

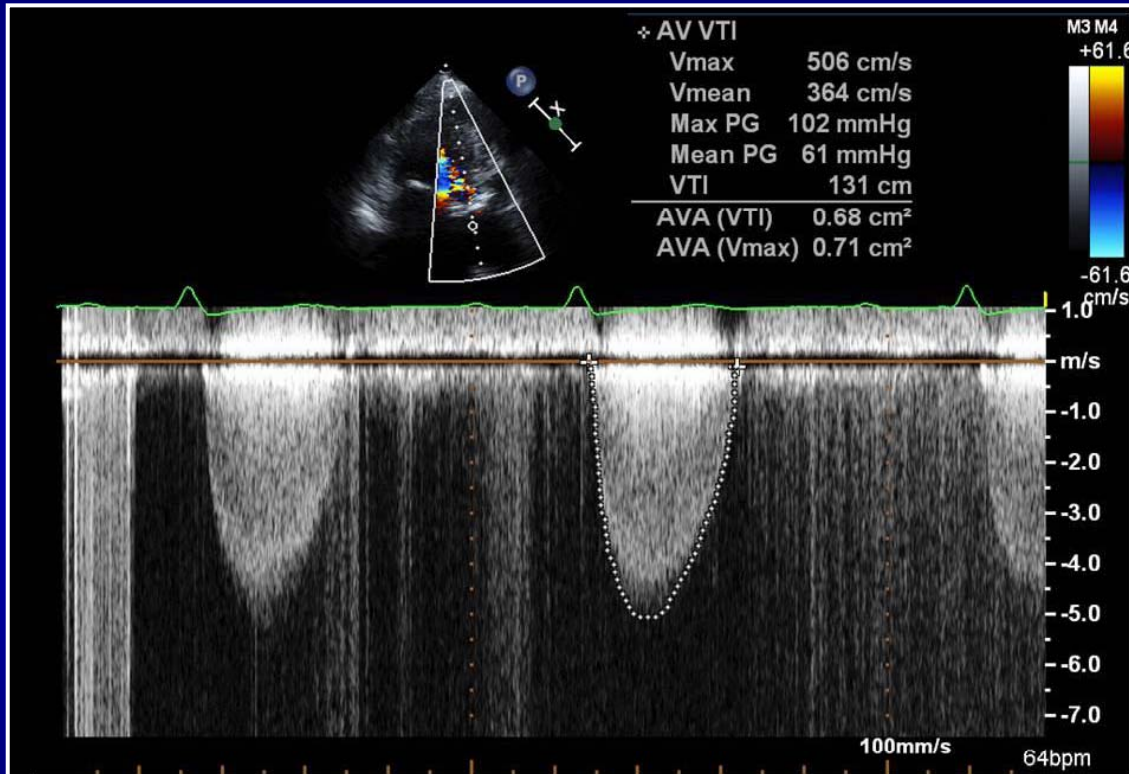


Trans-catheter Aortic Valve Replacement: Valve Embolization , Severe Acute AI: Some Practical Tips..

Raj Makkar ,MD
Director, Interventional Cardiology and Cardiac
Catheterization Laboratory
Cedars-Sinai Medical Center, Los Angeles

94 y/o female with Severe Aortic Stenosis,
NYHA Class IV and Near-syncope
STS score 11.1

