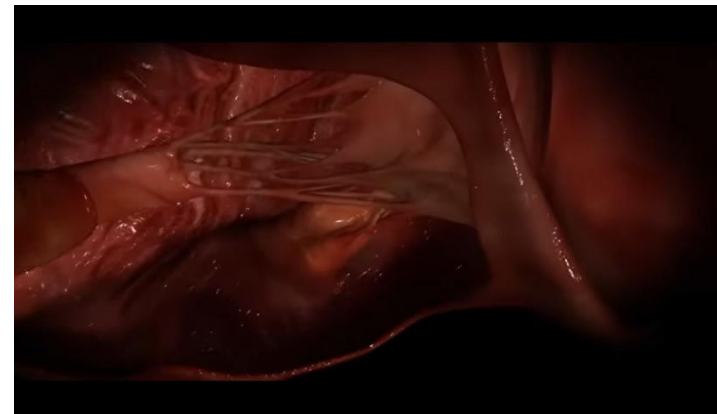
## TEER- MitraClip



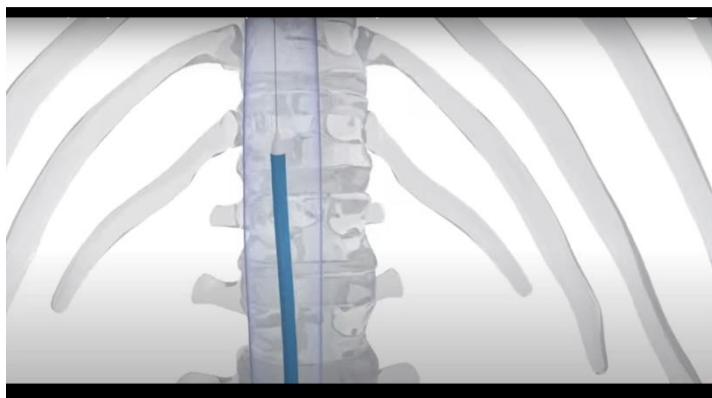
## Neochordy



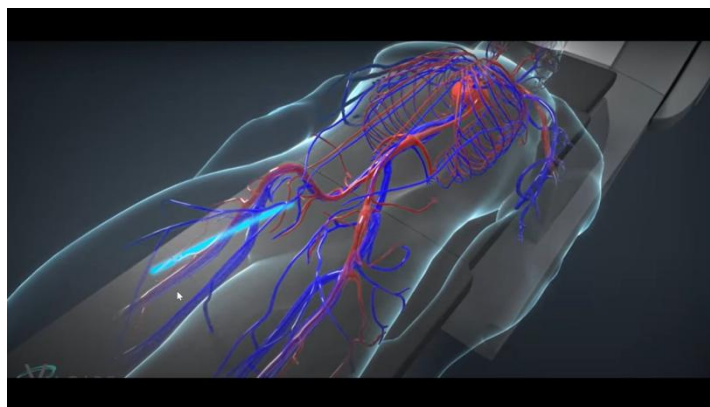
## Biologická náhrada



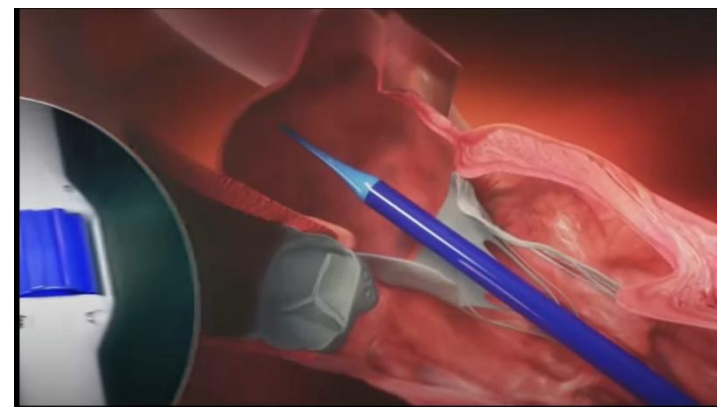
## TEER- PASCAL



## Anuloplastický ring



## Biologická náhrada



# Plastika



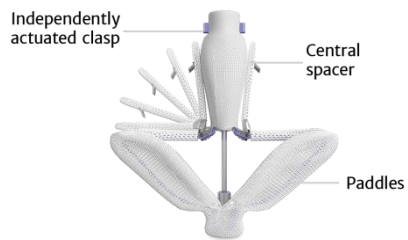
NeoChord  
(Neochord inc.)



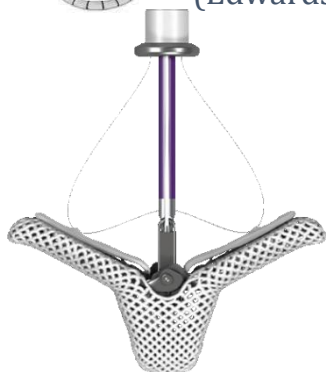
Carillon (Cardiac dimensions)



Cardioband  
(Edwards)

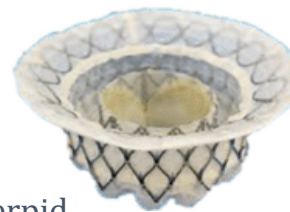


Pascal  
(Edwards)



MitraClip  
(Abbott)

# Náhrada



Interpid  
(Medtronic)



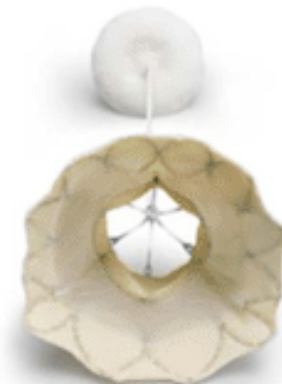
Tiara  
(Neovasc)



Sapien M3  
(Edwards)



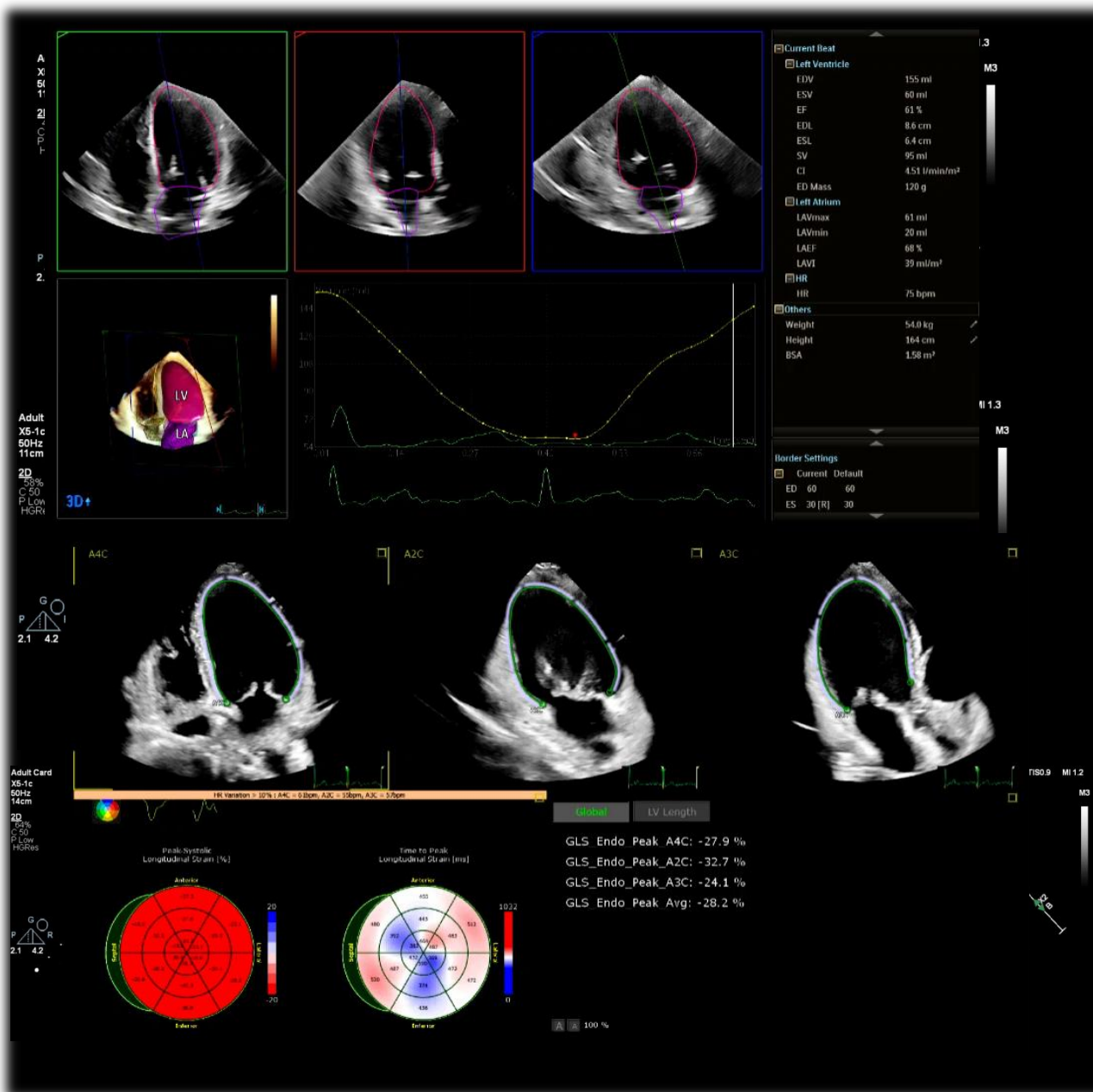
Evoque TMVR  
(Edwards)



