

# **Case Presentation**

## **Acute Severe MR and Shock**

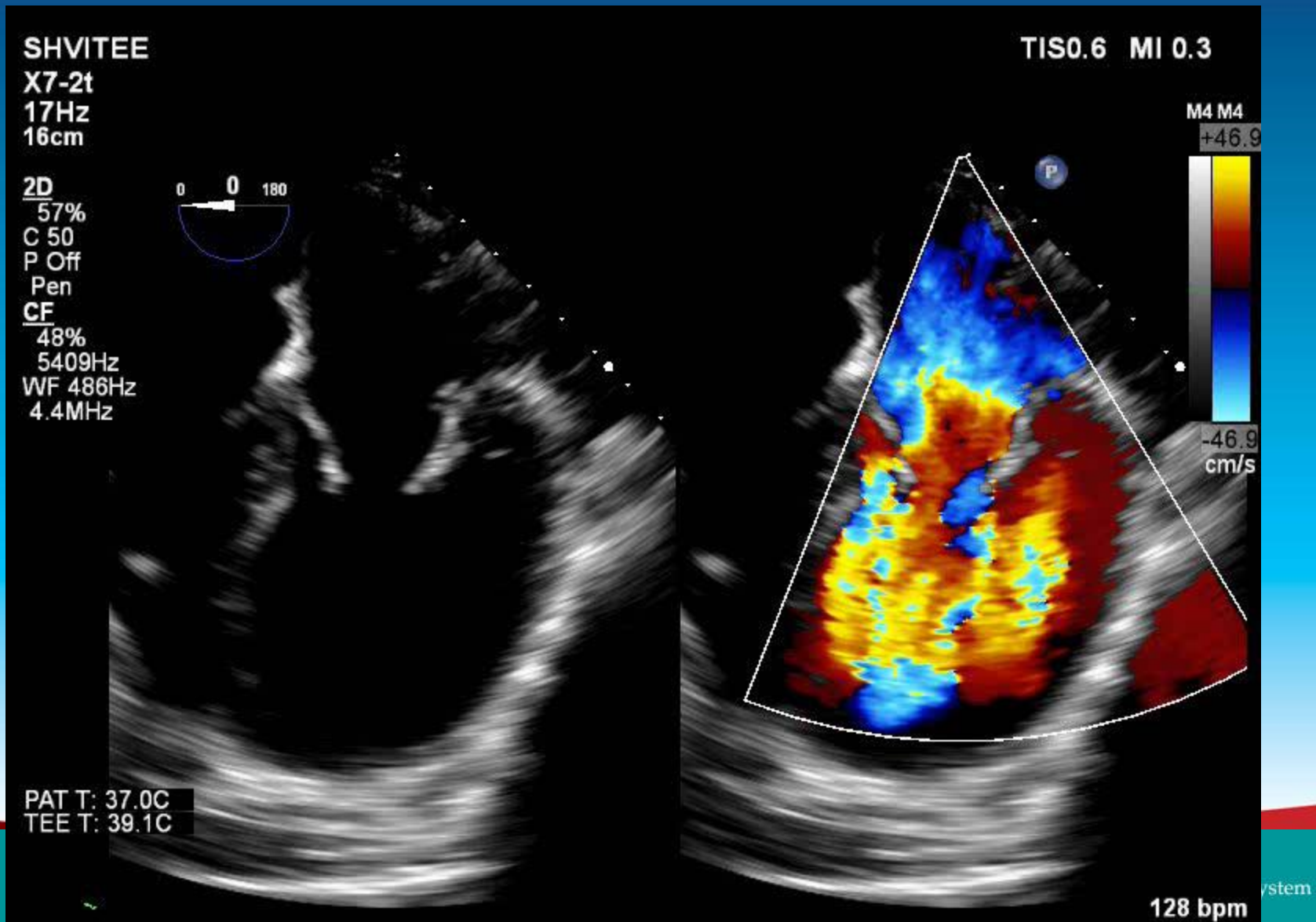
### **An Alternative Approach?**

**Michael J Rinaldi, MD**  
**Sanger Heart and Vascular Institute**  
**Carolinas HealthCare System**  
**Charlotte, NC**

# Case Example

- 45yo M with a month of progressive SOB and abdominal pain
- AF with RVR, elevated LFTs, INR 2, Cr 1.7
- TTE severe MR due to P2 flail with EF 35% and RV failure
- Cath CI 1.5, wedge 30 with V 45, PA systolic 64, coronaries patent
- IABP placed and transferred

# Sub-Acute MR with Shock

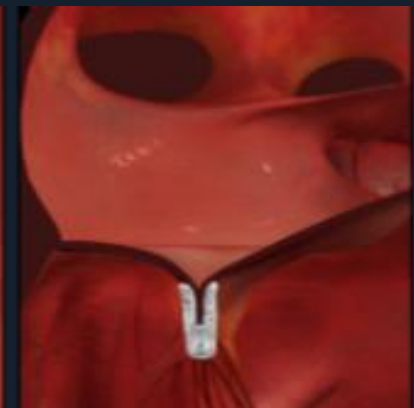


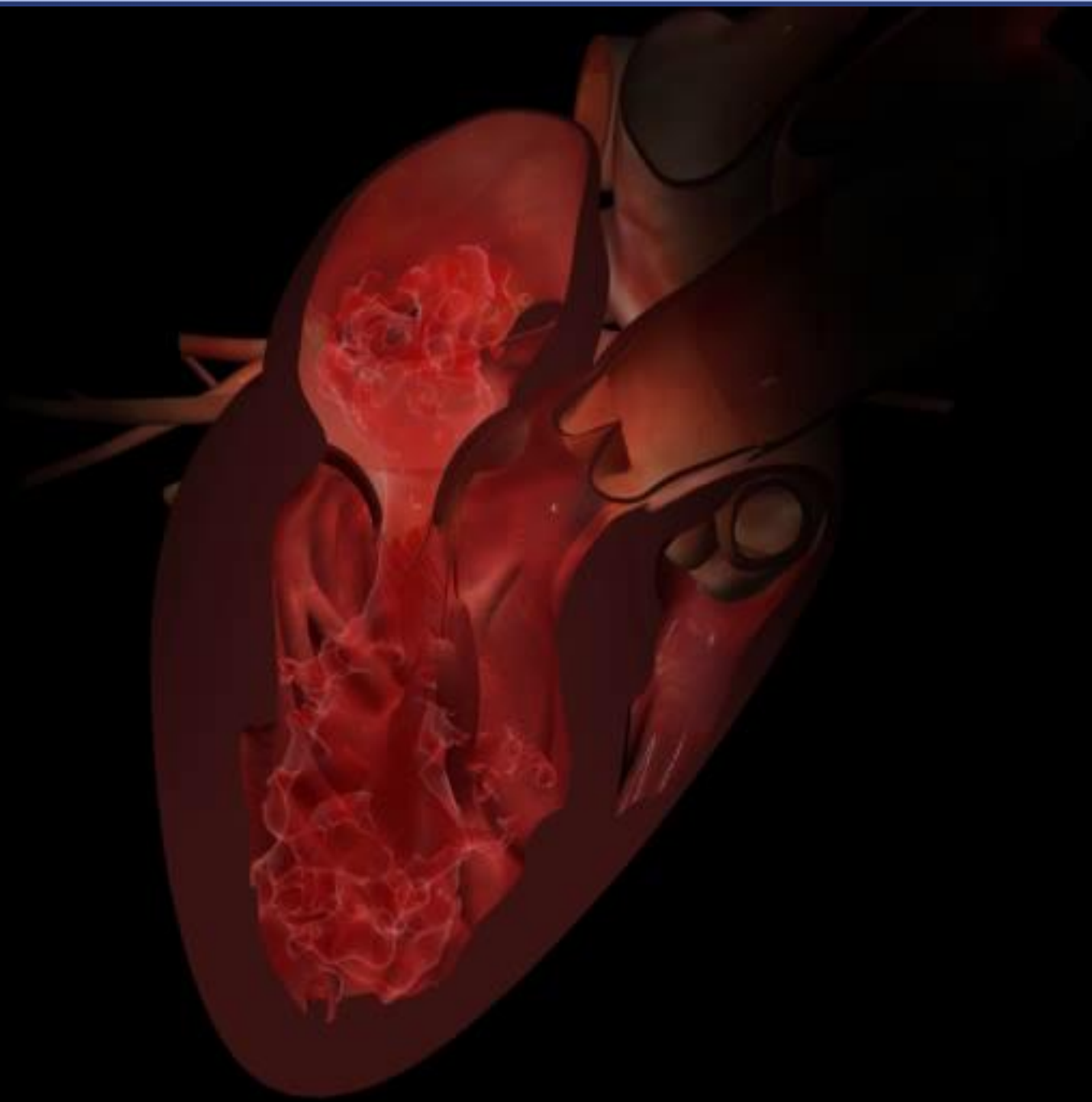
# Sub-Acute MR with Shock

- Given severe RV failure and multi-organ failure his operative mortality was felt to be too high for conventional surgery
- **What now?**

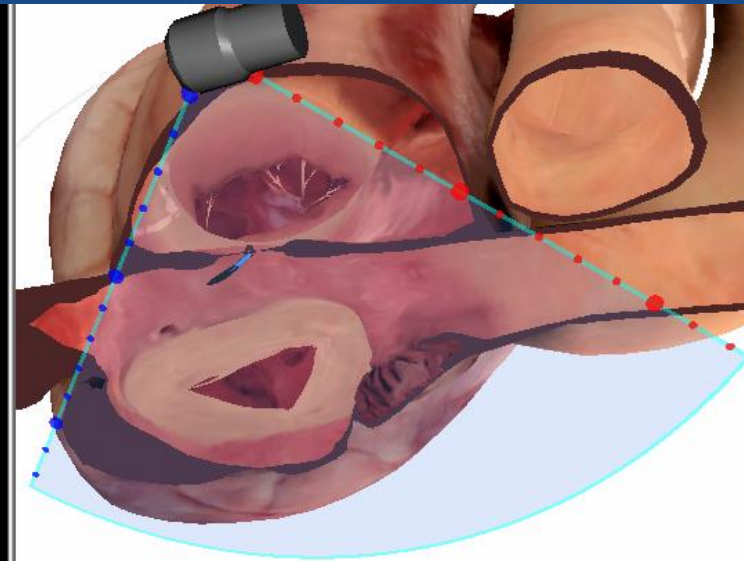
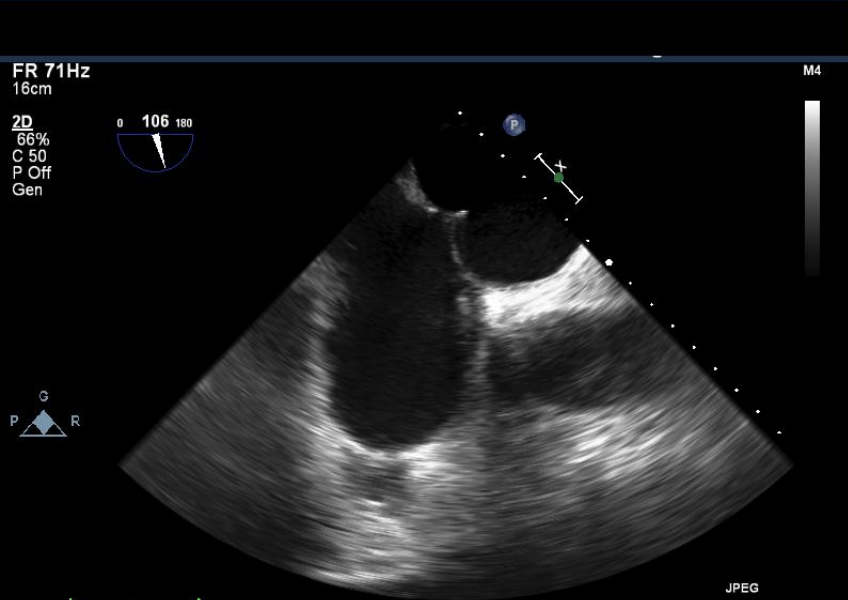
# MitraClip MV Repair