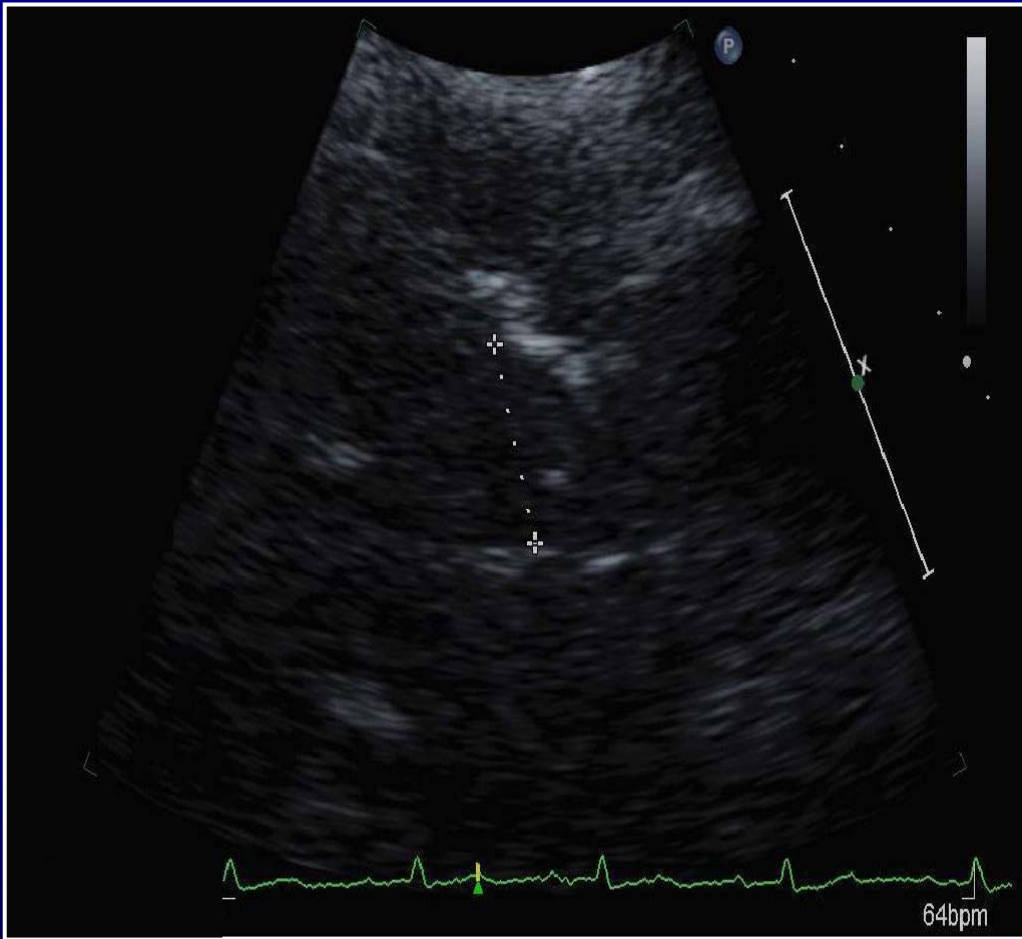
TRANSTHORACIC ECHO



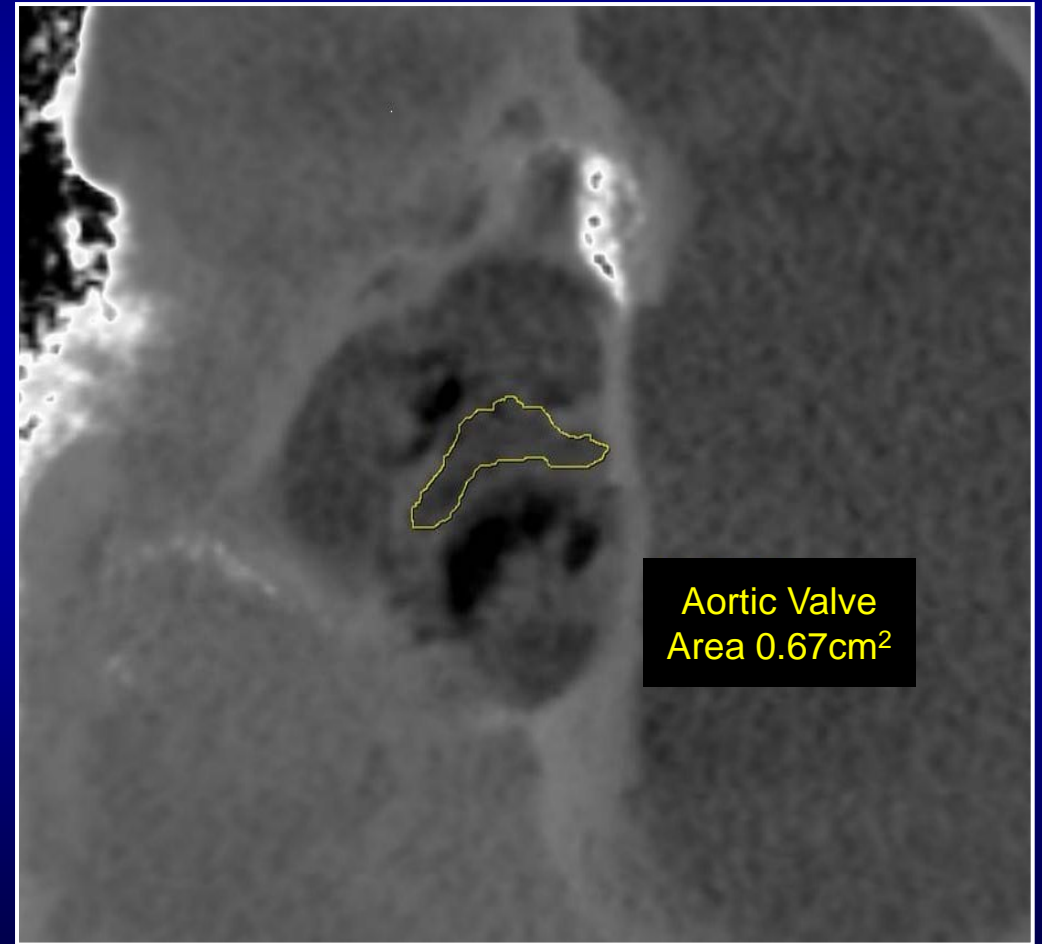
- AVA = 0.68 cm²
- Mean gradient = 61 mmHg
- Peak gradient = 102 mmHg
- EF = 75 %
- Annulus = 19 mm
- PA HTN (50 mmHg)