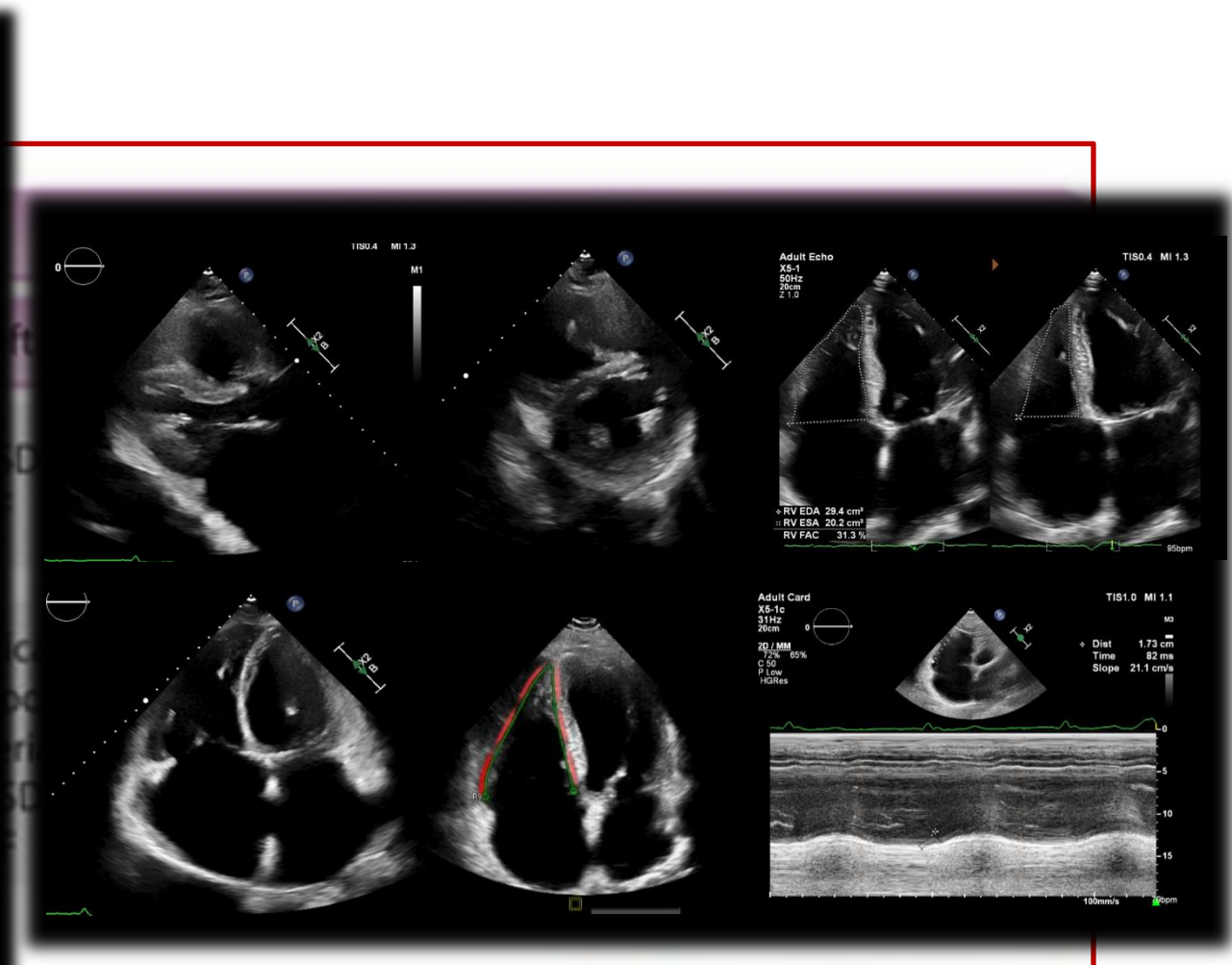
TENDYNE™  
(Abbott)



# Systolická funkce levé komory



# Systolická pravé komory



Pravá komora rozměry  
TAPSE , s TDI ,strain PK , FAC, přítomnost PH

Adult Card  
X5-1c  
50Hz  
11cm

2D  
48%  
C 50  
P Low  
HGRes

G  
P R  
2.1 4.2

TIS0.7 MI 1.3

Adult Card  
X5-1c  
50Hz  
14cm

2D  
64%  
C 50  
P Low  
HGRes

G  
P R  
2.1 4.2

LA A4Cs  
Atrial Length 4.88 cm  
Atrial Area 23.5 cm<sup>2</sup>  
Atrial Volume 86.4 ml  
LA ESV Index (A4C) 54.7 ml/m<sup>2</sup>

TIS0.9 MI 1.2

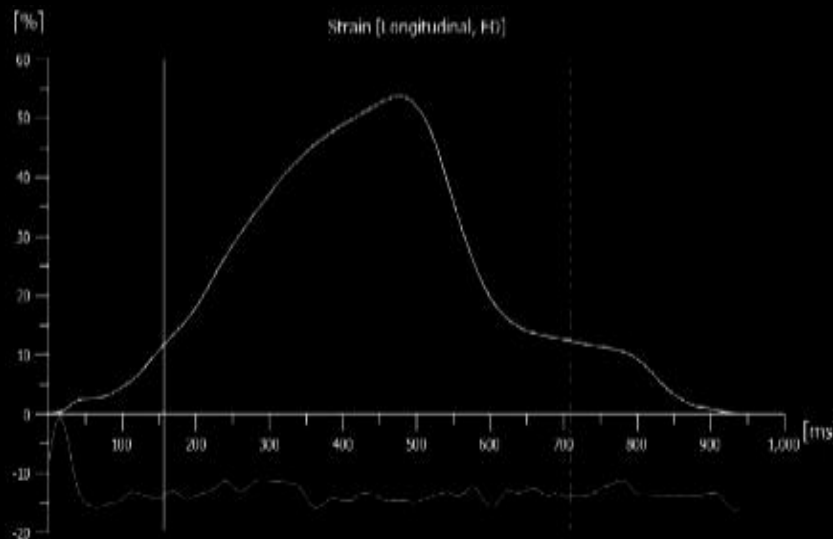
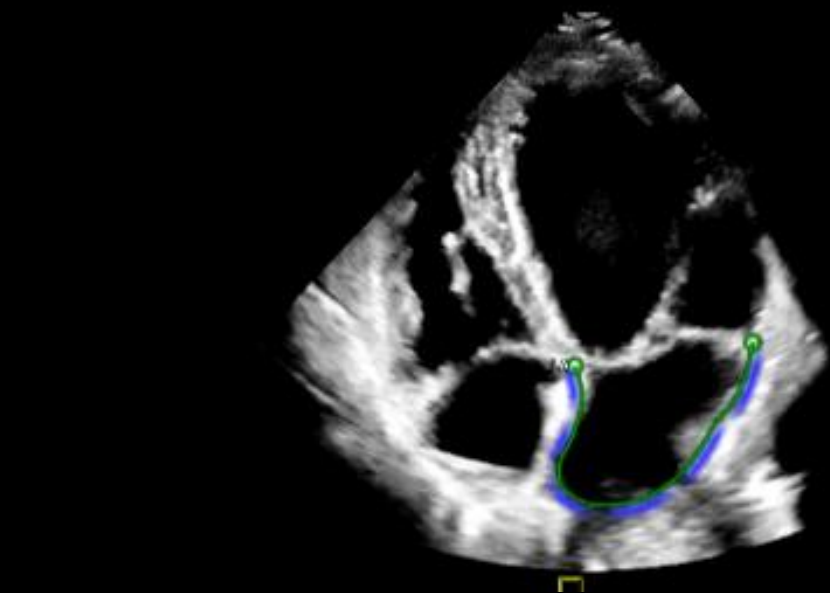
Adult Card  
X5-1c  
50Hz  
14cm

2D  
64%  
C 50  
P Low  
HGRes

G  
P R  
2.1 4.2

LA A2Cs  
Atrial Length 4.95 cm  
Atrial Area 20.6 cm<sup>2</sup>  
Atrial Volume 60.0 ml  
LA ESV Index (A2C) 38.0 ml/m<sup>2</sup>  
LA ESV (BP) 72.2 ml  
LA ESV Index (BP) 45.7 ml/m<sup>2</sup>