- The only FDA approved percutaneous therapy for MR in the US

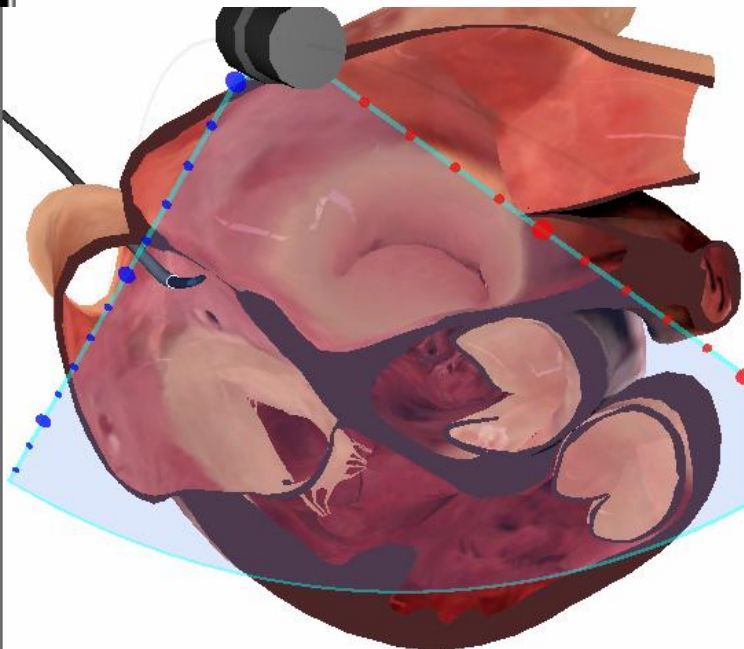
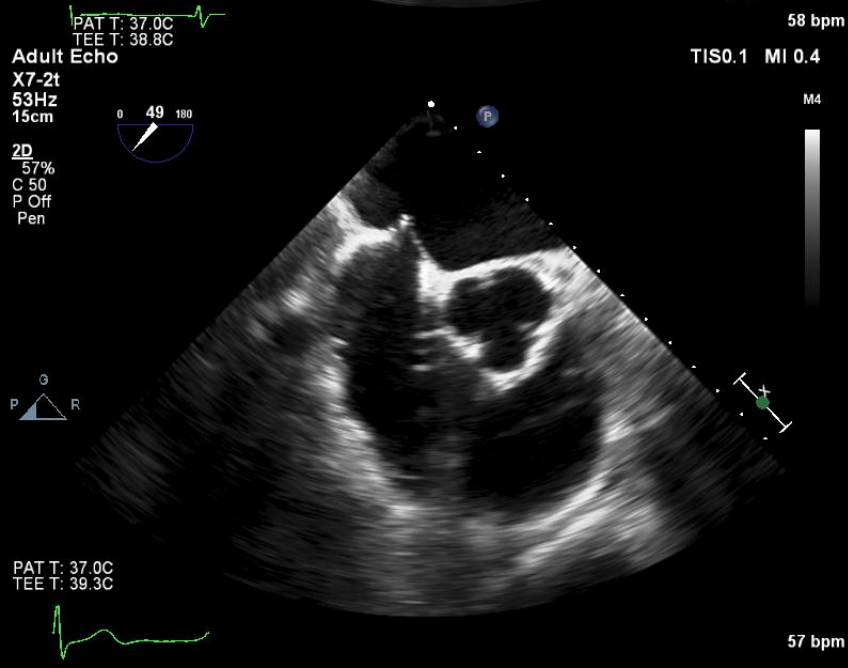




