

Jak léčit nemocného s mitrální a trikuspidální insuficiencí

Michael Želízko

Klinika kardiologie IKEM





Mechanismus mitrální regurgitace určuje terapeutický postup

MITRAL REGURGITATION

PRIMARY (DEGENERATIVE)

SECONDARY (FUNCTIONAL)



- PRIMARY:**
- Leaflets
 - Subvalvular apparatus
 - Chordae and papillary muscles



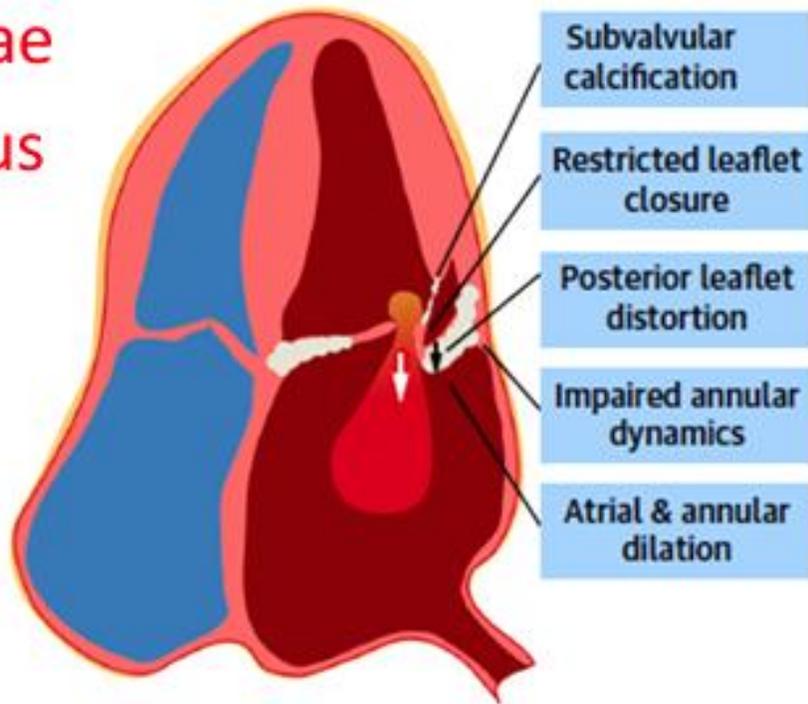
- SECONDARY:**
- Leaflet tethering
 - Mitral annular dilation
 - Incomplete coaptation of the mitral valve

Primární (degenerativní) mitrální
regurgitace

Primární (degenerativní) MR

• What is Primary MR ? *An abnormality of the*

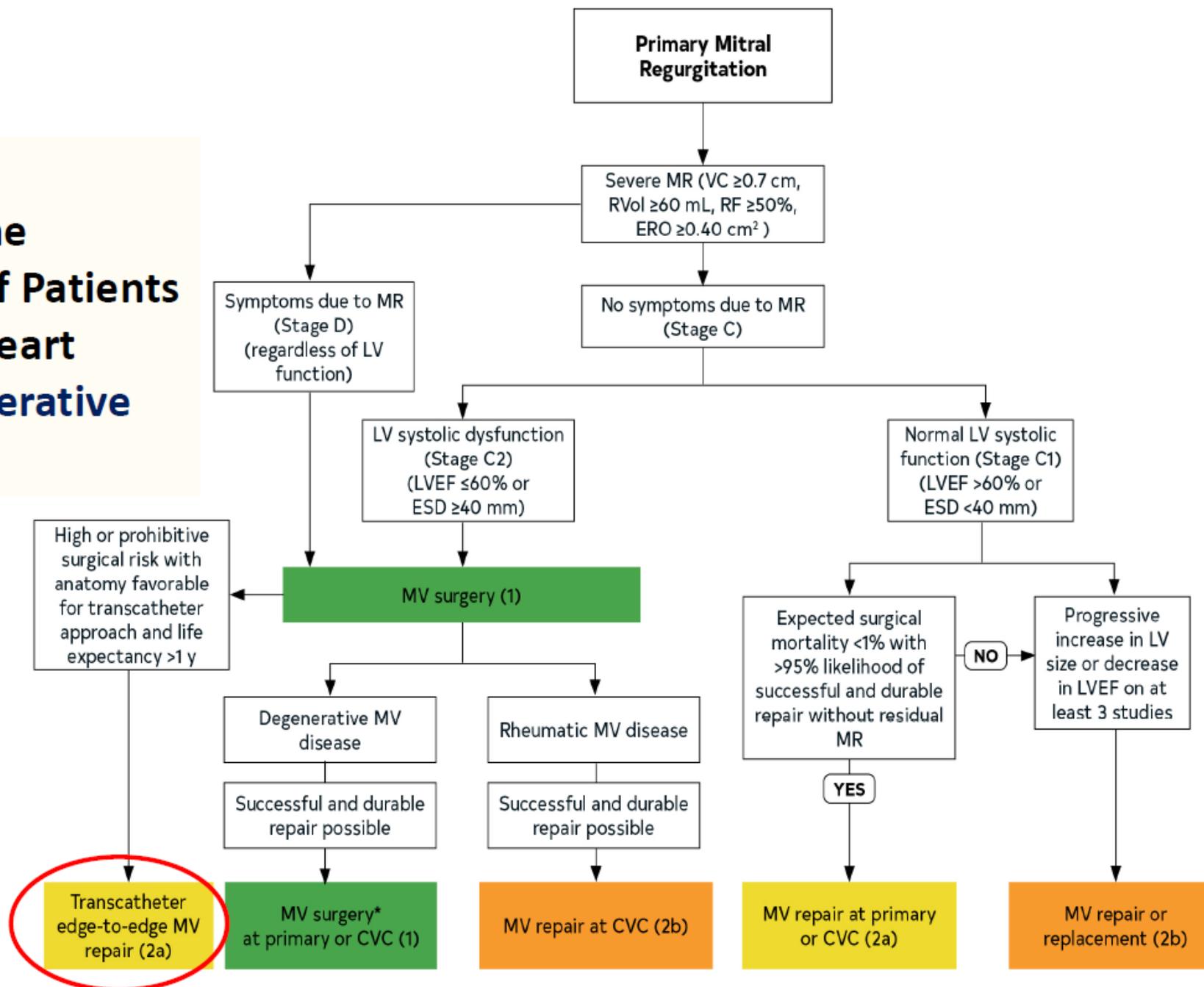
- Leaflet(s)
- Chordae
- Annulus



Systole
Churchill T et al. J Am Coll Cardiol 2022

	Calcium Burden	Echocardiography	Computed Tomography
Mild	<p>Eleid: Grade 1</p> <p><180° annulus</p> <p>Xu: Grades 1-2</p>		
Moderate	<p>Eleid: Grade 2</p> <p>180° to 270°</p> <p>Xu: Grade 3</p>		
Severe	<p>Eleid: Grade 3</p> <p>270° to circumferential</p> <p>Xu: Grade 4</p>		

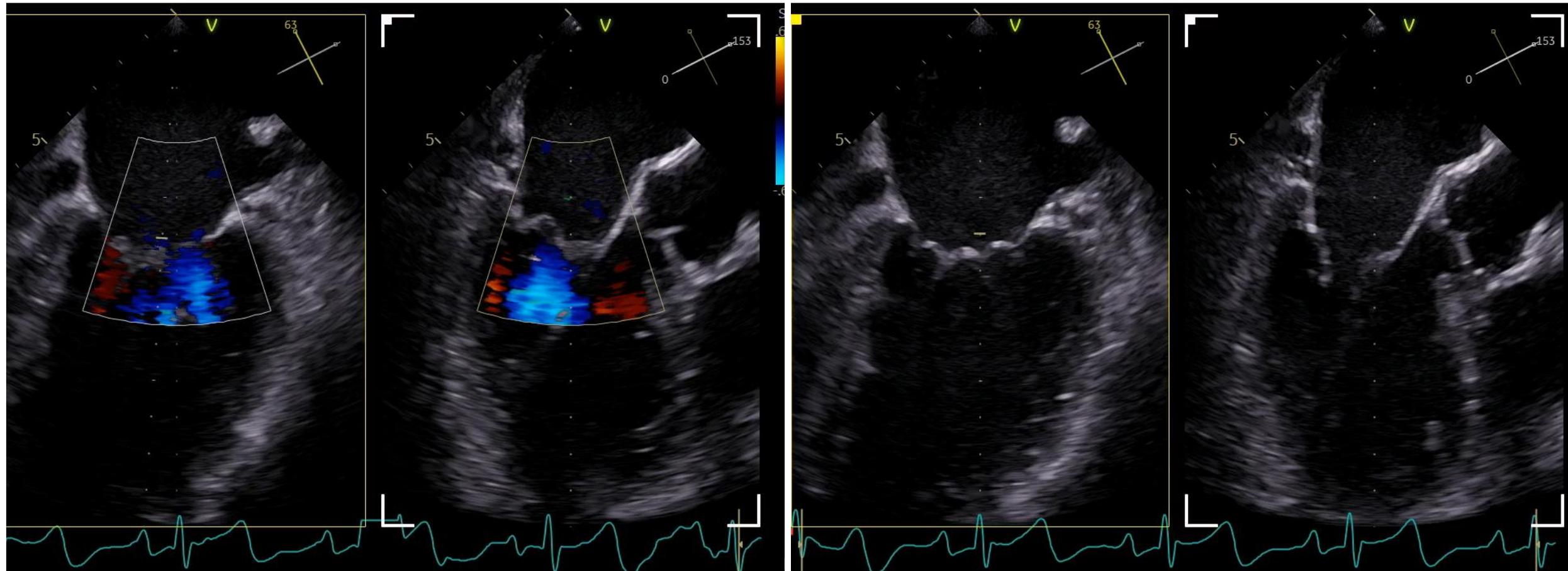
2020 ACC/AHA Guideline for the Management of Patients with Valvular Heart Disease: Degenerative (Primary) MR



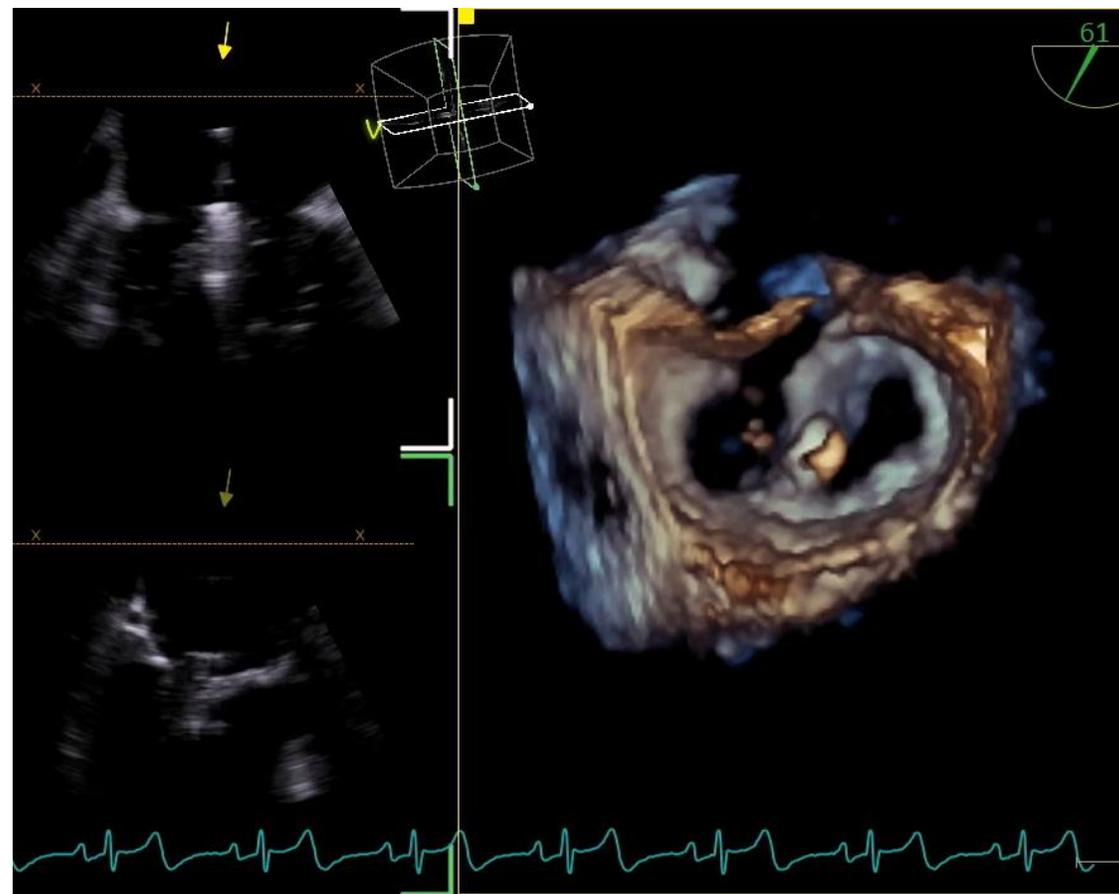
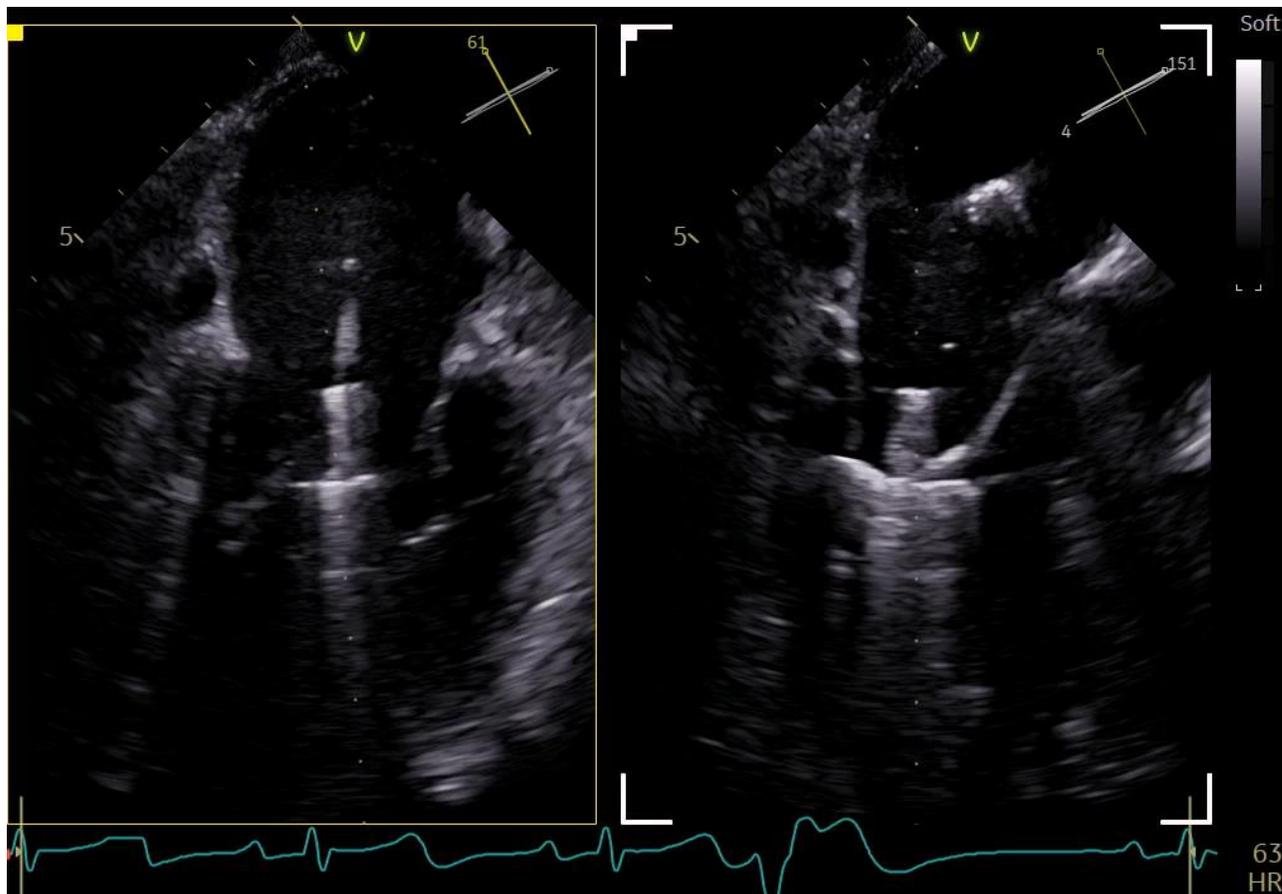
Mitrální regurgitace – primární