TIS0.9 MI 1.2



Reference ED Reference PreA

LASr\_ED: 53.8 %  
LAScd\_ED: -41.4 %  
LASct\_ED: -12.4 %

100 %

# Zhodnocení tíže vady - 2D echokardiografie

## Qualitative

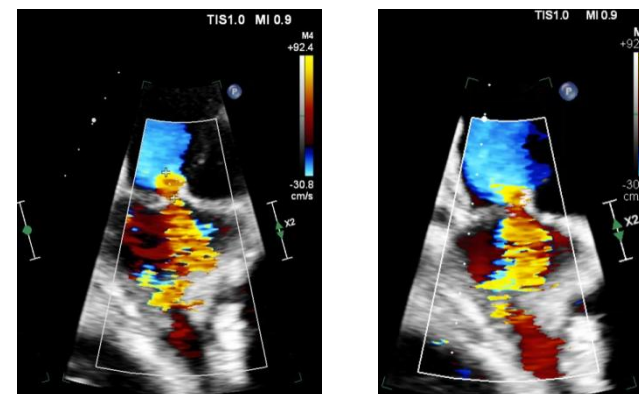
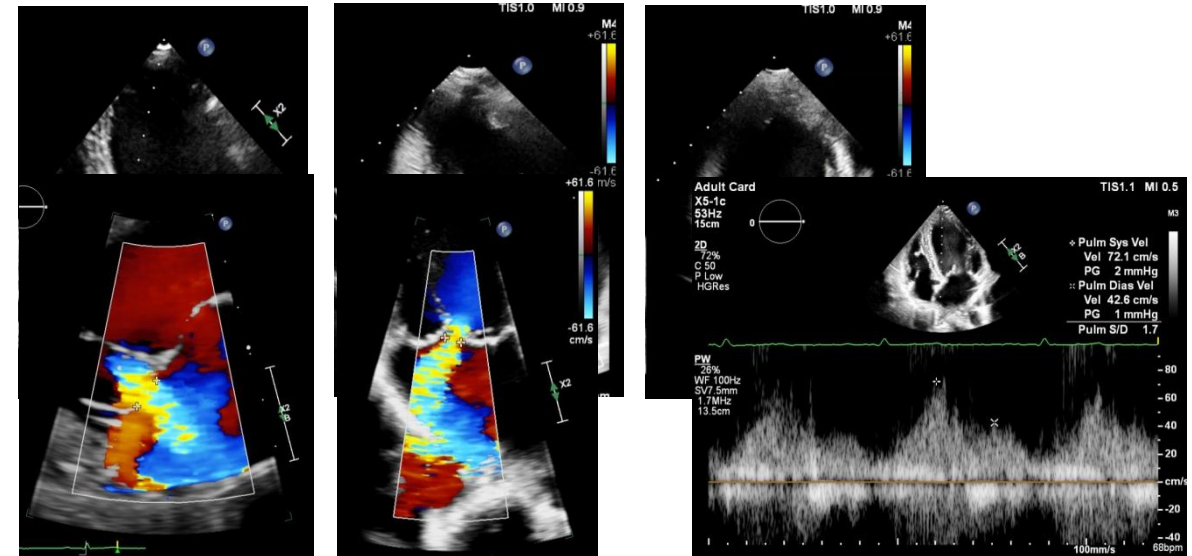
- Flail leaflet, large coaptation defect, severe tenting
- Large central jet
- Large holosystolic convergence zone

## Semi-quantitative

- Vena contracta  $\geq 7$  mm ( $\geq 8$  mm for biplane)
- Pulmonary vein systolic flow reversal
- E-wave dominant ( $>1.2$  m/s)
- VTI mitral / VTI LVOT  $>1.4$

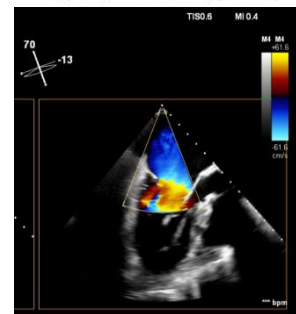
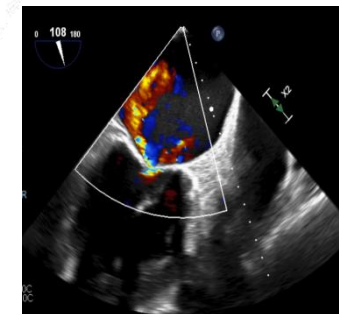
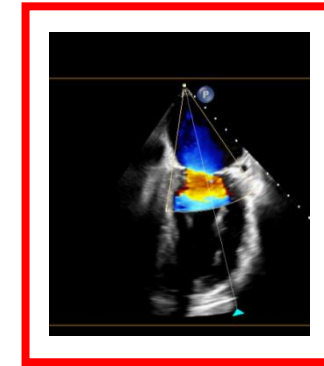
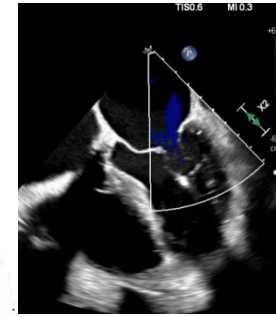
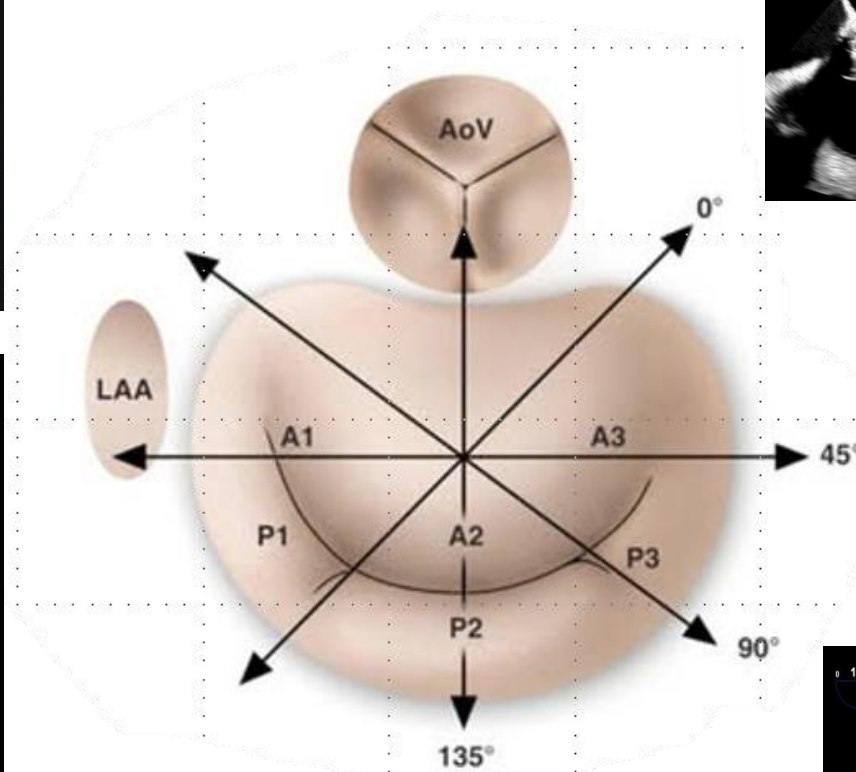
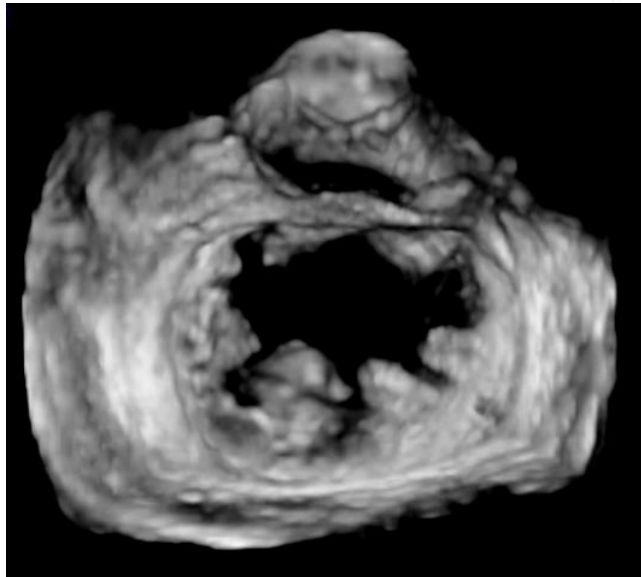
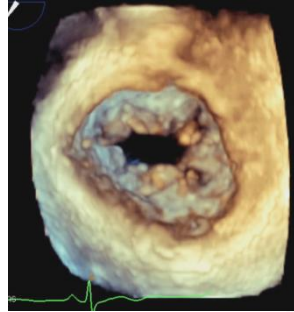
## Quantitative

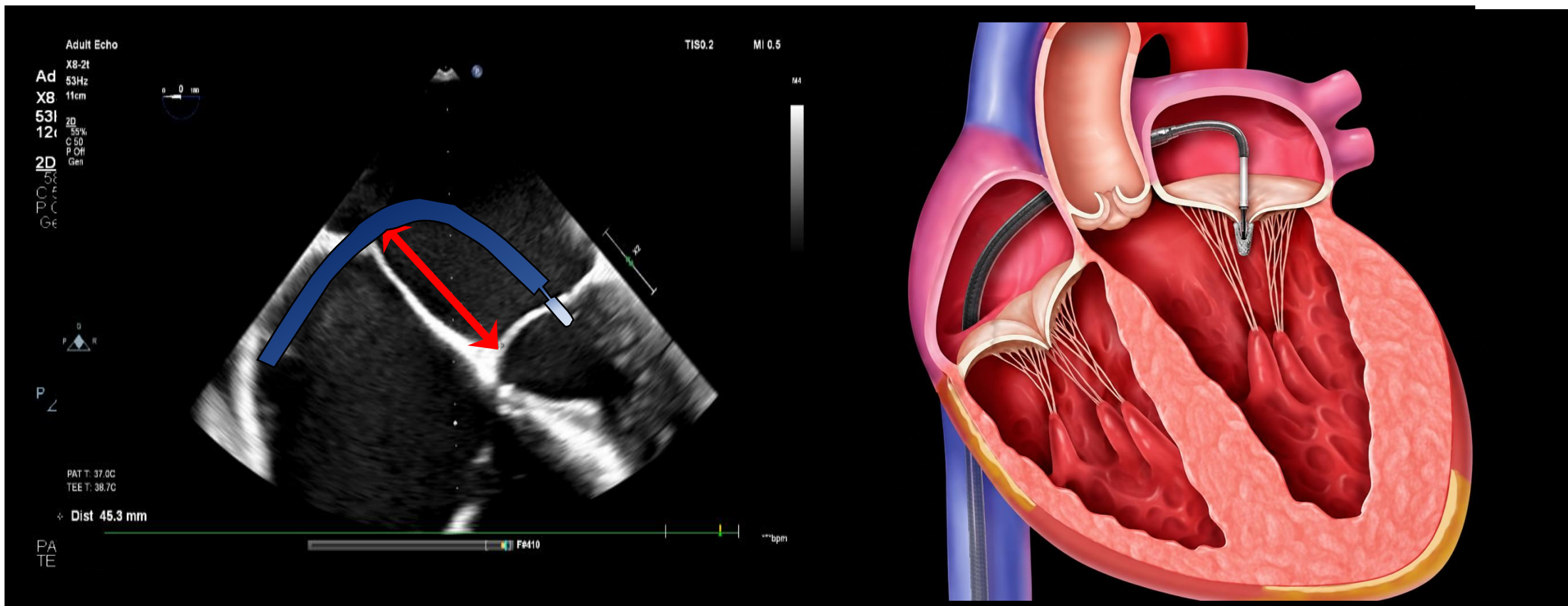
- EROA  $\geq 40$  mm<sup>2</sup> (or  $\geq 30$  mm<sup>2</sup> if elliptical regurgitant orifice area)
- RVol  $\geq 60$  mL (or  $\geq 45$  mL if low flow conditions)
- RF  $\geq 50\%$