Aortic Valve Anatomy

TTE: Aortic Annulus 19 mm

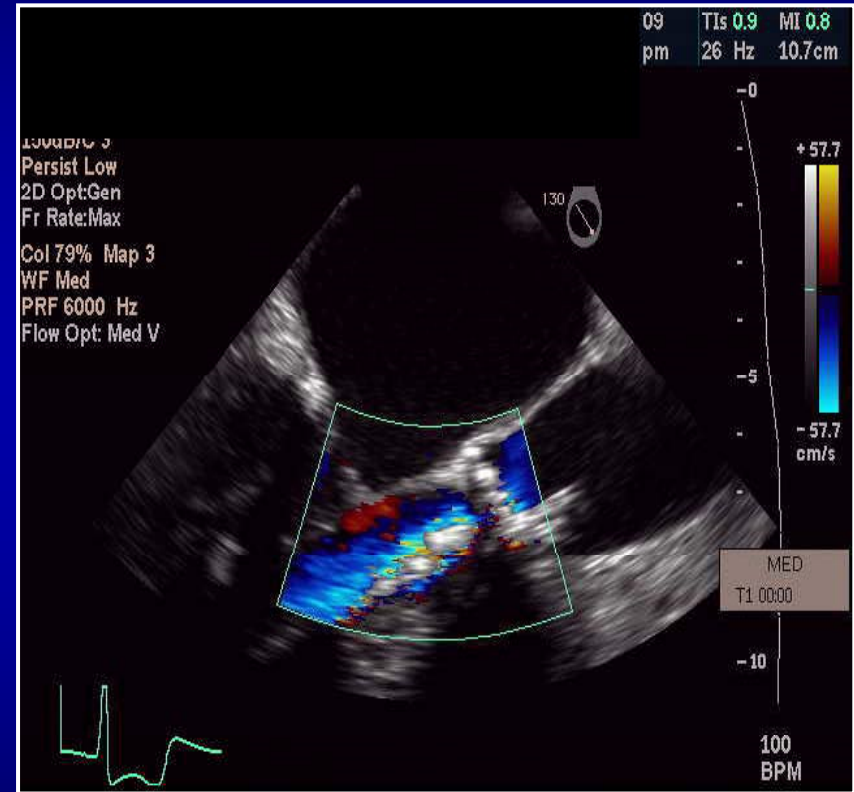
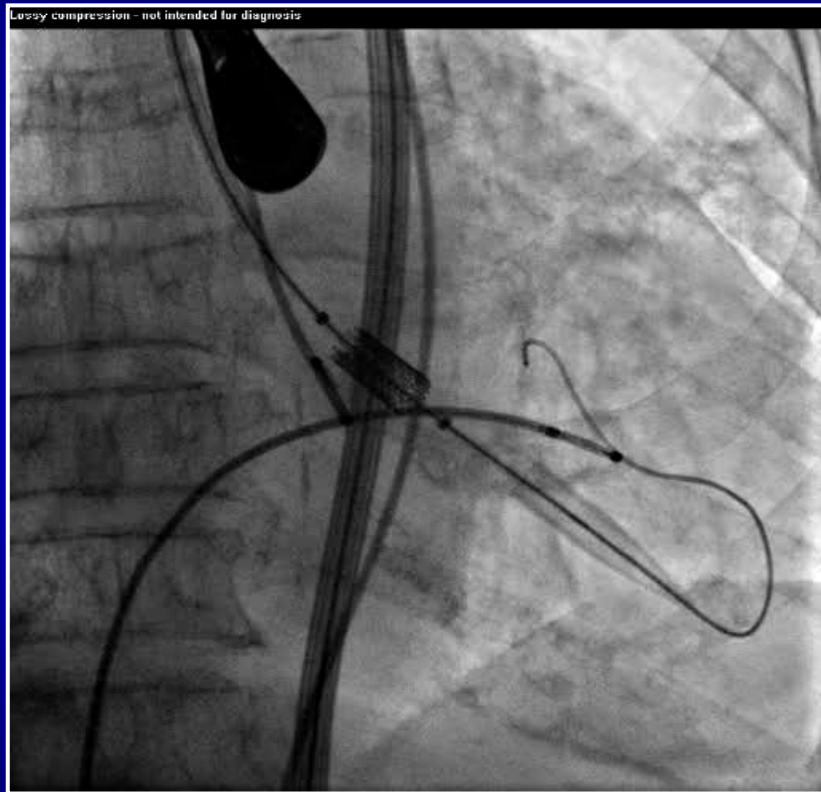