- Žena 88 let
- Polymorbidní pac.: CHOPN, st.p. aktinoterapii pro Ca mammae, thyreopatie
- ECHO: EDD 53 mm, ESD 35 mm, EF >60%
- Mitrální regurgitace 4/4
- NYHA III°
- Indik. k MitraClipu

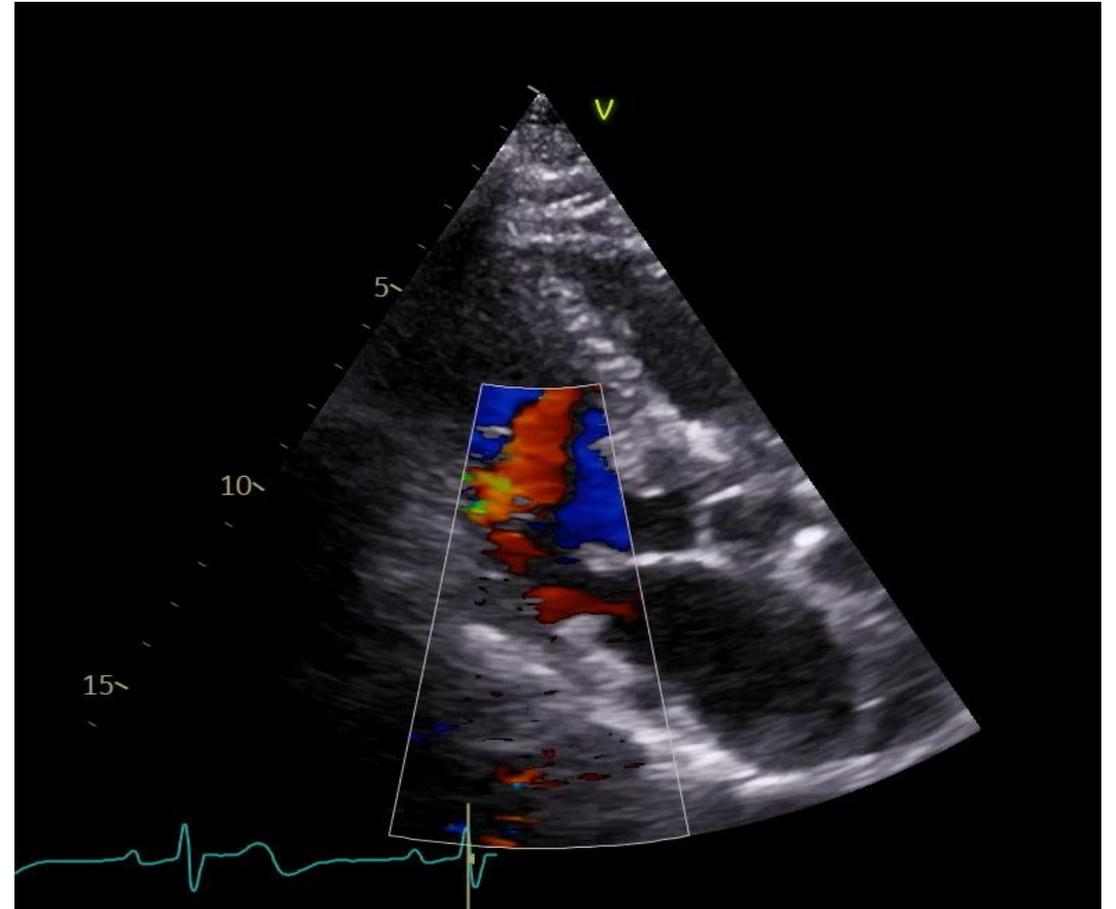
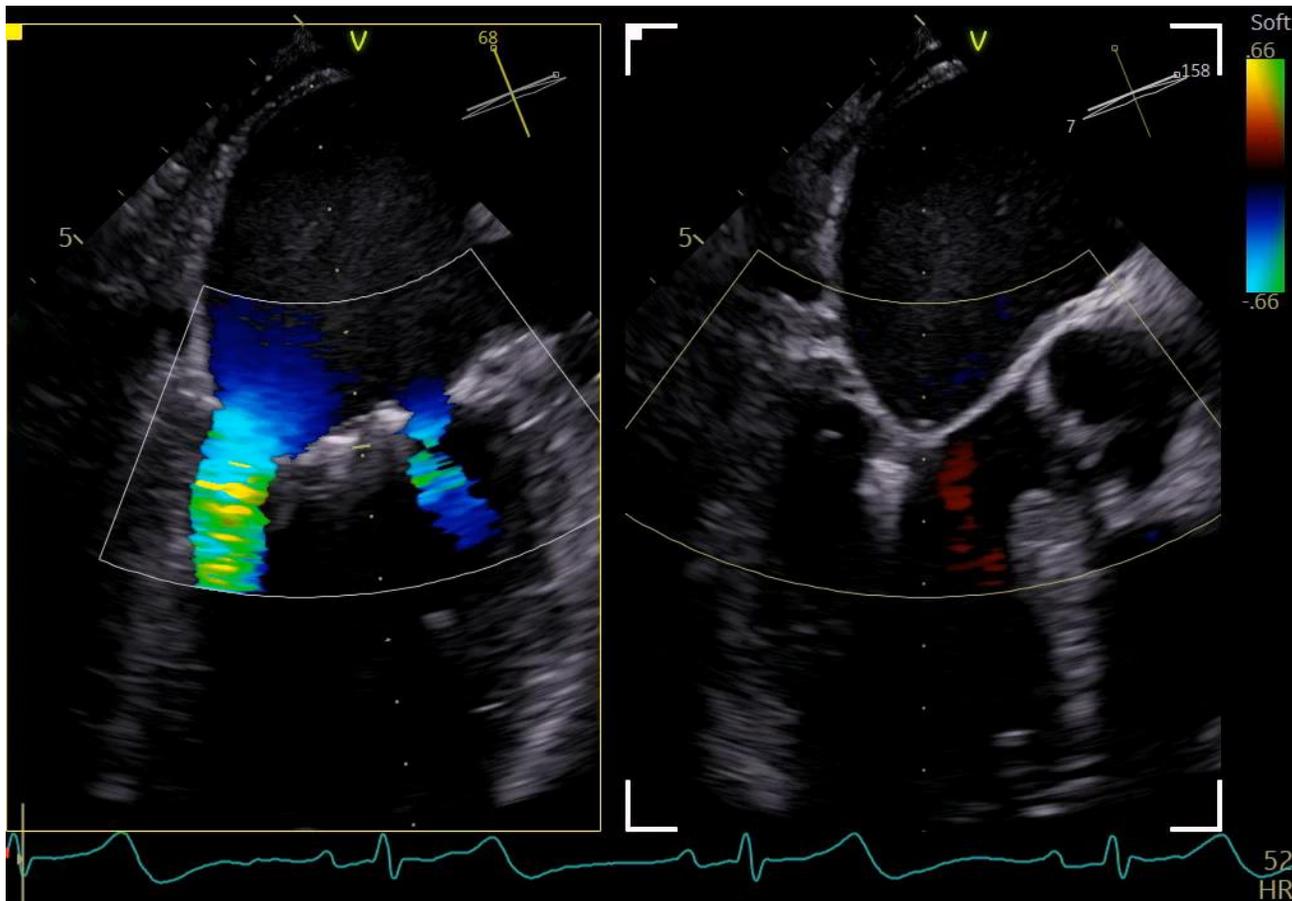
MR 4/4 při hlubokém prolapsu zadního cípu
při ruptuře šlašinky v P2, zc 13 mm, nekoaptace 7mm



1. klip G4 XTW laterální část A2P2
2. klip G4 XT A3P3



Akutní výsledek a 9 měs. TTE follow-up, regrese PH a TriR

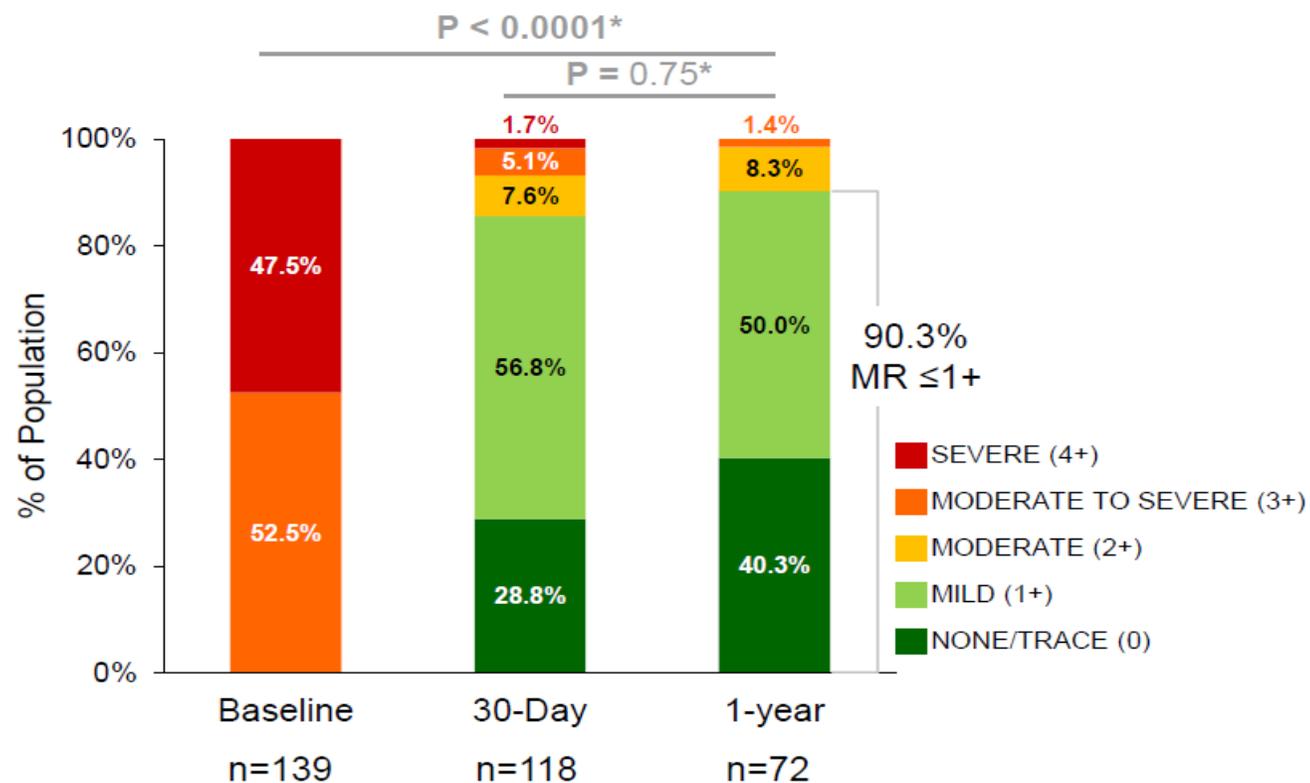


EXPAND G4 Registry:

Significant and Durable MR reduction in Complex Anatomies

Complex Anatomy
(N=139, 78.7% PMR)
Defined as MR ≥3+ and at least one of the following

- Primary jet outside A2-P2
- Presence of more than one significant jet
- Presence of wide jet
- Small valve area <4cm²
- Mitral annular or leaflet calcification
- Minimal leaflet tissue for attachment (coaptation length <2mm)
- Presence of severely degenerative leaflets or wide flail gaps (>10mm) or widths (>15mm)
- Presence of a Significant Cleft or Scallop
- Bileaflet Flail or Bileaflet Prolapse



90.3% of complex subjects achieved MR ≤ 1+ at 1 year

DMR trials – device vs surgery: CLASP IID, DRAGONFLY-DMR, REPAIR-MR, PRIMARY trial

REPAIR-MR: Mitral-TEER vs Surgical Repair in Intermediate-Risk Degenerative MR Patients



Symptomatic Severe Primary Mitral Regurgitation
(Grade III/IV per ASE* Criteria)

Cardiac Surgeon of the Site Heart Team
Concurs that the Subjects Mitral Valve is
Conducive to Mitral Valve Repair Surgery

NO

Exclude Subject

YES

Subject Meets all Inclusion/Exclusion Criteria
and the Eligibility Committee Confirms that MR
can be **Reduced to ≤ Mild** with Both MitraClip
and Mitral Valve Repair Surgery

NO

Exclude Subject

YES

Randomization (1:1)
(N=500)

Transcatheter Repair - MitraClip
(Device)

Surgical Mitral Valve Repair
(Control)

- ### Patient Population
- Subject is symptomatic (NYHA Class II/III/IV) or asymptomatic (LVEF ≤ 60%, Pulmonary Artery Systolic Pressure > 50 mmHg, or LVESD > 40 mm)
 - **Subject ≥ 75 years of age**, OR if younger than 75 years, then has:
 - STS-PROM Score ≥ 2%, OR
 - Presence of other comorbidities which may introduce a potential surgical specific impediment

* Zoghbi et al. J Am Soc Echocardiogr. 2017 Apr;30(4):303-371.