# Transseptal Puncture

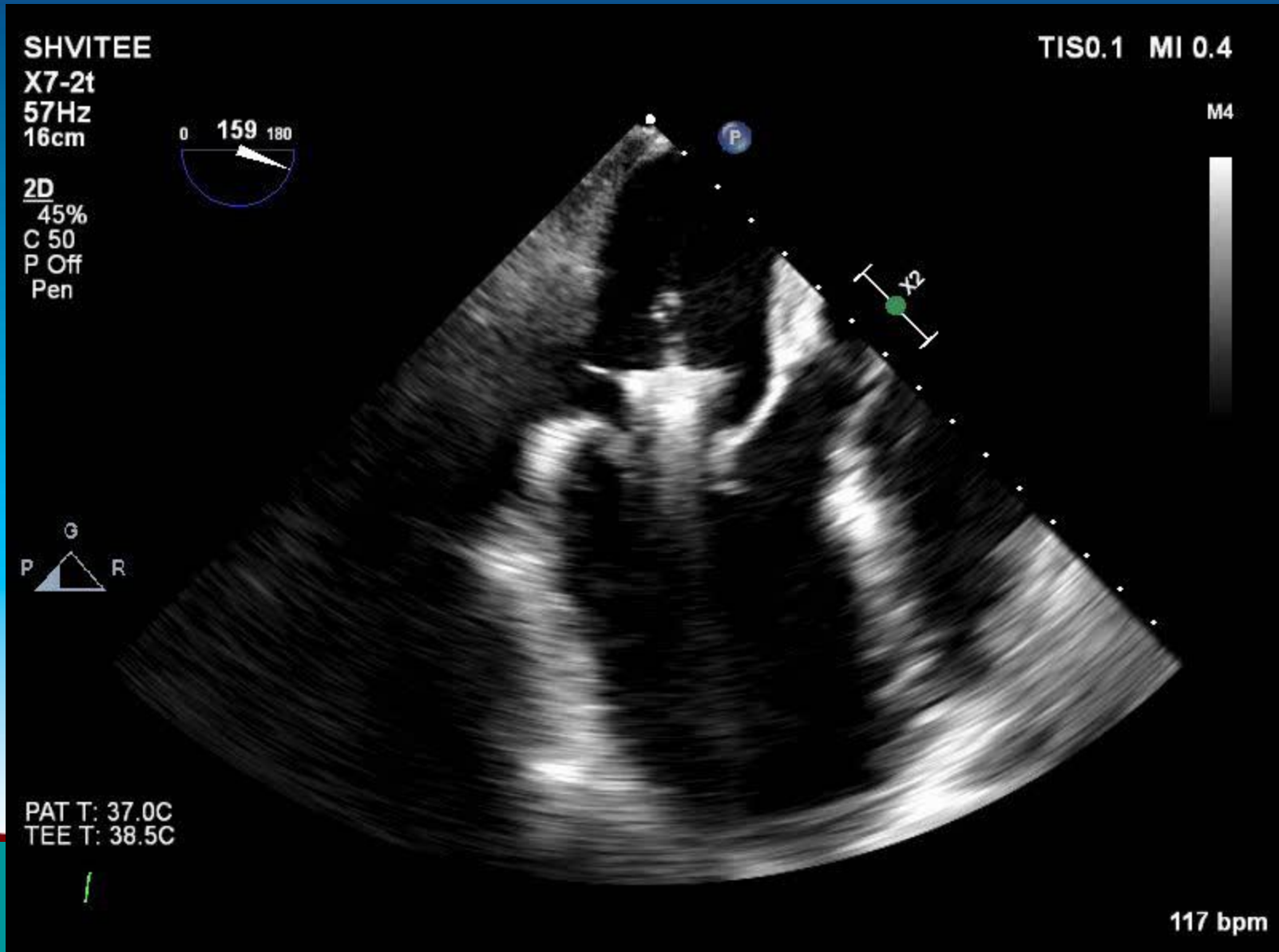


Bicaval  
View



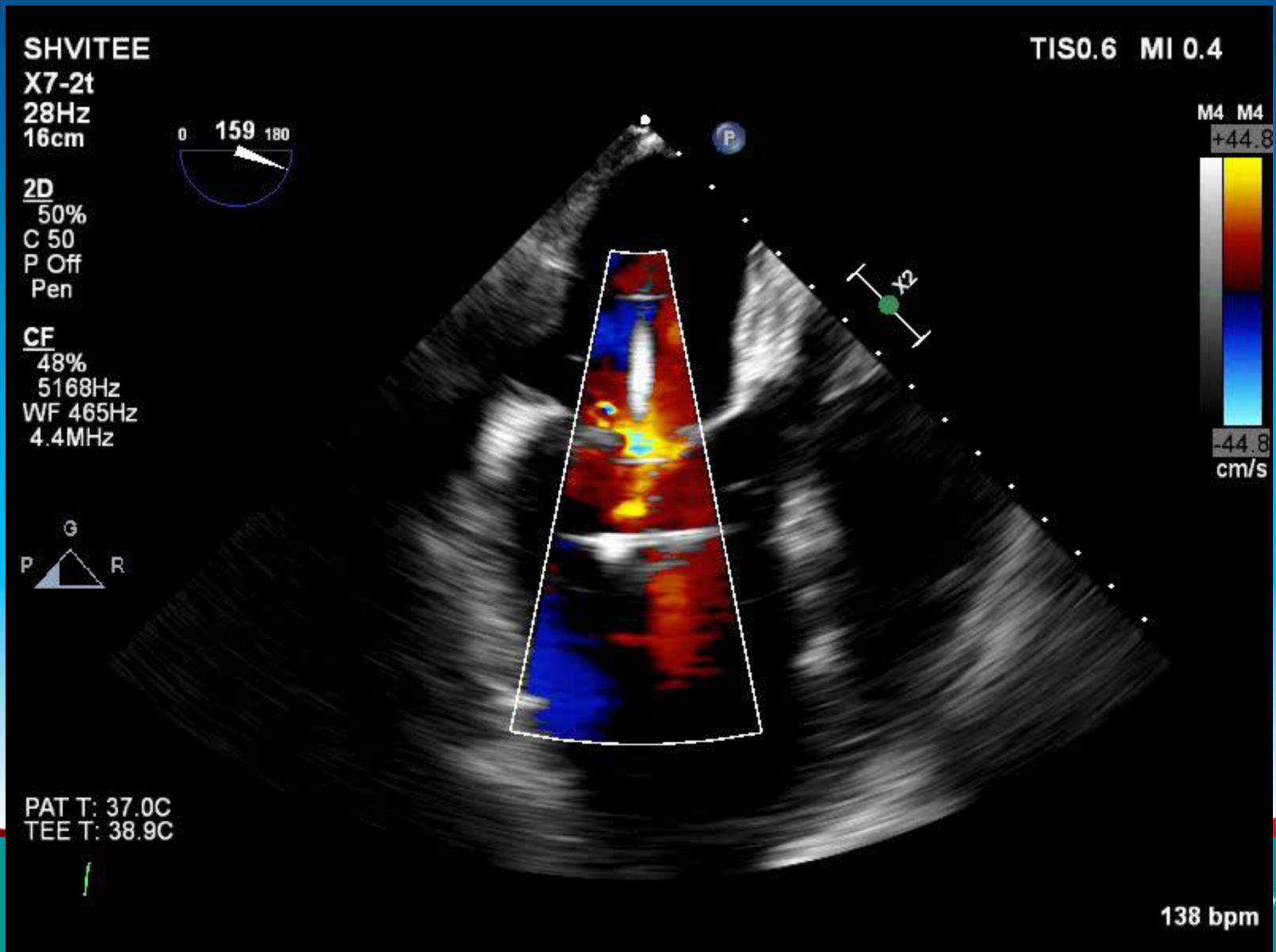
SAX

# Clip in LA – LVOT view

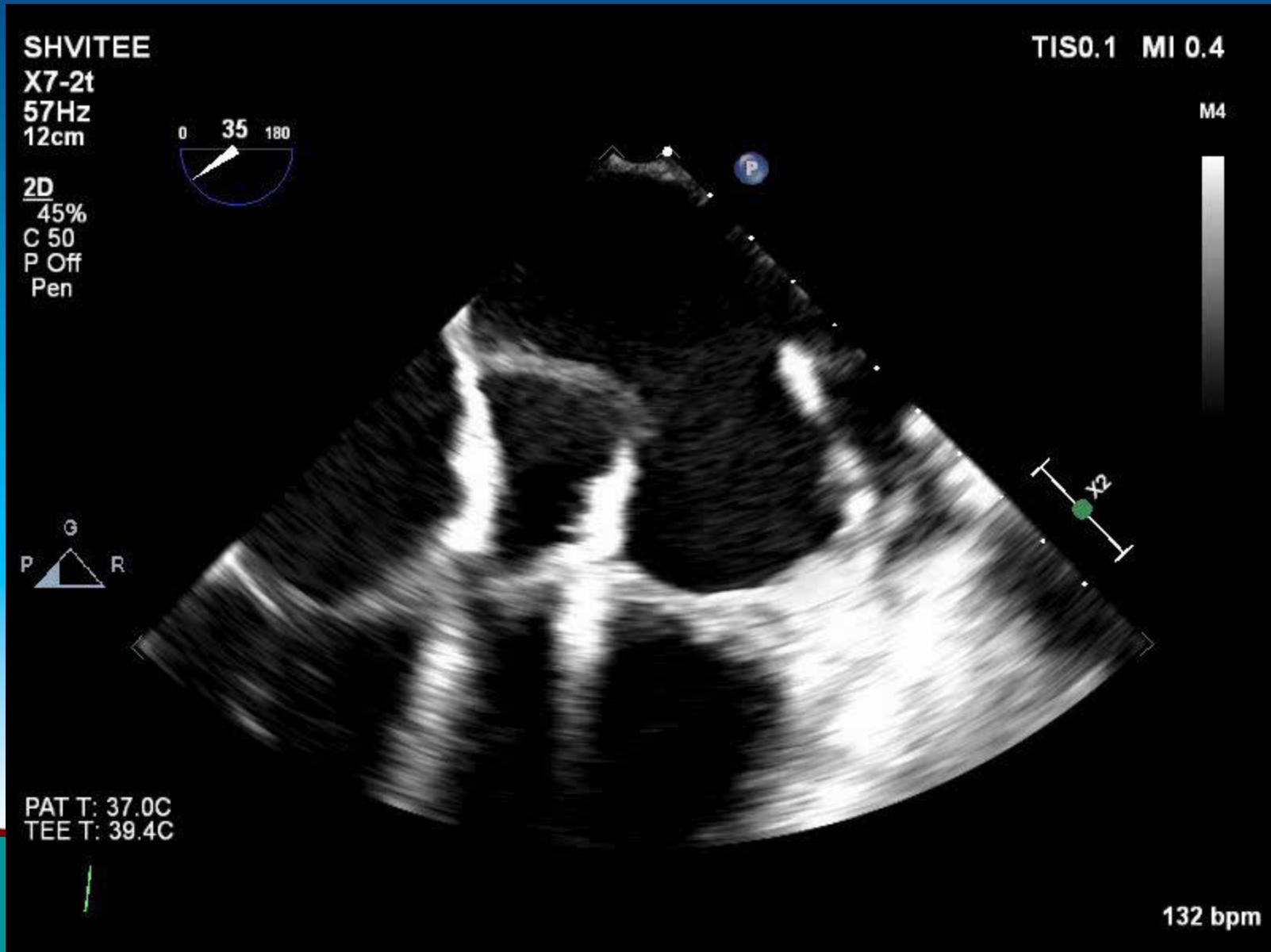




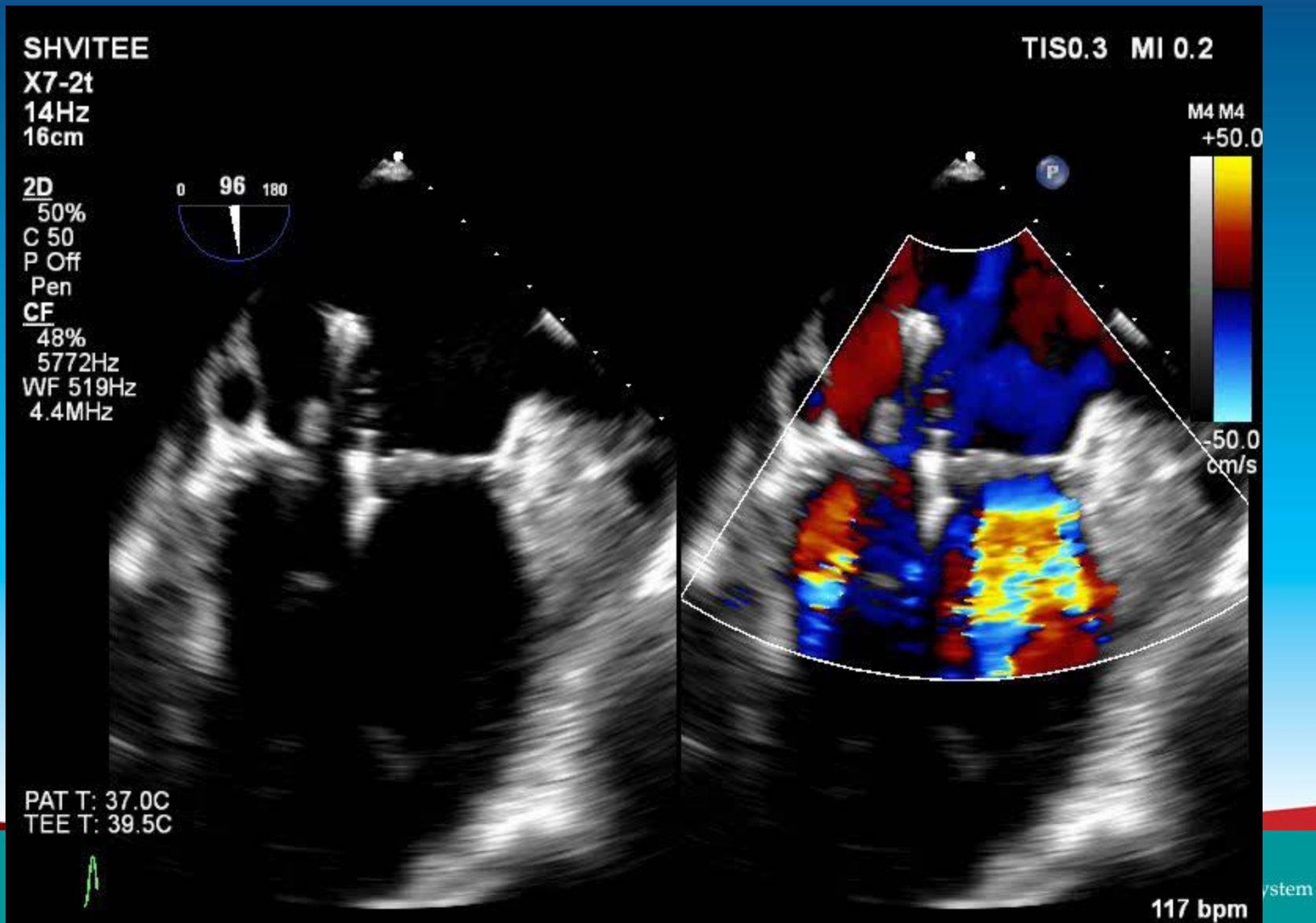
# Clip into LV – LVOT view



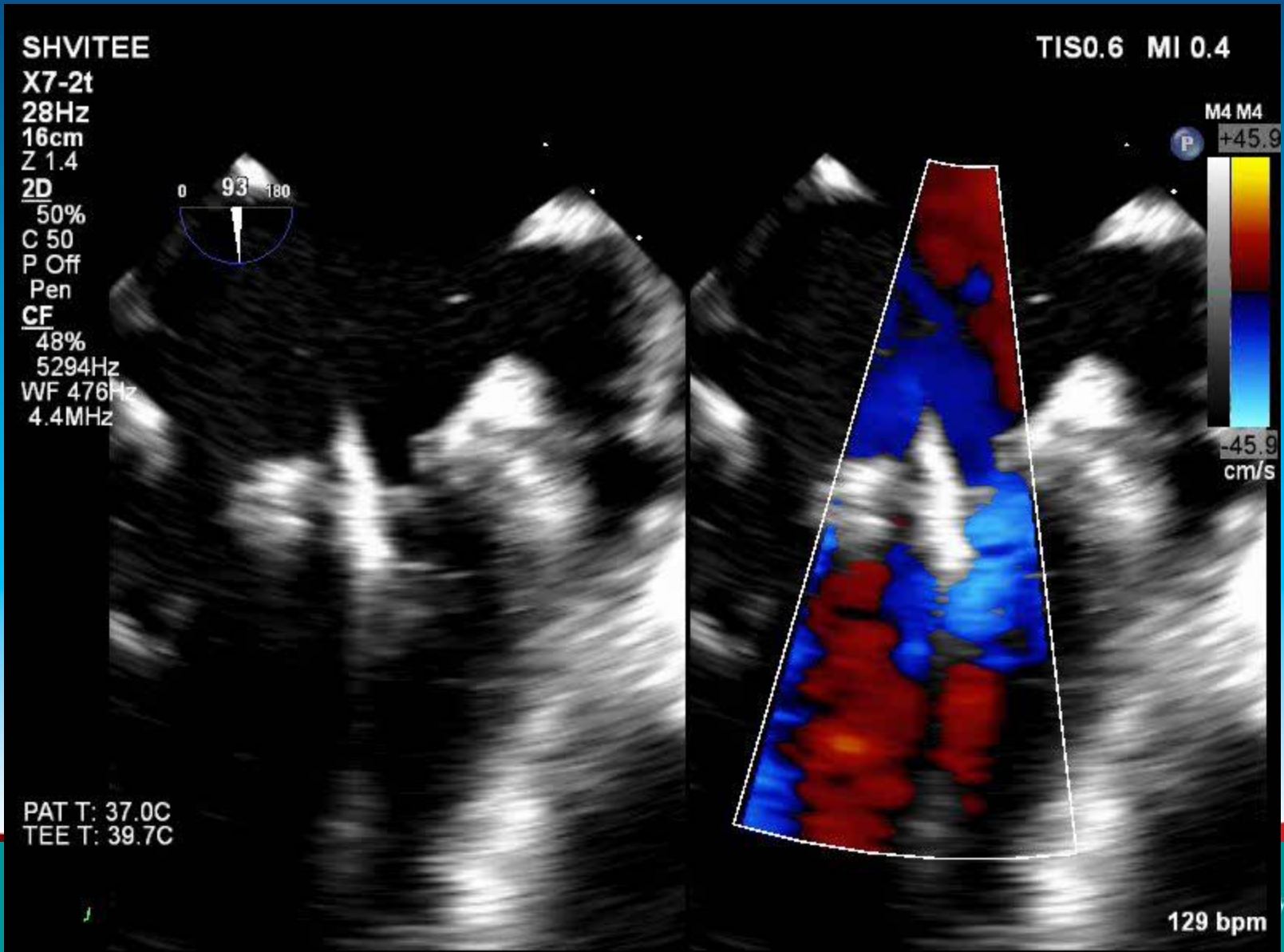
# Grasp Clip 1 – IC View



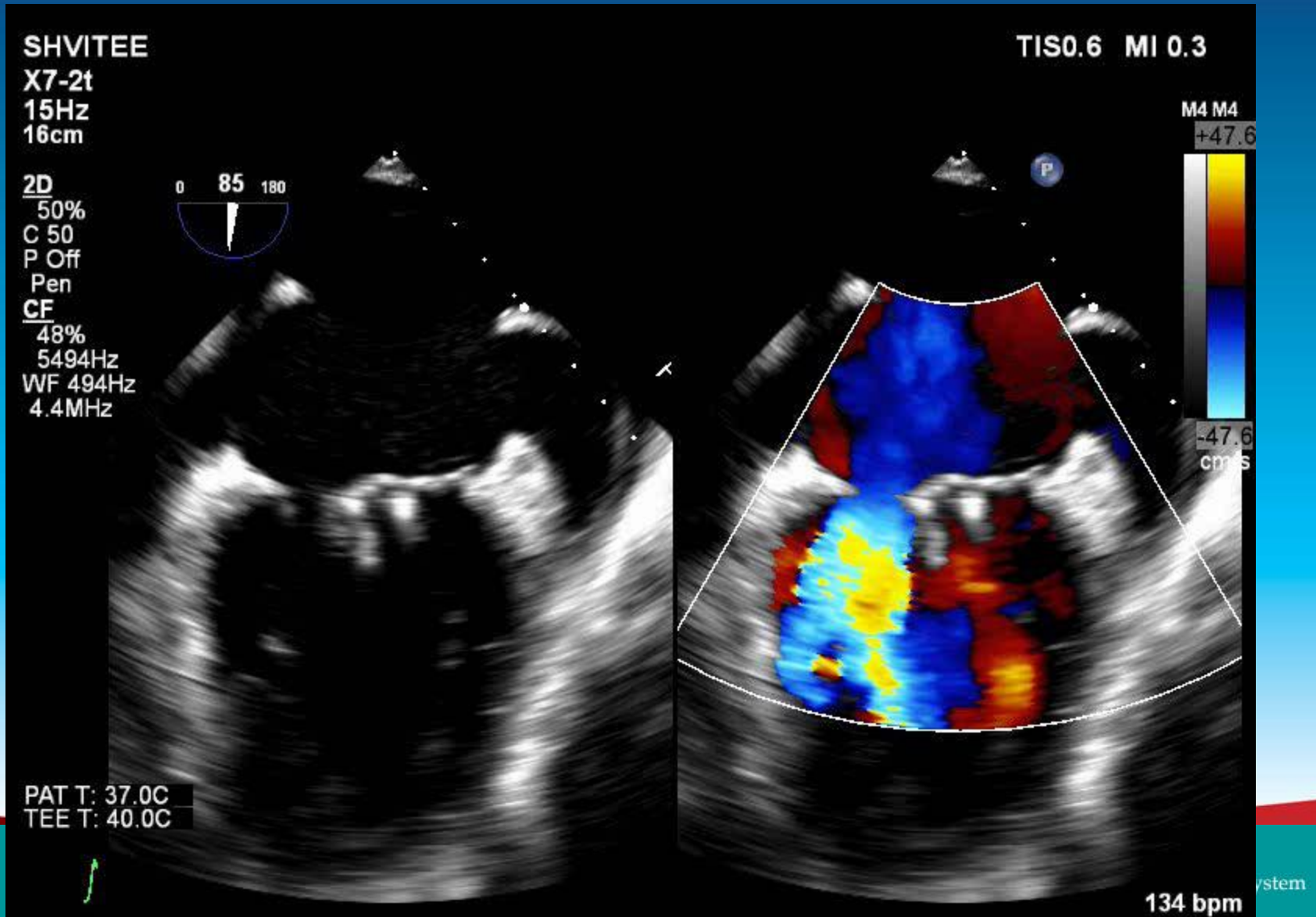
# Lateral Jet after Clip 1 – IC view



# Clip 2 lateral – IC view



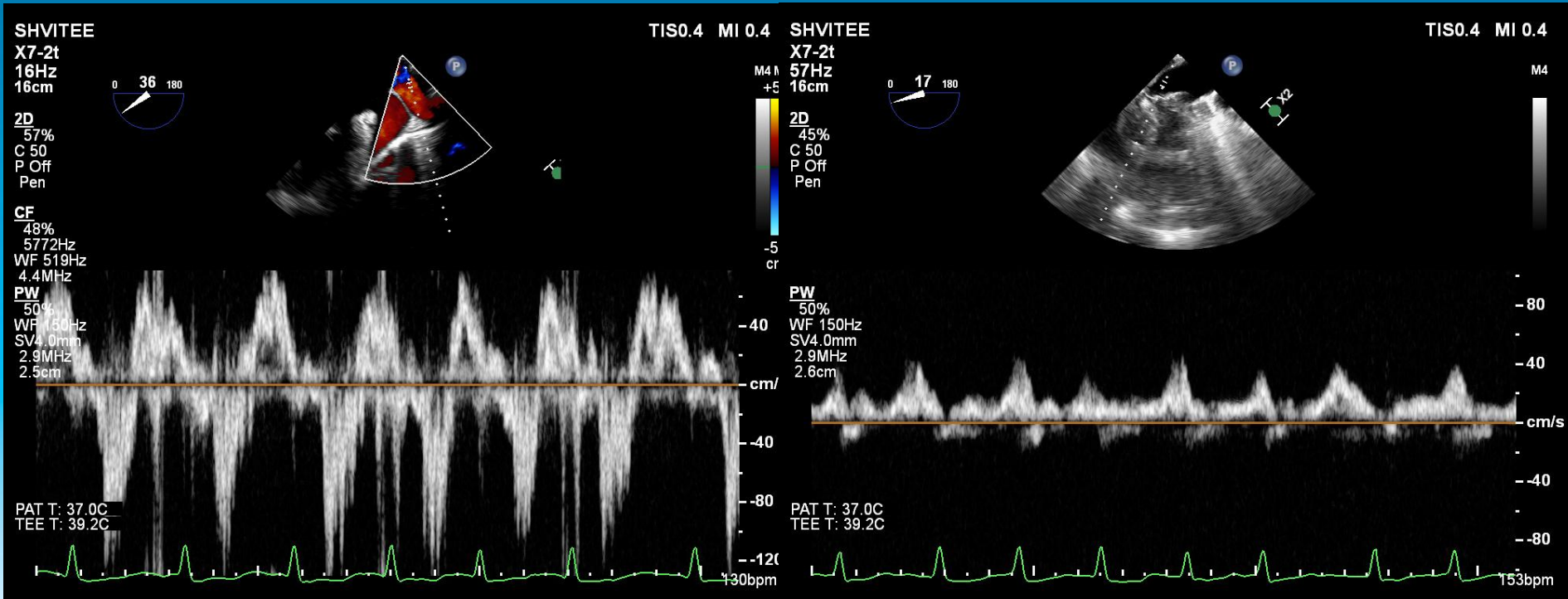
# Mild MR after 2 Clips – IC view



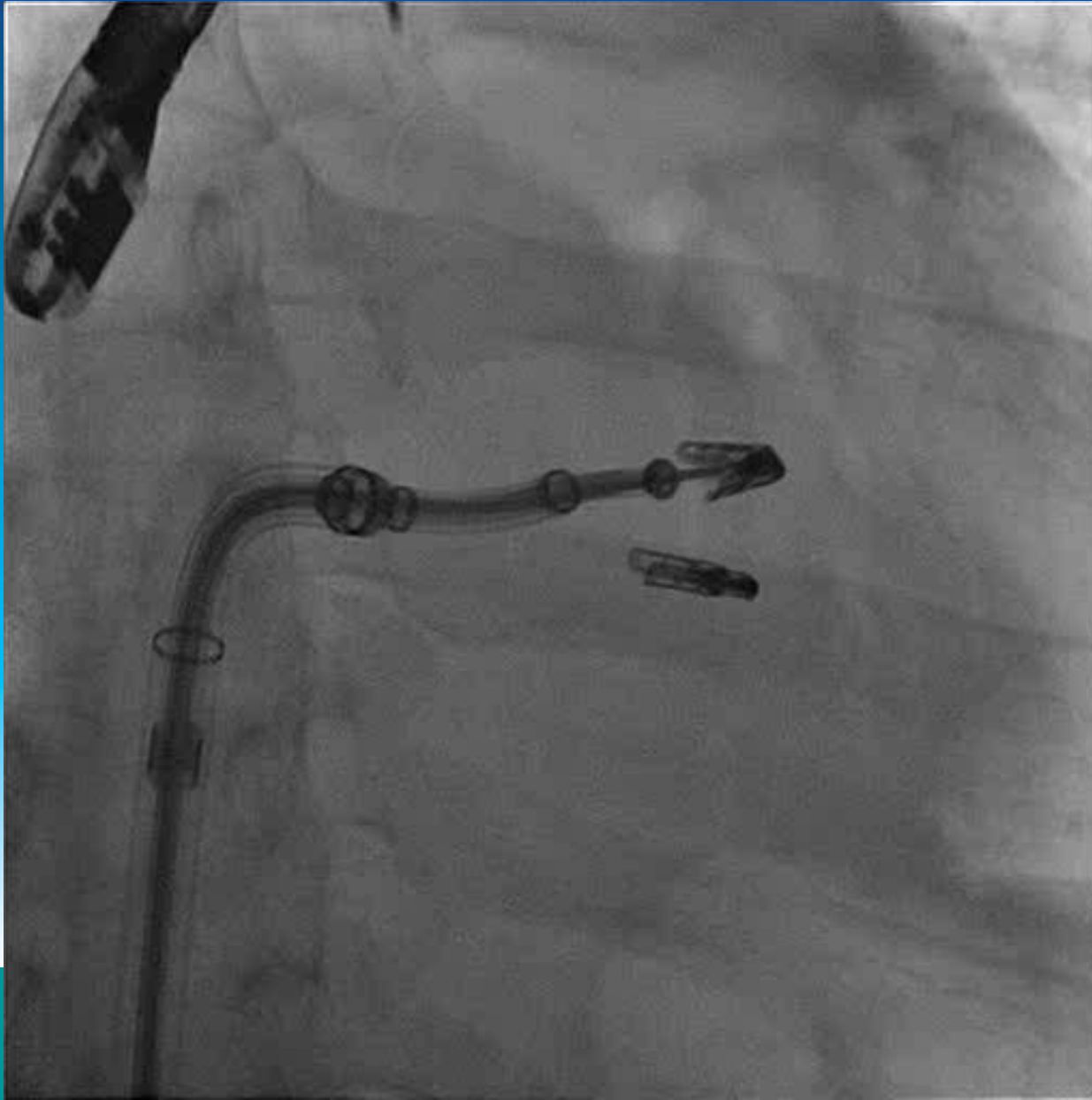