Cardiac CT

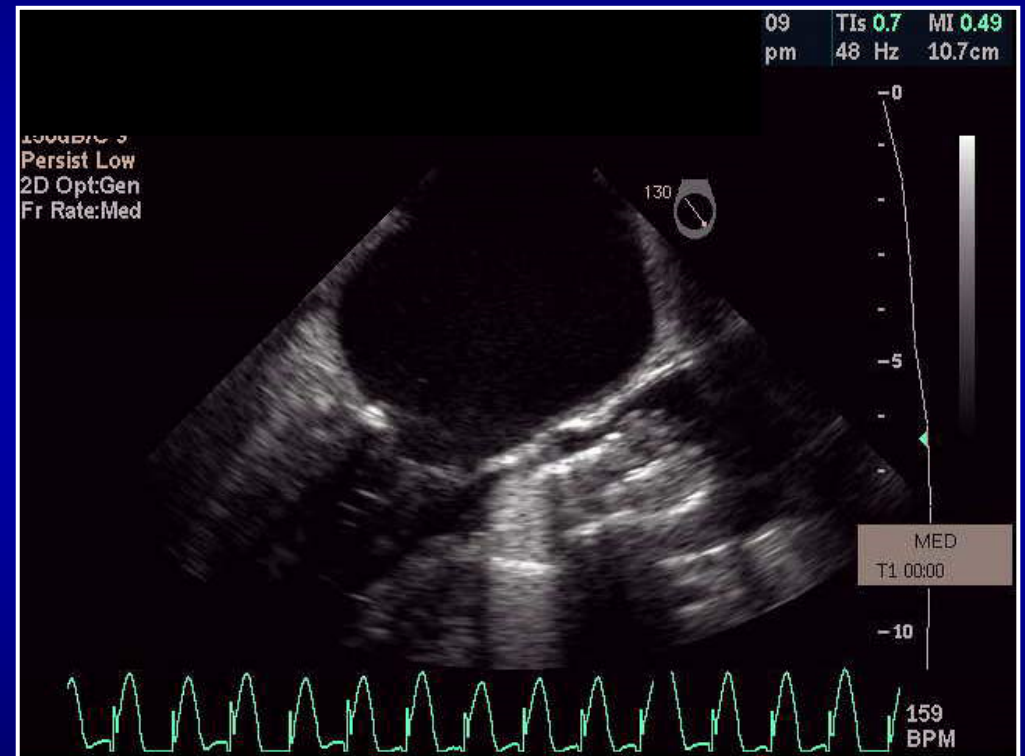
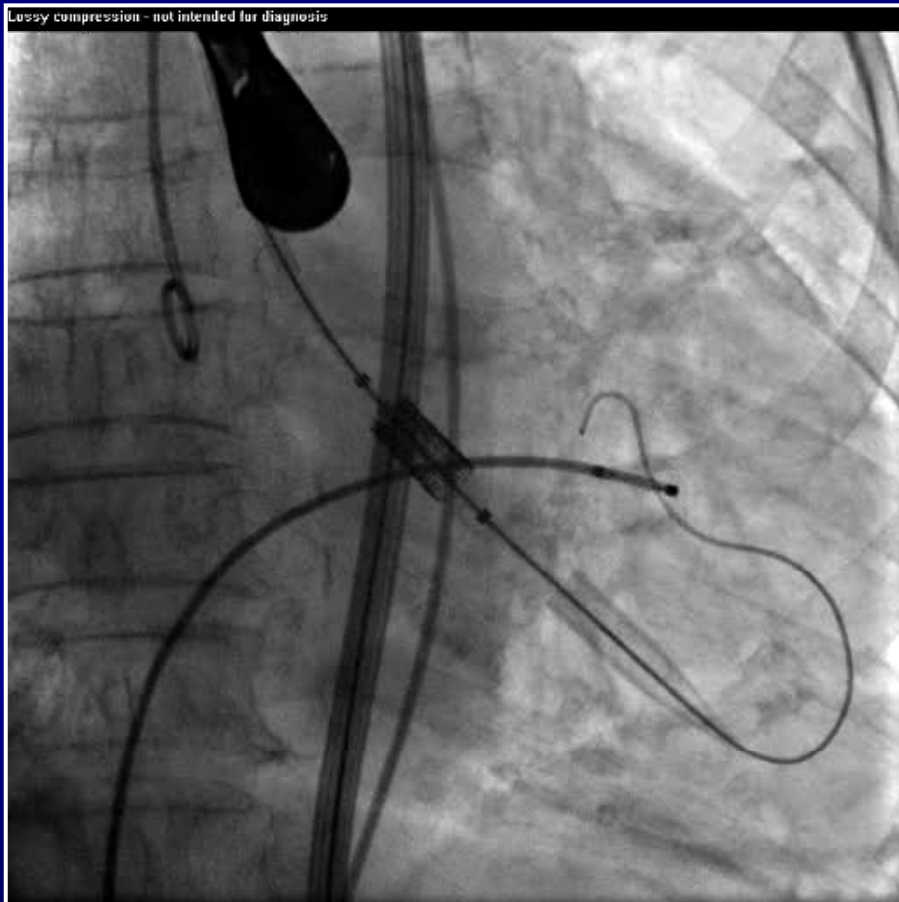