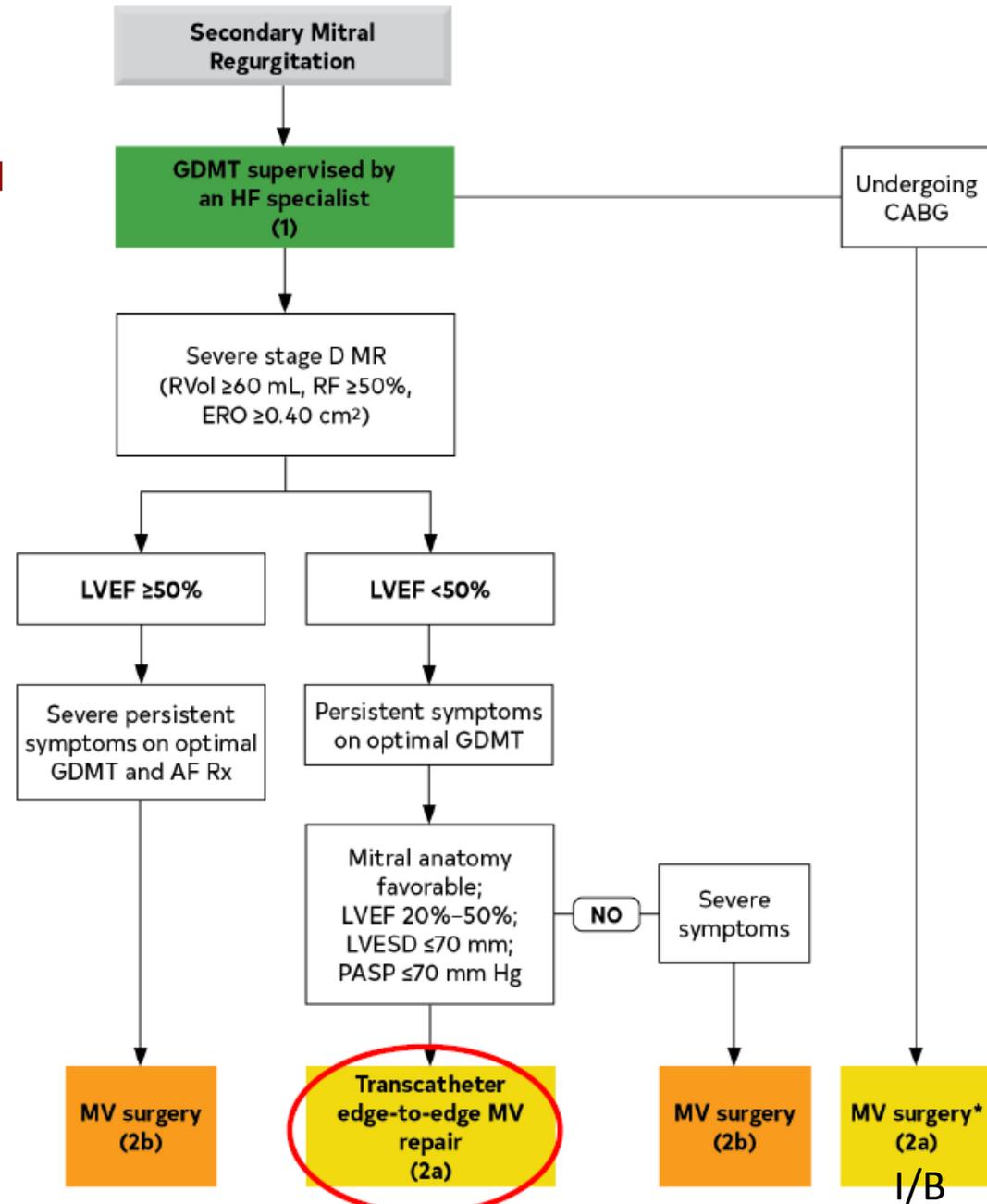
† Subjects in whom planned surgical procedure is replacement will be excluded

‡ As of Jan 11th, 2022

Sekundární (funkční) mitrální
regurgitace

2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: Secondary (Functional) MR

Mitral TEER: Class IIA recommendation, irrespective of surgical risk



MiR – sekundární

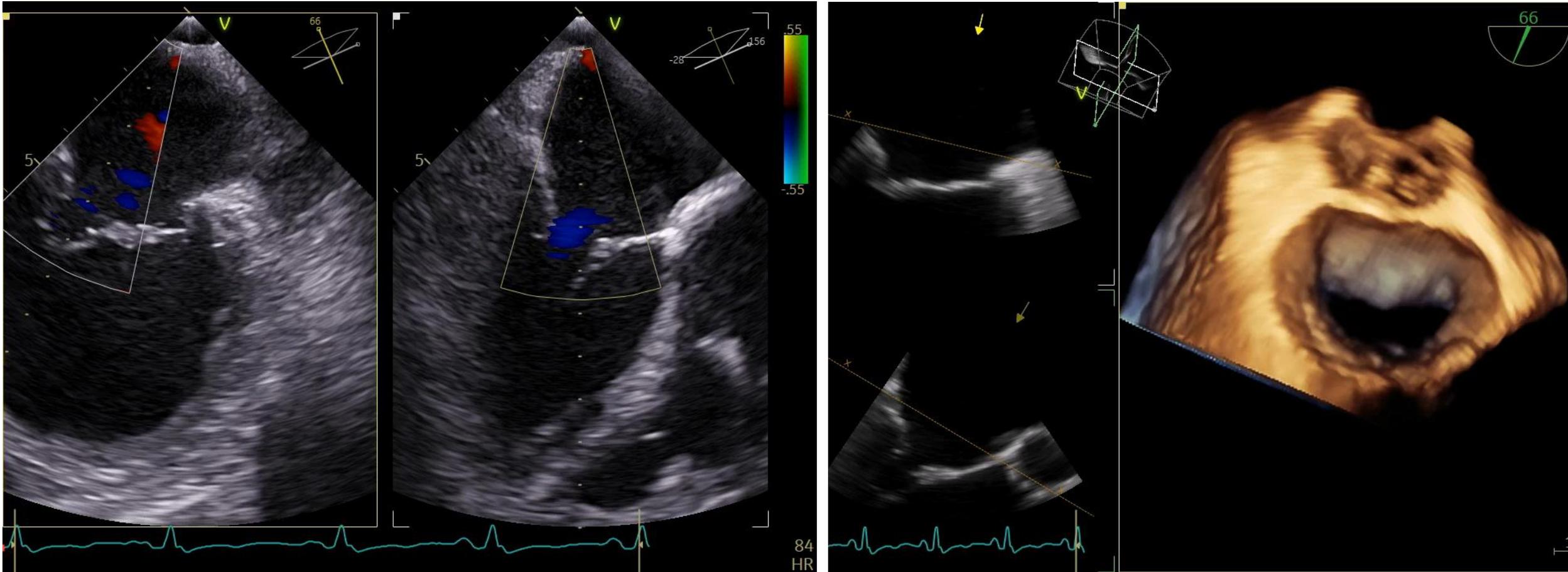
- Žena 79 let
- ICHS, st.p. IM, opak. PCI v minulosti
- Ischemická KMP s EF 20-25%, EDD 61 mm
- významná MiR
- Výrazně „suboptimální“ nález k TEER:
kalcif. anulu a zc, volná část zc 5-7 mm, MVA 3,0 cm²
- Dlouhodobě sledována v ambulanci, stabilní
- V posledních 6 měsících progresse LSI, 3x hospit. pro plíc. edém
- Po důkladné rozvaze indik. k MitraClipu

Anatomical Suitability for M-TEER in Primary MR			
Repair!		Replacement?	
Anatomy Suitability		Operator & Centre Experience	
Non-complex Ideal for M-TEER	Complex Suitable for M-TEER	Very complex Challenging for M-TEER	Criteria favouring replacement M-TEER hard or impossible
<ul style="list-style-type: none">- Central pathology- No calcification- MVA >4.0 cm²- Posterior leaflet >10 mm- Tenting height <10 mm- Flail gap <10 mm- Flail width <15 mm	<ul style="list-style-type: none">- Isolated commissural lesion (A1/P1 or A3/P3)- Annular calcification without leaflet involvement- MVA 3.5-4.0 cm²- Posterior leaflet length 7-10 mm- Tenting height >10 mm- Asymmetric tethering²⁶- Coaptation reserve <3 mm²⁴- Leaflet-to-anulus index <1.2²⁵- Flail width >15 mm- Flail gap >10 mm- Two jets from leaflet indentations	<ul style="list-style-type: none">- Commissural lesion with multiple jets- Annular calcification with leaflet involvement- Fibrotic leaflets- Wide jet involving the whole coaptation- MVA 3.0-3.5 cm²- Posterior leaflet length 5-7 mm- Barlow's disease- Cleft- Failed surgical annuloplasty	<ul style="list-style-type: none">- Concentric MAC with stenosis- MVA <3.0 cm²- Relevant mitral valve stenosis (mean gradient >5 mmHg)- Posterior leaflet <5 mm- Calcification in the grasping zone- Deep regurgitant cleft- Leaflet perforation- Multiple/wide jets- Rheumatic mitral stenosis

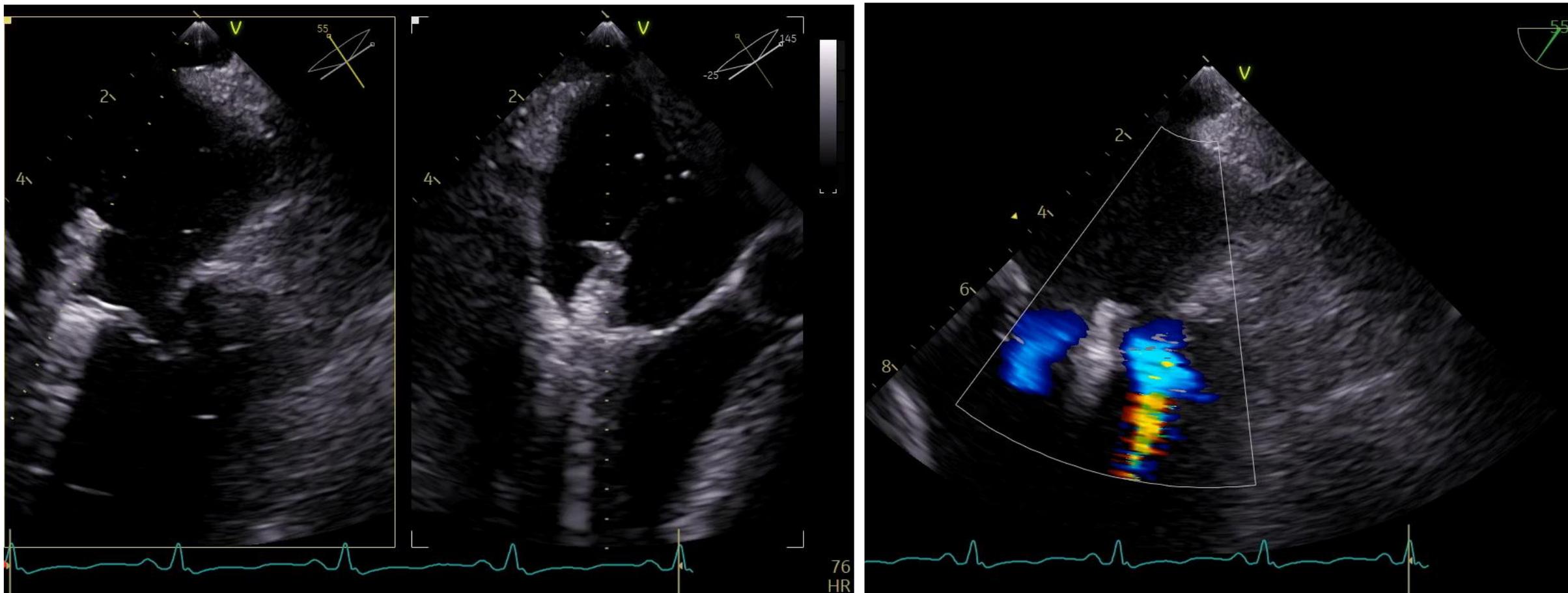
Hausleiter J et al. EuroIntervention 2023



