

Case 1. MitraClip

Jung-Sun Kim, MD, Ph D, FESC

**Division of Cardiology, Severance Hospital
Yonsei University College of Medicine**

8 min

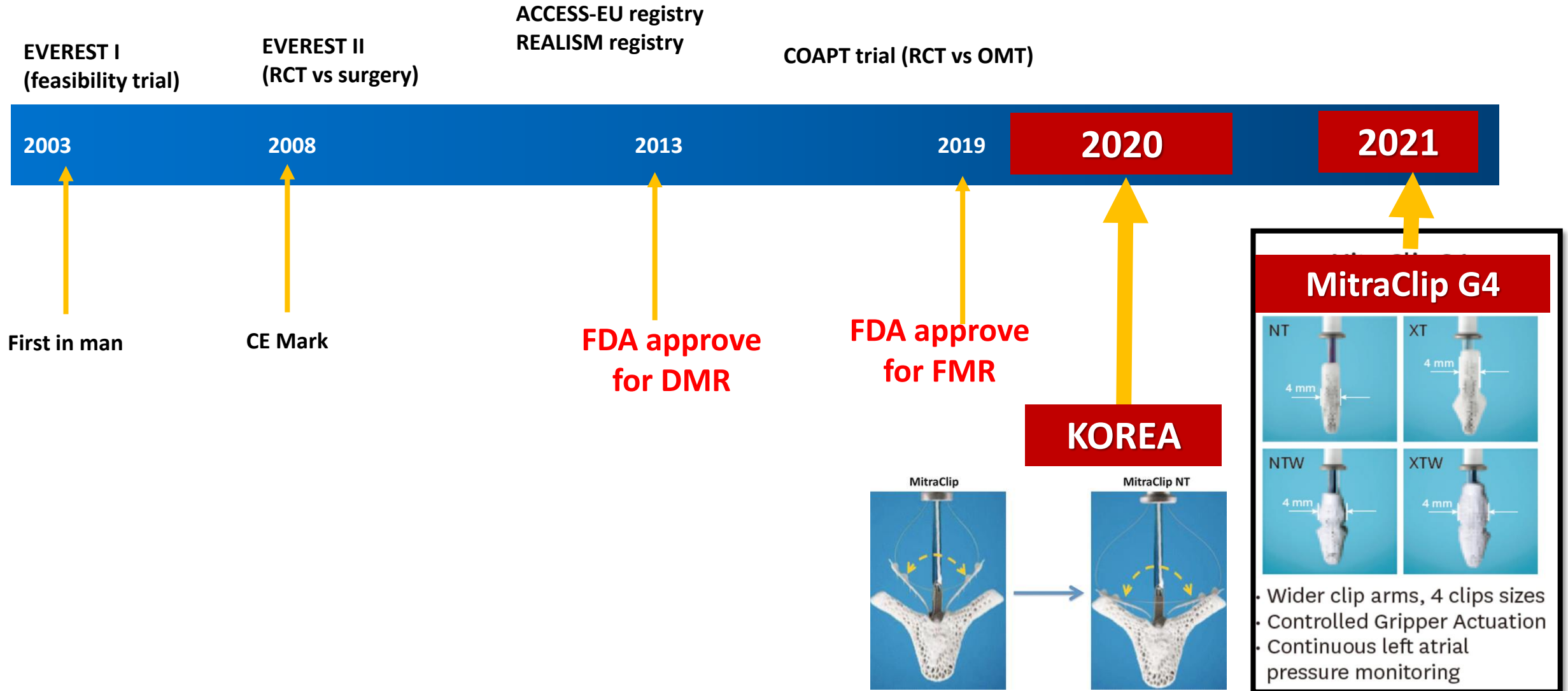
May 6th 2023

Disclosure Information

Jung-Sun Kim, MD, PhD

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- Support/Consultant: None
- Speaker's Bureau: Abbott Vascular

MitraClip in Korea



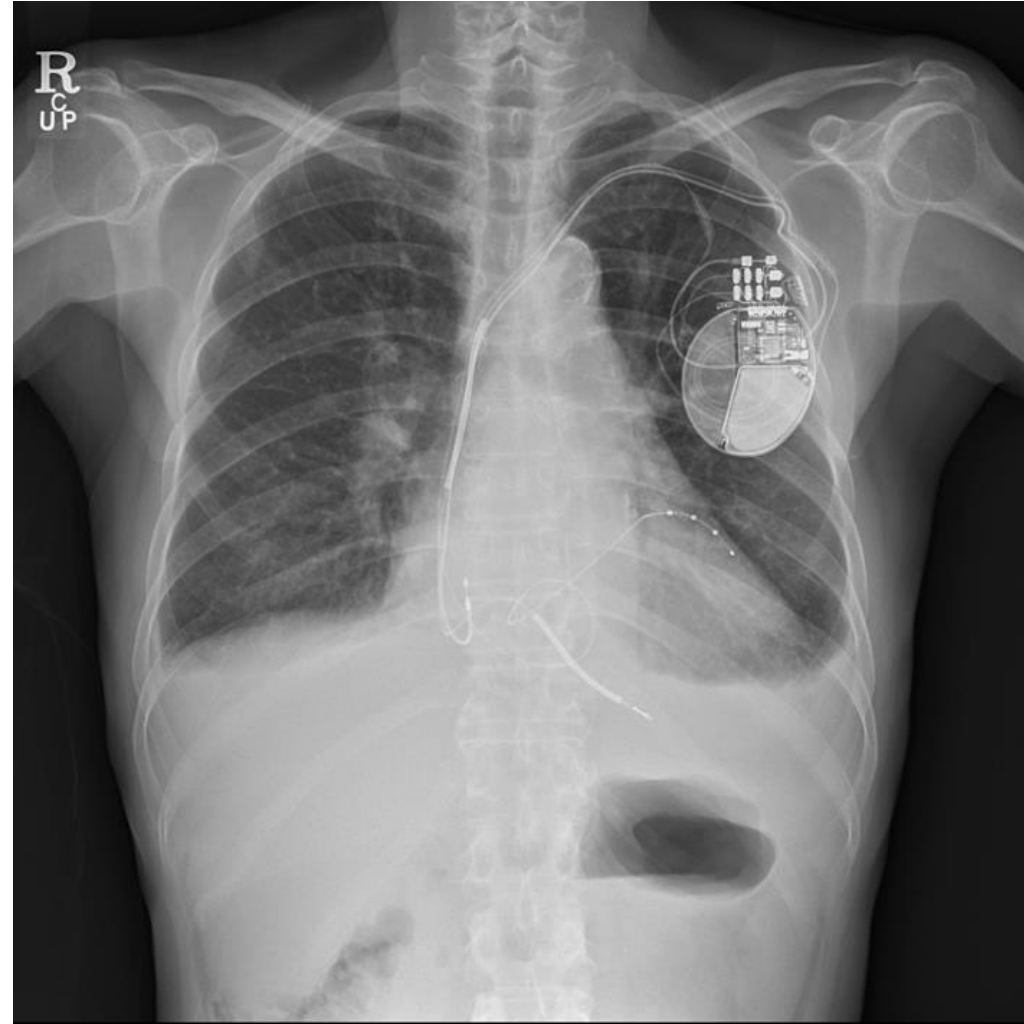
Current Situation of MitraClip in Korea

	Case No
2020	34
2021	64
2022	91
2023 March	22
Total	211
DMR	61 %
FMR	39 %

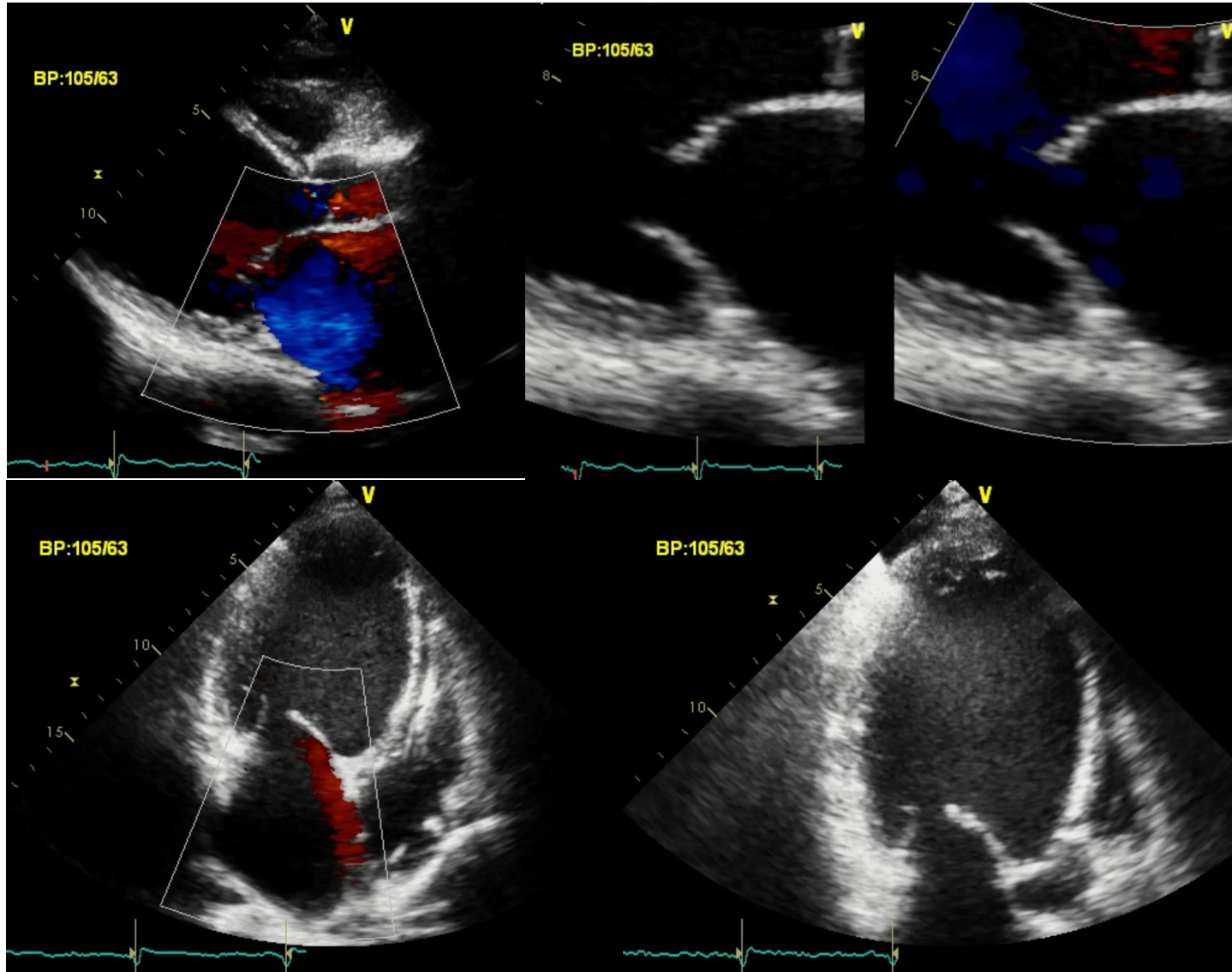
Case 1

- **M/66**
 - **Ischemic CMP and DCMP, HFrEF (EF 16%)**
 - **s/p ICD implantation s/p CRT-D upgrade**
 - **Persistent AF**
 - **HTN**
 - **CKD**

STS score : 3.201% for MV repair, 4.701% for MVR



Echocardiography



TTE

Severe MR due to tethering and incomplete coaptation

ERO 46 mm², RV 72 cc by PISA method

RWMA: multivessel territories

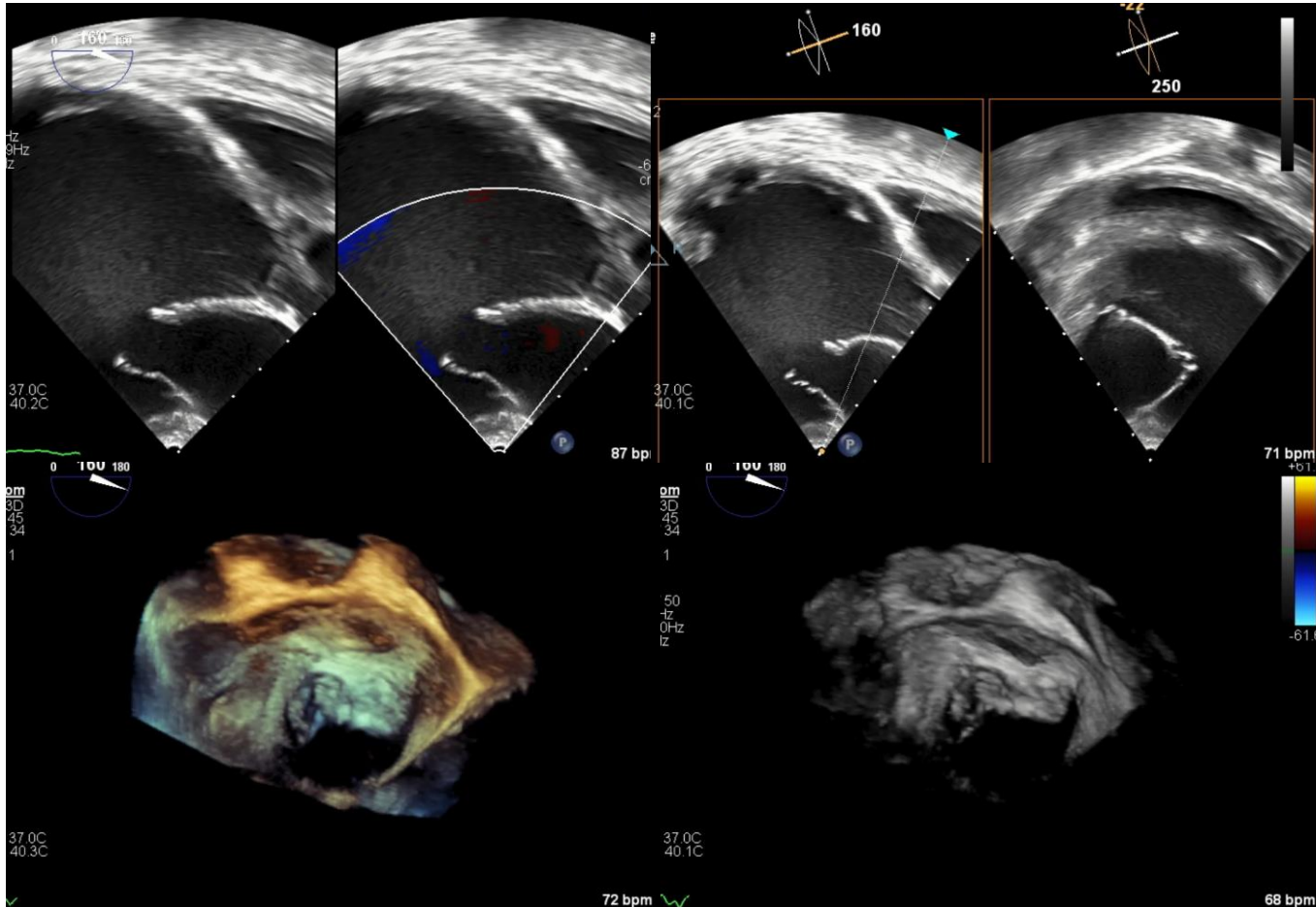
Enlarged LA (LAVI 99 ml/m²) and LV (LVEDD/LVESD 73/64 mm)

Reduced LV systolic function (EF 16% by biplane method)

What is the best option for this patient ?