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# Jícnová echokardiografie



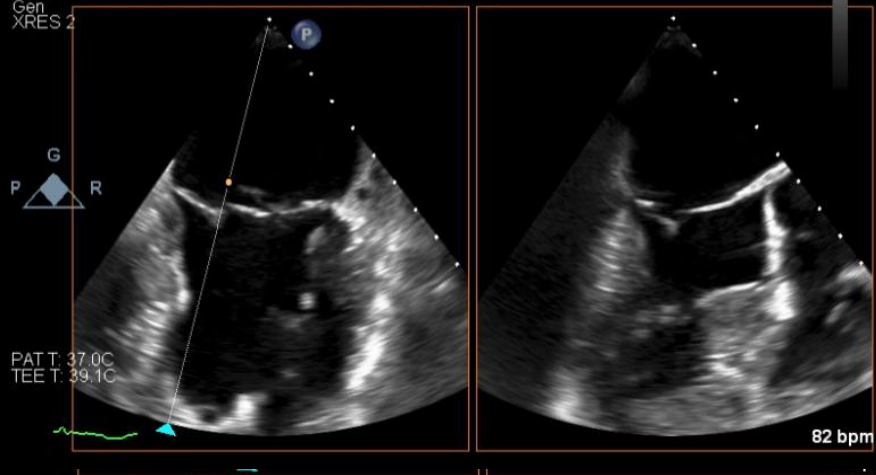


- ideální výška nad mitrální chlopní většinou ~4–5 cm (dle anatomie a typu MR)

Adult Echo TIS0.2 MI 0.5

X8-2t  
32Hz  
12cm

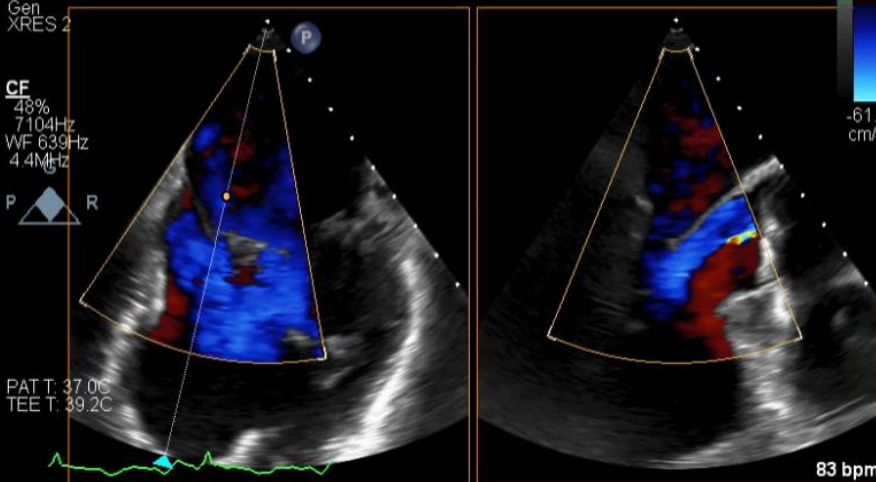
xPlane  
57%  
57%  
50dB  
P Off  
Gen  
XRES 2



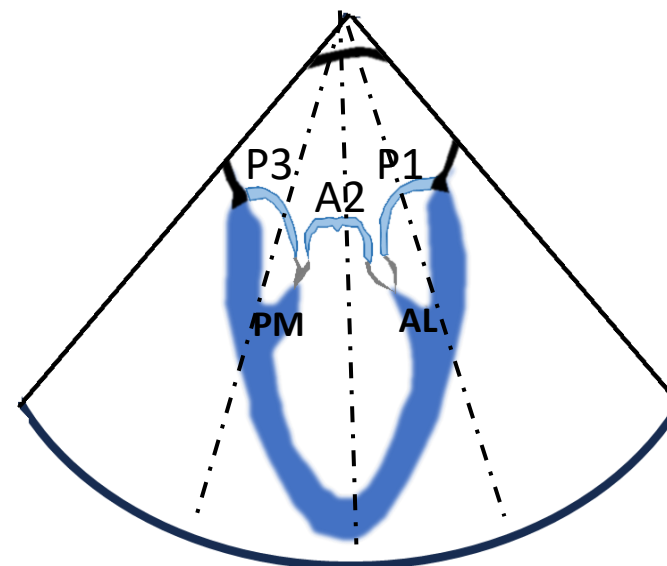
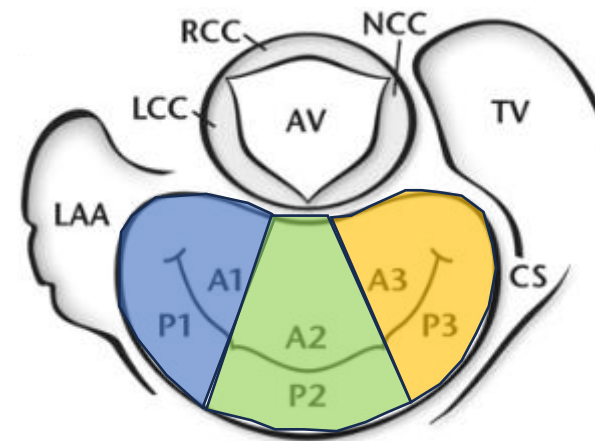
Adult Echo TIS0.6 MI 0.3