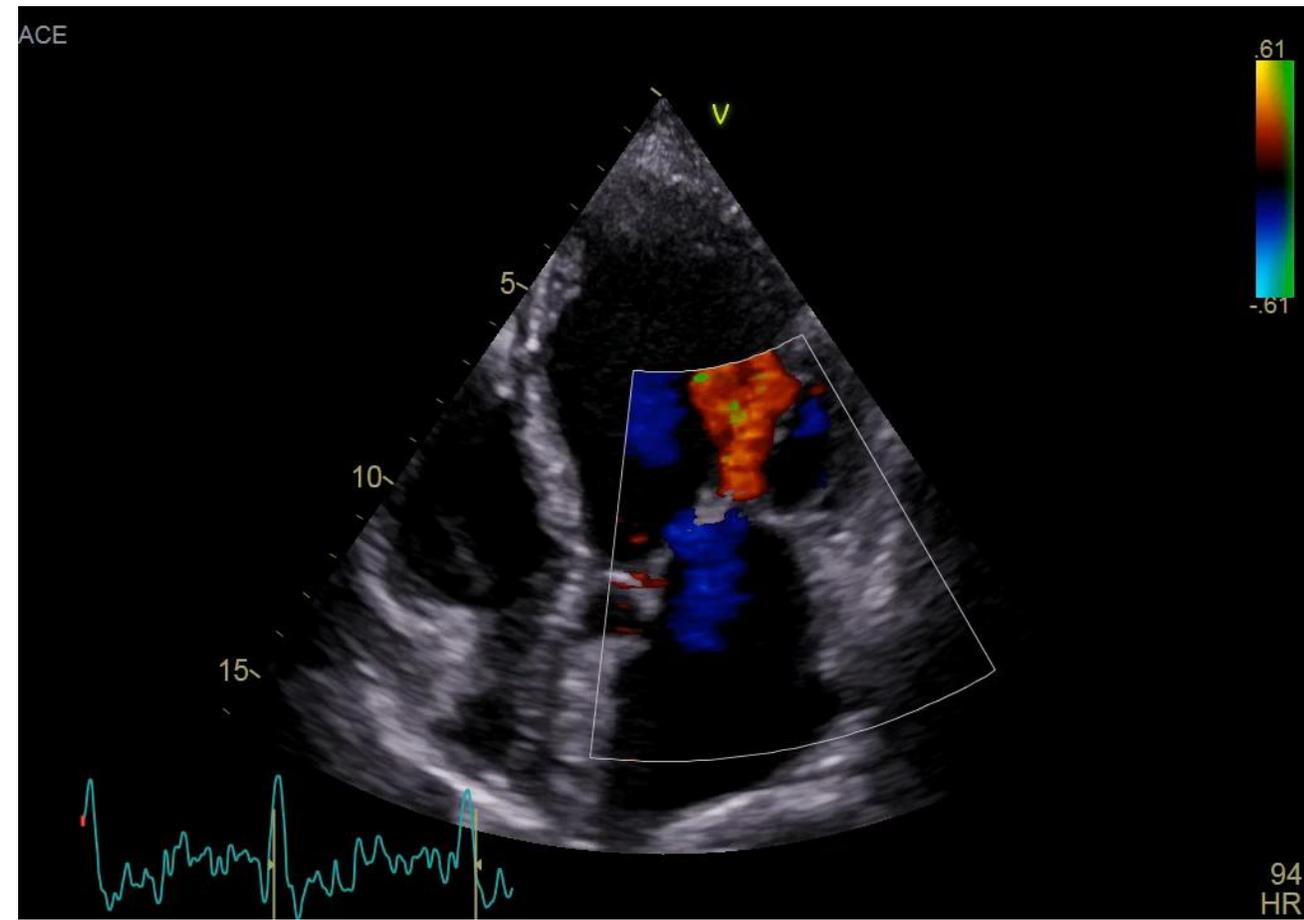
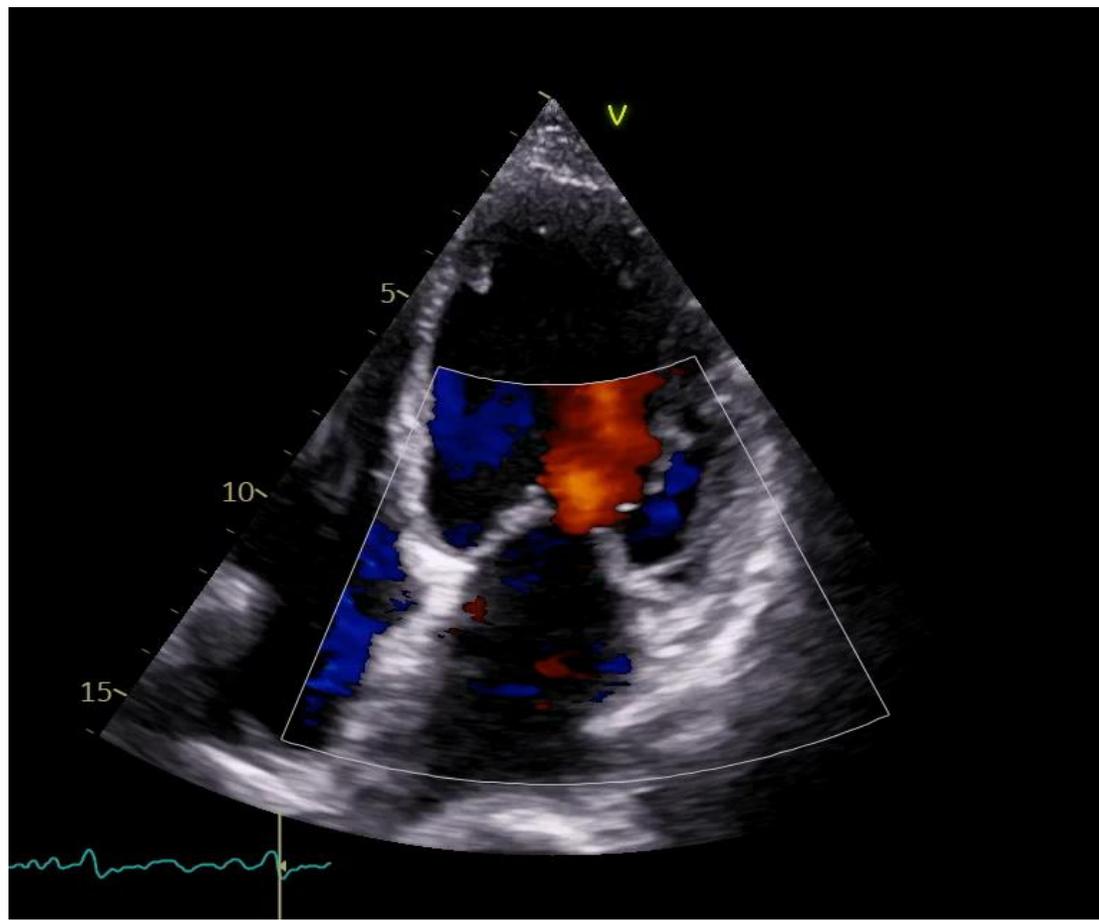
Sek. MiR při apik. vytažení cípů



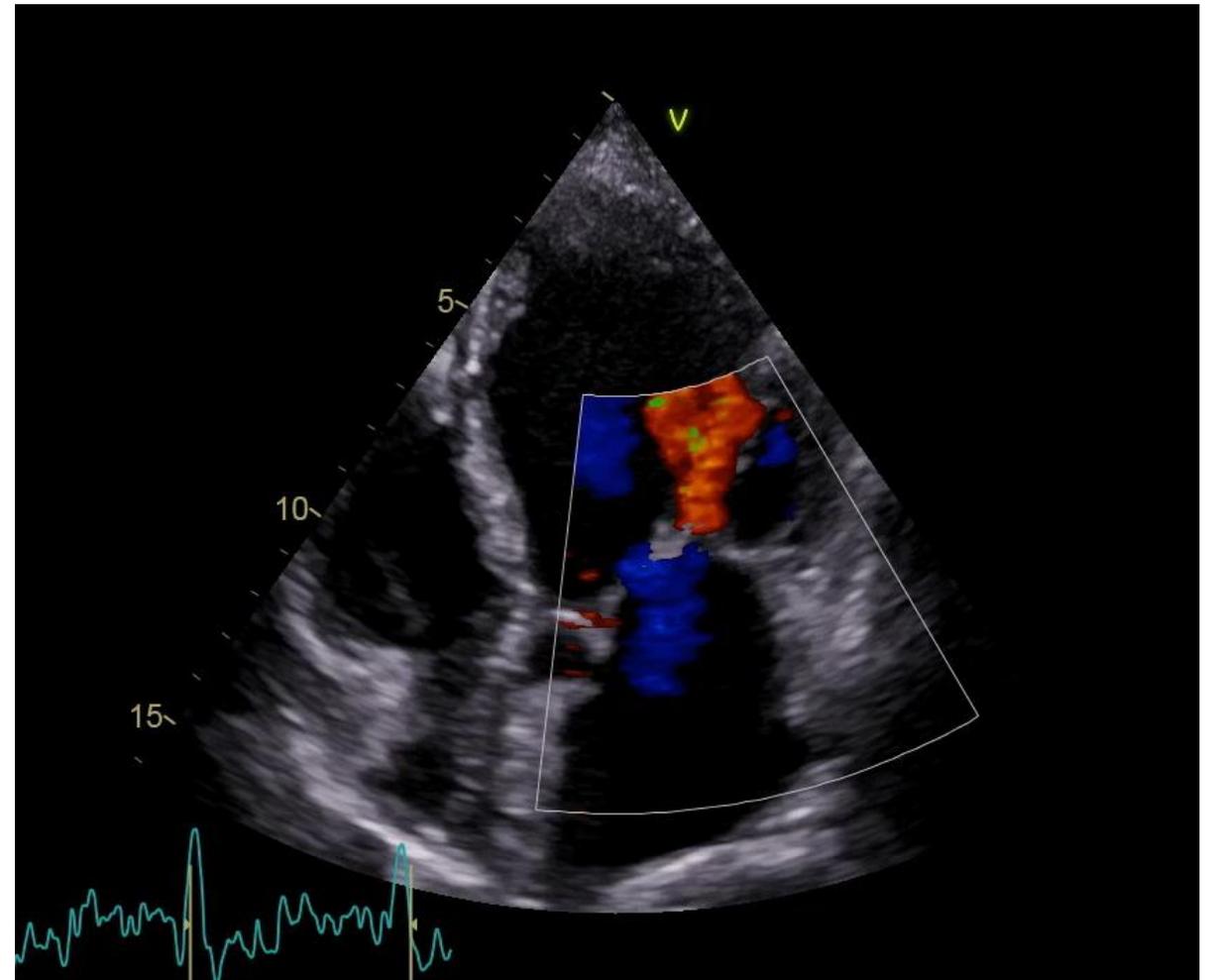
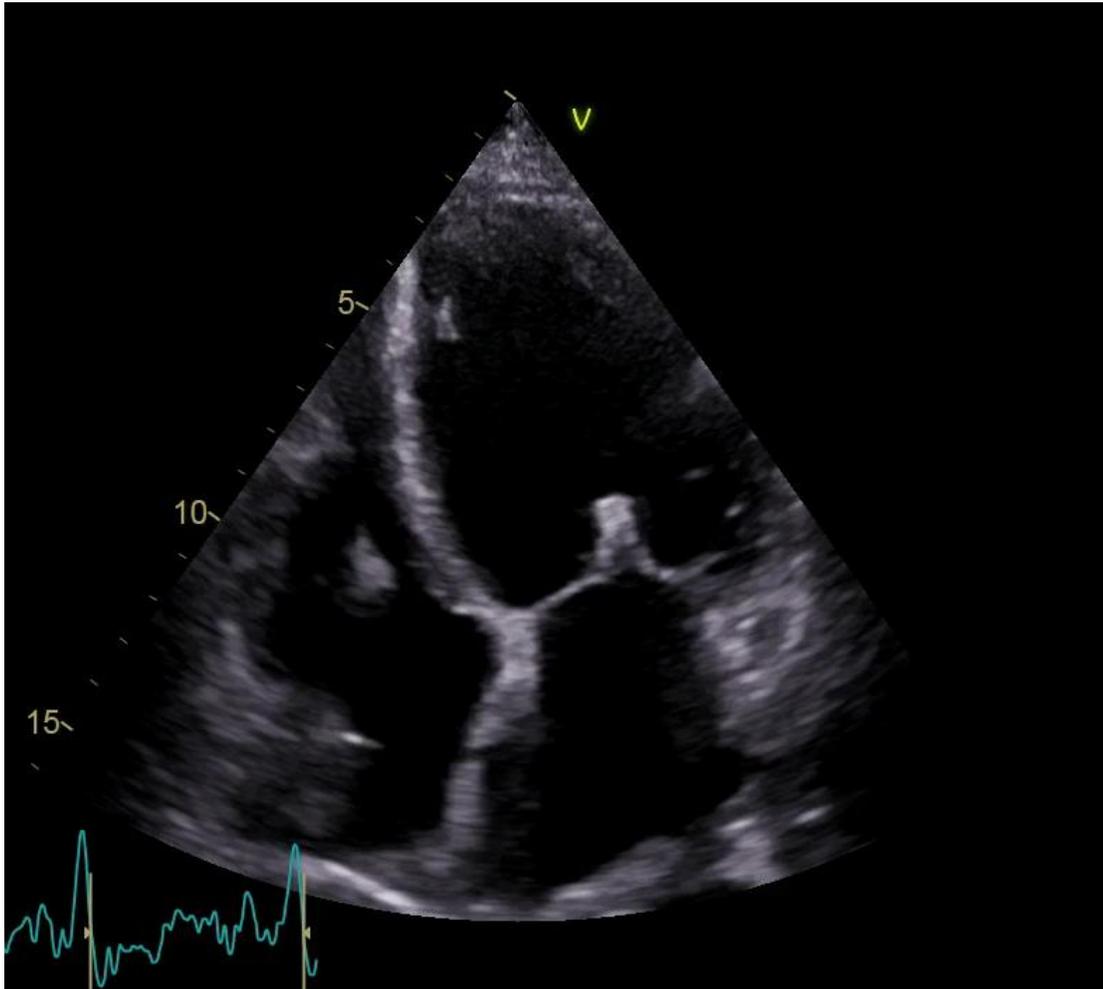
1x G4 XTW A2P2 mediálně