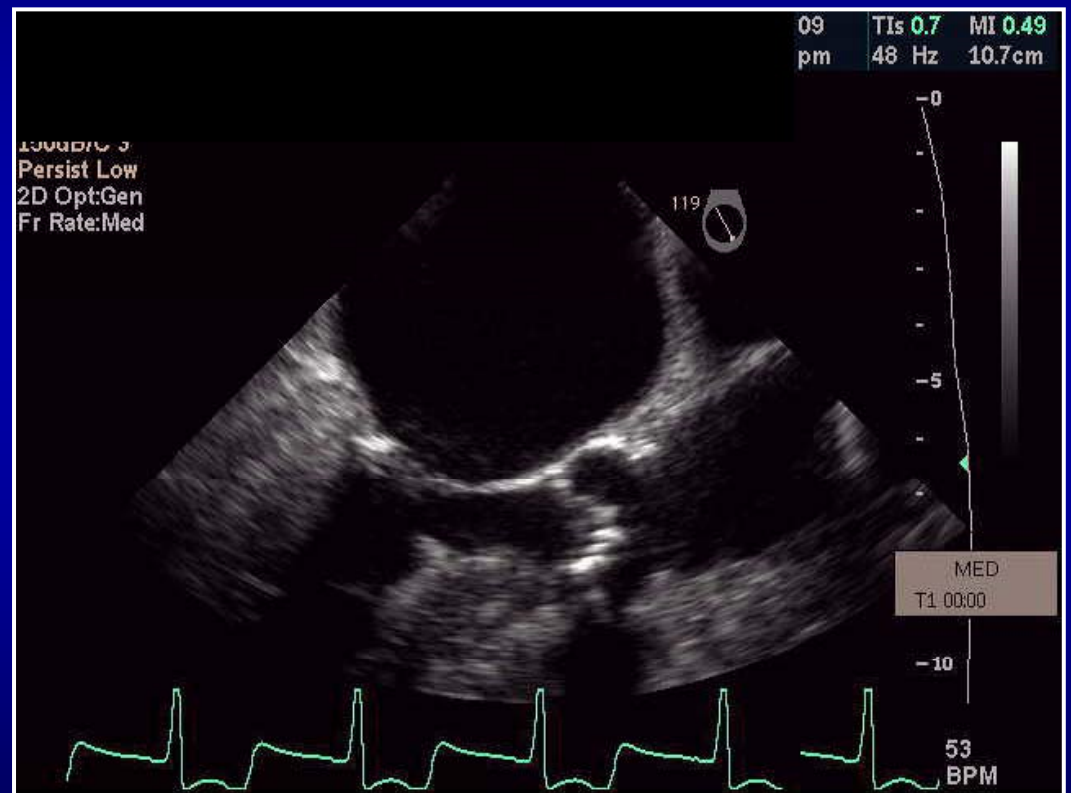
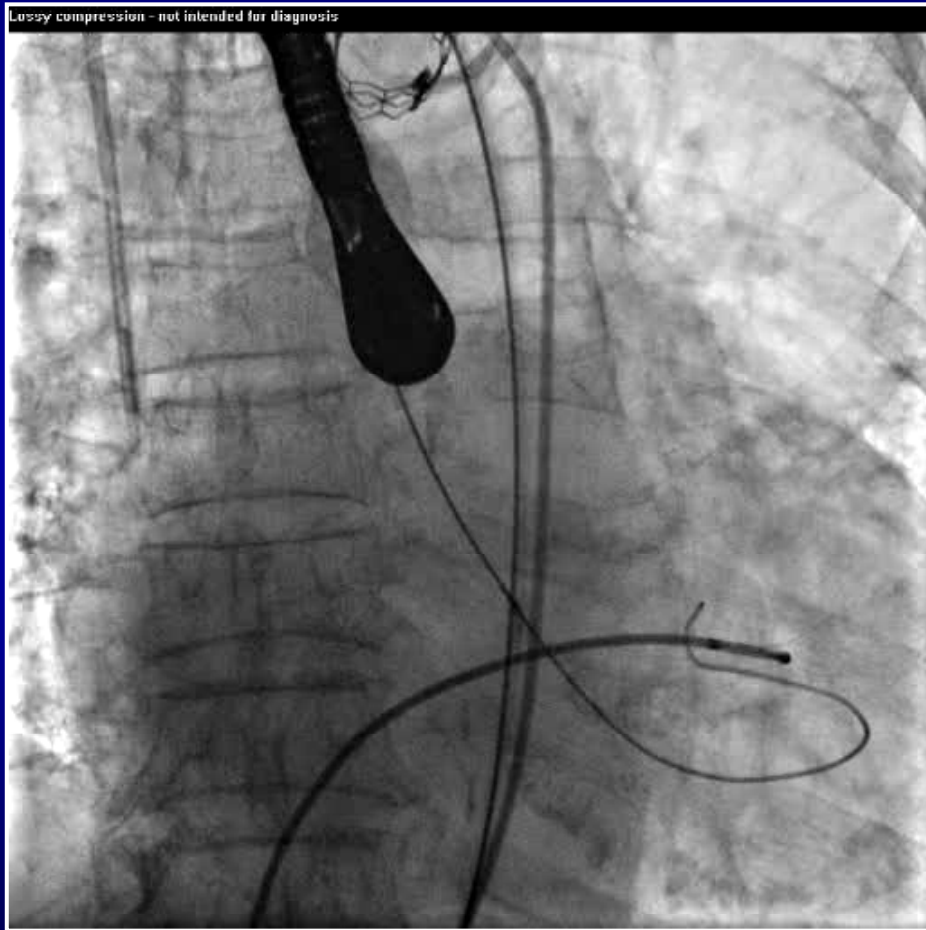
Positioning