- 1. LVAD or Heart transplantation.**
- 2. Bridging Treatment with TEER.**
- 3. Surgical Repair or Replacement.**

TEER (1st trial, 2023-04-11)

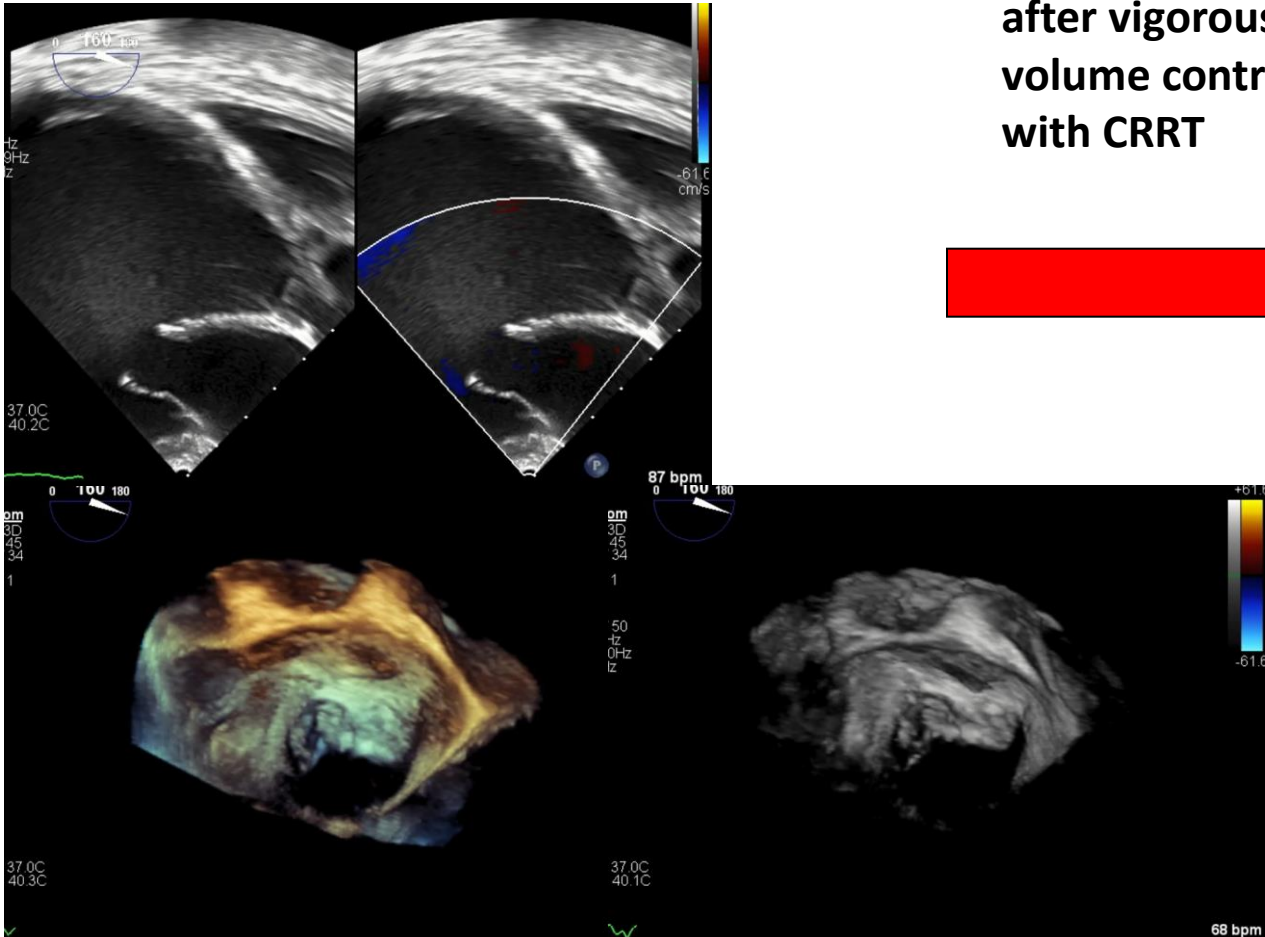


Renal function was deteriorated and volume control was not effective with maximal dose of diuretics

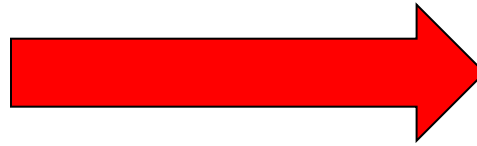
Large coaptation gap → TEER was postponed. After vigorous volume control, retry of TEER was planned.

TEER 3 days later

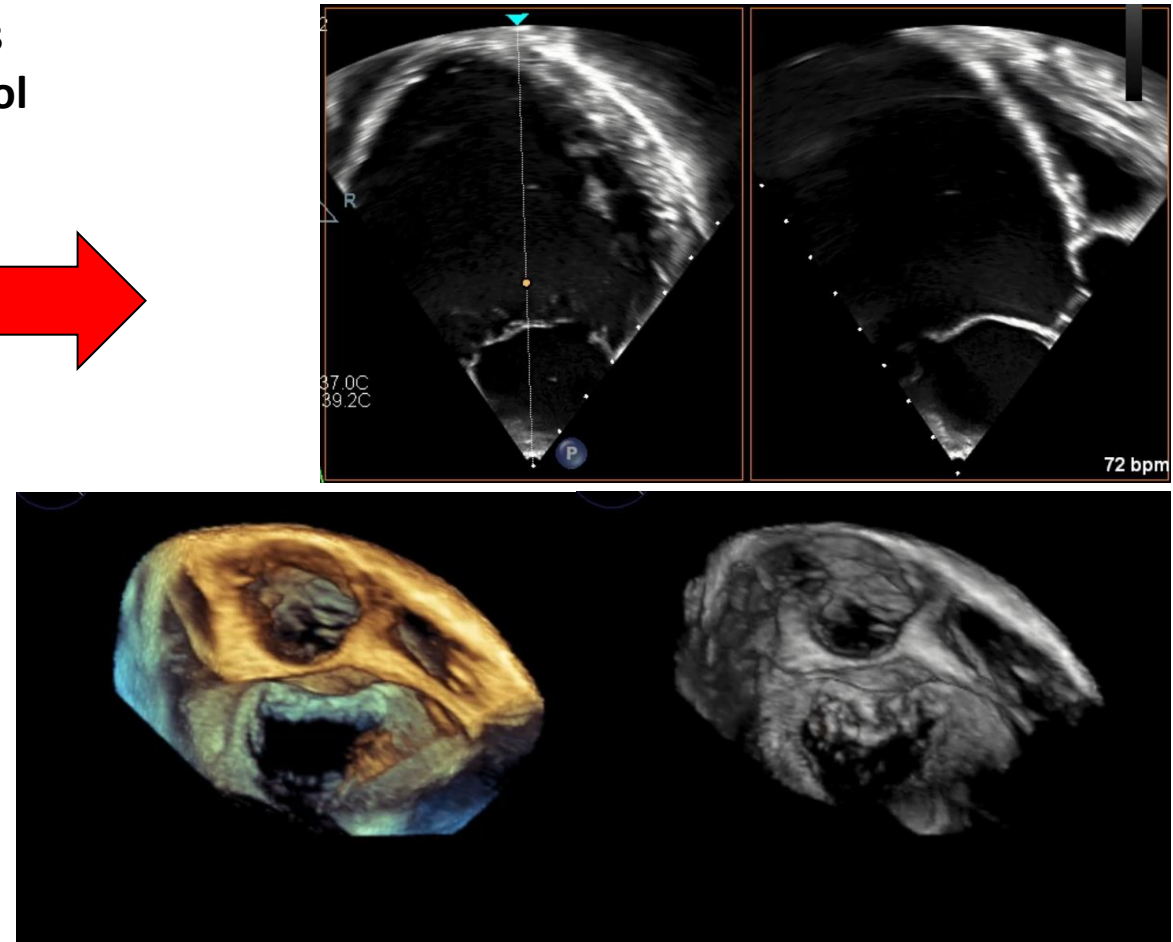
2023-04-11



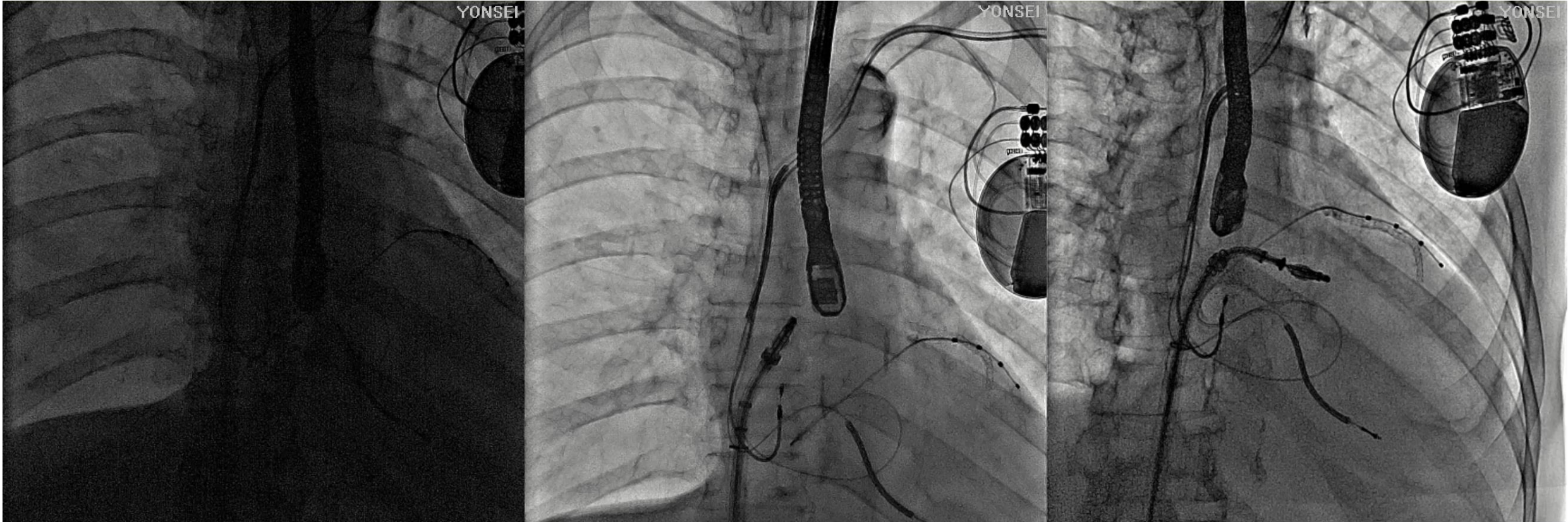
Coaptation gap greatly decreased after vigorous volume control with CRRT