MiR před a po výkonu

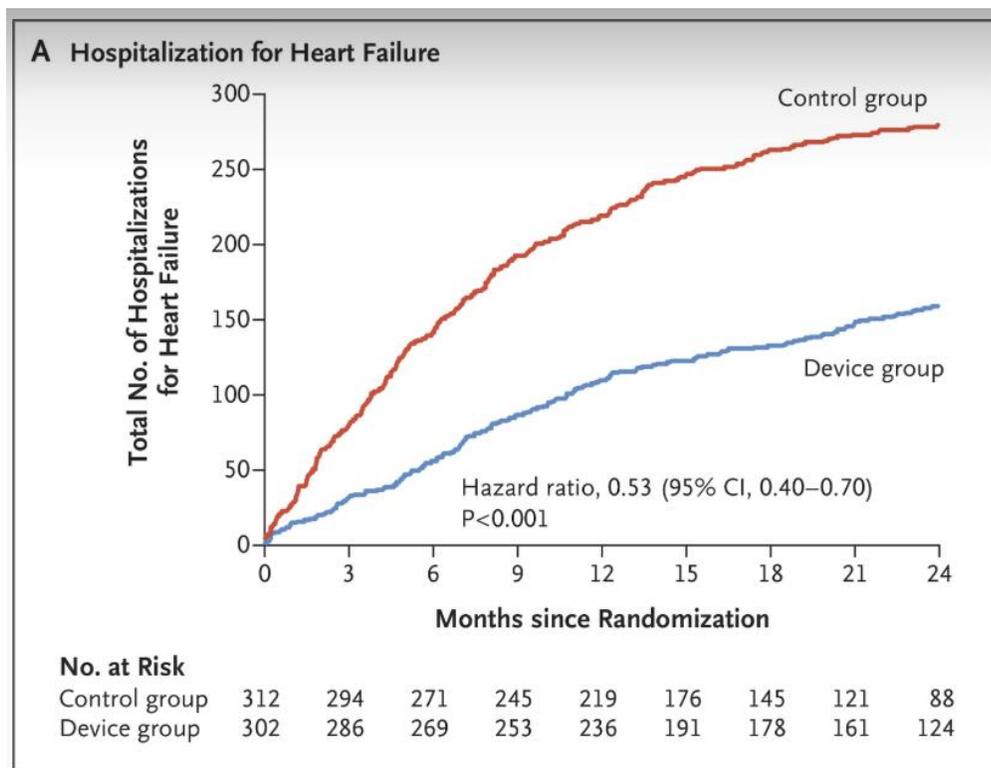


3M follow – up, NYHA I°

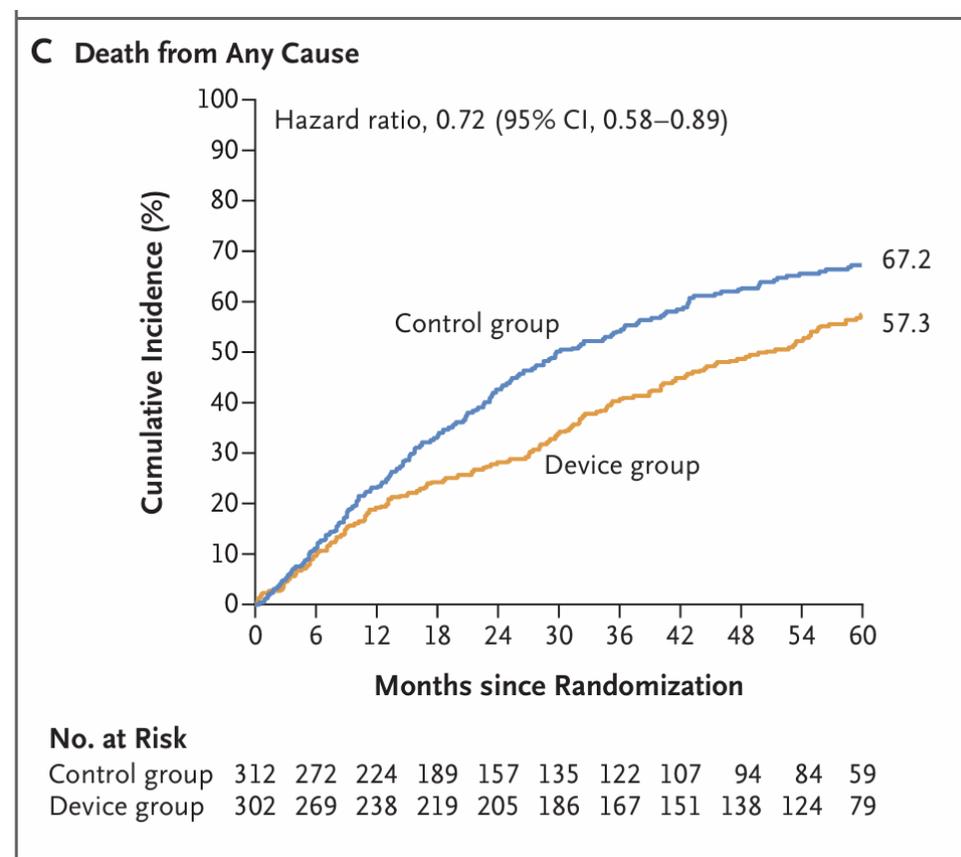


COAPT trial: n=614, secondary MR (ischemic or nonischemic 60%:40%), EF 20-50%, MR 3+ to 4+, NYHA II – IVa
MitraClip + OMT vs OMT

Primární endpoint 2 roky



Mortalita - 5 let f-up





RESHAPE-HF 2: M-TEER + GDMT vs. GDMT Alone in Patients With Mod-Severe FMR

Mean age 70 yrs, mean LVEF 31±8%, mean EROA 0.23cm²

Death from any cause†

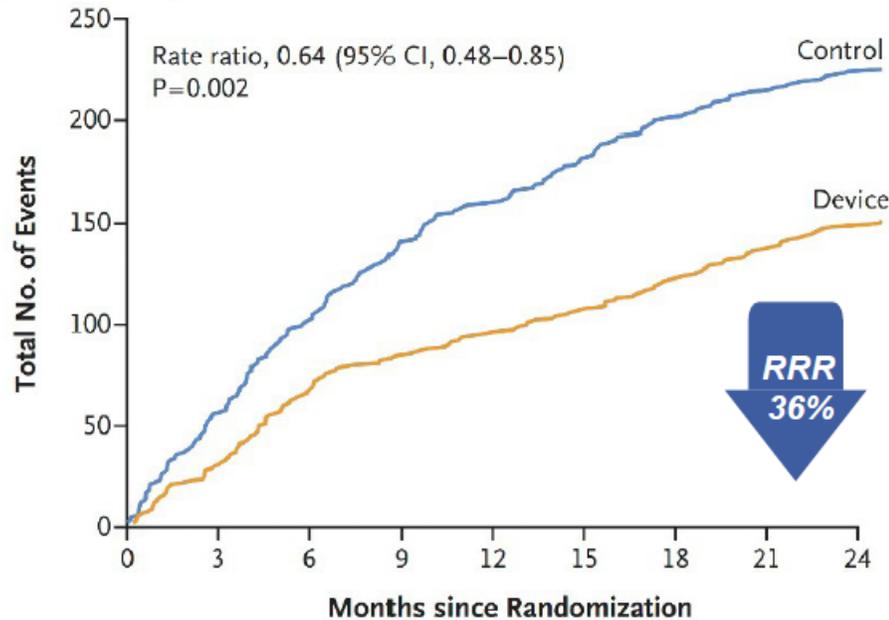
51 (22.3)

67 (29.6)

0.73 (0.51–1.05)

0.09

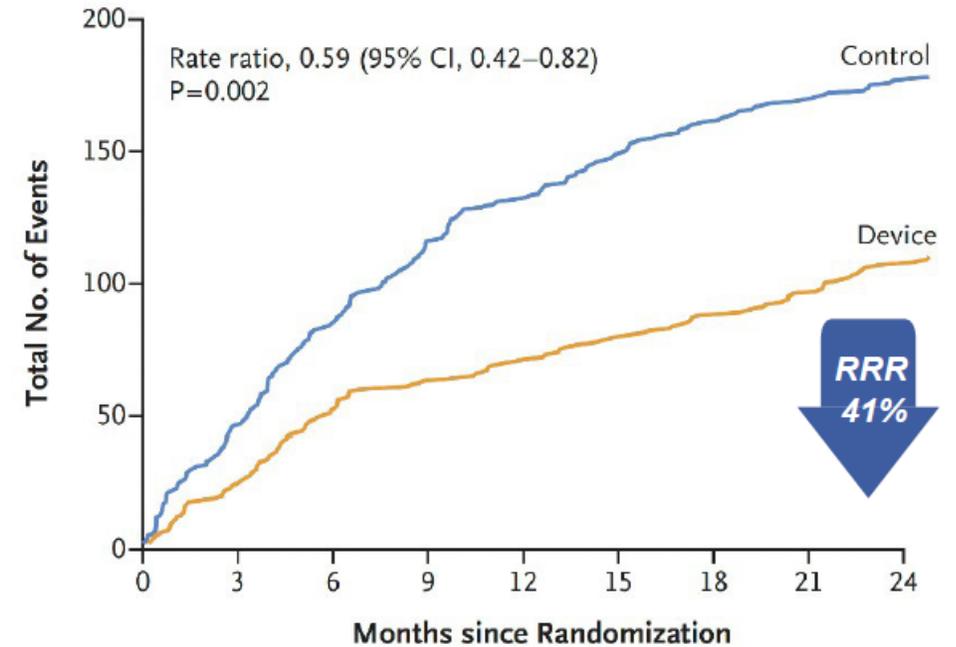
Composite of Hospitalization for Heart Failure or Death from Cardiovascular Causes



No. at Risk

Control	255	240	223	204	189	179	165	155	146
Device	250	241	222	207	197	191	179	170	163

Hospitalization for Heart Failure



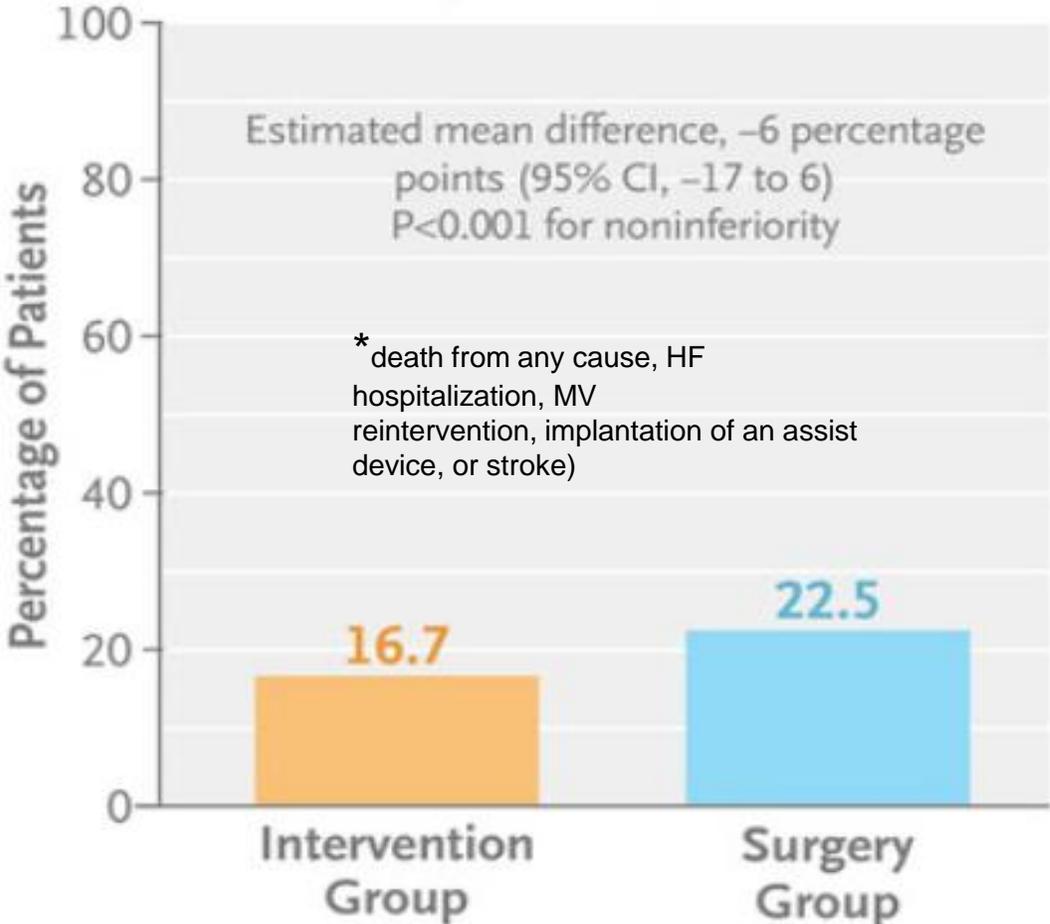
No. at Risk

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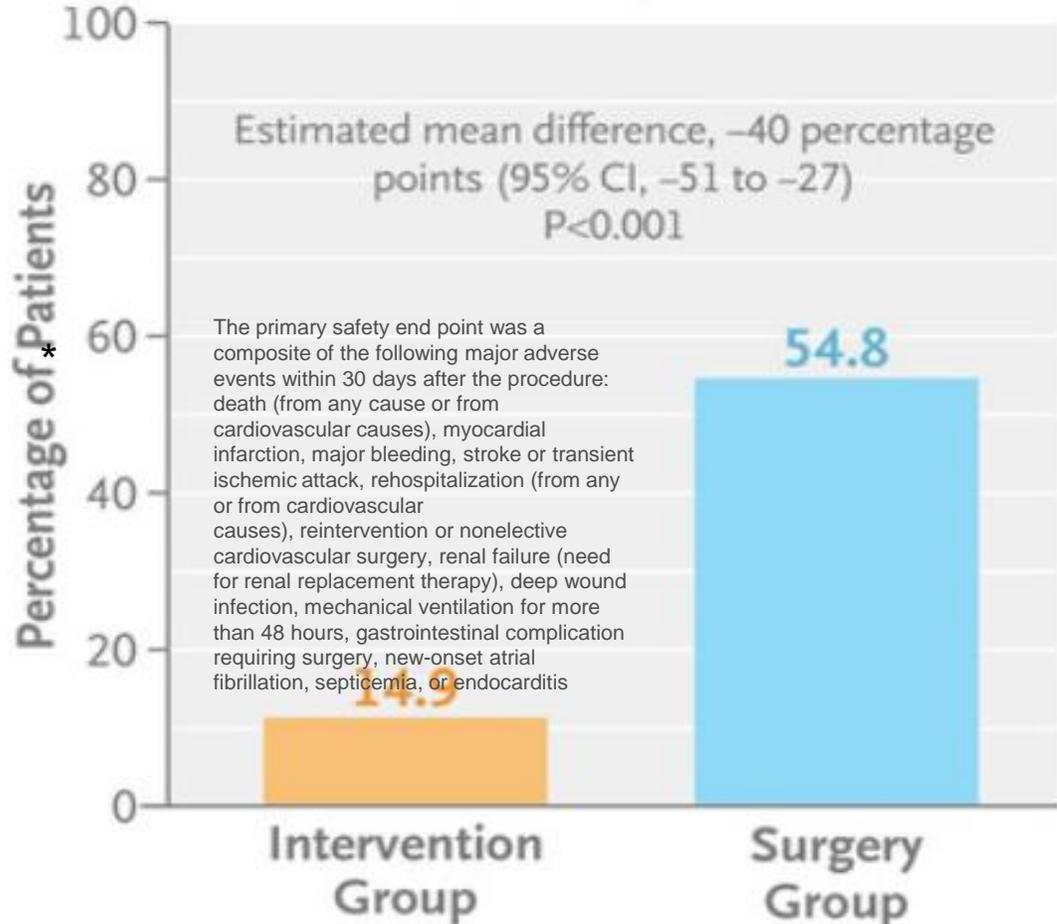