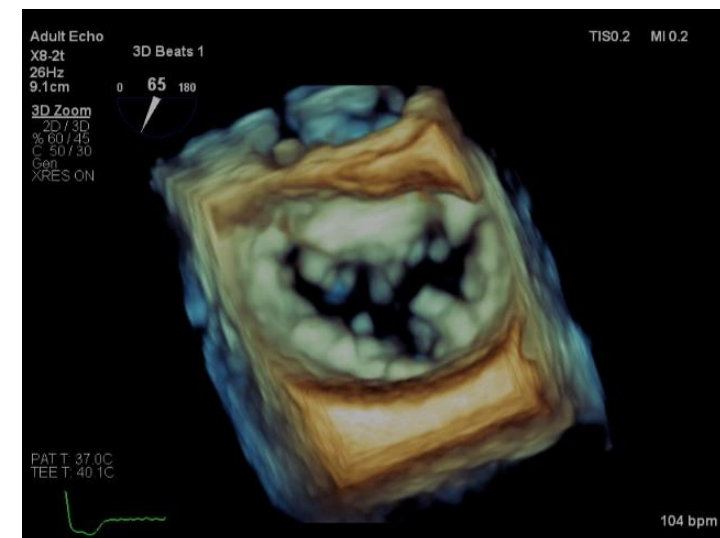
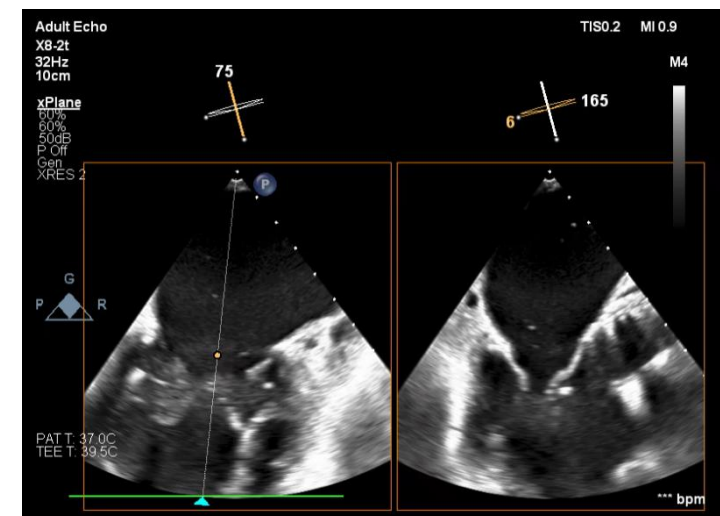
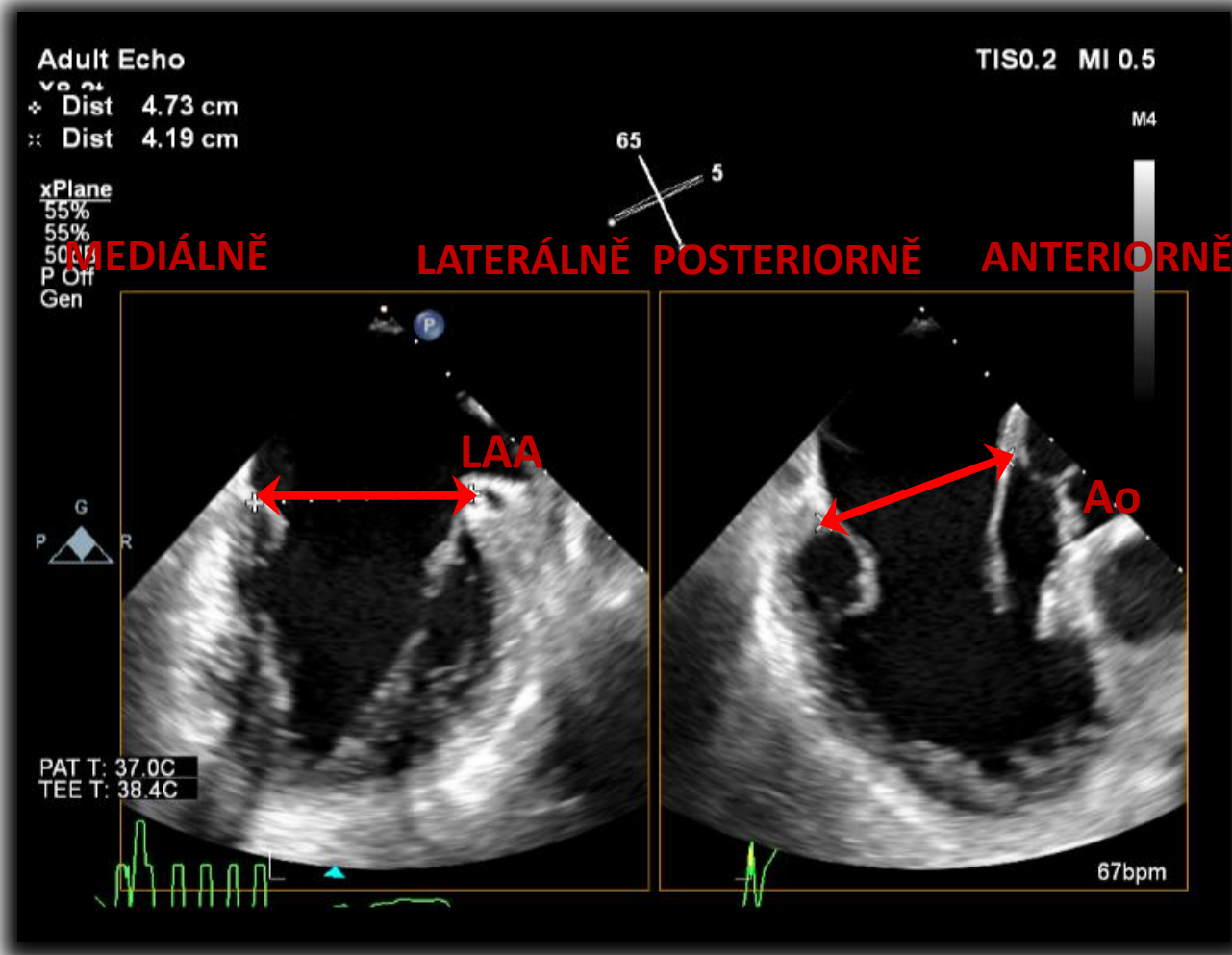
X8-2t  
13Hz  
12cm

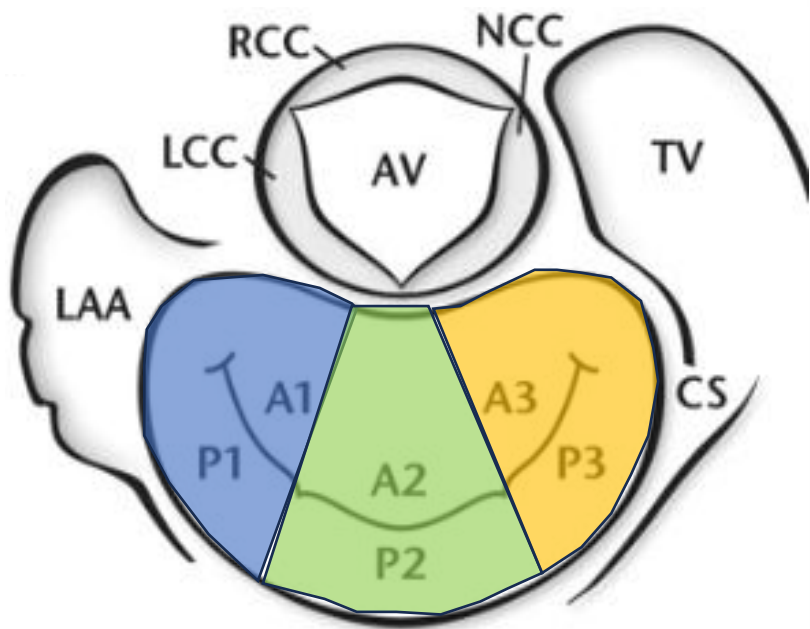
xPlane  
59%  
59%  
50dB  
P Off  
Gen  
XRES 2