2023-04-14

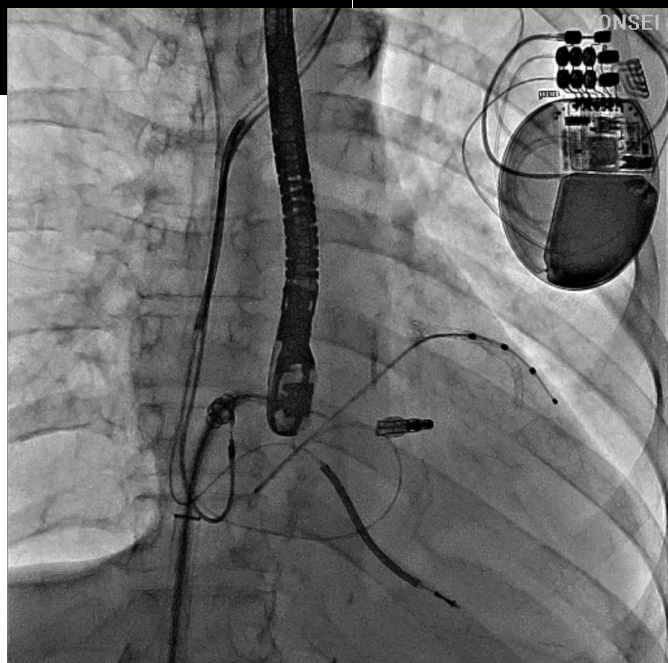
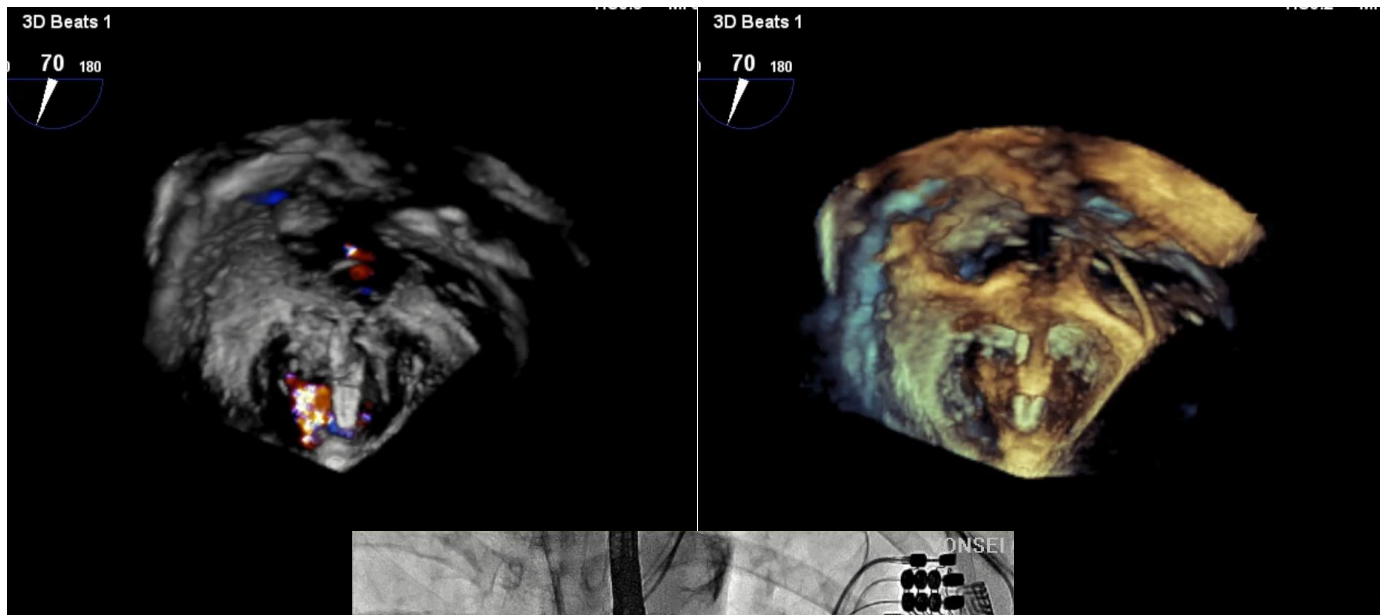


TEER 3 days later

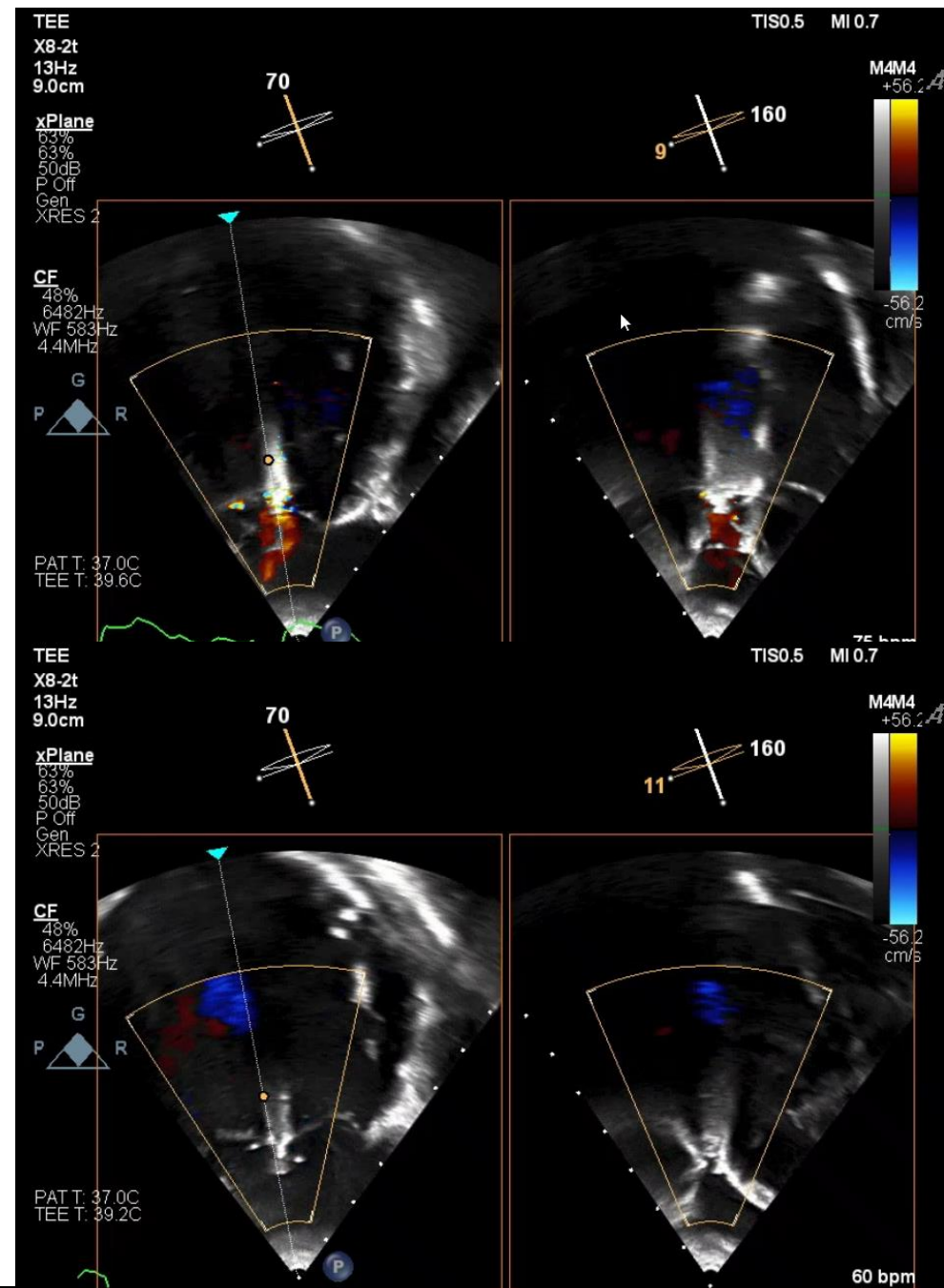


Septal puncture was done. JR catheter was inserted through SL1 catheter into LA.