MATTERHORN: Cardiac Surgery vs. M-TEER for Functional MR

Primary Efficacy End Point



Primary Safety End Point



*death from any cause, HF hospitalization, MV reintervention, implantation of an assist device, or stroke)

Trikuspidální regurgitace

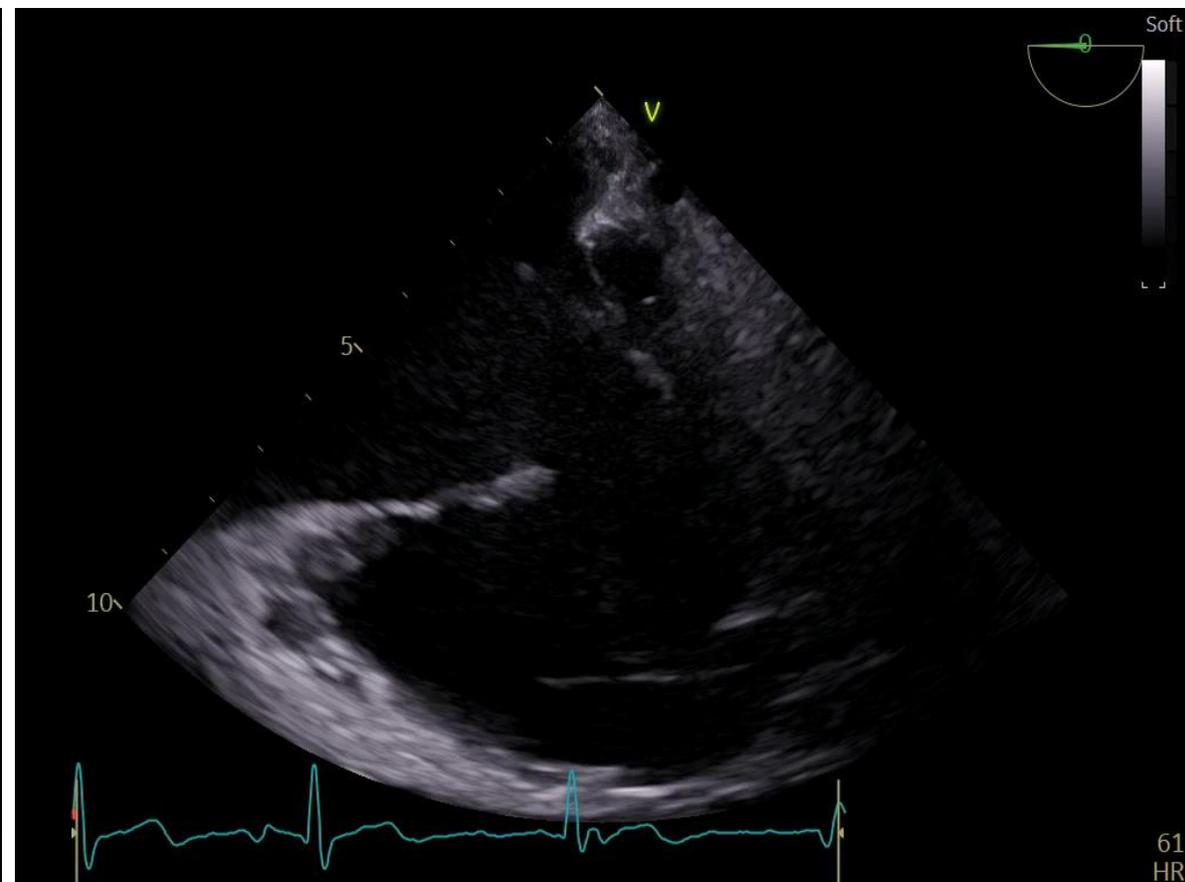
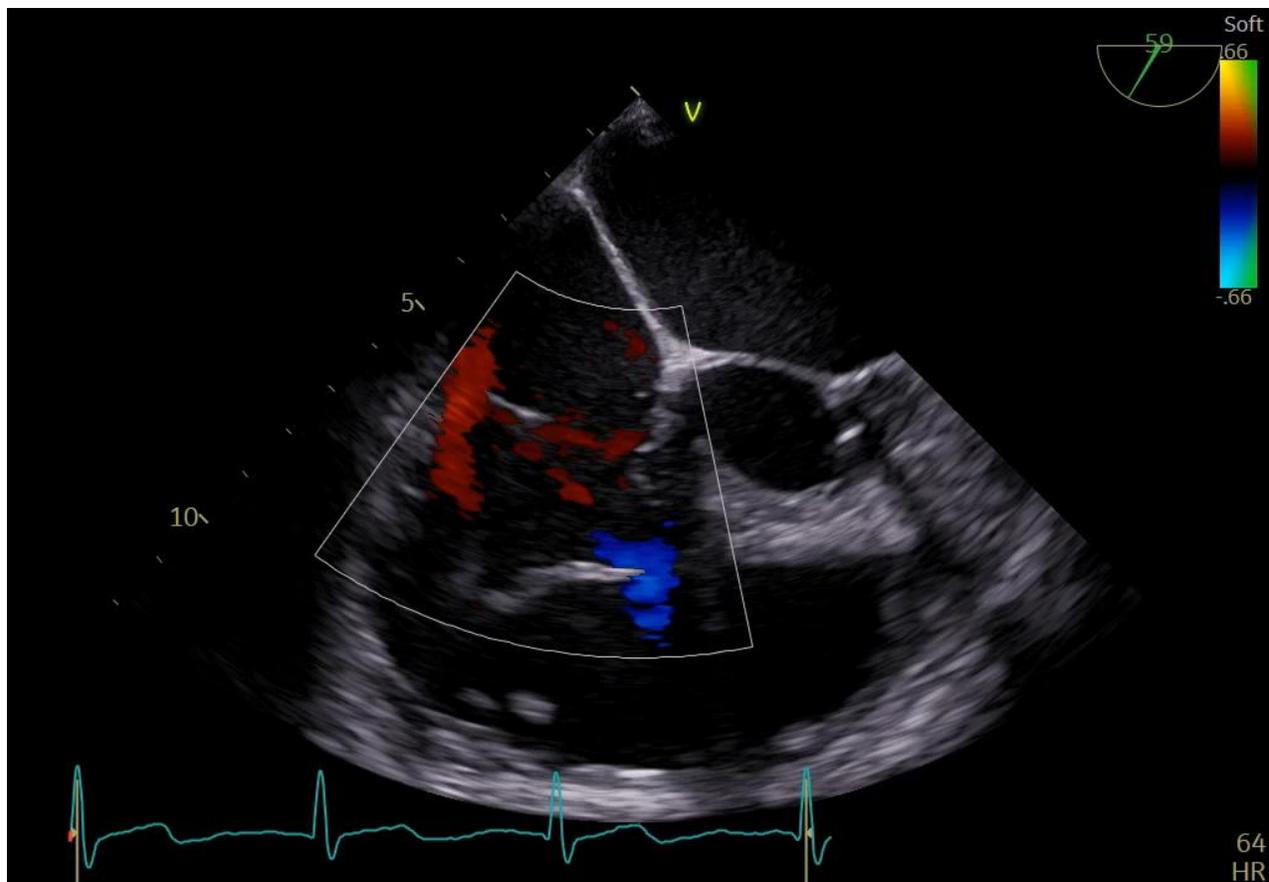
Symptomy trikuspidální regurgitace

- Systémová retence tekutin
 - Zvýšený CVP, periferní otoky, ascites
- Metabolický efekt
 - Nechutenství, kachexie
- Snížená srdeční rezerva
 - Dušnost, intolerance zátěže, nízká funkční kapacita
- Snížený minutový výdej
 - Progresivní selhání orgánů (venosní kongesce a hypoperfuze)

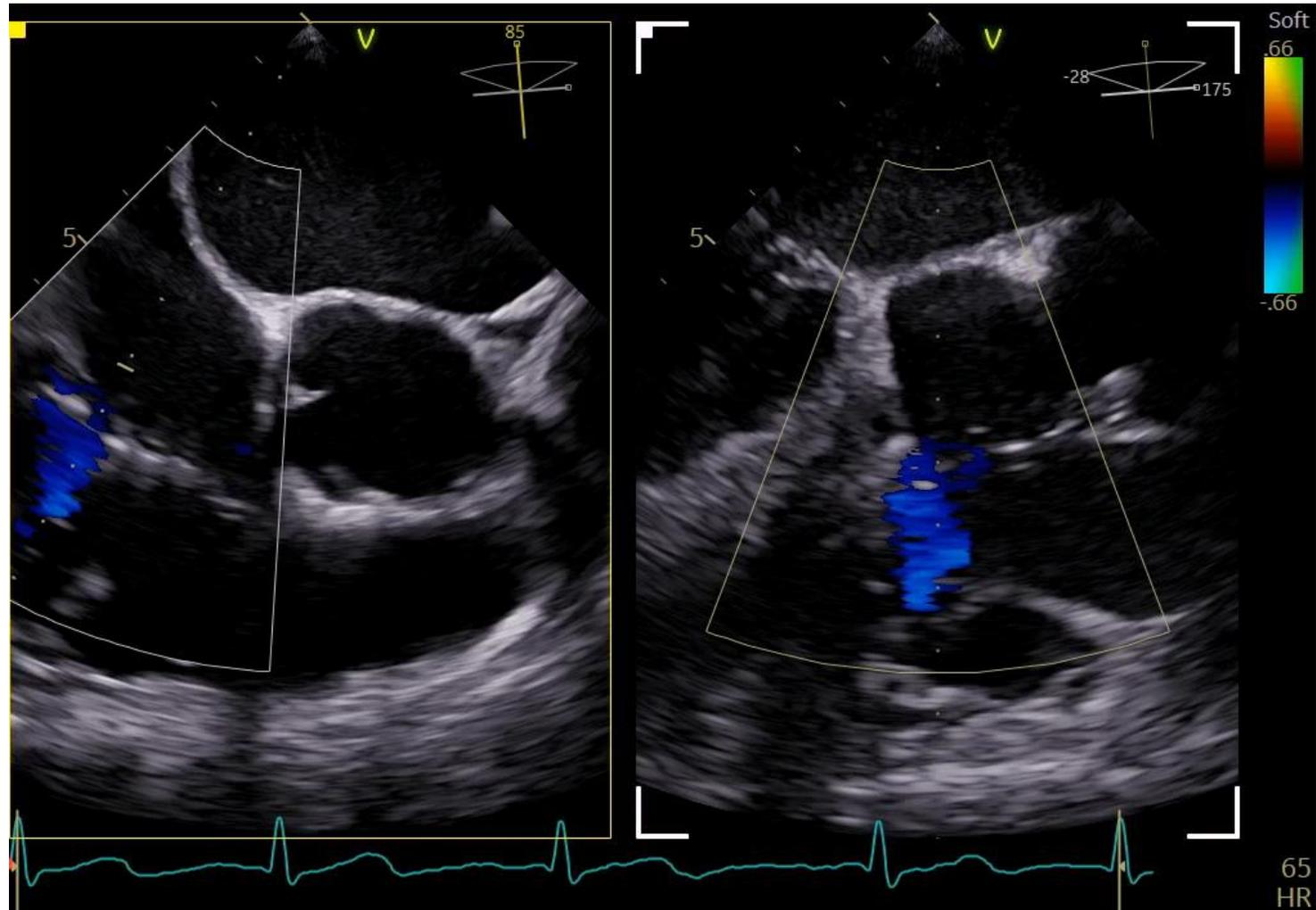
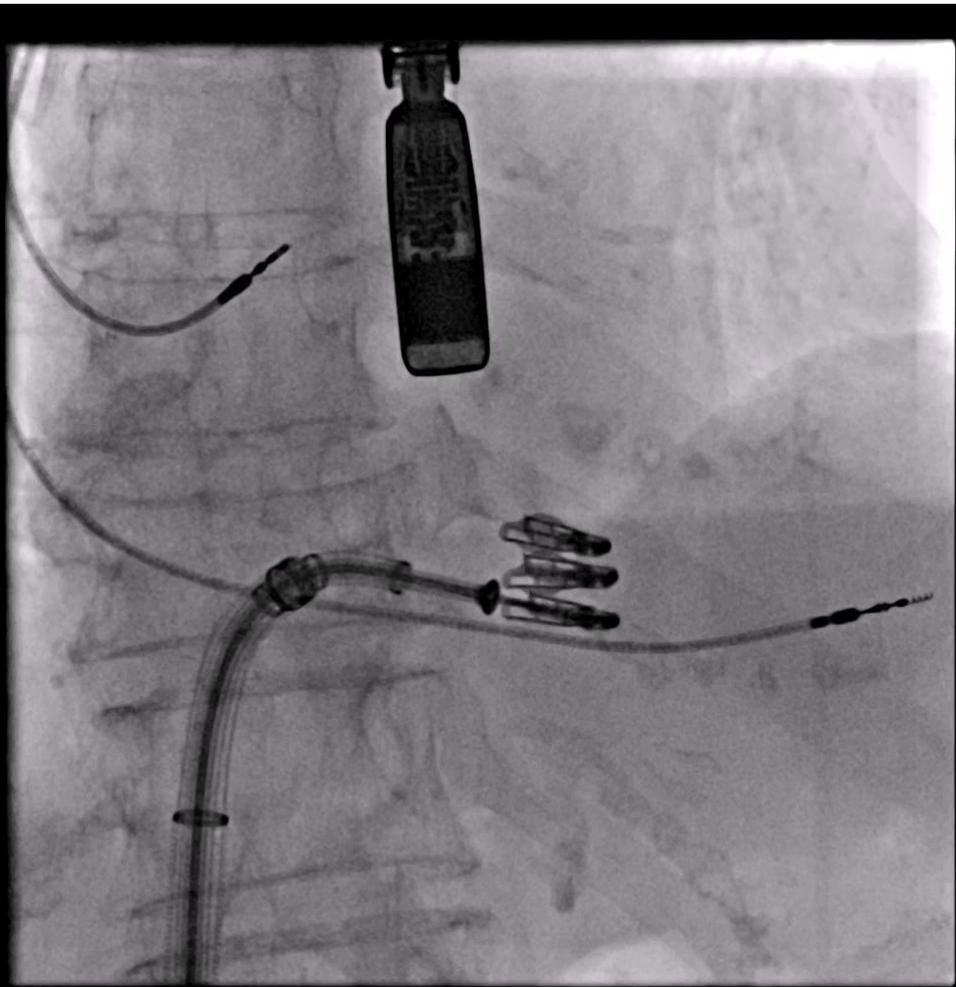
Trikuspidální regurgitace funkční