# PV flow reversal now eliminated

## Pre-Clip

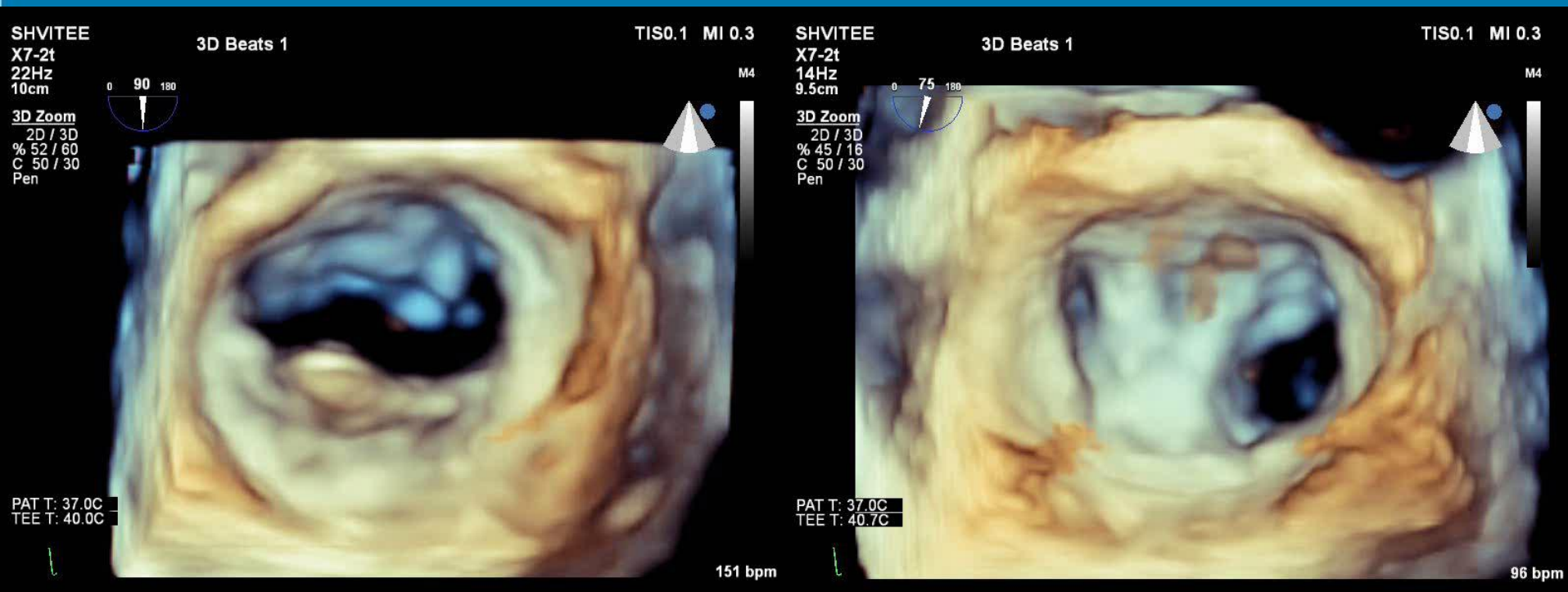
## Post-Clip 2



# Second Clip Release



# Pre and Post Clip – 3D TEE





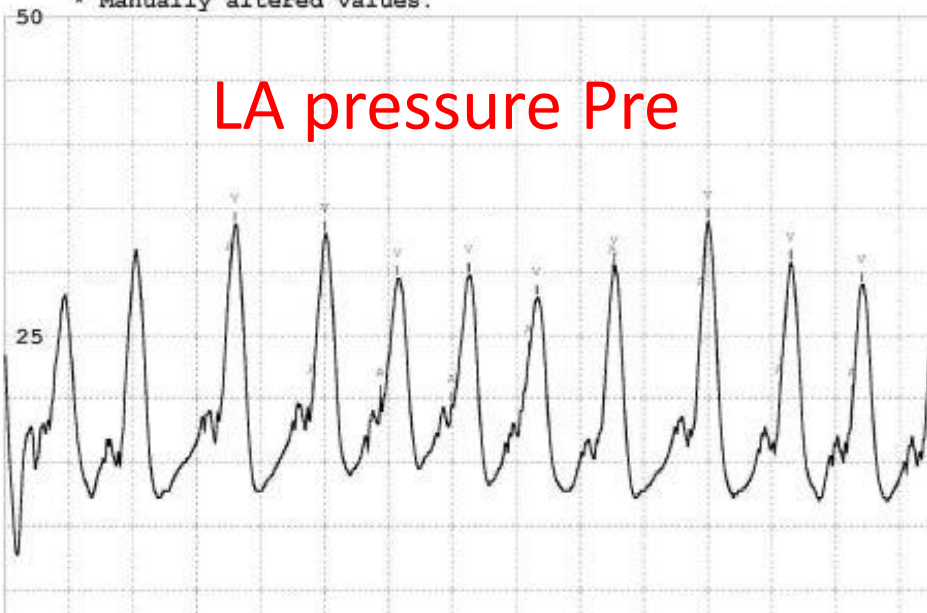
# Favorable Outcome

- CI increased from 1.7 to 2.9
- Eventually extubated and home

LA a/v/m  
23/31/19

\* Manually altered values.

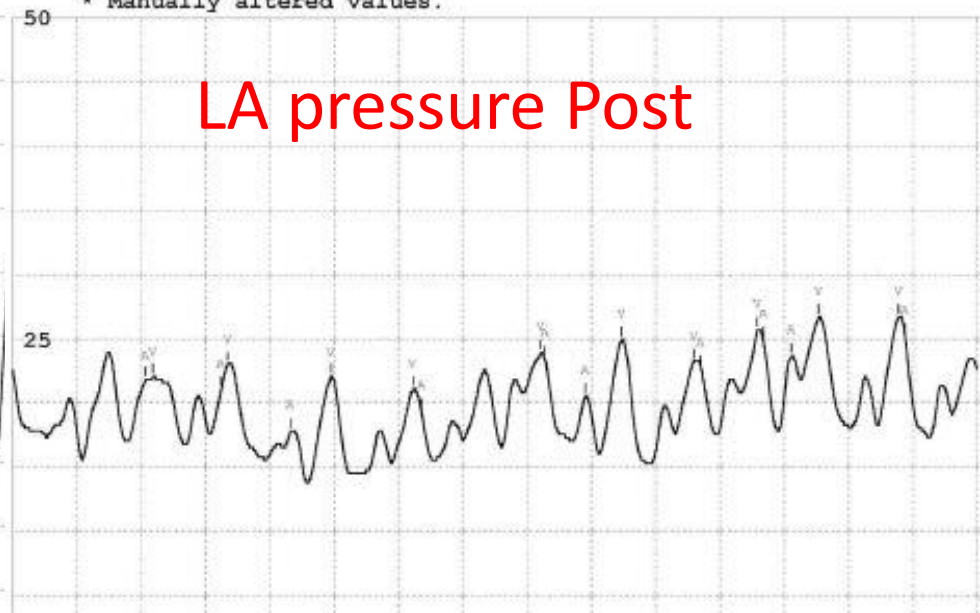
LA pressure Pre



LA a/v/m  
22/24/19

\* Manually altered values.

LA pressure Post



# Conclusion

- MitraClip is the most effective and widely adopted therapy for high surgical risk patients
- Effective for degenerative and functional etiology
- We continue to gain experience with more complex anatomy

One



Carolinan HealthCare System

**Case Presentation:**  
**Why is the patient hypotensive?**  
**I thought we were done!**

**Michael Rinaldi, MD**

The Sanger Heart and Vascular Institute  
Carolinas HealthCare System  
Charlotte NC

- 74 yo F with class 3 heart failure
- Severe AS with mean gradient 40mmHg
- No CAD, GFR >60, EF 60%, PA pressure 30
- Comorbidities: obesity BMI 40, frailty, gait disorder felt to be a poor candidate for conventional AVR
  