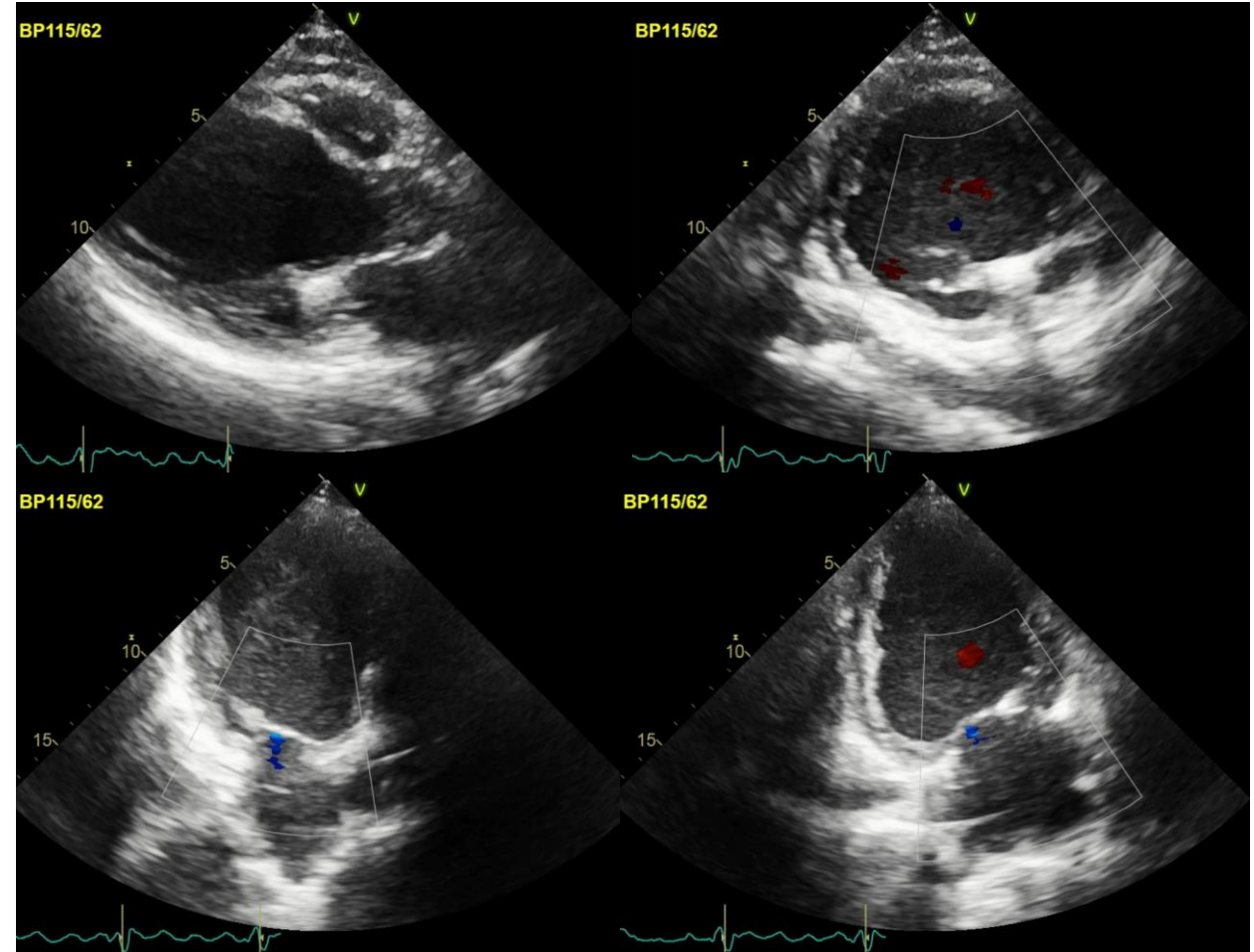
TEER 3 days later



XT



Post-procedural CXR

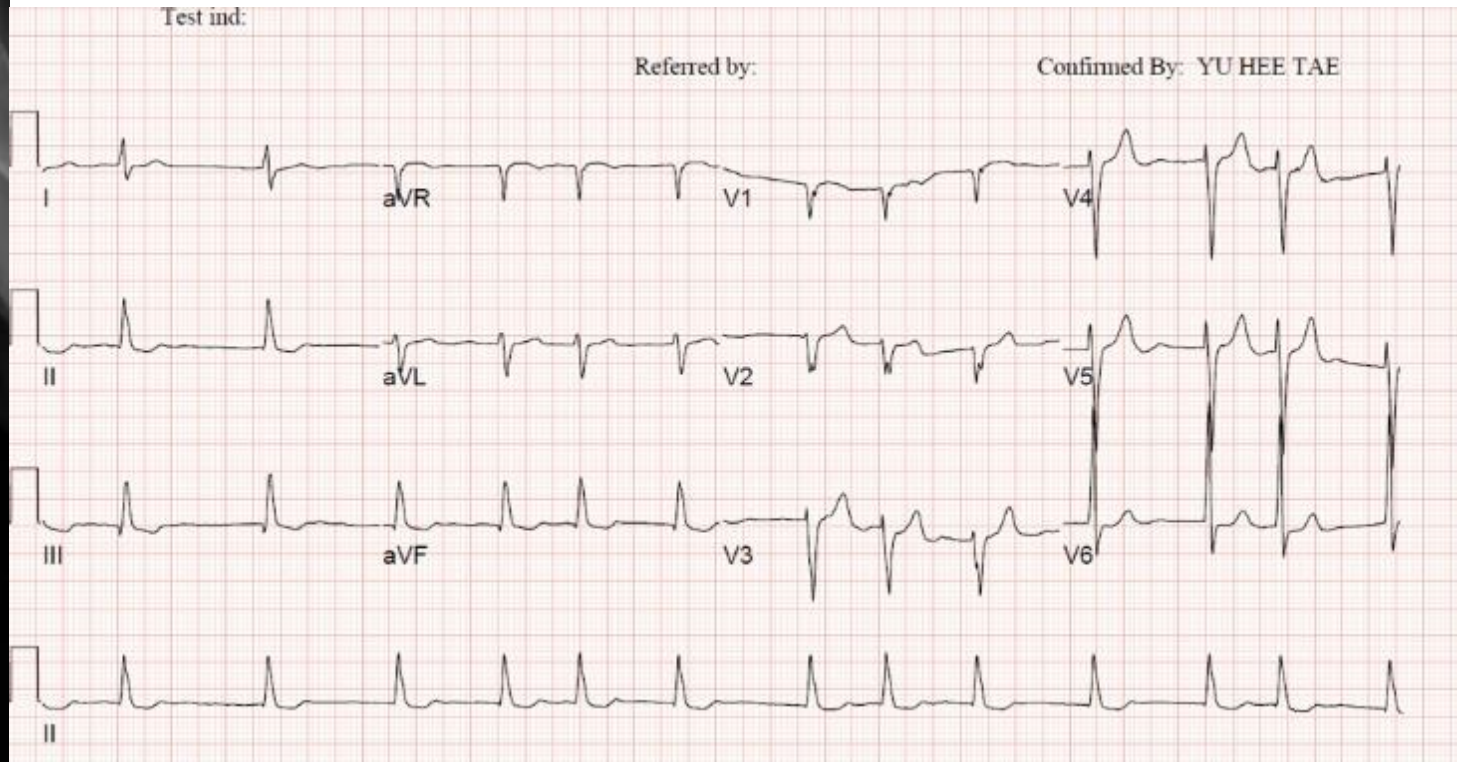


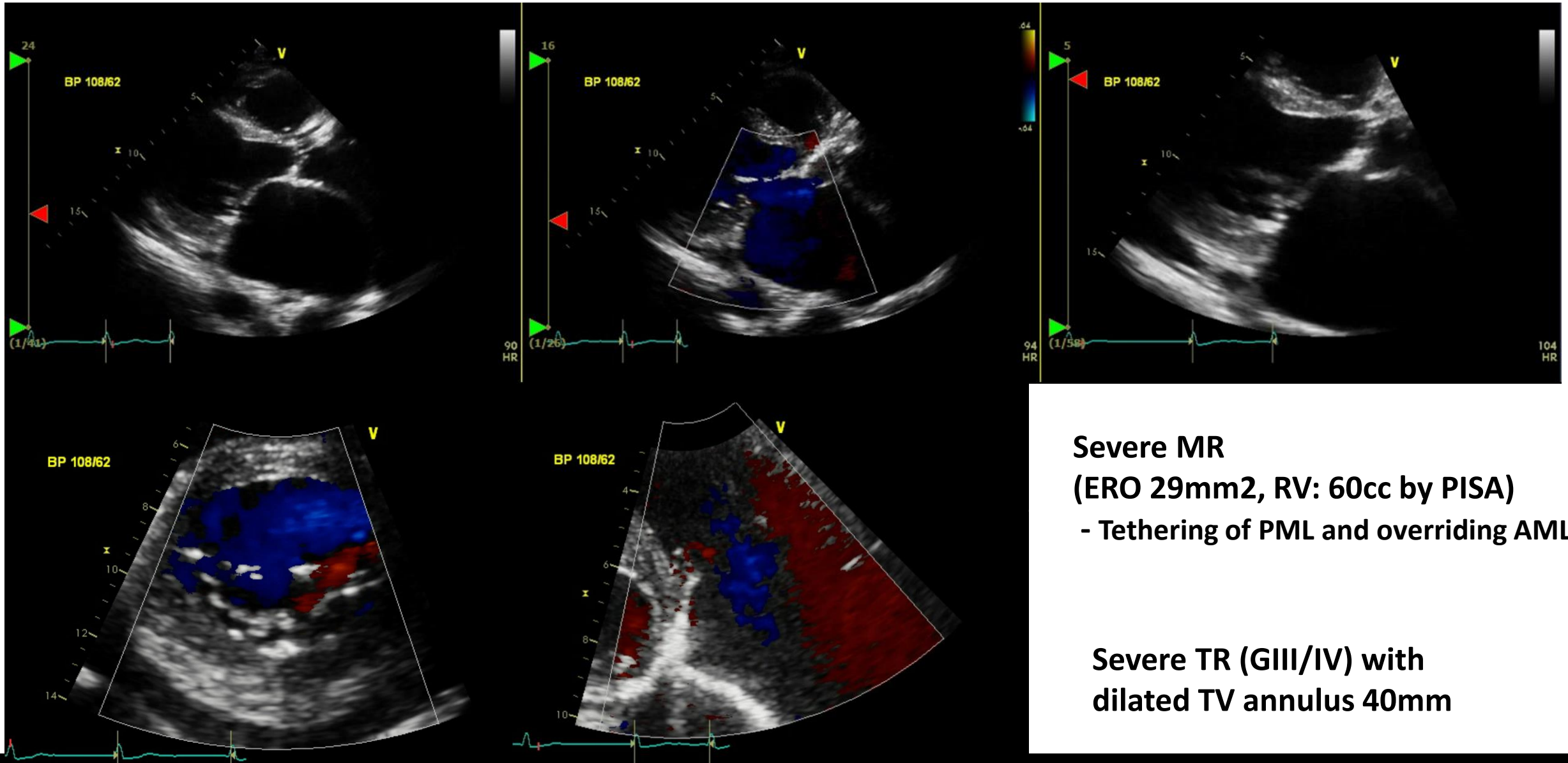
S/P Mitraclip (MDPG 1.0 mmHg) with trivial MR

Case 2

- F/84
- Chief complaint
 - Dyspnea and orthopnea
- Past history
 - Hypertension, Diabetes mellitus
 - PeAF (CHA₂DS₂-VASc 6) on warfarin
 - CKD
 - CAD (1VD)- mLAD 50%
- STS score : 5.28 % for MV repair / 8.35 % for MV replacement

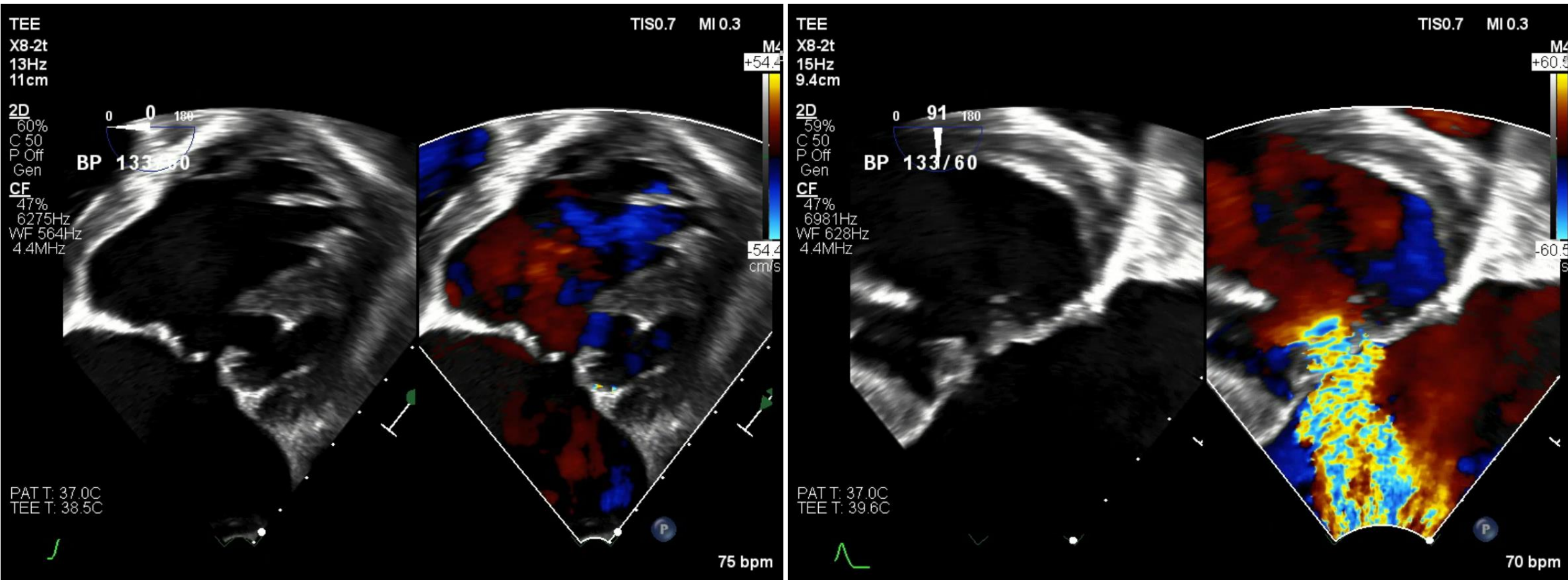
CXR & ECG





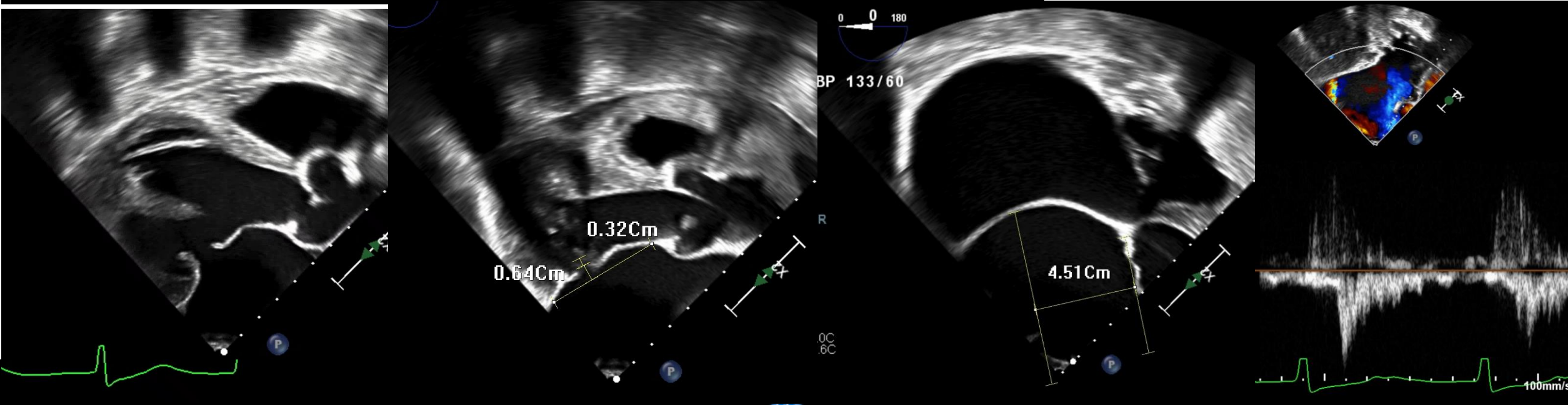
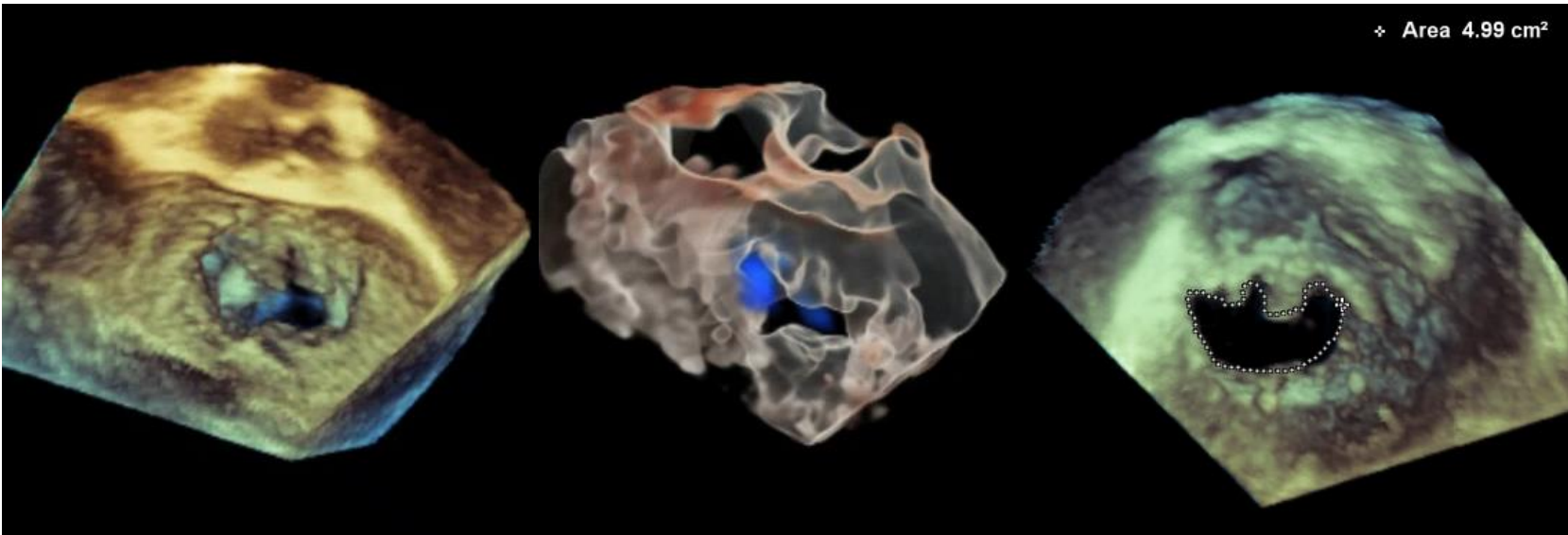
Severe MR
(ERO 29mm², RV: 60cc by PISA)
- Tethering of PML and overriding AML

Severe TR (GIII/IV) with
dilated TV annulus 40mm

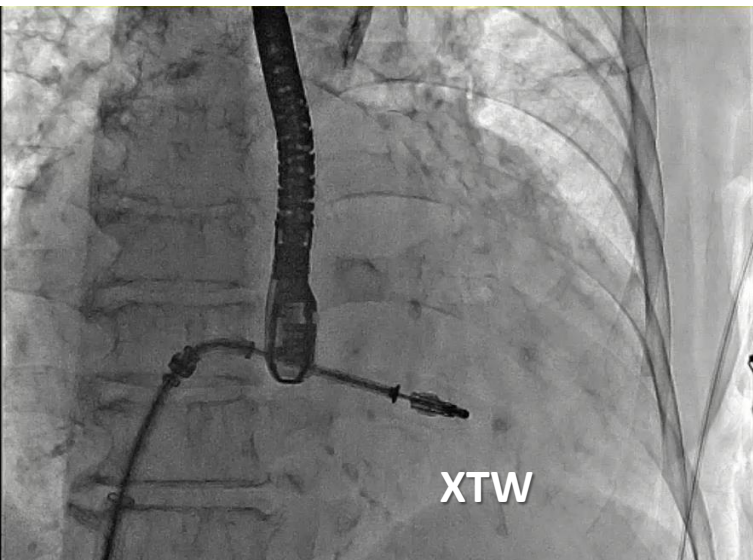


Severe MR (GIV/IV) d/t annular dilatation (53.6mm) and overriding AML and tethering PML