- Pacientka 86 let
- Arytmolog. anamnéza - RFA AVNRT 2006
 - perzist. FiS, SSS, 2D PM 2014 (RAA, septum)
- TTE 2014 TriR + MiR $\frac{1}{4}$, norm. EF PK i LK
- TTE 2017 TriR 2-3/4, ost. dtto
- 2023 zn. PSI, dle TEE nově zj. masívní TriR 4/4, dilatace anulu a PK s norm. EF
- Klinicky invalidizovaná PSI

- Indikována a přijata k plánované implantaci TriClip
- Ale dle TEE na sále... masívní TriR, gap 14 mm...



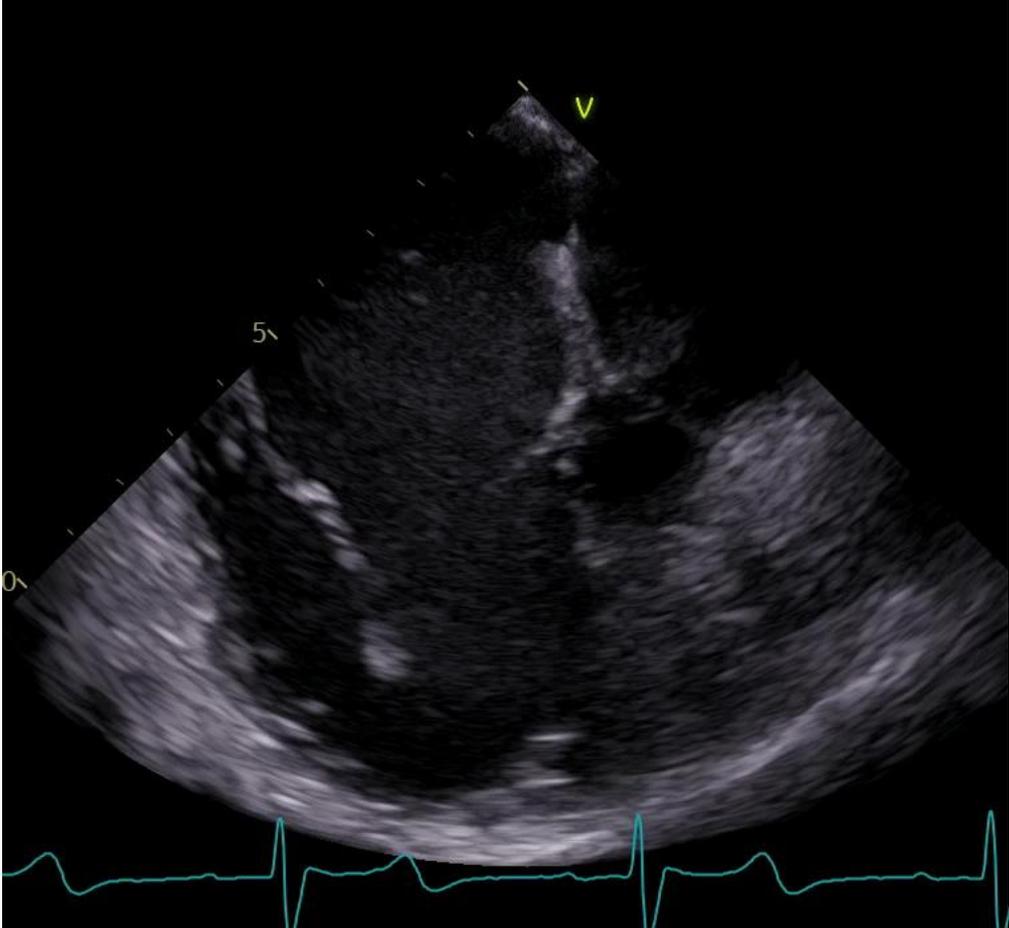
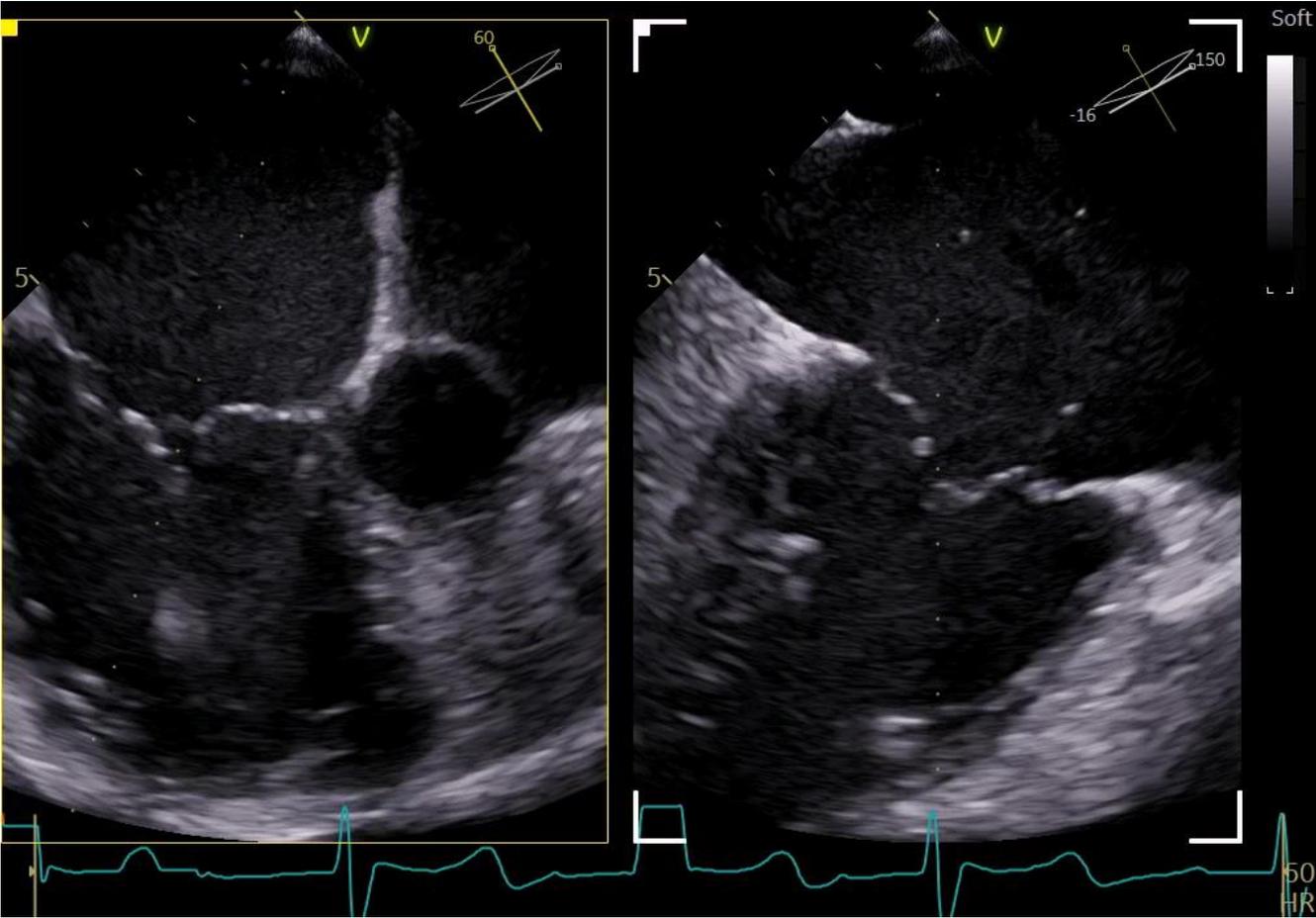
- Po roce pac. jezdí na kole!



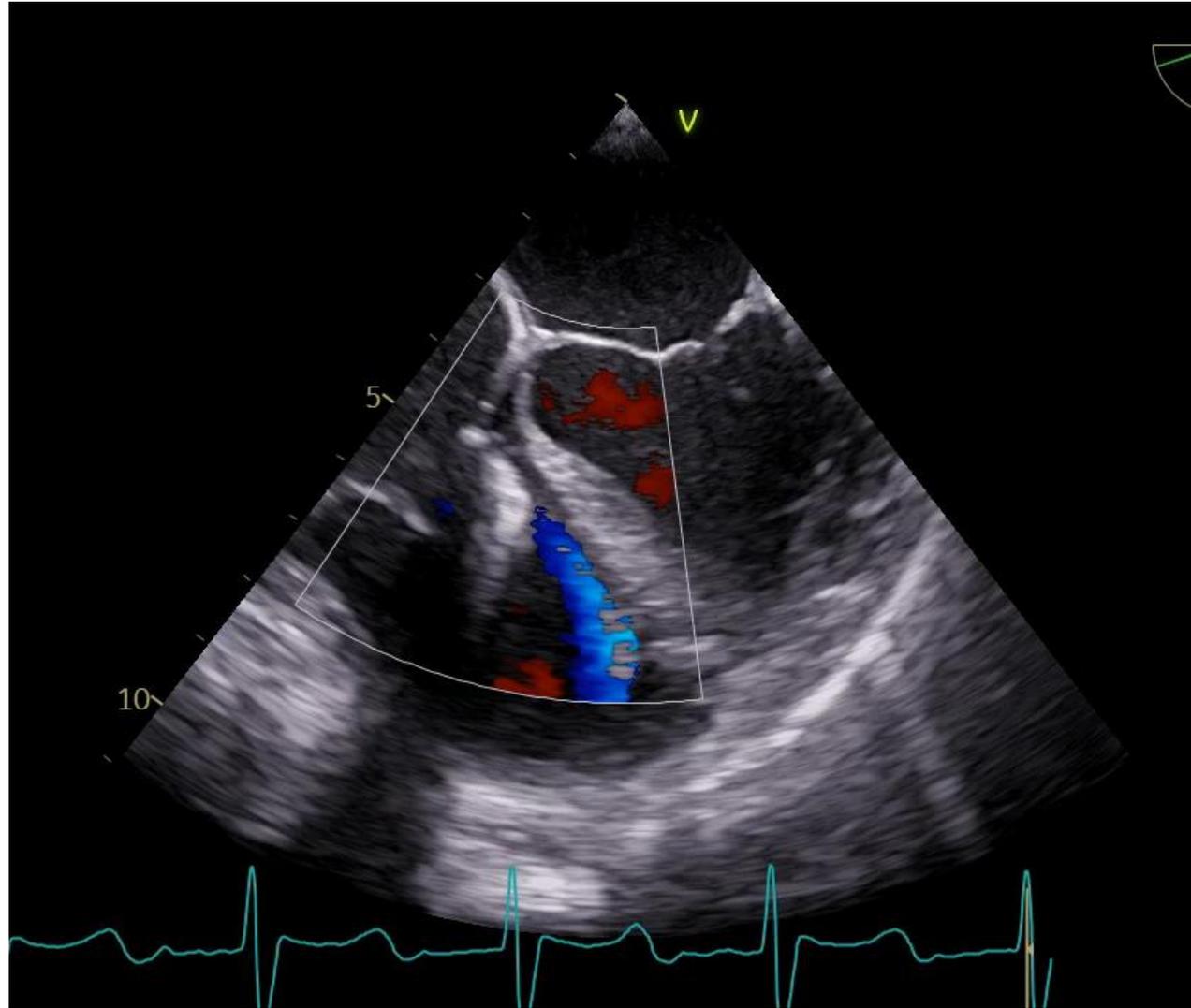
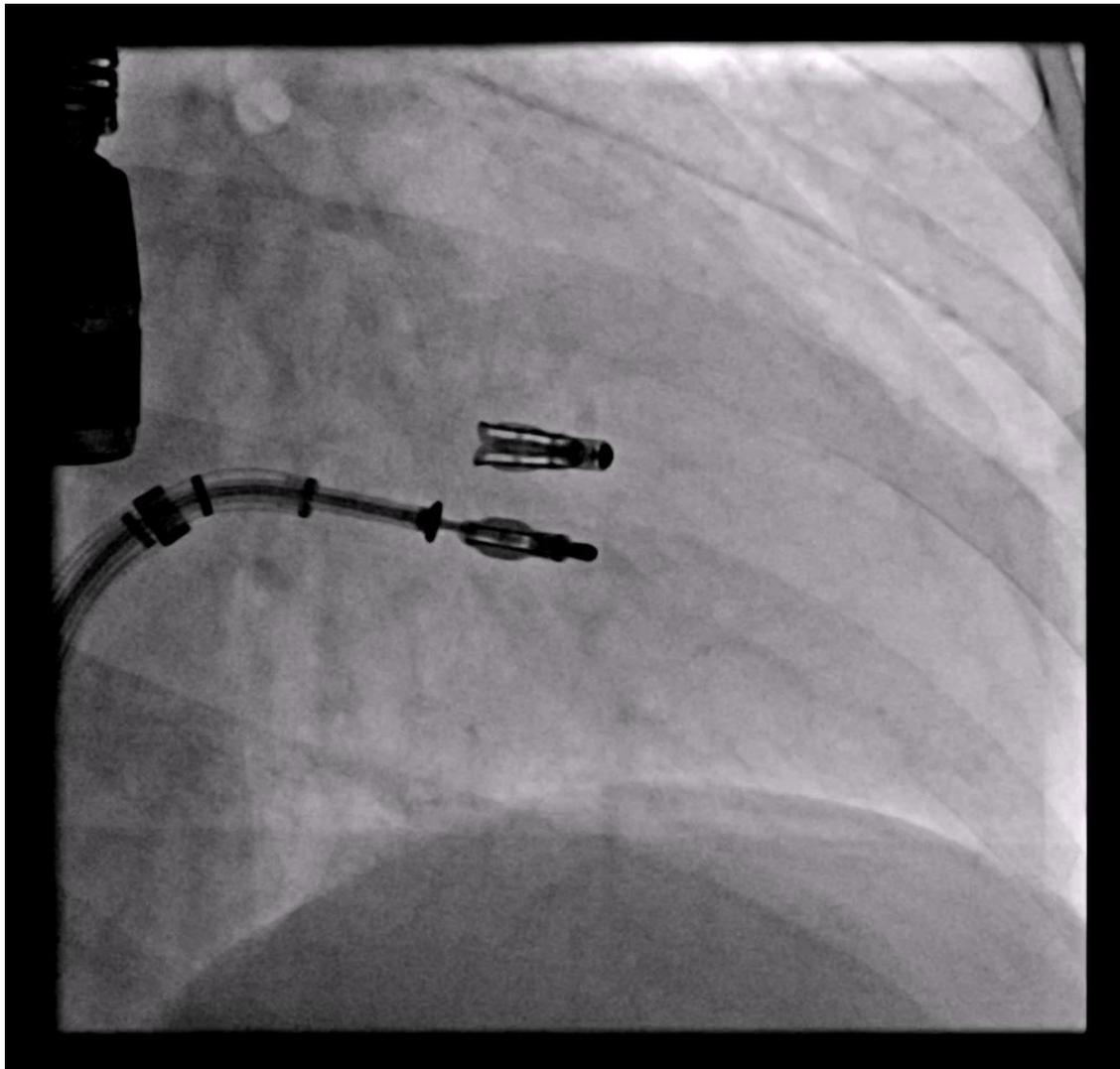
Trikuspidální regurgitace - primární