# Midkomisurální s x-plane







Adult Echo  
X8-2t  
12Hz  
7.3cm

3D Beats 1

3D Zoom  
2D / 3D  
% 55 / 45  
C 50 / 30  
Gen

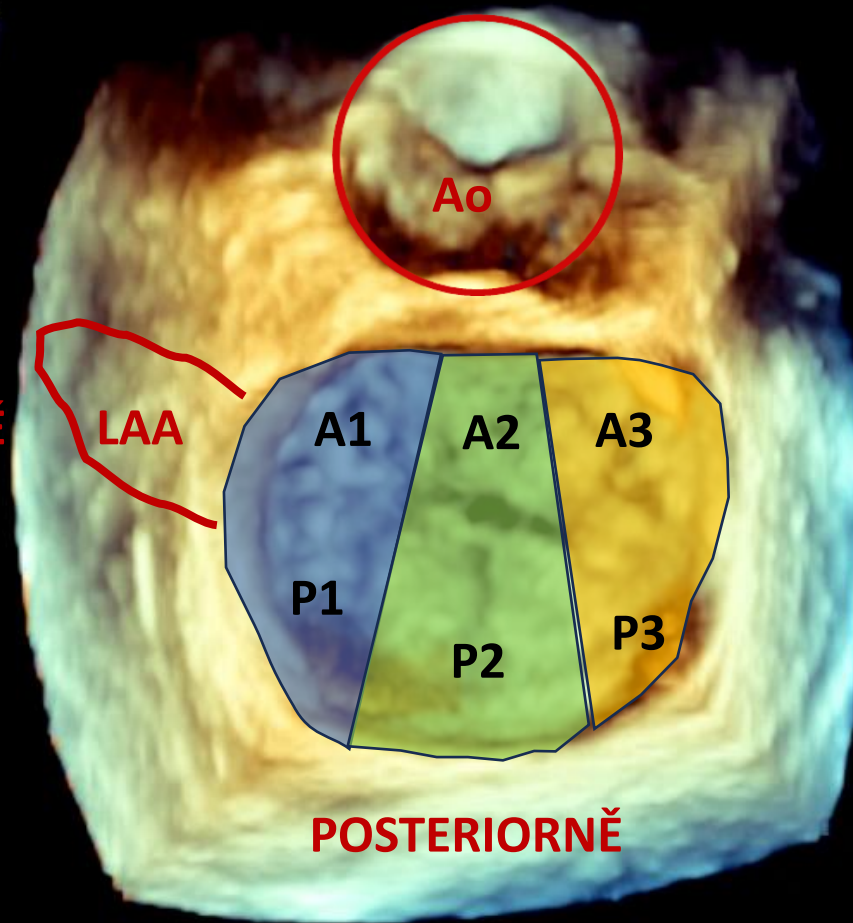


TISO.2 MI 0.3

M4



LATERÁLNĚ

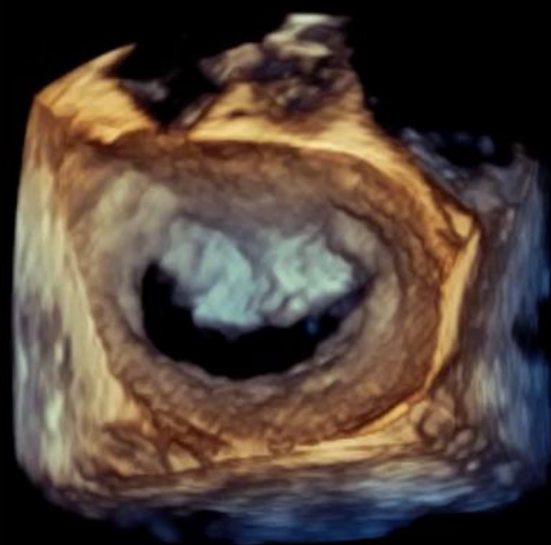


MEDIÁLNĚ

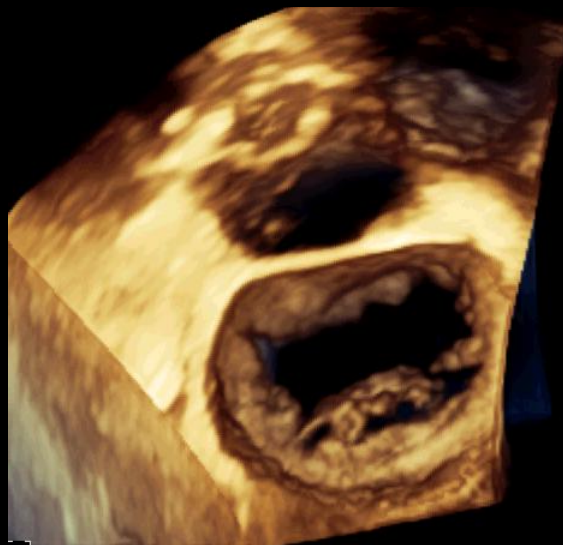
POSTERIORNĚ

PAT T: 37.0C  
TEE T: 39.1C

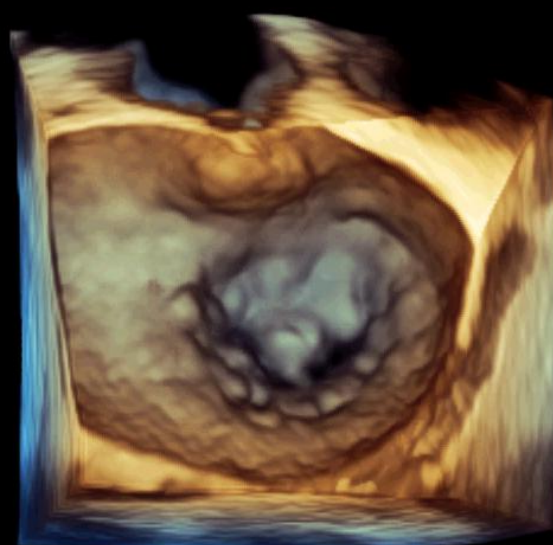
V



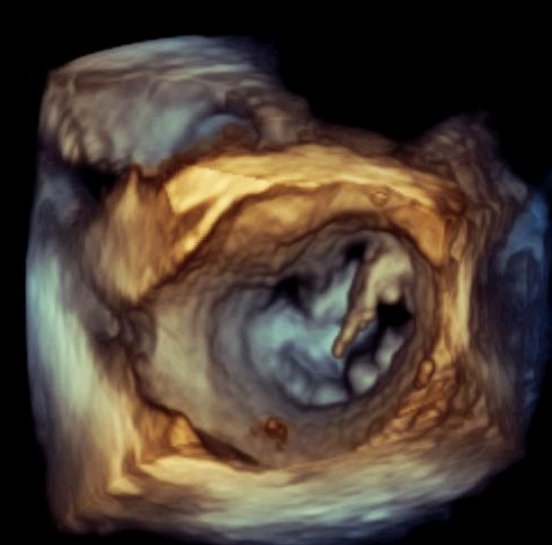
sekundární MR



patologie na zadním cípu



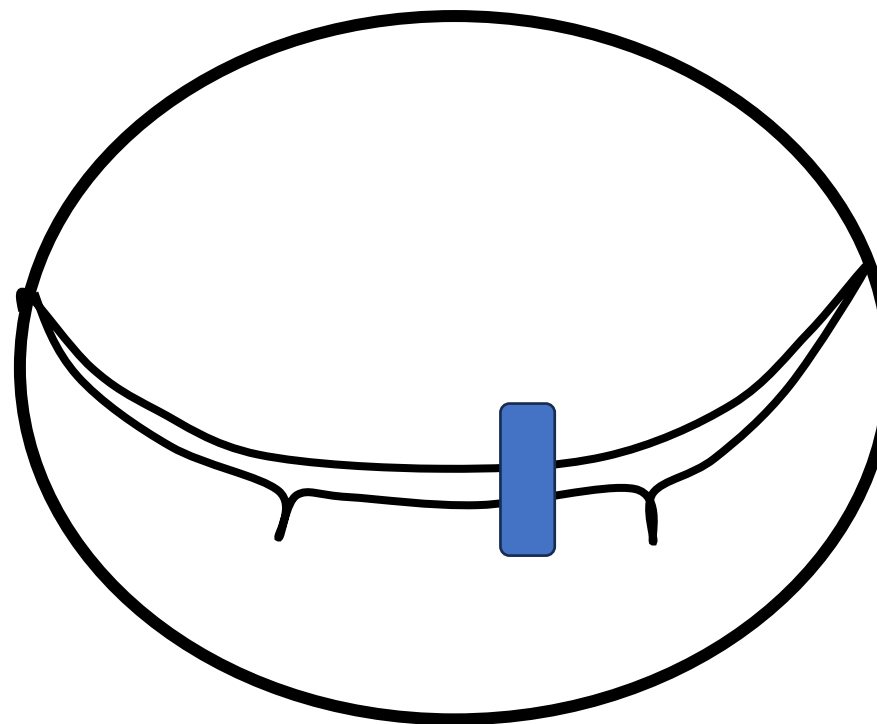
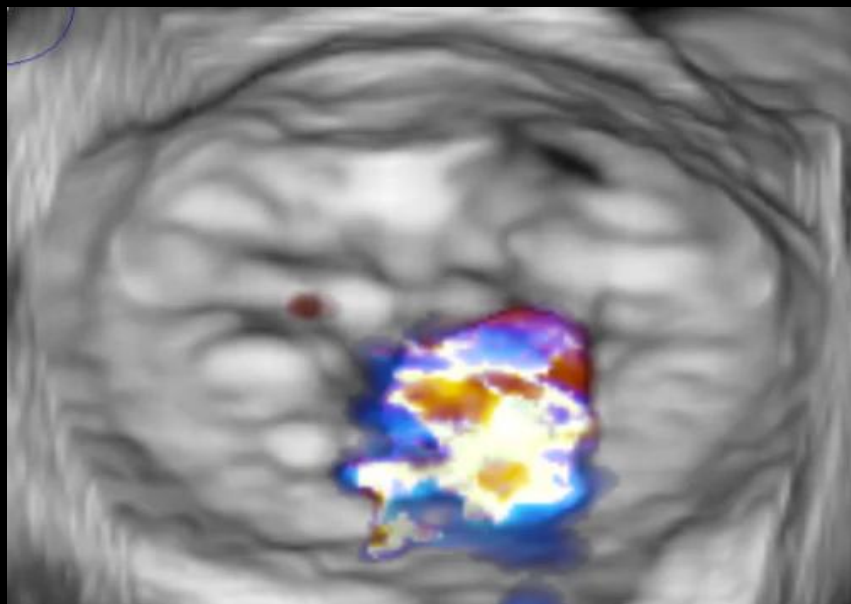
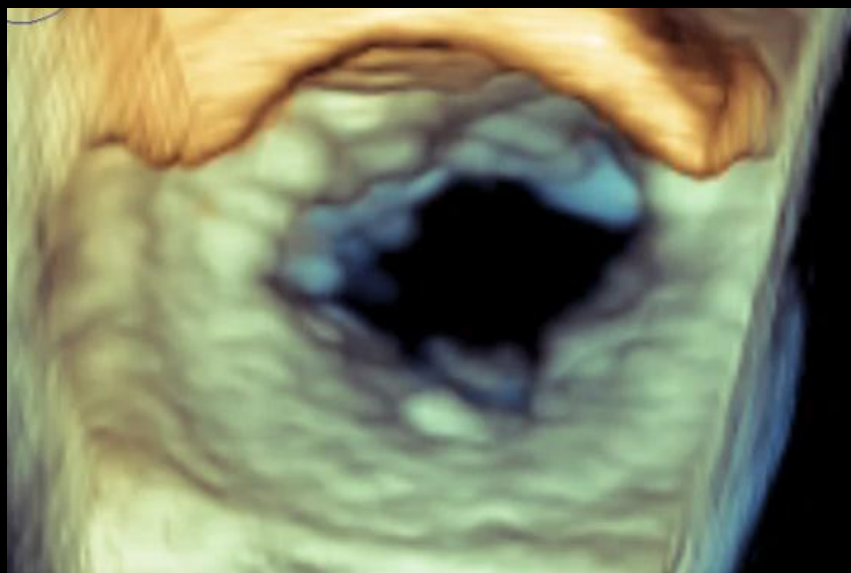
patologie na předním cípu