Inadequate and slow expansion of the stent

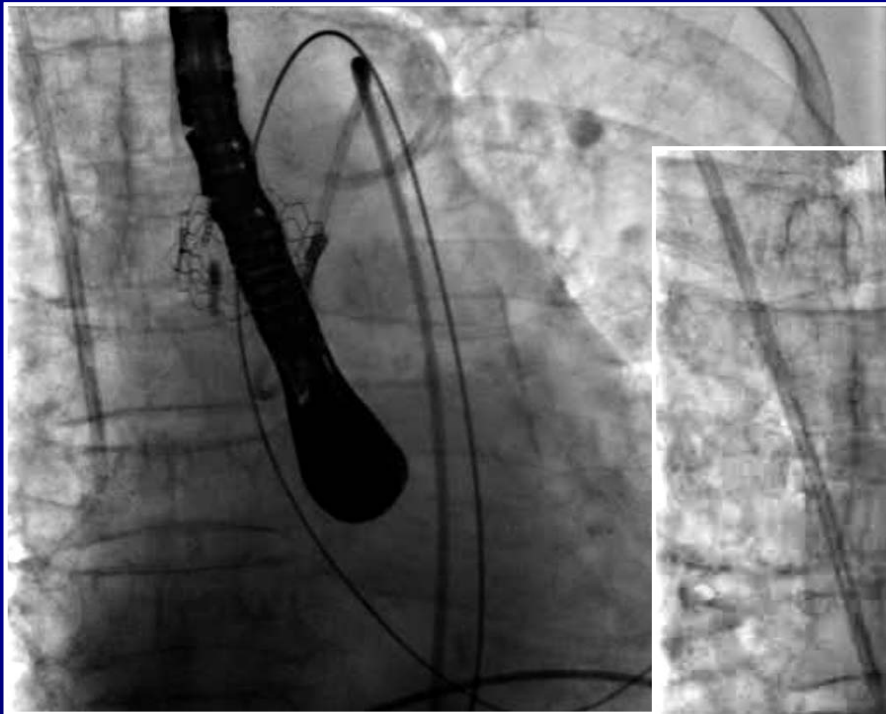


Native valve after embolization of device

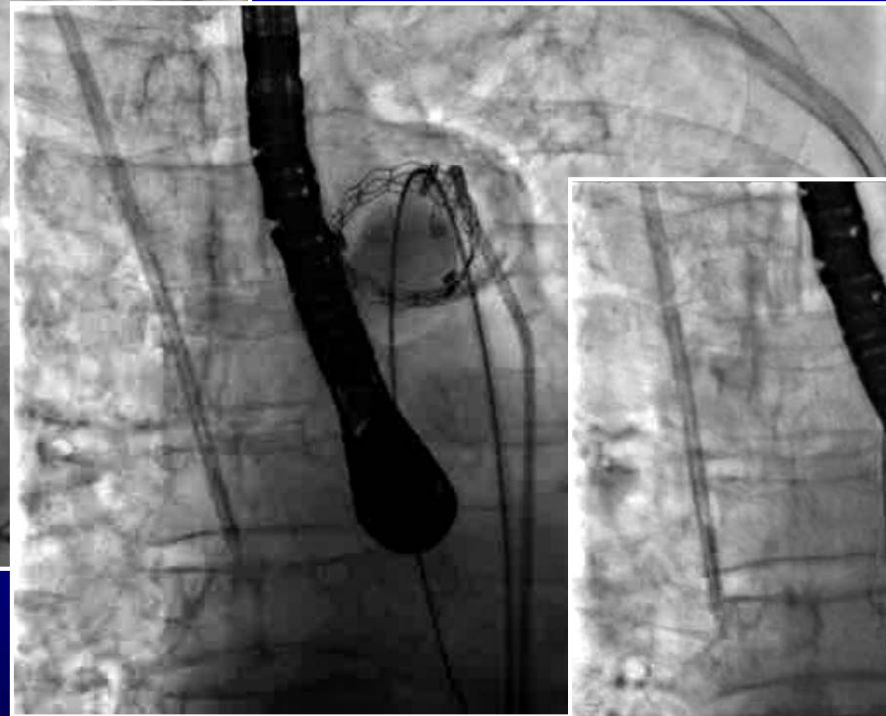