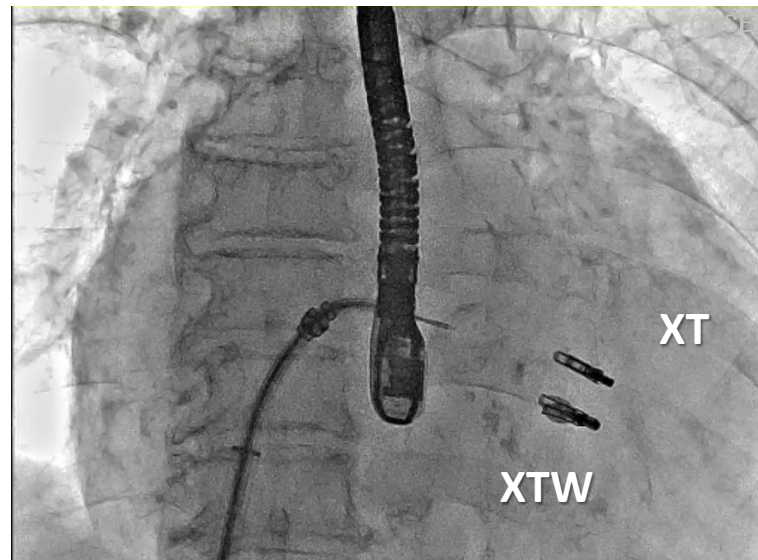
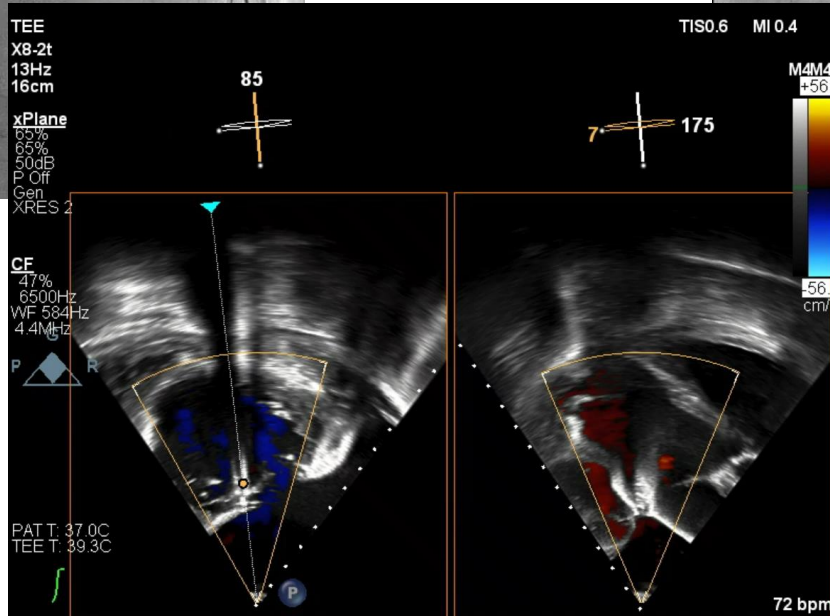
- MVA: 5 cm²
- Coaptation length: 3.2 mm
- Coaptation depth: 6.4 mm
- PML length: 11 mm
- Pliable valves /s calcification



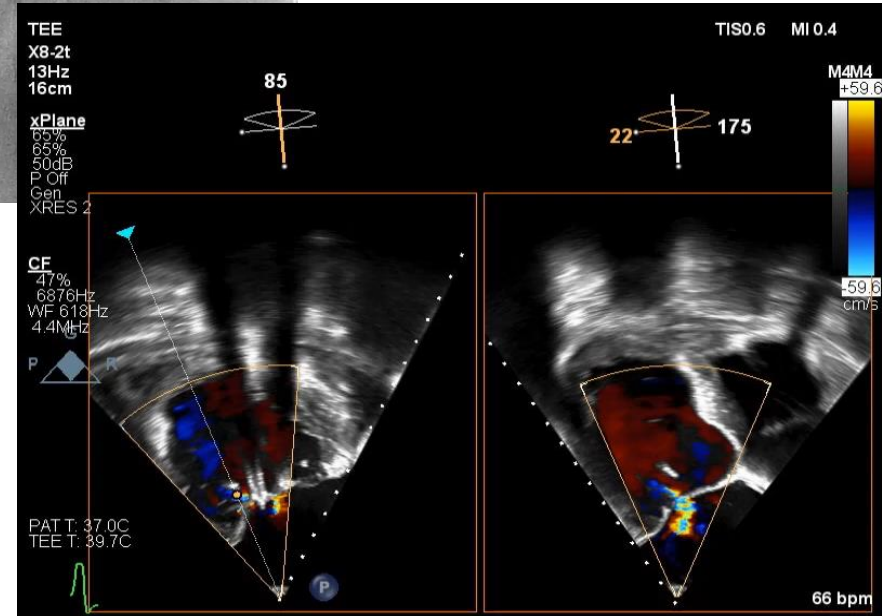
MitraClip Procedure



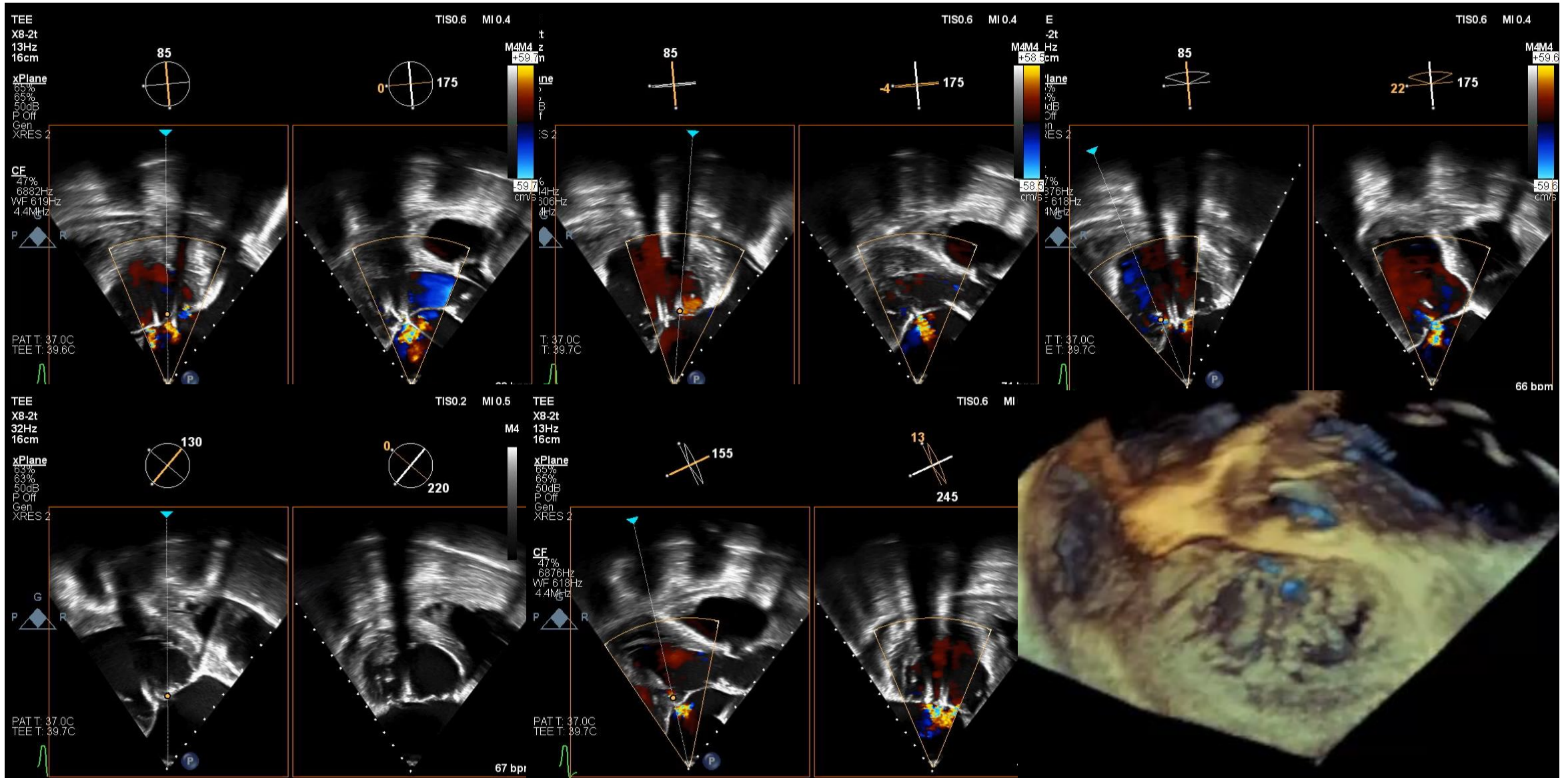
LAO 7, CRA 12



LAO 0, CRA 0



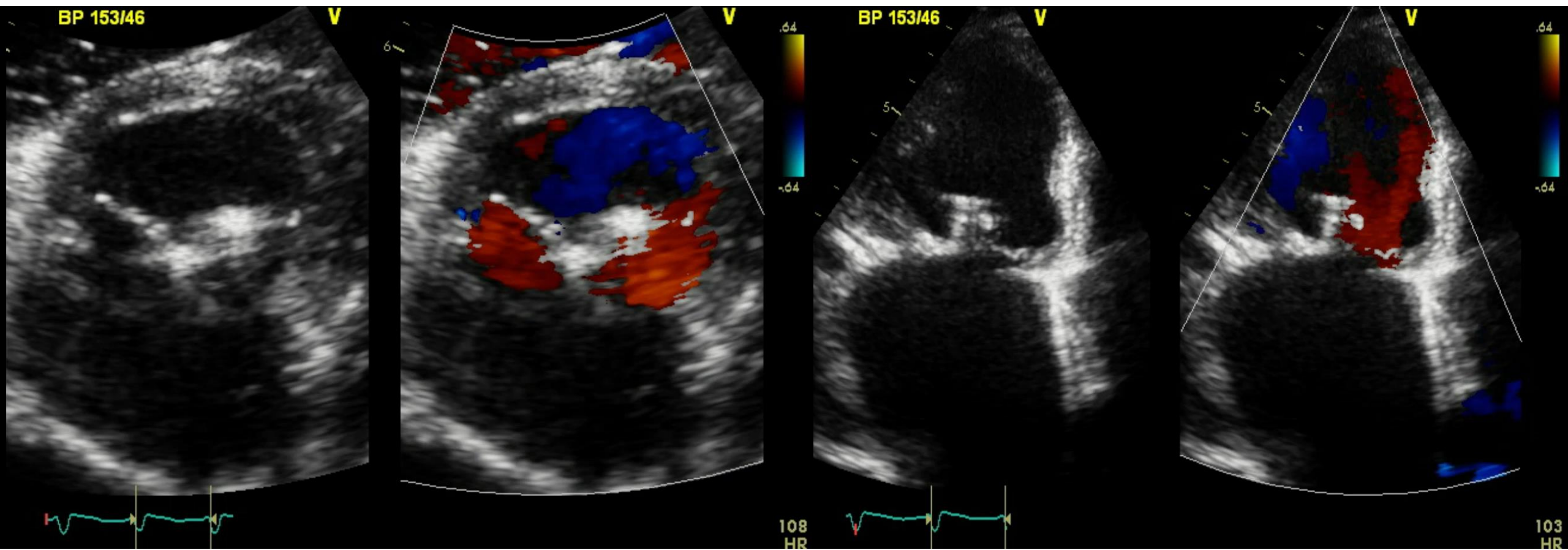
SLDA was occurred in second clip with XT



How to manage a SLDA ?