- Heart Team decision to offer TAVR

# CTA

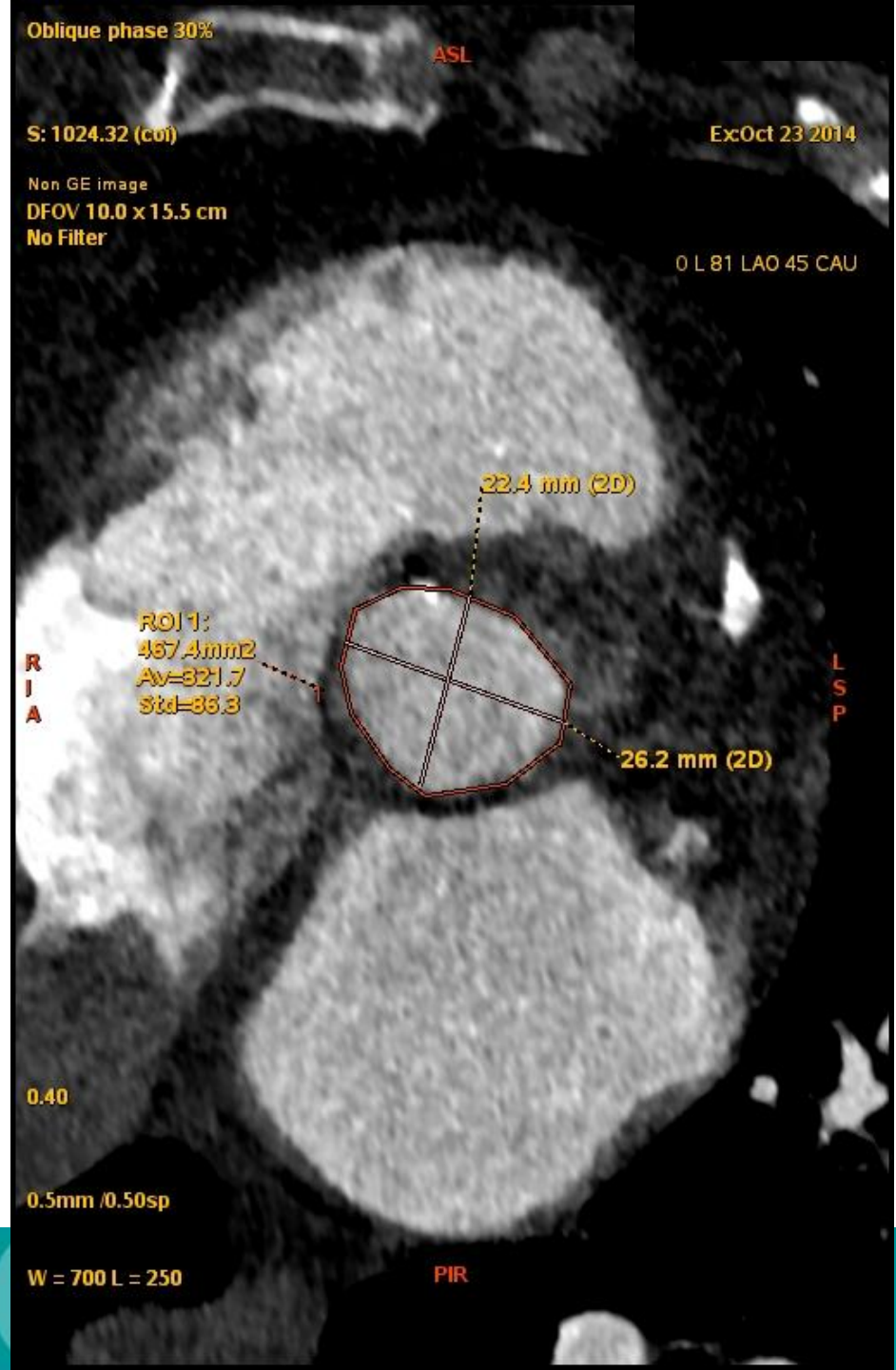
Trileaflet

Modest calcification

Annulus 26x22mm

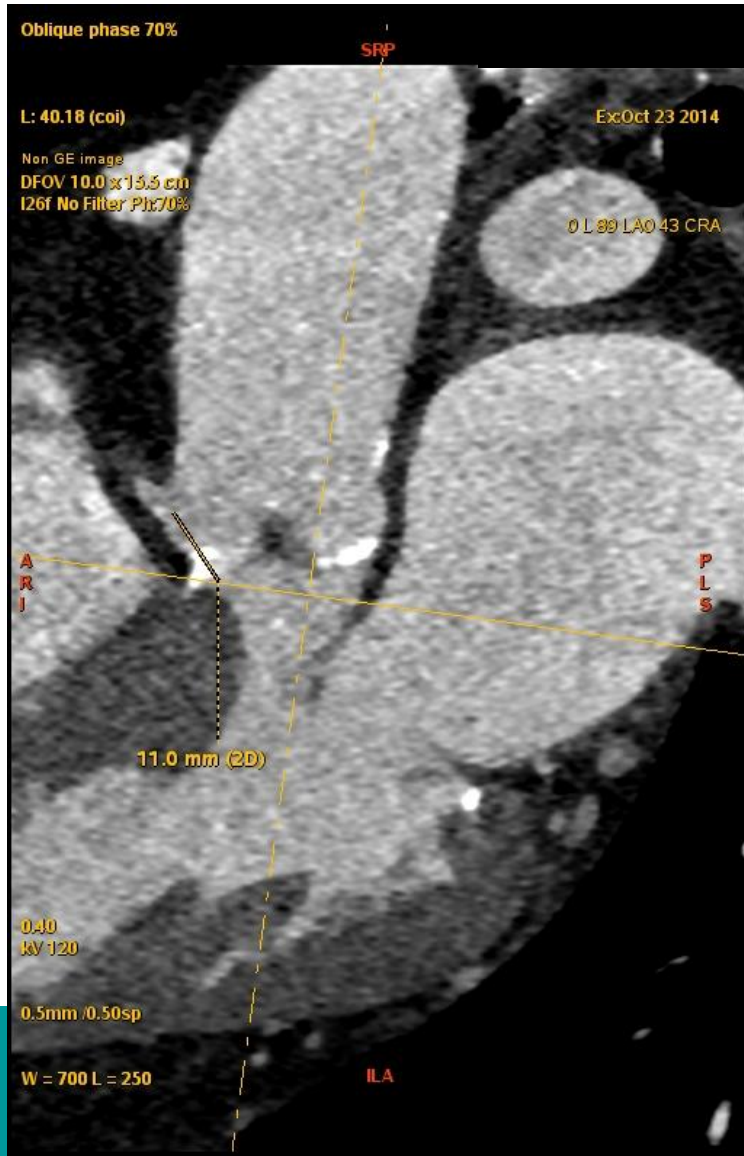
Circumference 76mm<sup>2</sup>

26mm Edwards Sapien  
XT TAVR chosen



# Height to Coronary Arteries

## LMCA 13mm, RCA 11mm



# Other Data

- Iliacs: not tortuous or calcified
- R CIA 11x9mm, R EIA 9x7mm, R CFA 9x6mm
- L CIA 10x7mm, L EIA 9x7mm, L CFA 10x8mm
  
- Right percutaneous transfemoral access chosen





One



Carolina HealthCare System



One



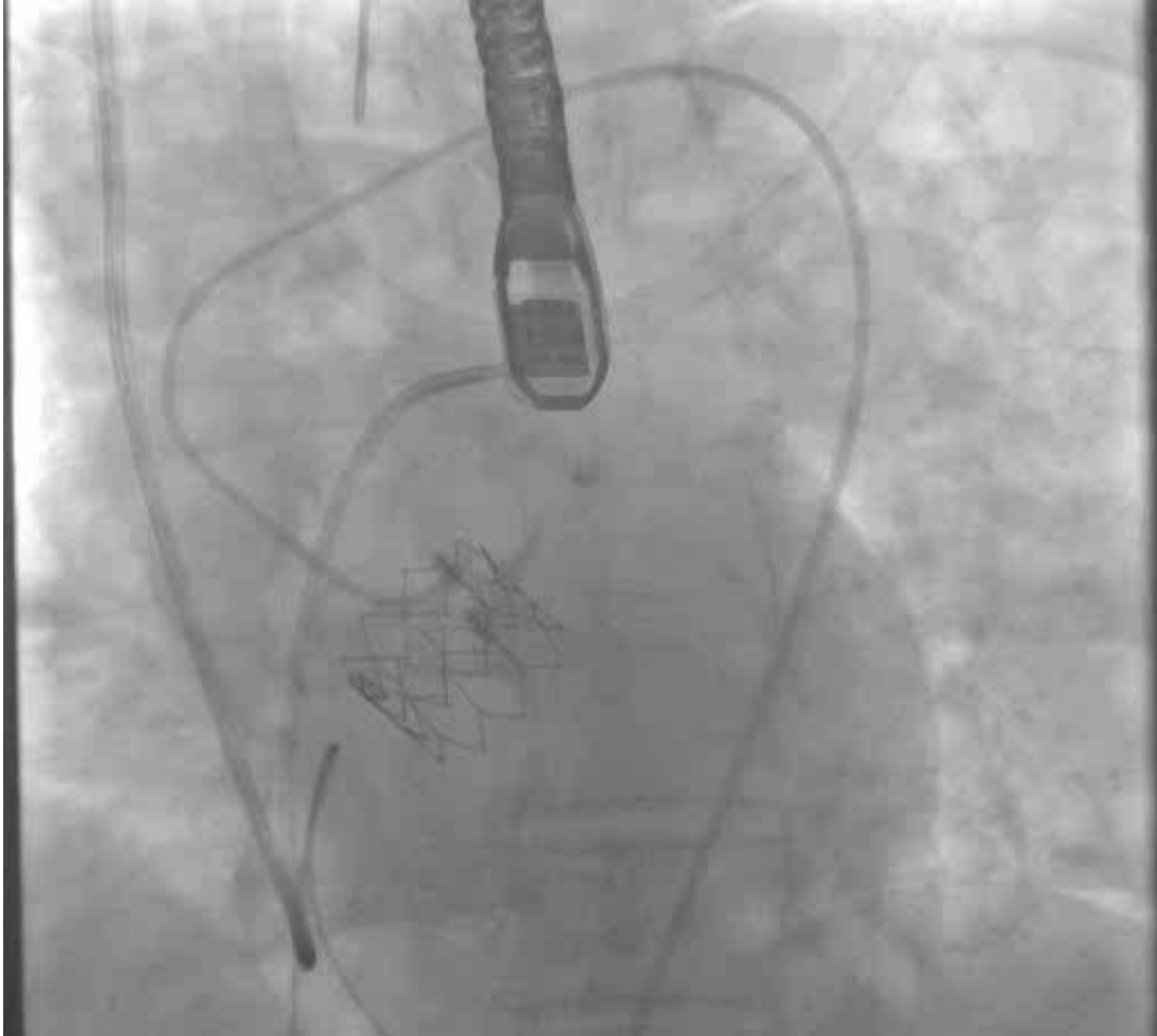
Carolina HealthCare System

# Success!

- Valve functioning well with trace perivalvular leak
- Delivery system removed
- Preclosure completed (required a 3<sup>rd</sup> Perclose for hemostasis)
- Protamine given
- That was easy!

# Not so Fast!

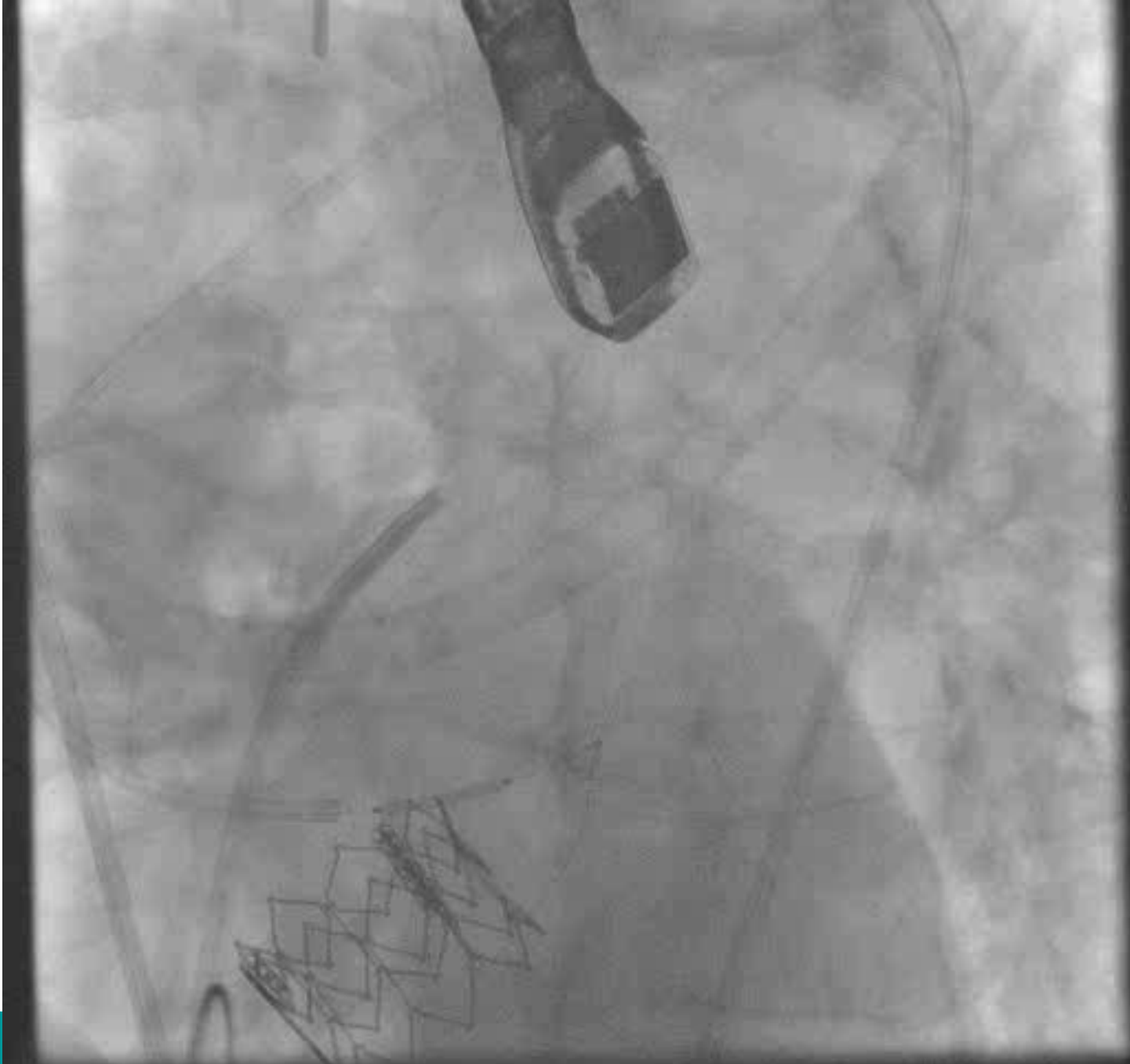
- Patient becomes hypotensive to 50mmHg
- Mildly bradycardic without need for pacing
- TEE shows new LV global hypokinesis
- No effusion, valve still functioning well
- Dopamine started
- Progressive hypotension – CPR started
  
- What now?