patologie na předním cípu  
PM komisura



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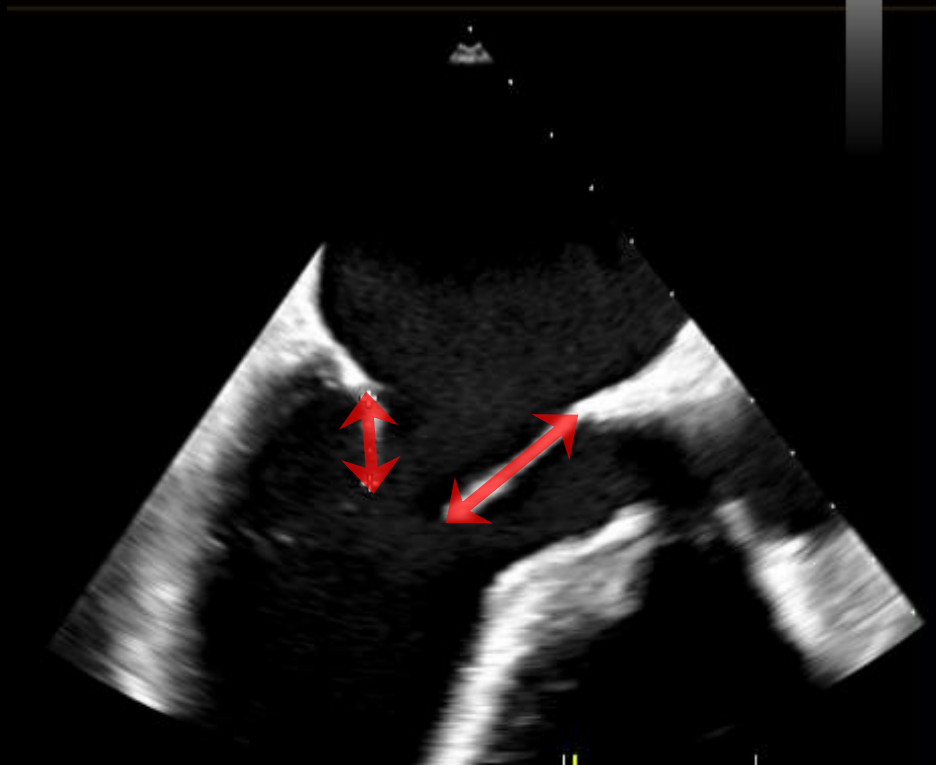
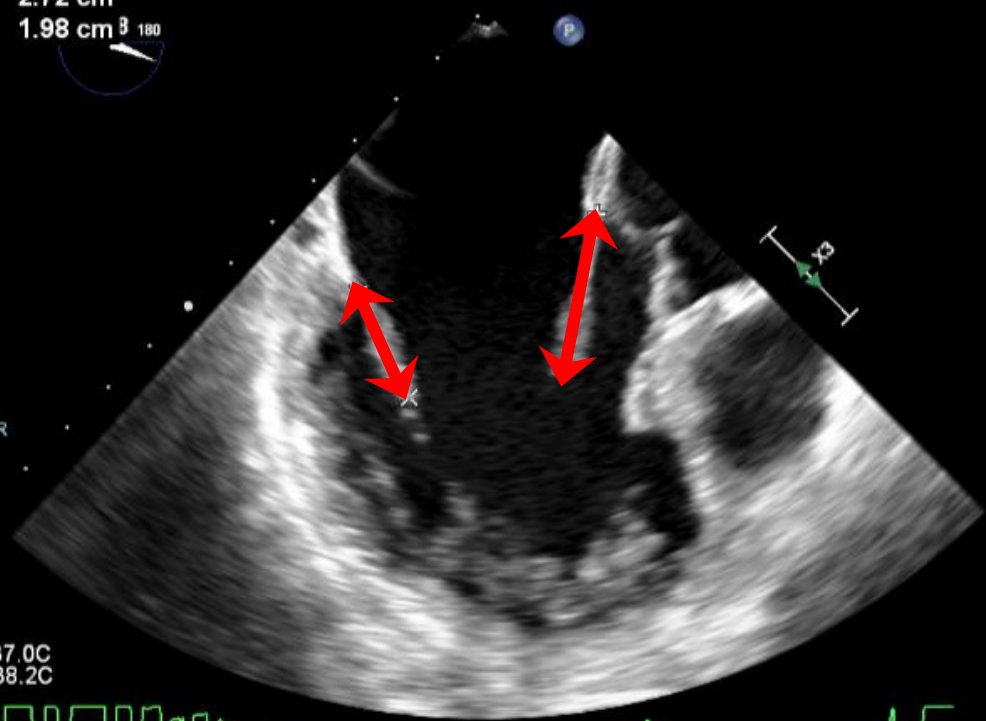
Dist 2.12 cm  
Dist 1.98 cm  $\beta$  180

2D  
55%  
C 50  
P Off  
Gen

M4

G  
P R

PAT T: 37.0C  
TEE T: 38.2C



G4 NT  
4 mm



G4 NTW  
6 mm



**50% wider  
in the  
grasping  
area**

G4 XT  
4 mm

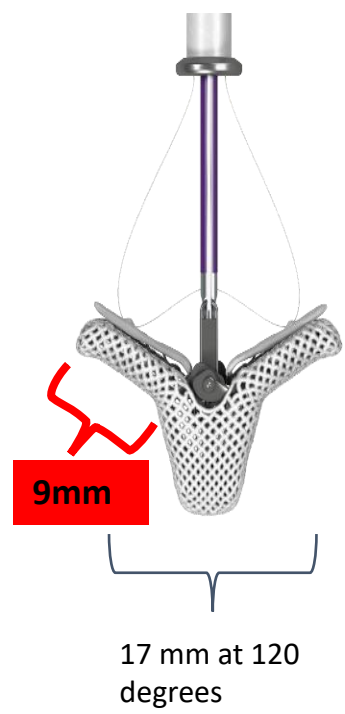


G4 XTW  
6 mm

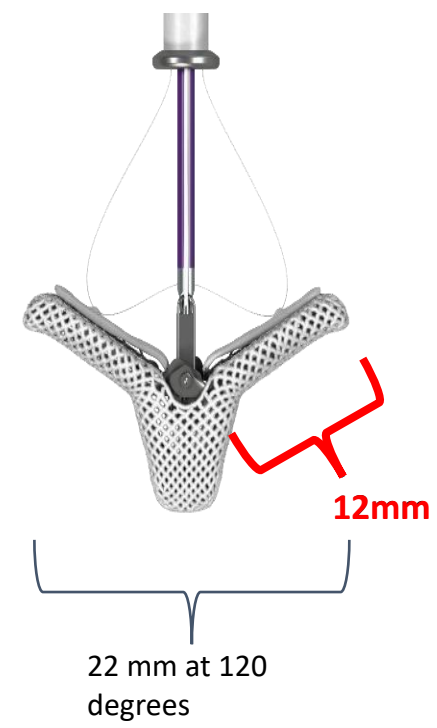


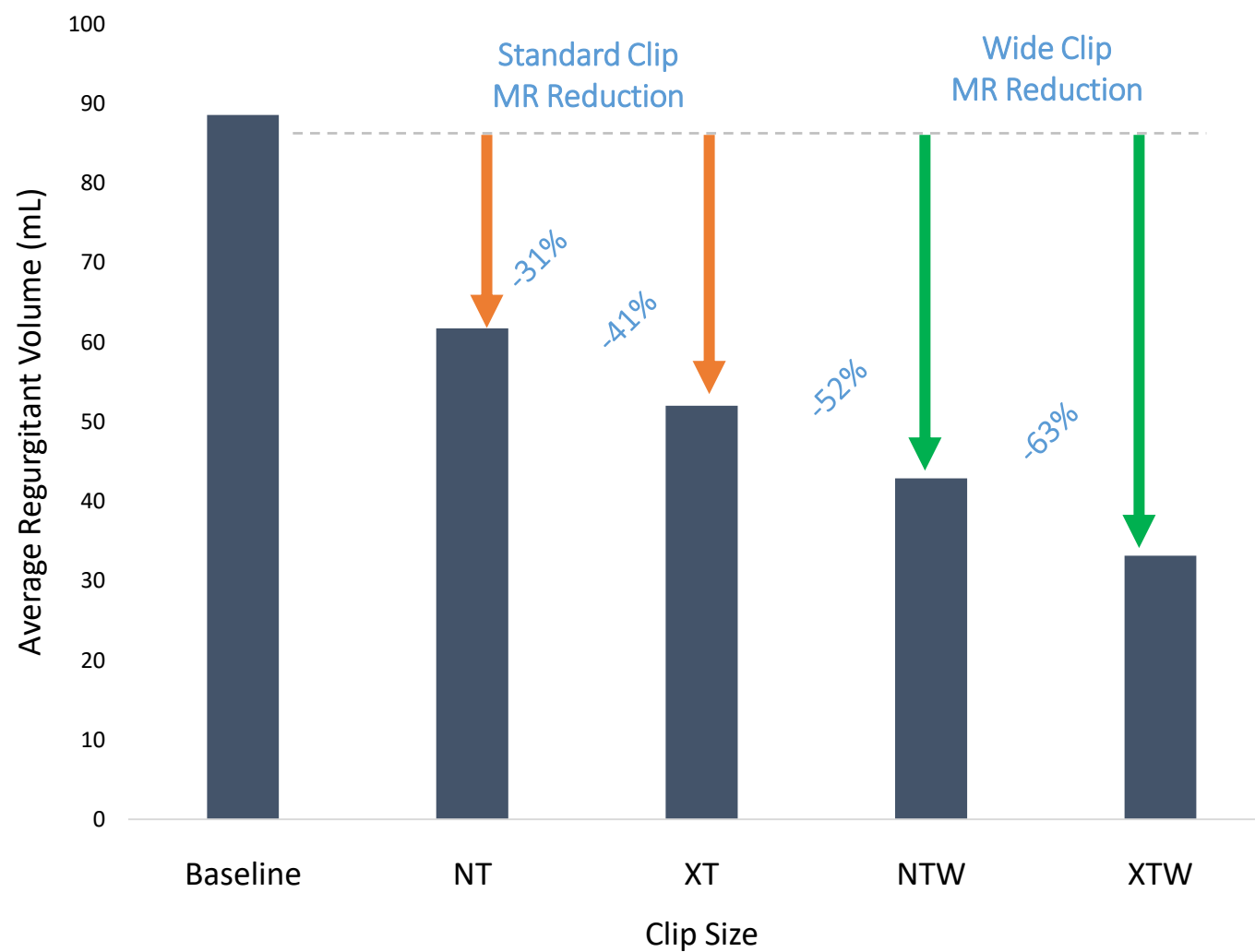
**50% wider  
in the  
grasping  
area**