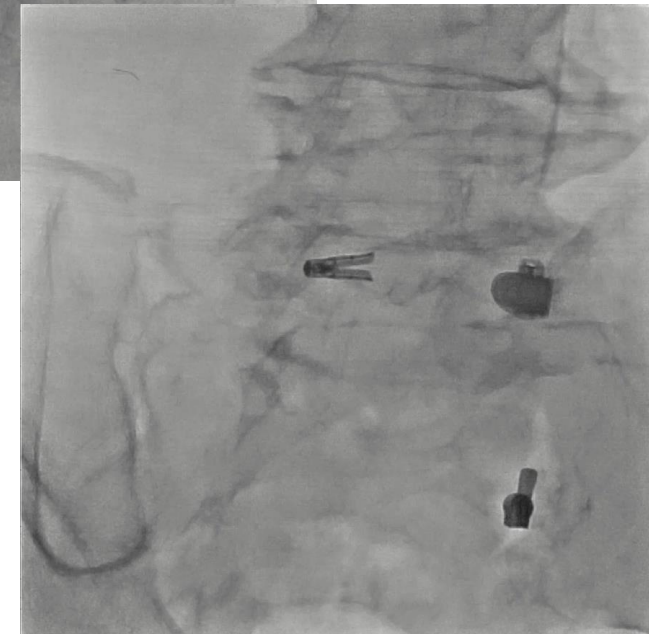
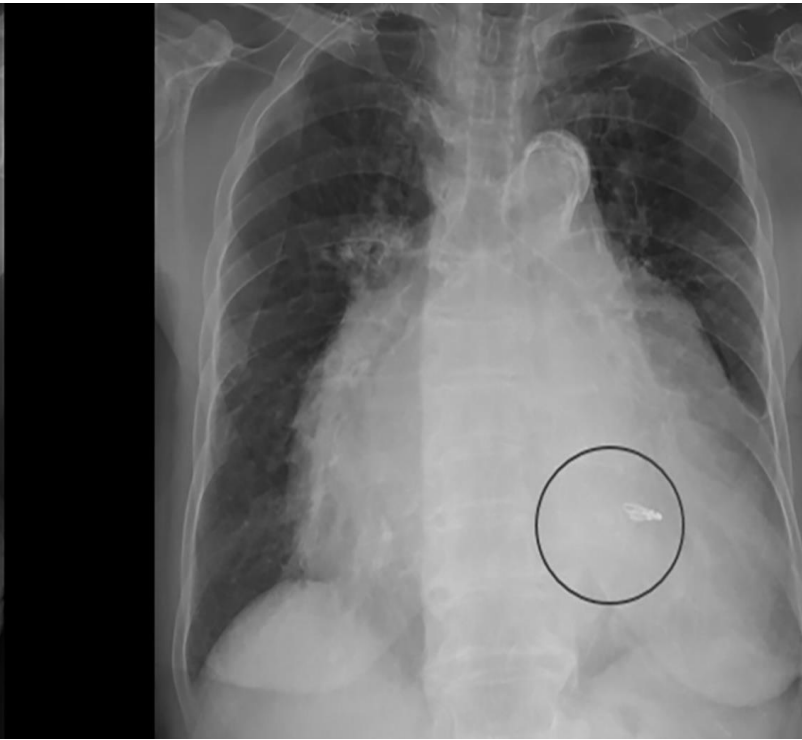
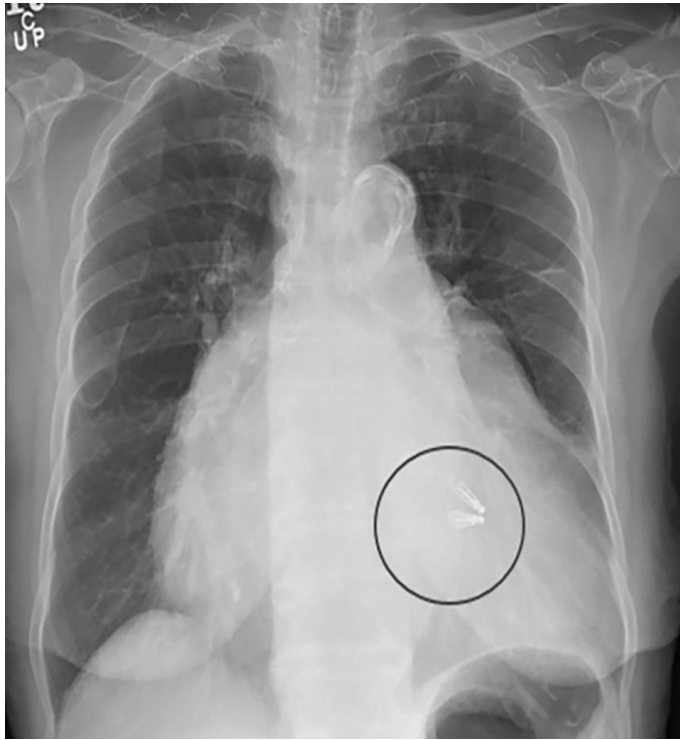
- 1. Apply 3rd Clip to stabilize a second clip**
- 2. Observation because clip was well attached with AML and MR was significantly decreased.**
- 3. Surgical Treatment.**

TTE POD #1



MDPG: 3.4mmHg
Markedly decreased MR

Fluoroscopy (POD #15)



**Patient complaint of right inguinal area pain and aggravated dyspnea.
Embolized MitraClip (XT) was found in right common iliac artery.**

Non-contrast CT



About 1.7cm sized radio-opaque material in the right common iliac artery bifurcation.

How to solve this problem ?

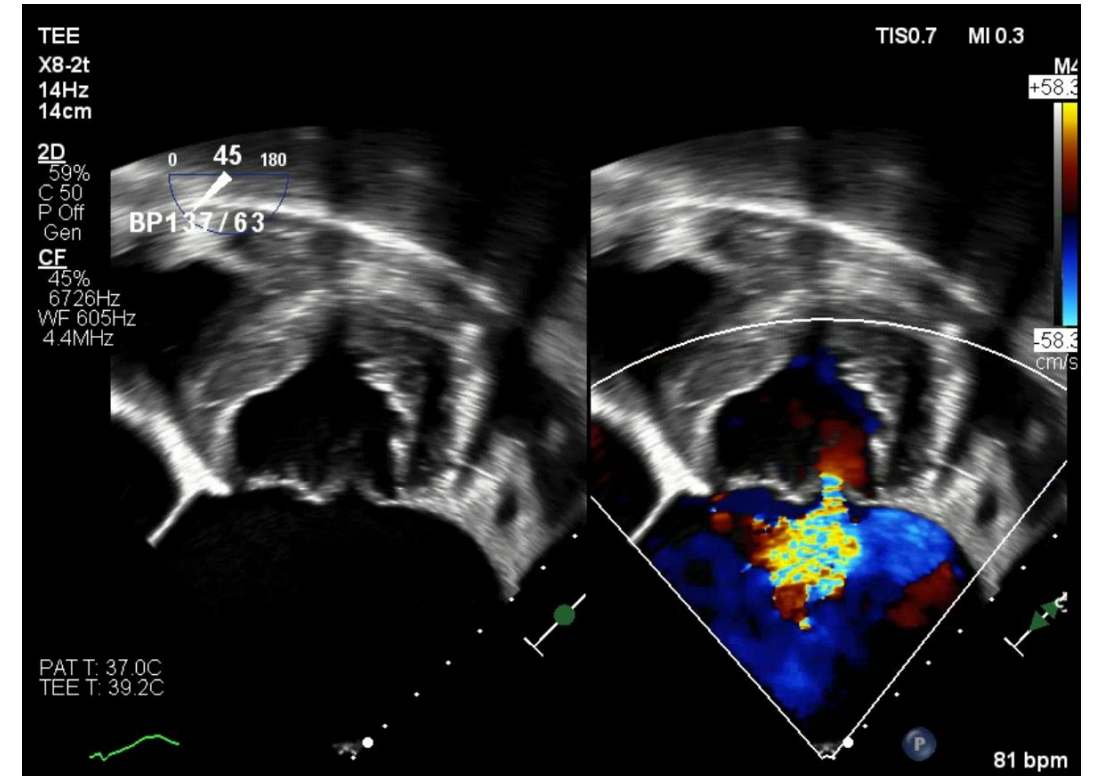
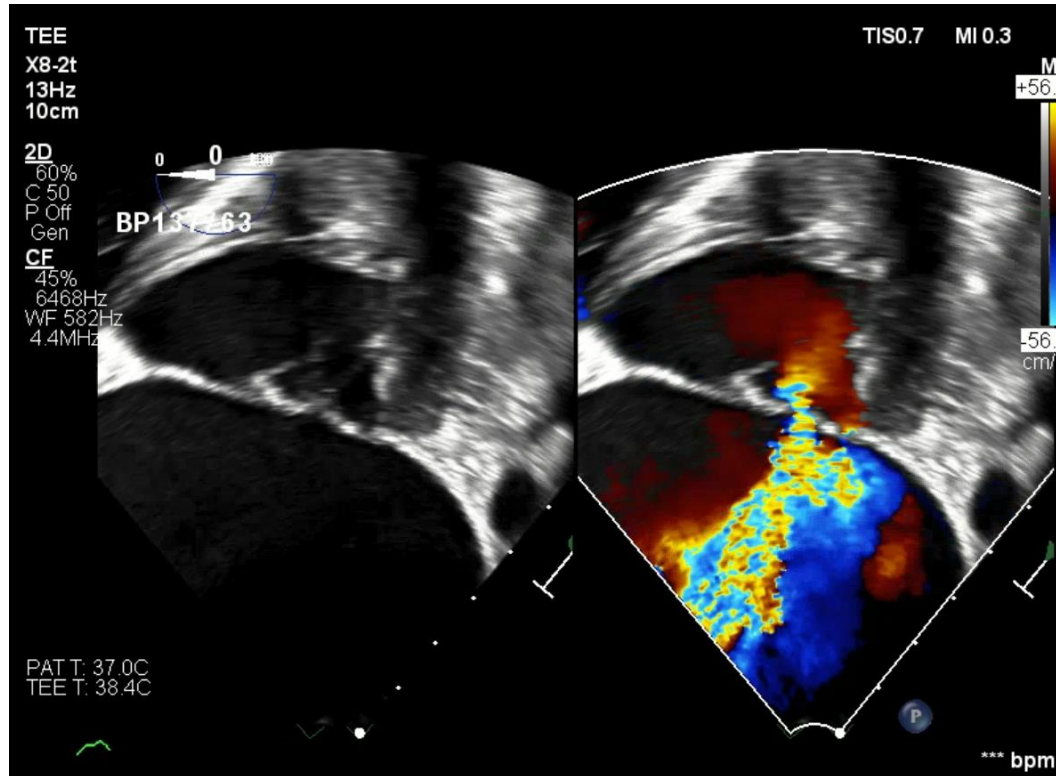
1. Reduction of MR

- Additional TEER
- Vascular occlurer
- Surgical repair

2. Removal of embolized clip

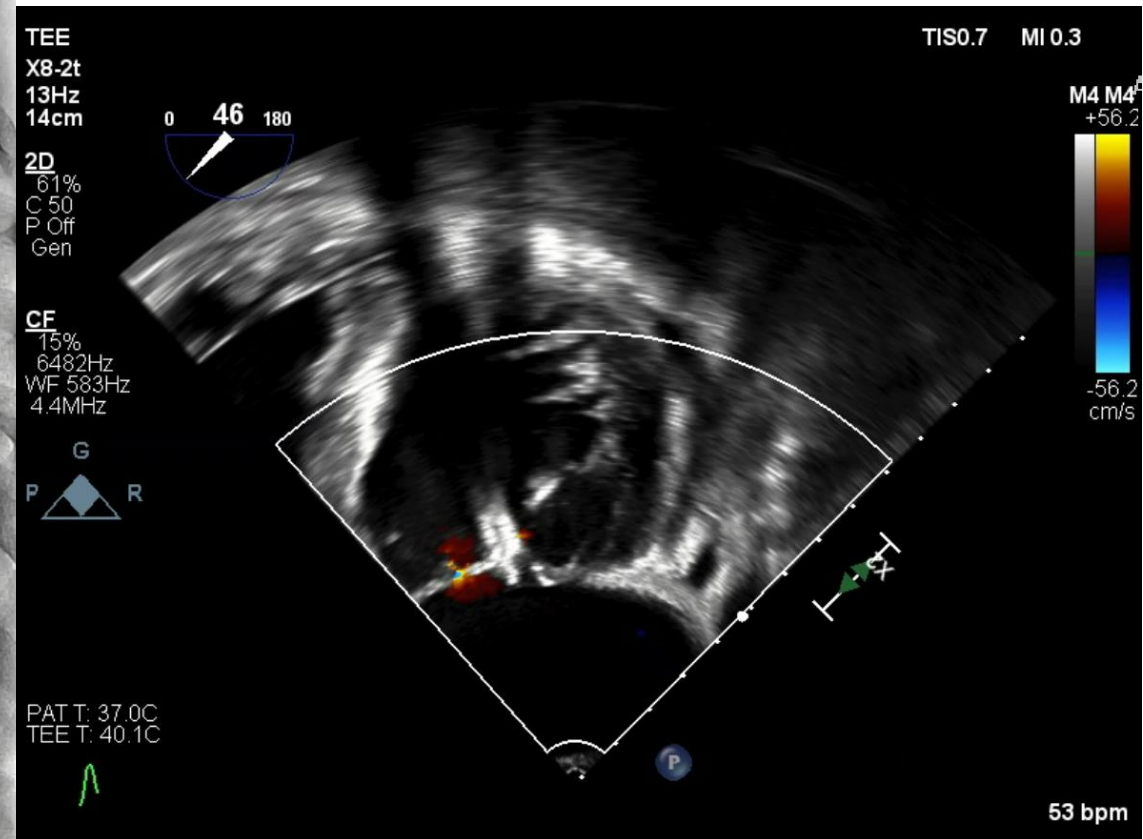
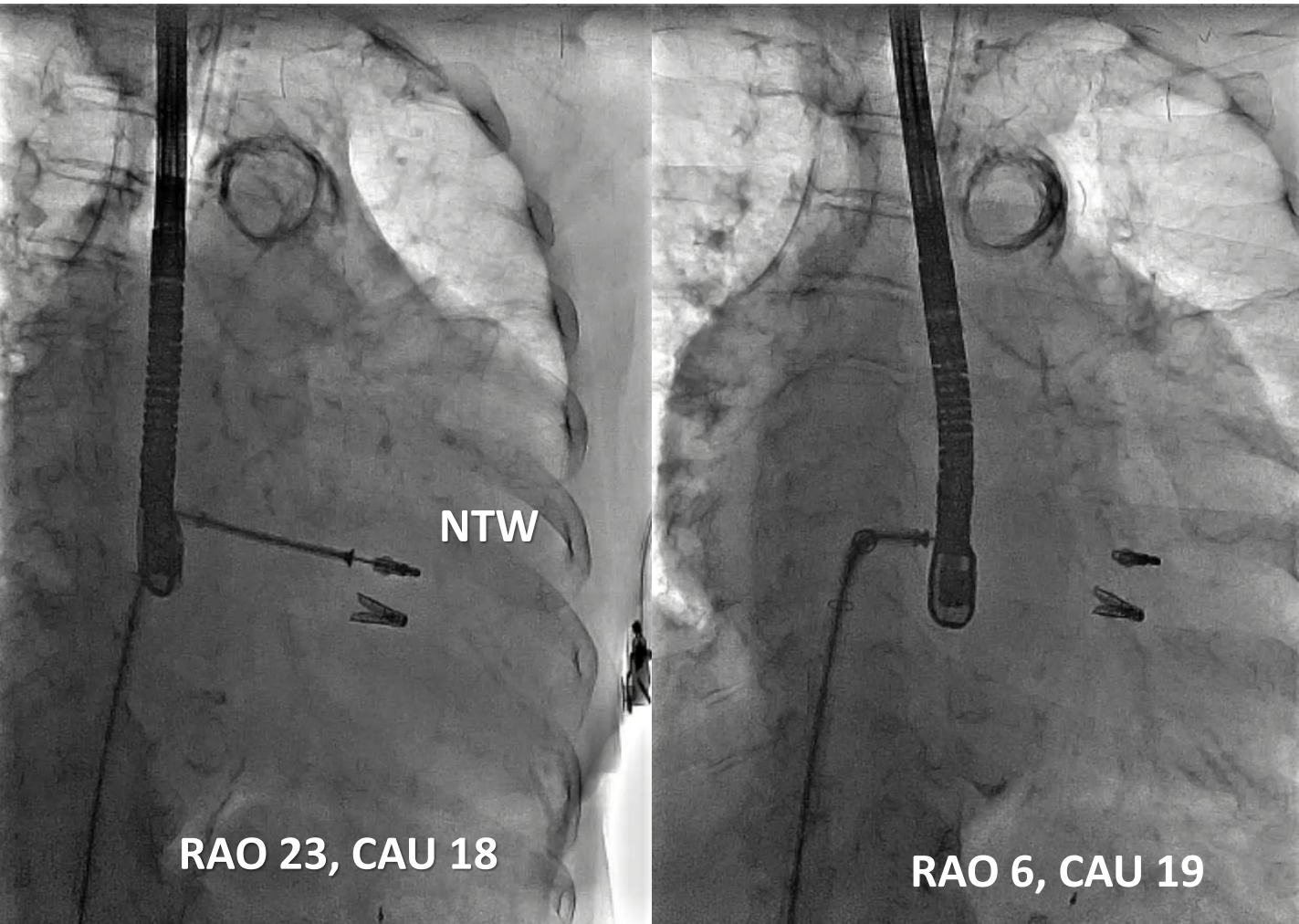
- Percutaneous removal
- Surgical removal