One



Carolinas HealthCare System





# Clinical Outcome

- Stented with a 4.0x12mm Xience DES post dilated to 5.0 with IVUS guidance
- Recovered LVEF completely and no neurologic issues
- Discharge in good condition to rehab



# Conclusion

- Coronary occlusion is a rare but critical complication of TAVR
- Can occur with any device
- Predictable based on CTA measurements
  - <10mm coronary height
  - Effaced “stovepipe” sinuses
- Should be considered in any patient with hypotension shortly after TAVR
- If recognized quickly stenting can be life saving

# **Case Presentation: Critical Error**

**Michael Rinaldi, MD**

The Sanger Heart and Vascular Institute  
Carolinas HealthCare System  
Charlotte NC

- 85yo M with class 3 heart failure
- Severe AS mean gradient 41mmHg AVA 0.9cm<sup>2</sup>
- Comorbidities: Cr 2.8, DM, AF, RA with felty syndrome, CAD with unrevascularizable 95% diffusely diseased LAD – STS risk estimated >8%
  
- Heart Team decision to offer TAVR

Oblique  
Ex: 22420806

Se:6 +c  
I: 218.60 (coi)

Non GE image  
DFOV 20.0 x 15.9 cm  
I26f No Filter Ph:78%

CLEMENTS JOHN PAUL  
CMC  
M 85 5311547  
DoB: Jul 09 1928  
Ex: Apr 02 2014

# CTA

6 L 93 LAO 55 CAU

## Trileaflet

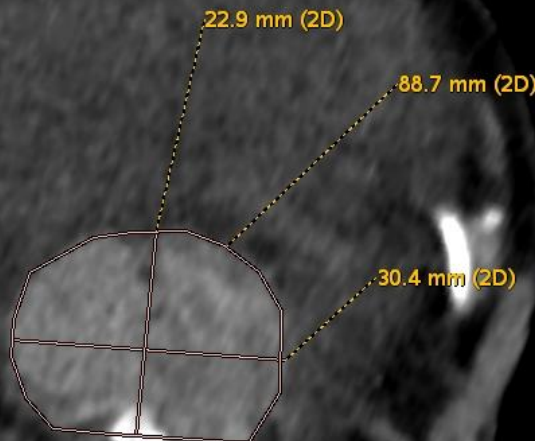
## Area of eccentric calcification

## Annulus 23x30mm

## Circumference 89mm<sup>2</sup>

R  
I  
P

## 29mm MDT CoreValve TAVR chosen



L  
S  
A

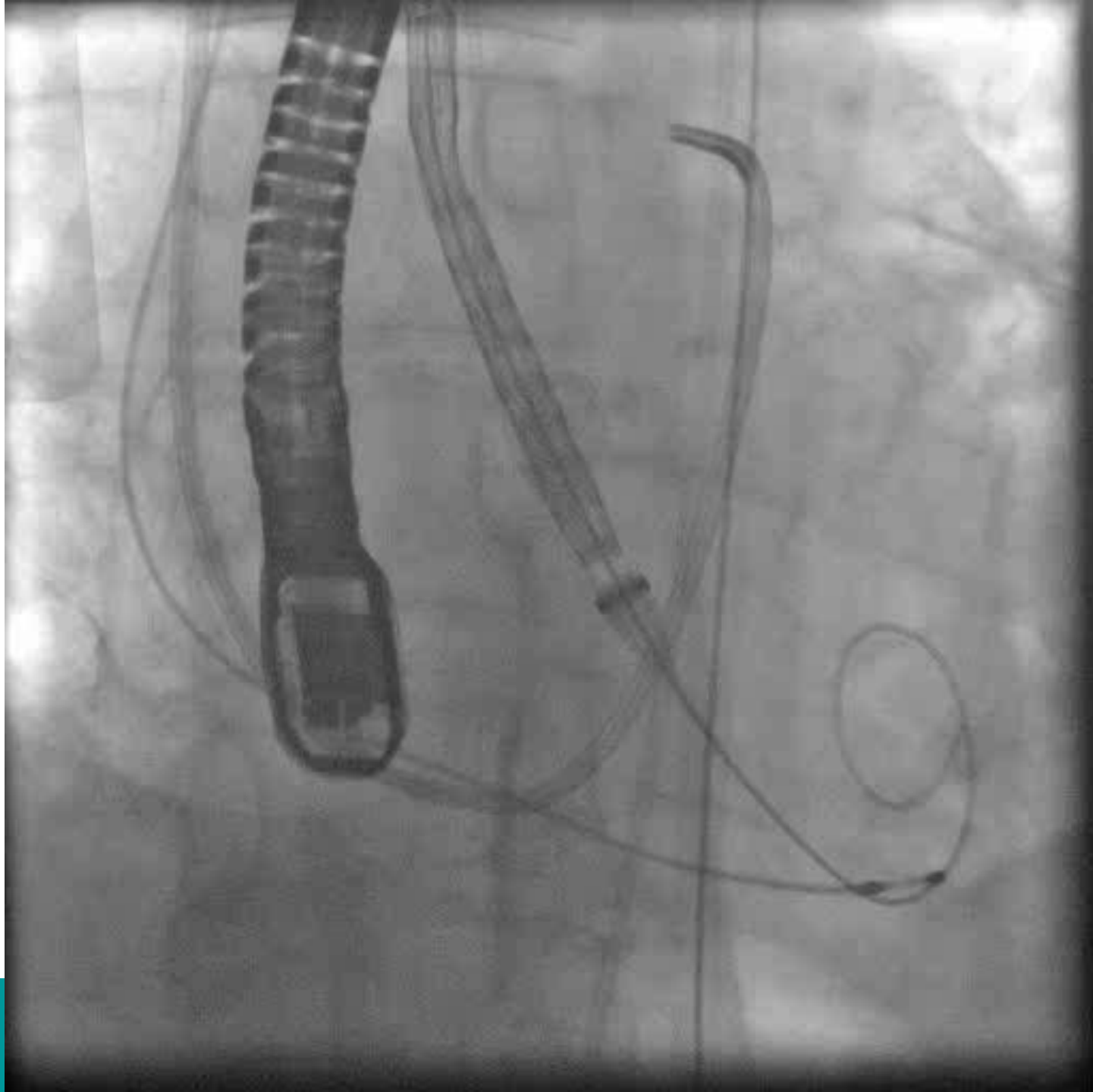
0.50  
kV 120  
mA 1402  
285ms  
0.5mm / 0.50sp  
Tilt: 0.0  
TP78PC0958 03:58:14 PM  
W = 700 L = 250

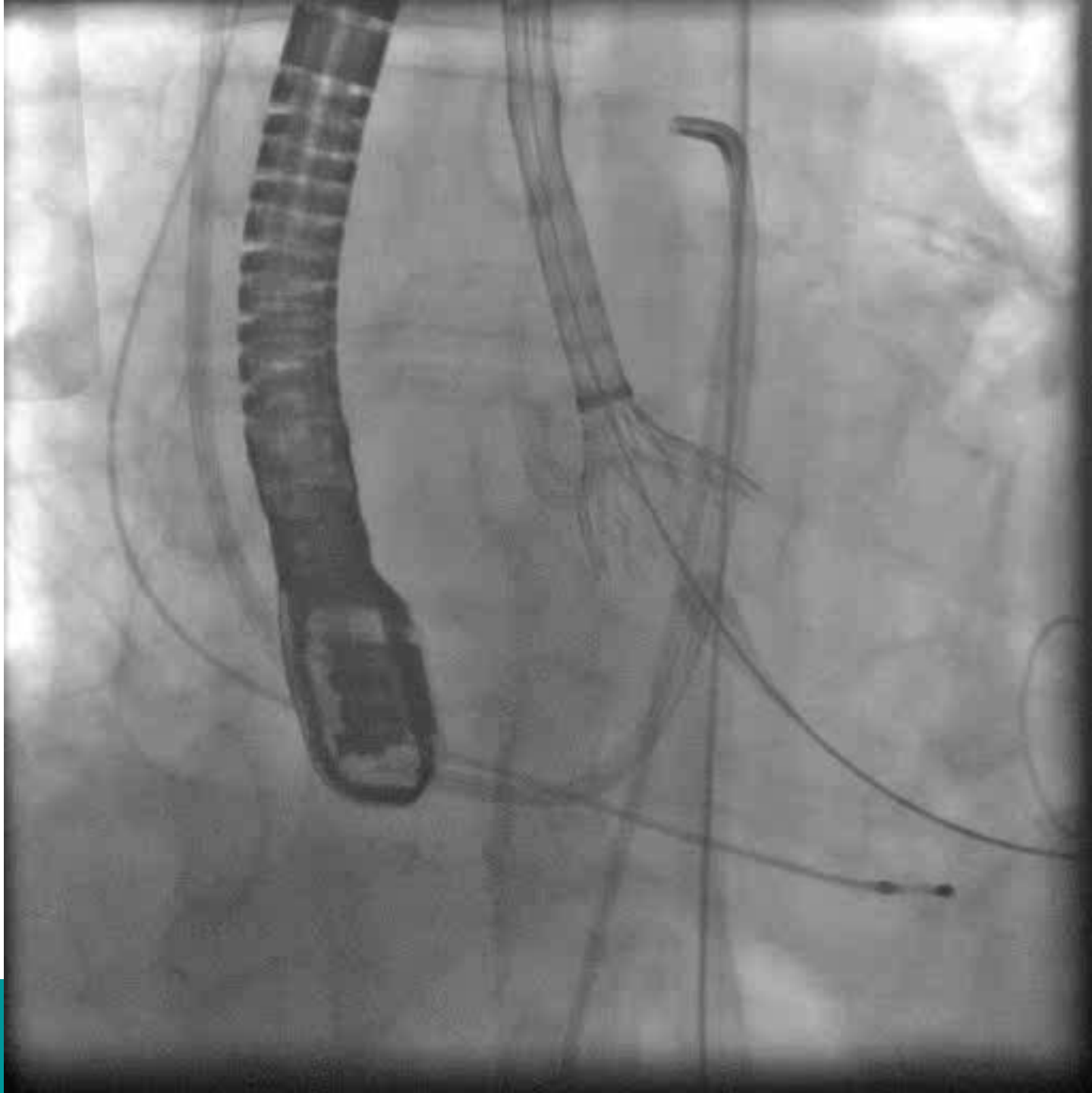
651/4

PLS

# Other Data

- Height to coronaries: LM 16mm, RCA 18mm
- Iliacs: not tortuous or calcified
- R CIA 8x10mm, R EIA 8x10mm, R CFA 9x10mm
- L CIA 8x11mm, L EIA 10x11mm, L CFA 9x11mm
  