G4 NT/NTW

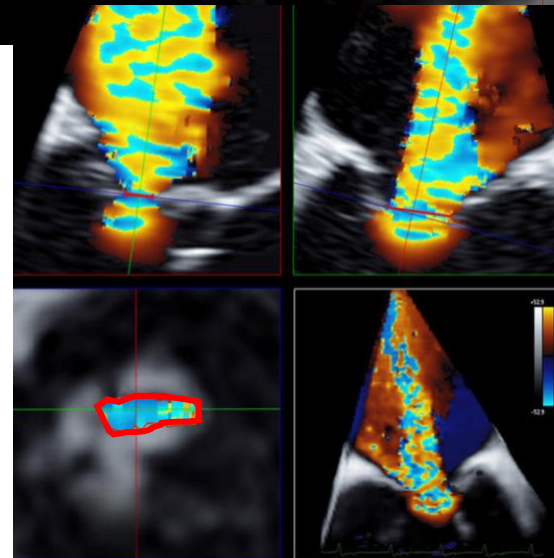
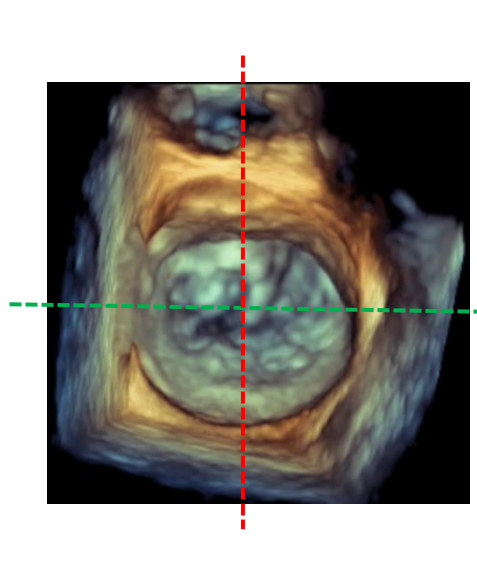
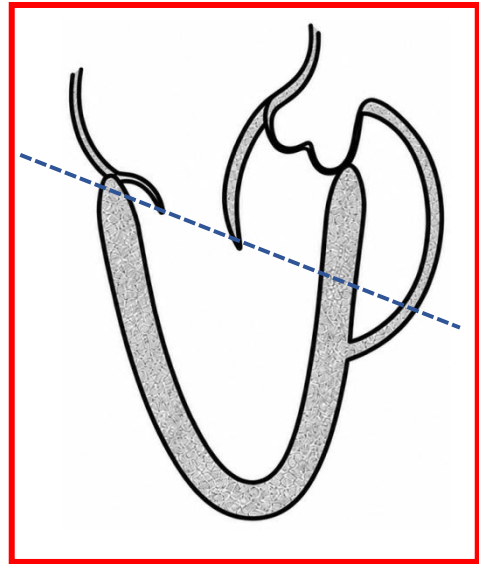
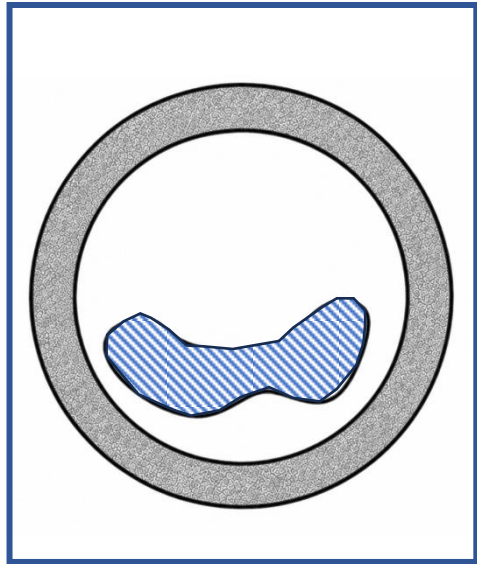
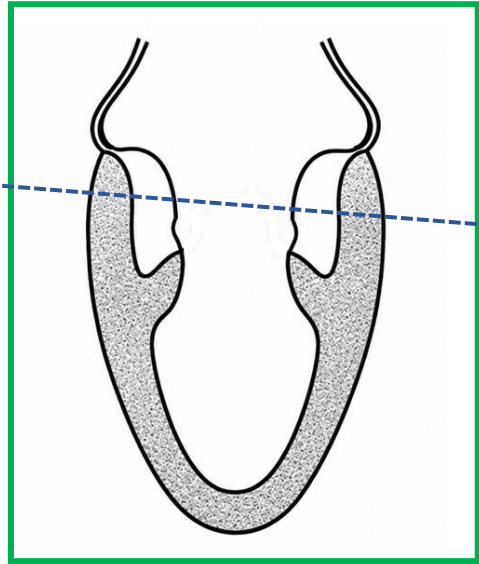


G4 XT/XTW





Test performed by and data on file at  
Abbott.



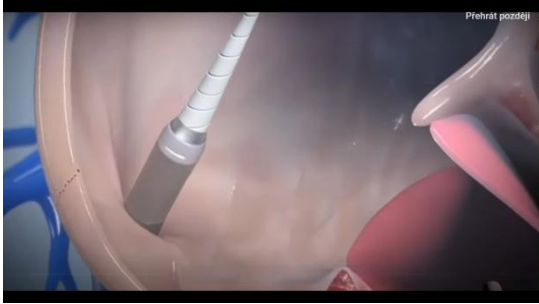


- Central pathology
- No calcification
- MVA  $>4.0 \text{ cm}^2$
- Posterior leaflet  $>10 \text{ mm}$
- Tenting height  $<10 \text{ mm}$
- Flail gap  $<10 \text{ mm}$
- Flail width  $<15 \text{ mm}$

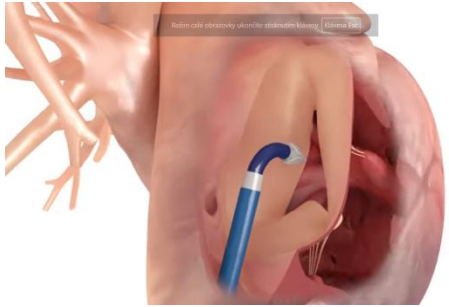
Repair

Replacement

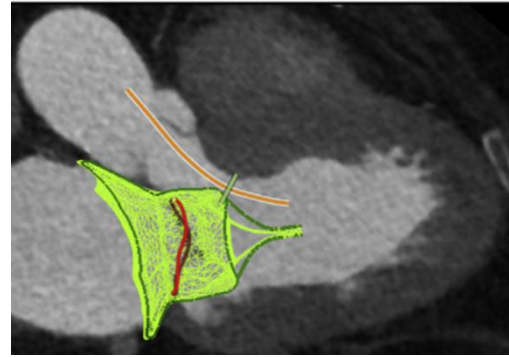
TEER- TriClip



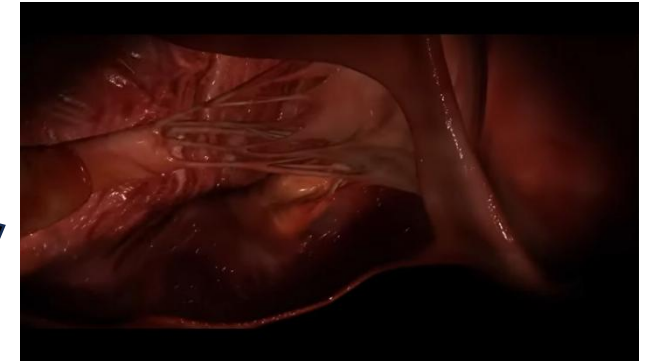
TEER- PASCAL



CT srdce



Biologická náhrada



Biologická náhrada



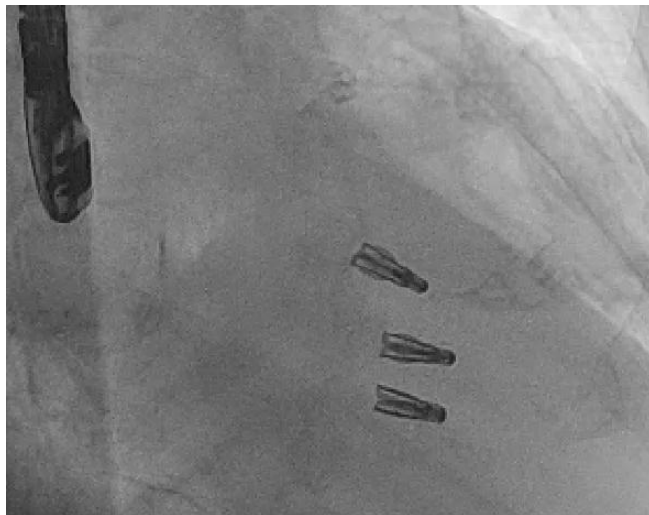
TEE

CT

# Závěr

- **Echokardiografie je klíčem k úspěšné intervenci**
- Důležitá není jen závažnost MR, ale i anatomie a klinický kontext pacienta
- Anatomie rozhoduje o proveditelnosti i výsledku výkonu
- 3D TEE a systematický přístup zvyšují bezpečnost a úspěšnost výkonu
- Echokardiografista je součástí intervenčního týmu

Děkuji za pozornost



Konečný výsledek po implantaci jednoho Mitraclipu a dvou Triclipů aneb Galaxie útočí