TEE was performed to check the possibility of re-do TEER (POD #33)



Increased MR (GIII-IV/IV)

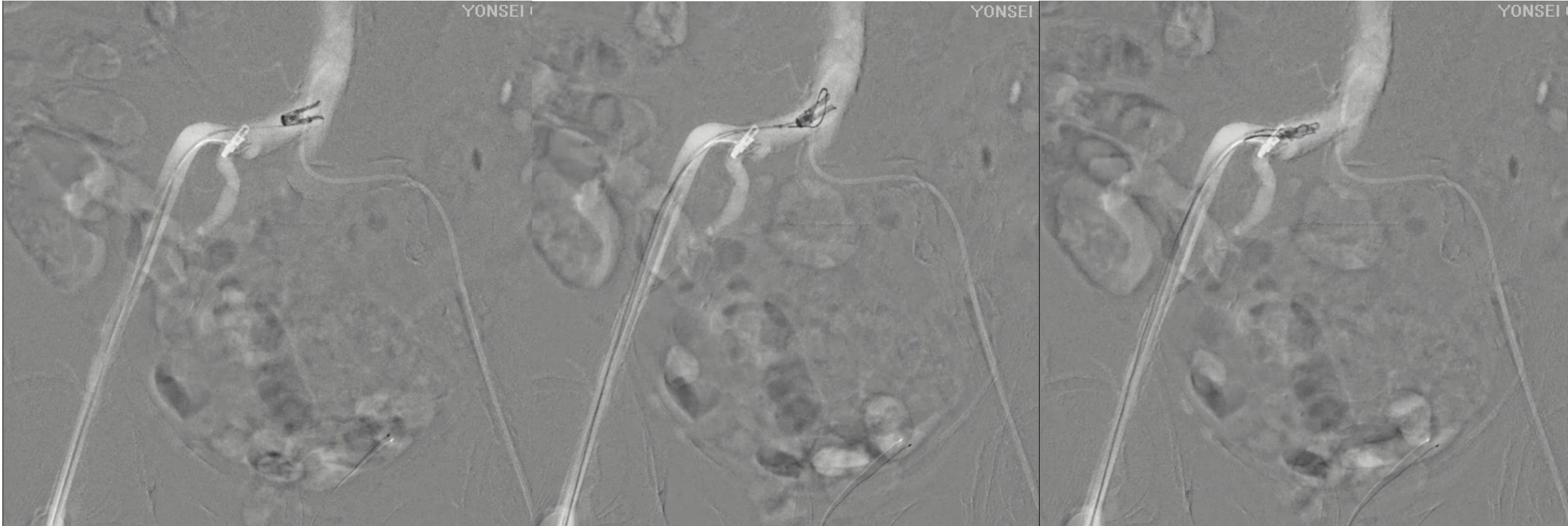
Re-do MitraClip & Retrieval of embolized clip (POD #34)



After successful re-do Mitraclip procedure, markedly decreased MR was noted.

Re-do MitraClip & Retrieval of embolized clip (POD #34)

Preclosed technique with 16 F Check-Flo® Introducer sheath



Gooseneck Snare with 10mm

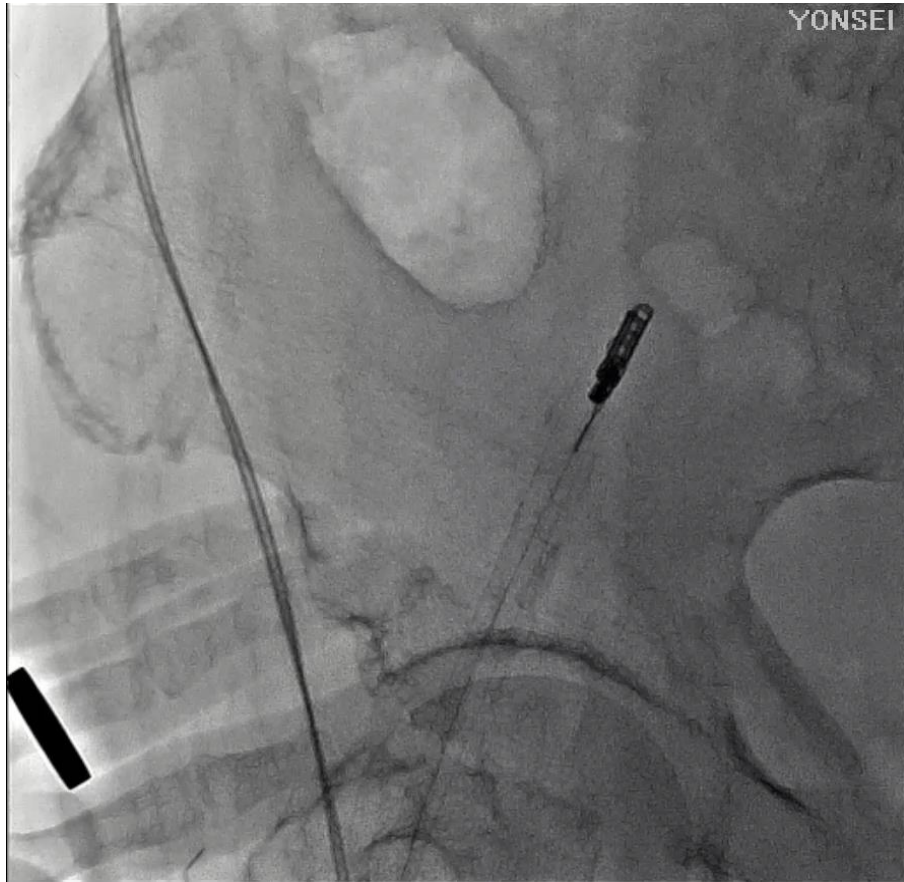
Failure to descend at bifurcation site

By putting another snare (15mm) in the first snare (10mm), angle adjustment was made easier and it passed the bifurcation site.

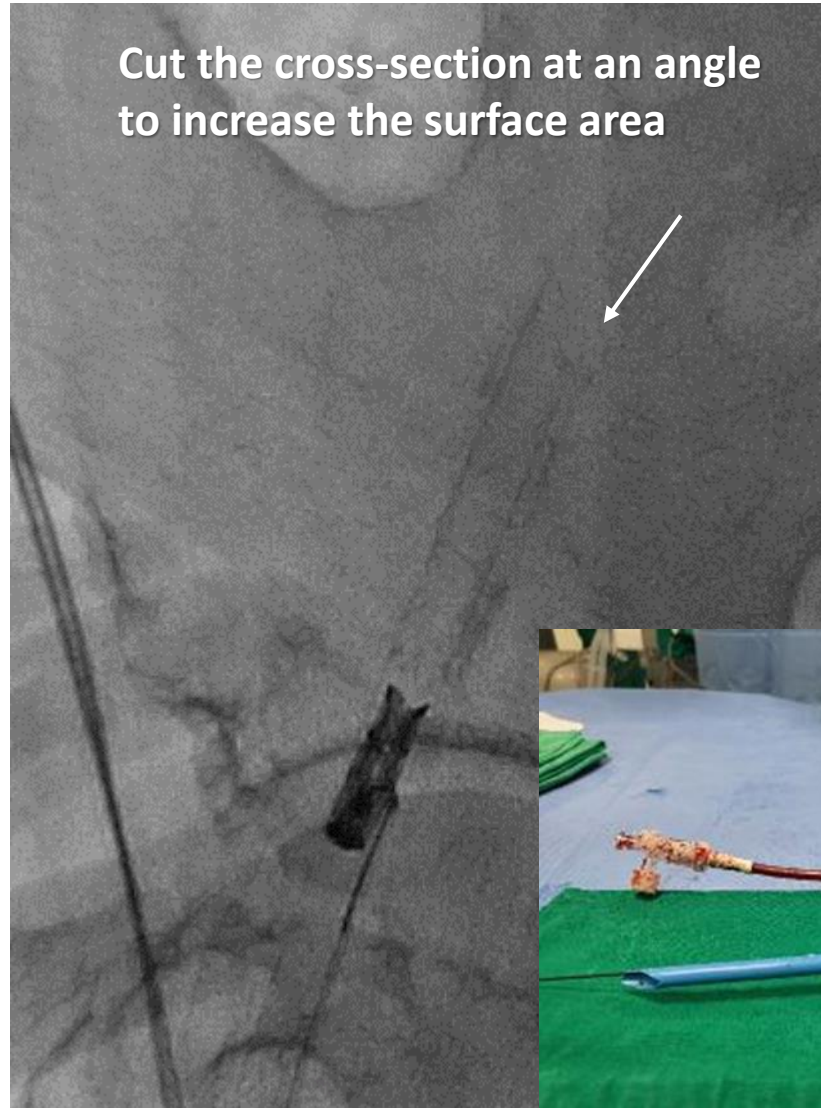
Re-do MitraClip & Retrieval of embolized clip (POD #34)



Snare with Mitraclip could not enter into the 16Fr sheath.



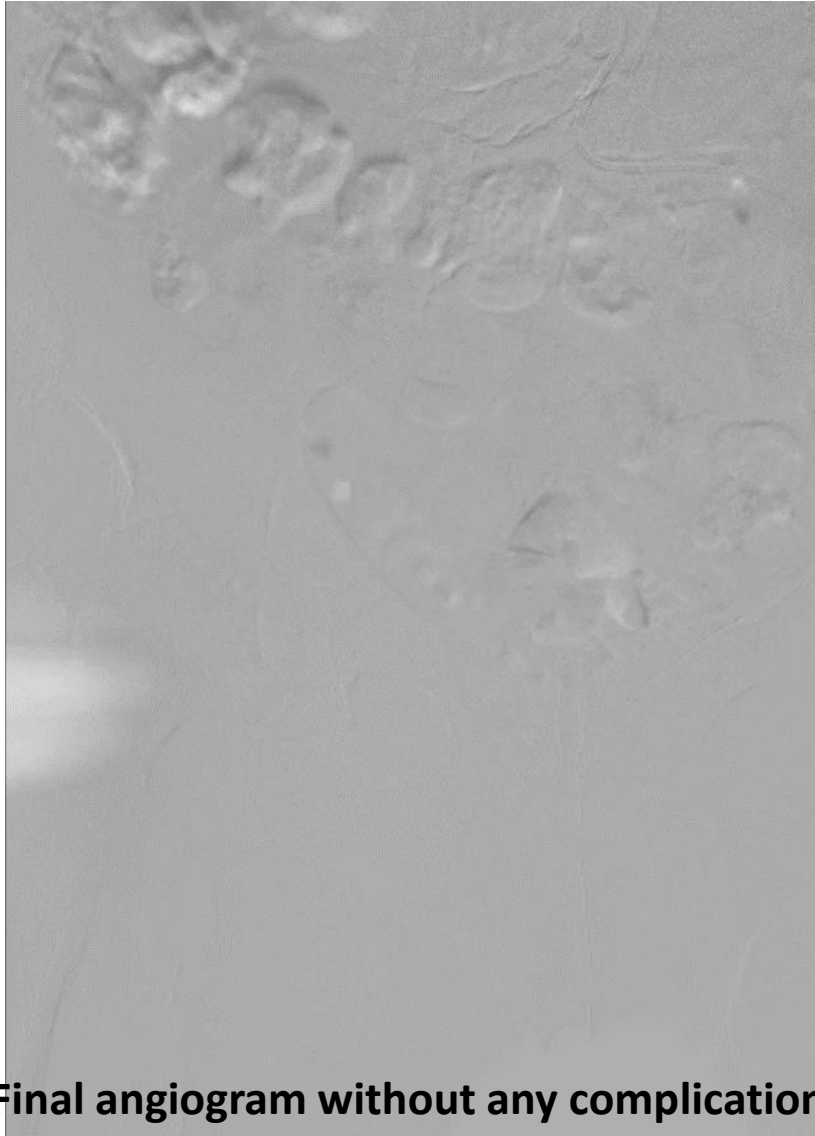
Successful retrieval of embolized mitral clip