- Right percutaneous transfemoral access chosen





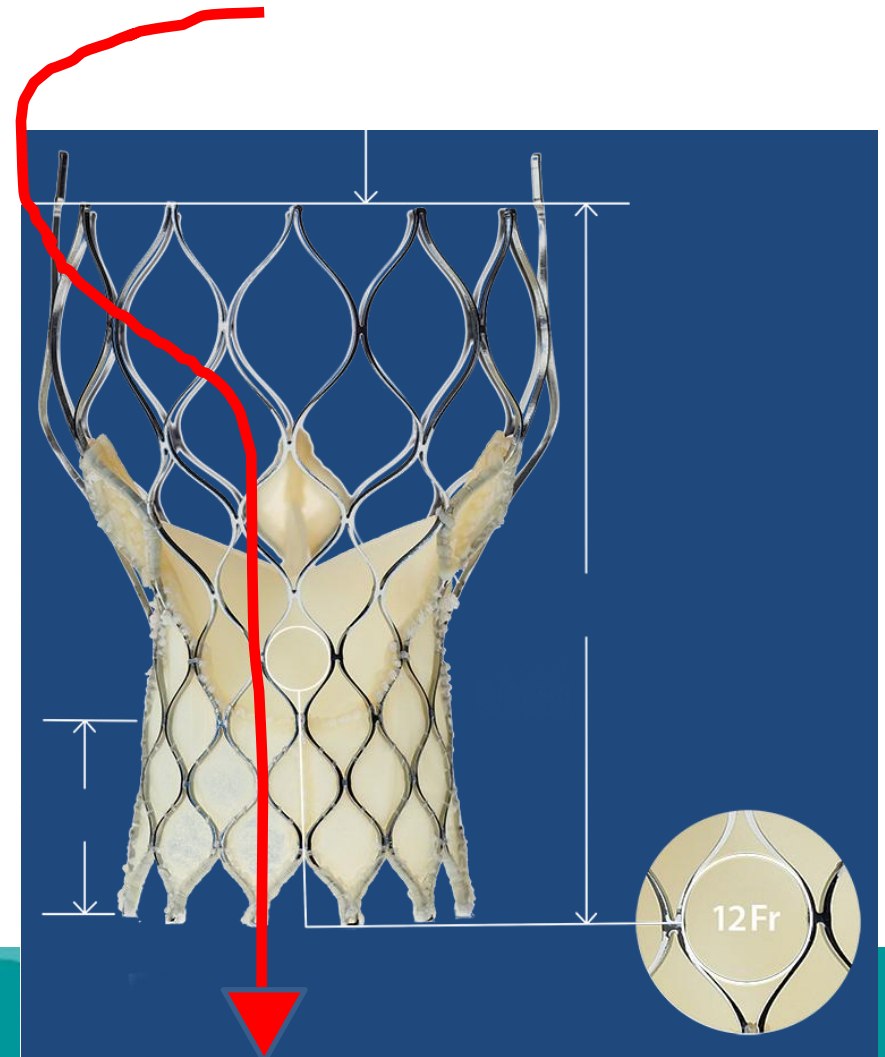
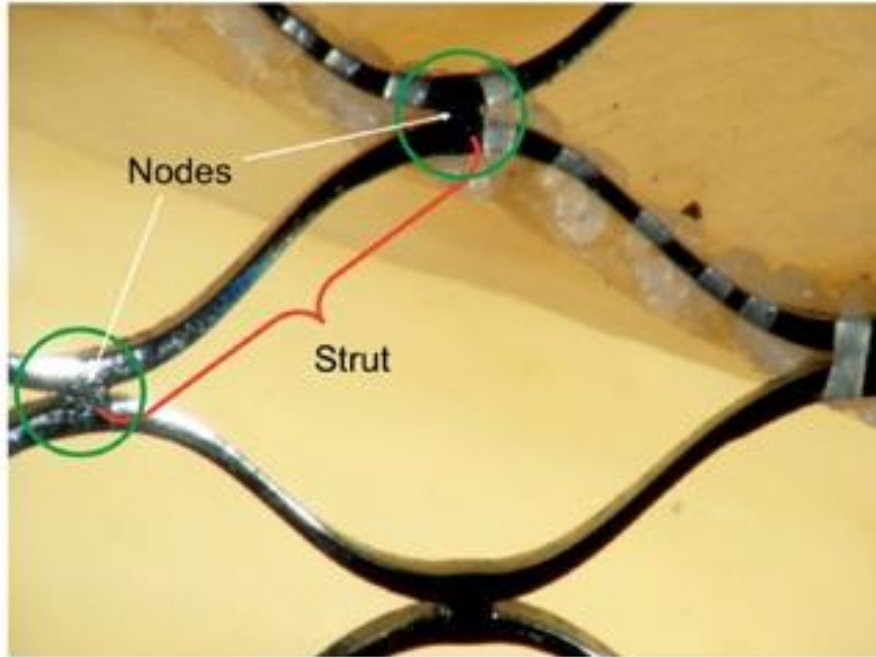




- Following deployment 2+ perivalvular AI is noted despite 10 min observation
- A decision is made to post-dilate the valve
- On recovery of the delivery system wire access to the ventricle is lost
- The valve is re-crossed with a 5F Pigtail and wire access to the LV is restored
- A 25mm balloon is brought to the valve doesn't advance beyond the proximal frame
- Worse still the balloon will not withdraw and is stuck in the frame

# What happened?

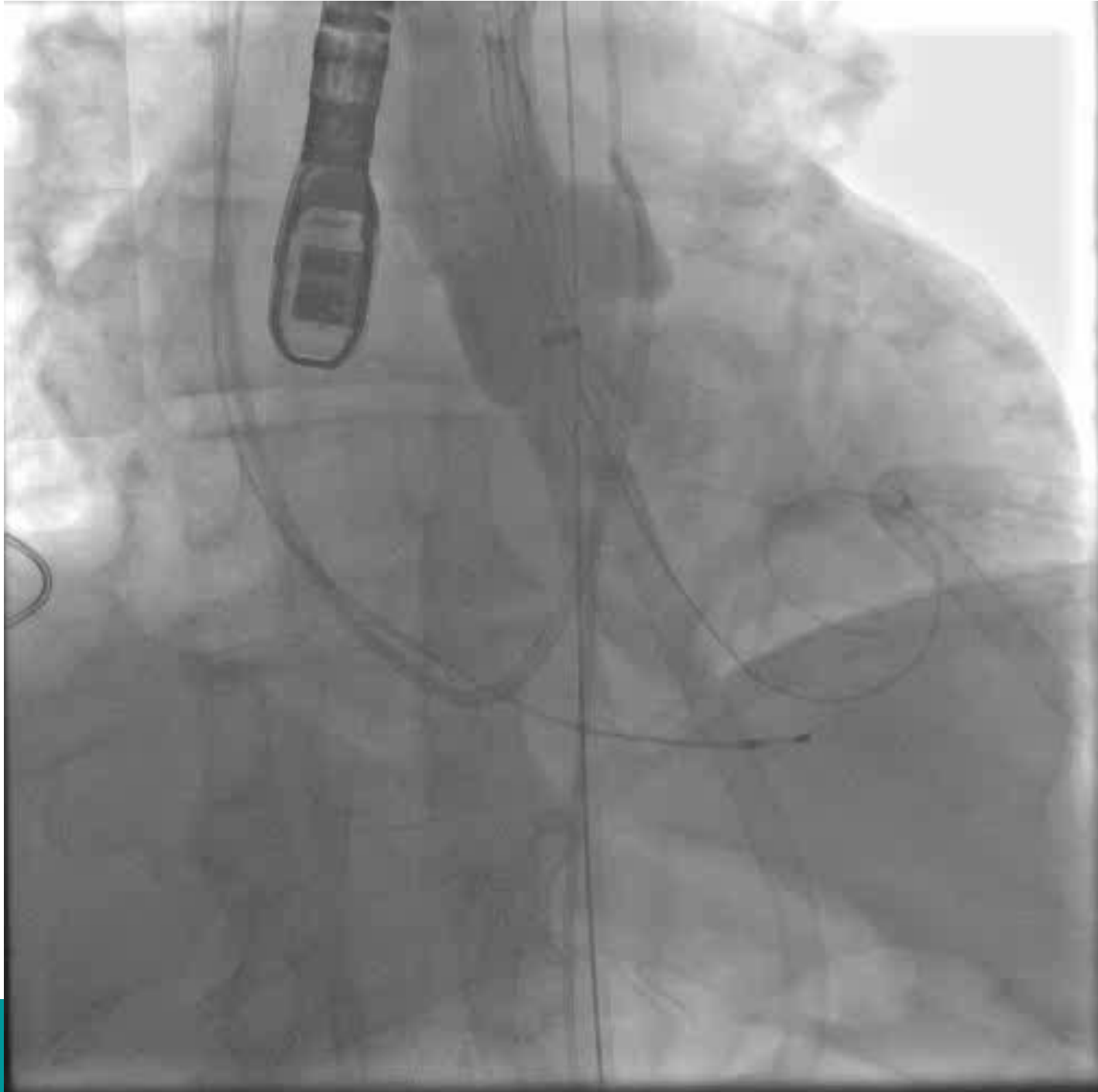
Pigtail passes outside the frame, through the top strut, then down into the ventricle



- Numerous attempts to manipulate the balloon were attempted including contralateral snare work
- Eventually the balloon comes free but simultaneously the valve embolises into the ascending aorta
- The patient immediately becomes severely hypotensive and arrests



- A second valve is rapidly prepped while the patient is resuscitated
- Preparations are made insert femoral cannula for bypass support
- Second valve is deployed

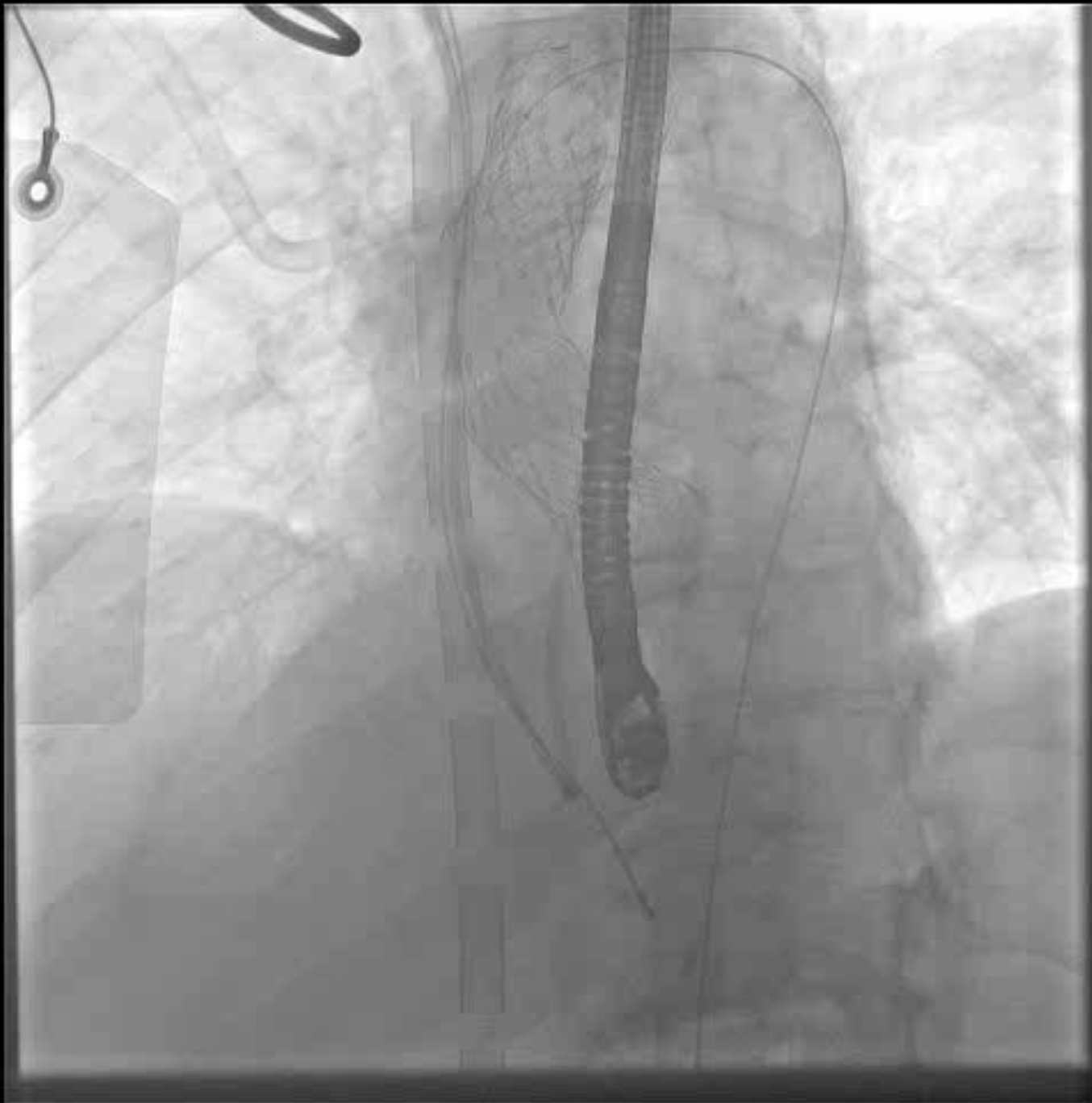


- Despite successful placement of a second valve the patient remains hypotensive and bypass support is started





- Occurs to the operator that retrograde bypass flow is not reaching the coronary arteries given the presence of the embolized valve the ascending aorta
- A large bare metal stent is placed to pin the embolized CoreValves leaflets open



- Hemodynamic stability is restored and the patient is weaned off bypass
- Unfortunately the patient suffers anoxic brain injury from prolonged hypotension as expires

# Conclusion

- If wire access is lost to the ventricle during TAVR with a self expanding frame wire repositioning must be done carefully
  - A pigtail catheter can fit through the CoreValve struts and thus does not guarantee central access throughout the valve
- In the setting of hemodynamic catastrophe the first priority should be rapid placement on bypass