- Pac. 57 let
- 12/2015 obrovskobuněčná myokarditida se zn. SI (verif. EMB), EF 35%, imunosupresivní terapie – normalizace EF, TriR 1/4
- 10/2017 TTE – TriR 4/4, prolaps sept. cípu při ruptuře šlašinky
- Od r. 2022 progresse PSI s obrazem „flail leaflet“ sept. cípu

do oblasti A-S postupně 2 svorky - G4 XTW a G4 XT

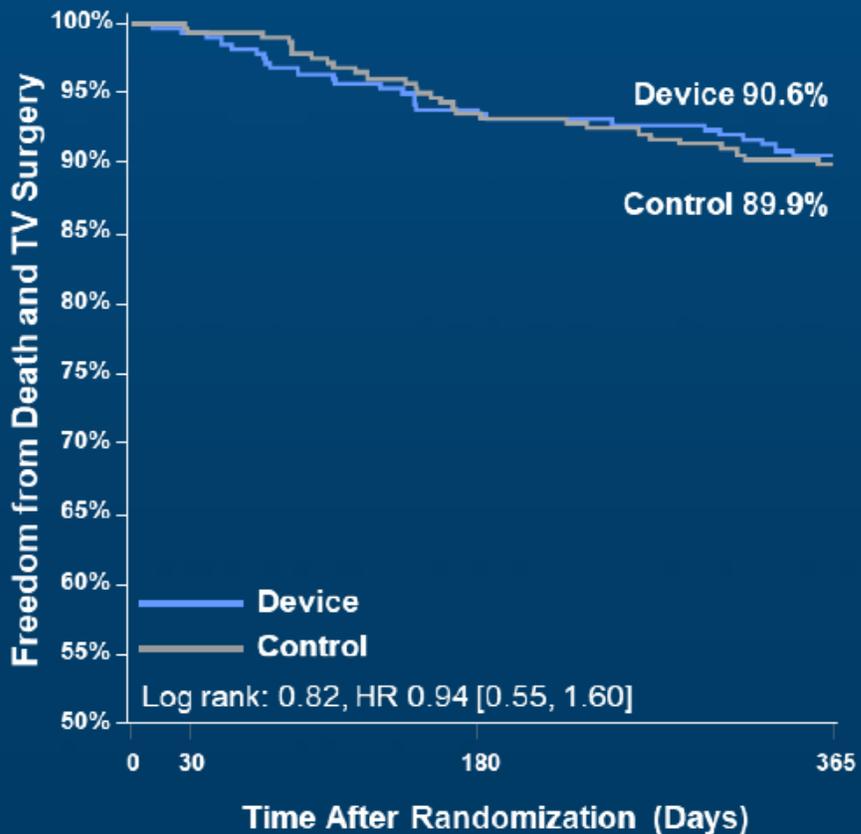


- Výsledek ...
- Po 4 měs. TriR 2/4

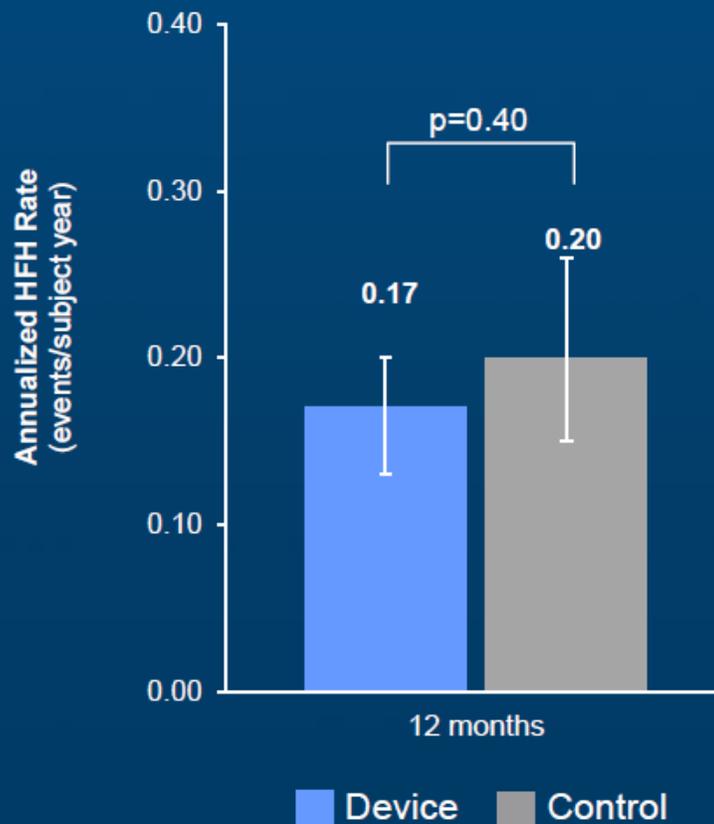


TRILUMINATE RCT: TriClip vs OMT (n=589)

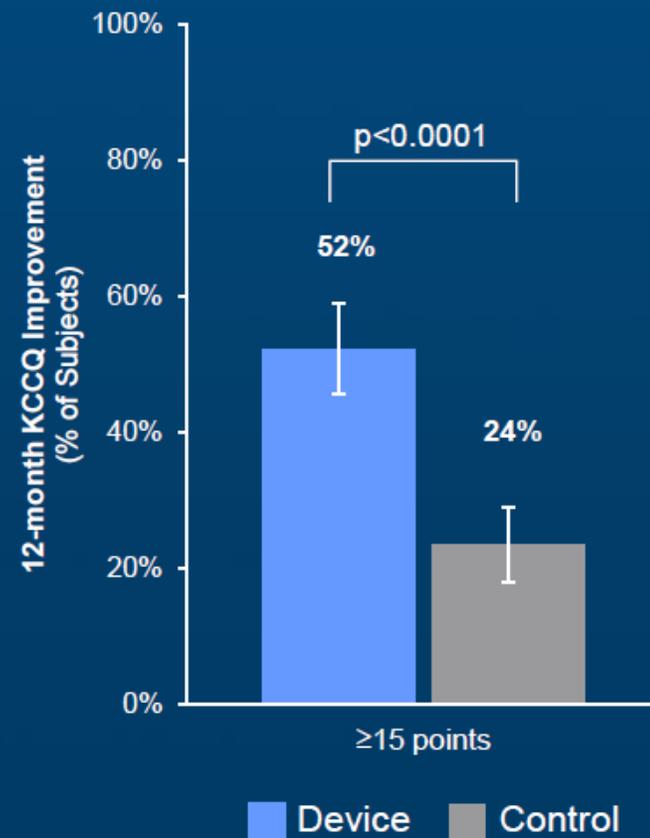
Freedom from Mortality and TV Surgery



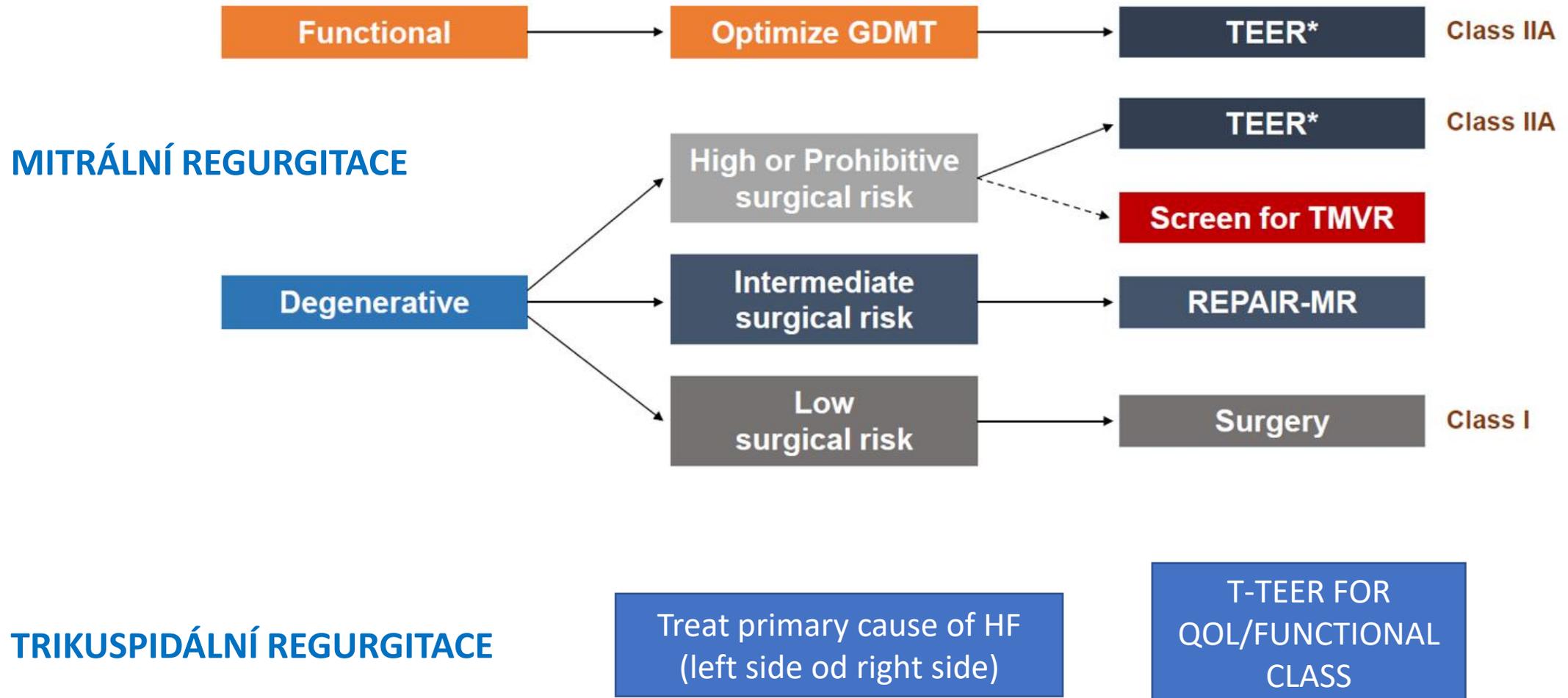
Annualized HFH



Δ KCCQ-OS



Intervenční léčba nabízí více nežli OMT včasná indikace k intervenci !!!



Centrum pro komplexní léčbu chlopenních vad

Kardiocentrum IKEM



ambulance.kardiologie@ikem.cz

marketa.segetova@ikem.cz

michael.zelizko@ikem.cz