1. **Preclose with perclose device**
2. **At least 16 Fr sheath**
3. **Beveled distal part of sheath**
4. **Sheath removal after introducing the mitral clip into the distal part of sheath**



Re-do MitraClip & Retrieval of embolized clip (POD #34)



Final angiogram without any complication

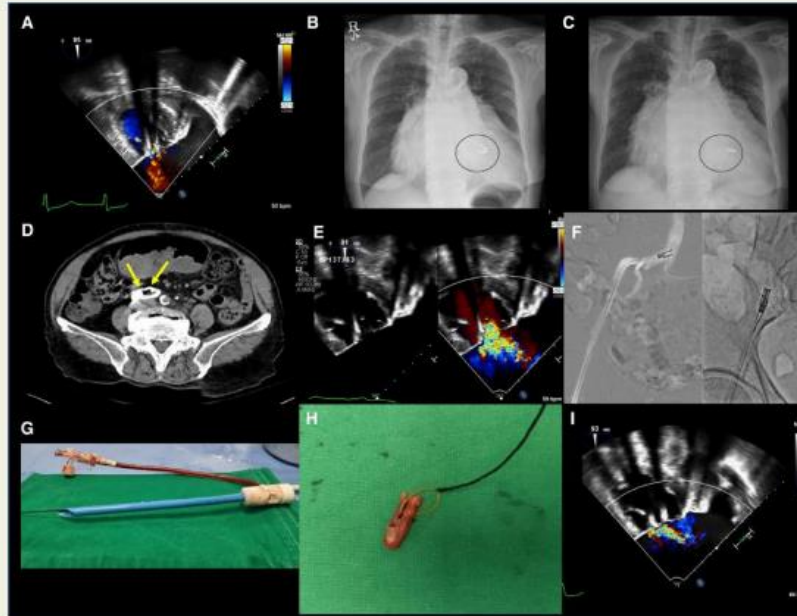
MitraClip single-leaflet detachment and consequent migration in atrial functional mitral regurgitation

Jooyeon Lee ¹, Jung Sun Kim ¹, and Chi Young Shim ^{1*}

¹Division of Cardiology, Severance Cardiovascular Hospital, Yonsei University College of Medicine, Yonsei-ro 50-1, Seodaemun-gu, 03722 Seoul, Republic of Korea

*Corresponding author. Tel: 82-2-2228-8453, Fax: 82-2-2227-7732, E-mail: cysprs@yuhs.ac

An 84-year-old woman with symptomatic severe functional mitral regurgitation (MR) due to long standing atrial fibrillation underwent percutaneous edge-to-edge repair using the MitraClip system (Abbott Vascular, Santa Clara, CA, USA) (see [Supplementary data online, Video S1](#)). Following deployment of an XTR clip in the A2-P2 segment, a second MitraClip XT device was deployed laterally to prevent recurrence of MR caused by stretching of left atrium and mitral leaflets. However, single leaflet detachment of the anterior leaflet occurred immediately (*Panel A, Supplementary data online, Video S2*). Since only mild MR was observed after the procedure, additional clipping was not performed, and her symptoms were relieved. However, at 2 weeks after discharge, she presented with right inguinal pain and aggravated dyspnea. The lateral clip was not observed on chest x-ray (*Panels B and C*). Computed tomography revealed the migrated MitraClip at the right common iliac artery bifurcation (*yellow arrows in Panel D*). Transesophageal echocardiogram showed recurrence of severe MR with newly developed small chordae rupture (*Panel E, Supplementary data online, Video S3*). The embolized MitraClip was successfully retrieved using 10- and 15-mm Amplatz GooseNeck® snares (Ev3, Plymouth, MN, USA) through a 16-French Check-Flo® Introducer sheath (Cook Medical, Bloomington, IN, USA) (*Panels F, G, and H, Supplementary data online, Video S4*), and another NTW clip was deployed. Post-procedure transesophageal echocardiogram confirmed residual mild to moderate MR (*Panel I, Supplementary data online, Video S5*). Images from this case show the complications of MitraClip single leaflet detachment and distal migration, and how this problem was solved.



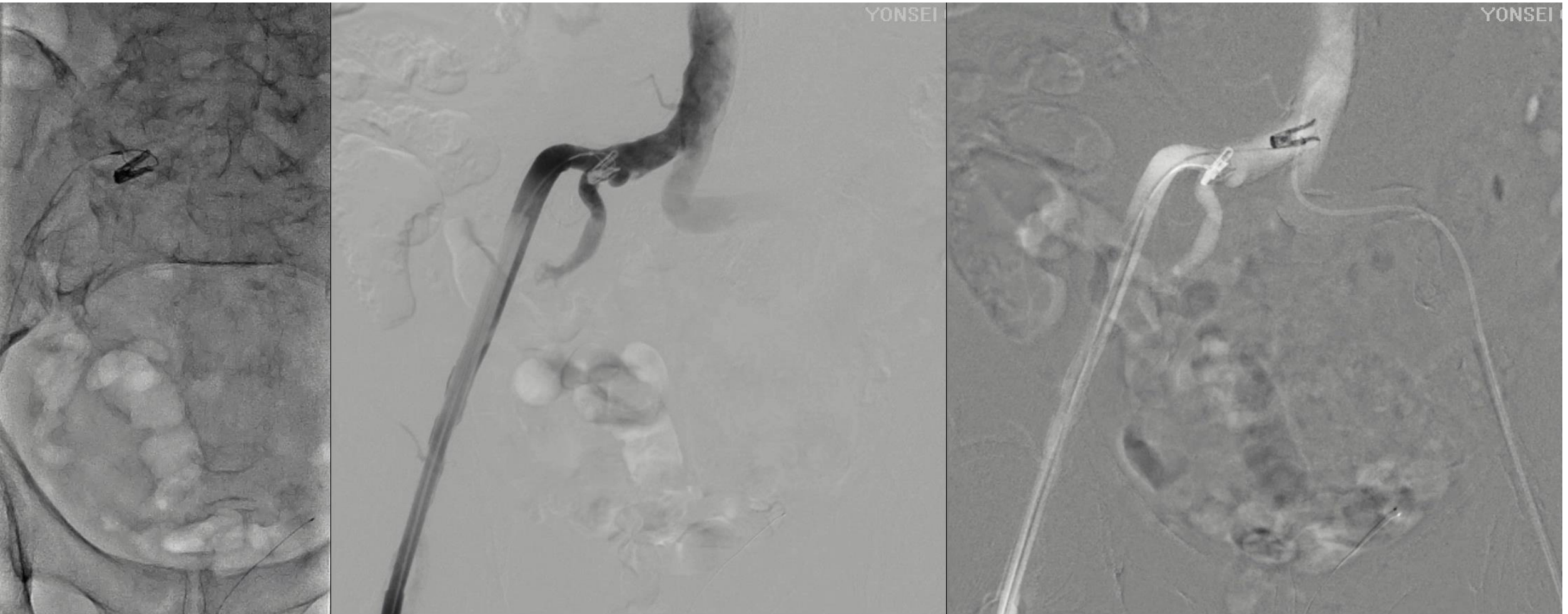
[Supplementary data](#) is available at *European Heart Journal* online.

All authors declare no conflict of interest for this contribution.

No data were generated or analysed for or in support of this paper.

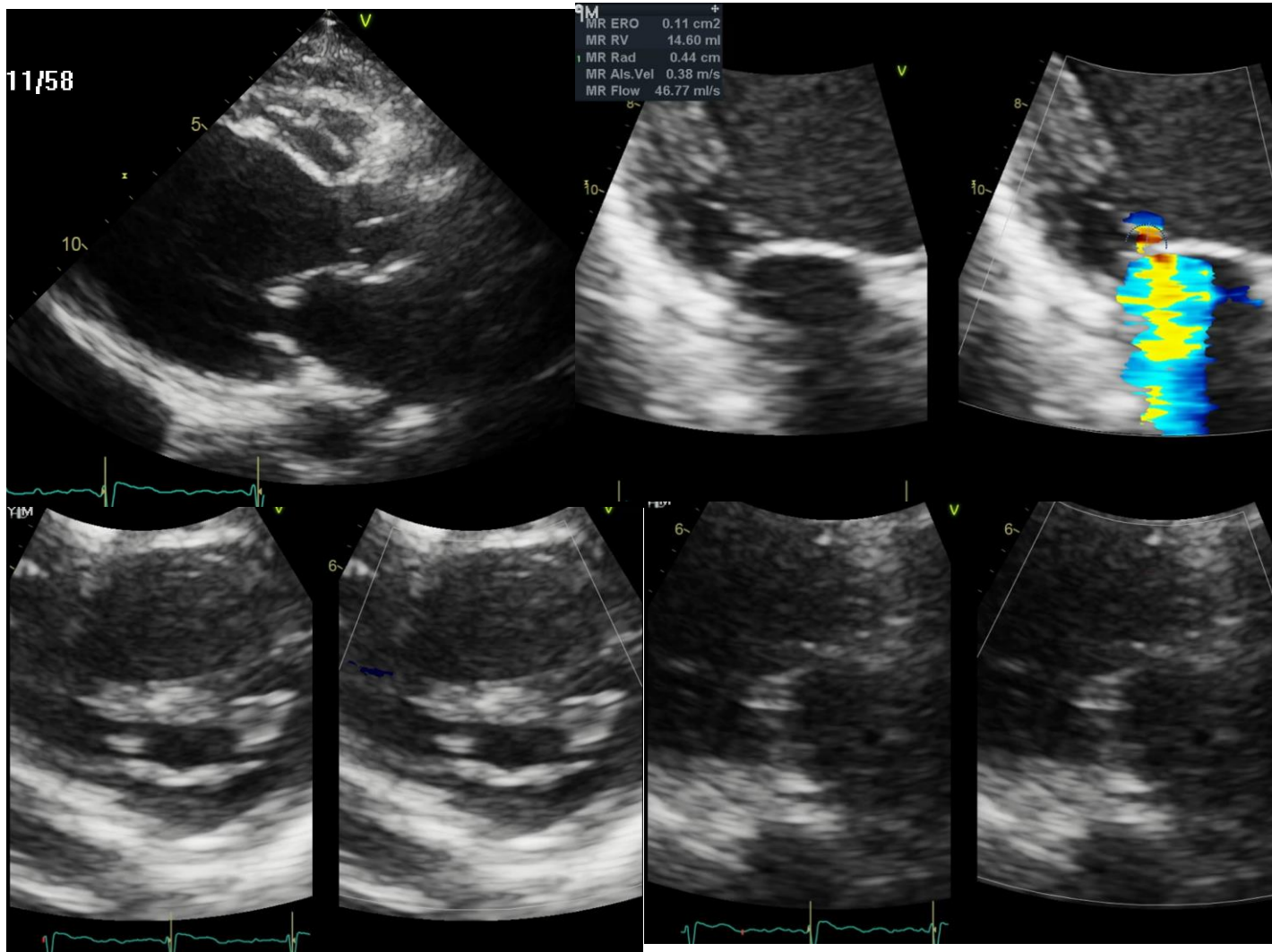
Images from this case show the complications of MitraClip single leaflet detachment and distal migration, and how this problem was solved.

Re-do MitraClip & Retrieval of embolized clip (POD #34)



Goose neck Snare 10mm

TTE 2 days later after volume reduction with CRRT



TTE

Decreased to mild MR with reduced coaptation gap

GIII-IV/IV → I/IV, ERO 11 mm², RV 15 cc by PISA method

LAVI 99 → 48 ml/m²

LVEDD/LVESD 73/64 → 68/62 mm

What is the cause of SLDA and Clip embolization ?

Continuous reduction in SLDA over years, which likely reflects the *implanter's learning curve* and *advances in the clip systems*: EVEREST I 11.0%, EVEREST II 5.1%, ACCESSEU 4.8%, TRAMI 2.0%, TVT 1.5%, Praz et al. 4.0%, Mitra EXPAND 1.9%, and "G4" 1.7%

The hypothesis of an increased risk for XTR to injure the leaflets due to the longer arms with a higher force on the leaflet per area.

Only two studies, the TCVT and TVT, describe clip embolization in 0.7% and 0.1% - *Right axillar artery, renal artery and apex of the LV.*

Success rate of re-intervention with TEER: Around 25 -50 %

Schnitzler K, et al. Curr Cardiol Rep 2021;23: 131

■ Laboratory study

WBC: 6300

Hgb: 8.9

Plt: 149k

BUN: 45.9

Cr: 1.53

eGFR: 31

AST/ALT 22/11

NT-proBNP: 732

■ Medications

- Aspirin 100mg qd
- Valsartan 80mg qd
- Torsemide 10mg qd
- Spirolactone 25mg qd
- Hydrochlorothiazide 12.5mg qd
- Diltiazem 180mg qd
- Warfarin 2.5mg qd
- Digoxin 0.125mg qd