Embolizing Valve Visualized on Fluoroscopy

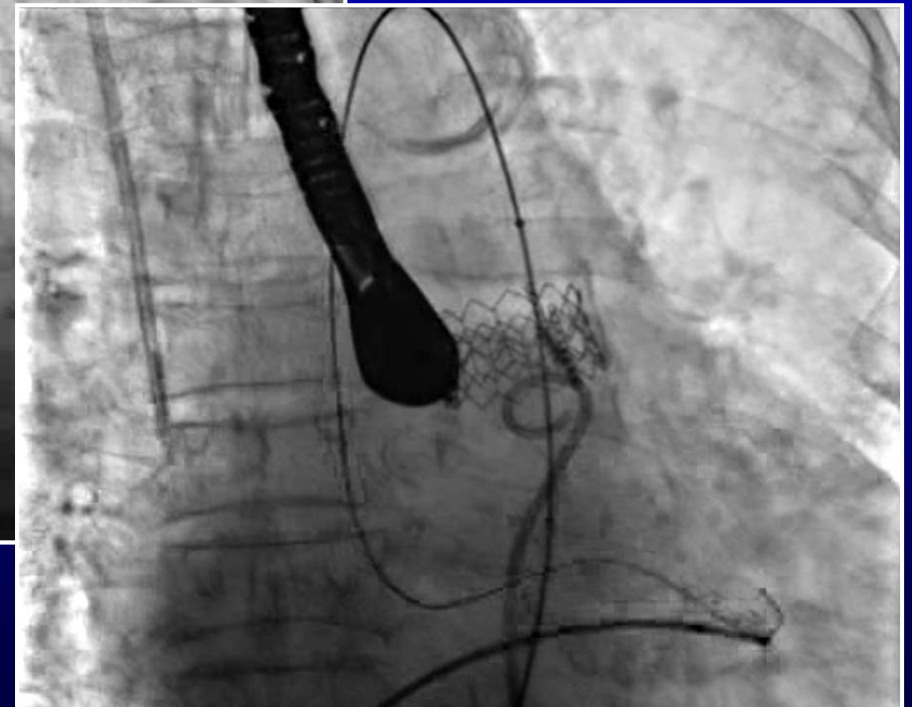
Ascending aorta



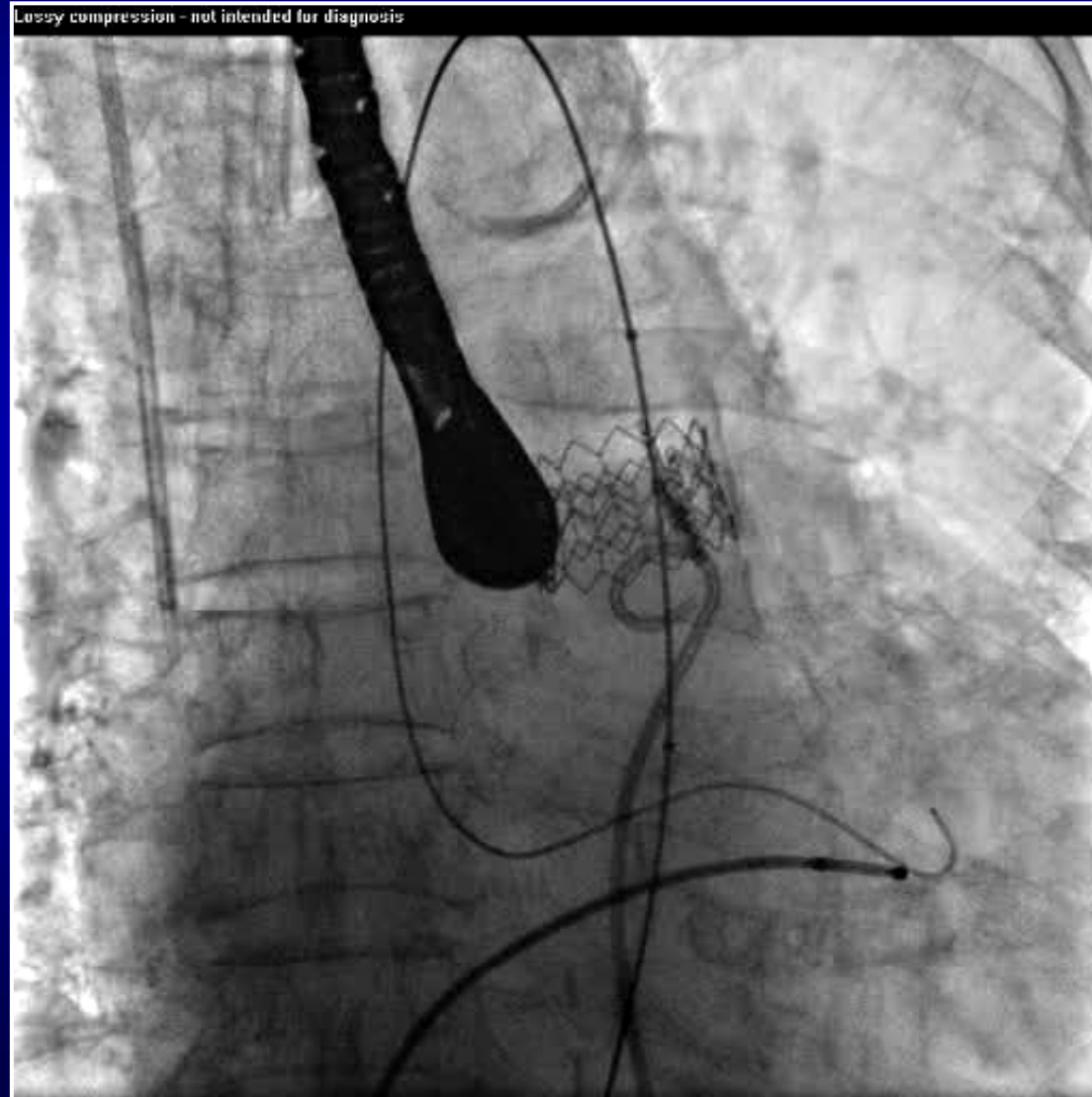
Arch of aorta



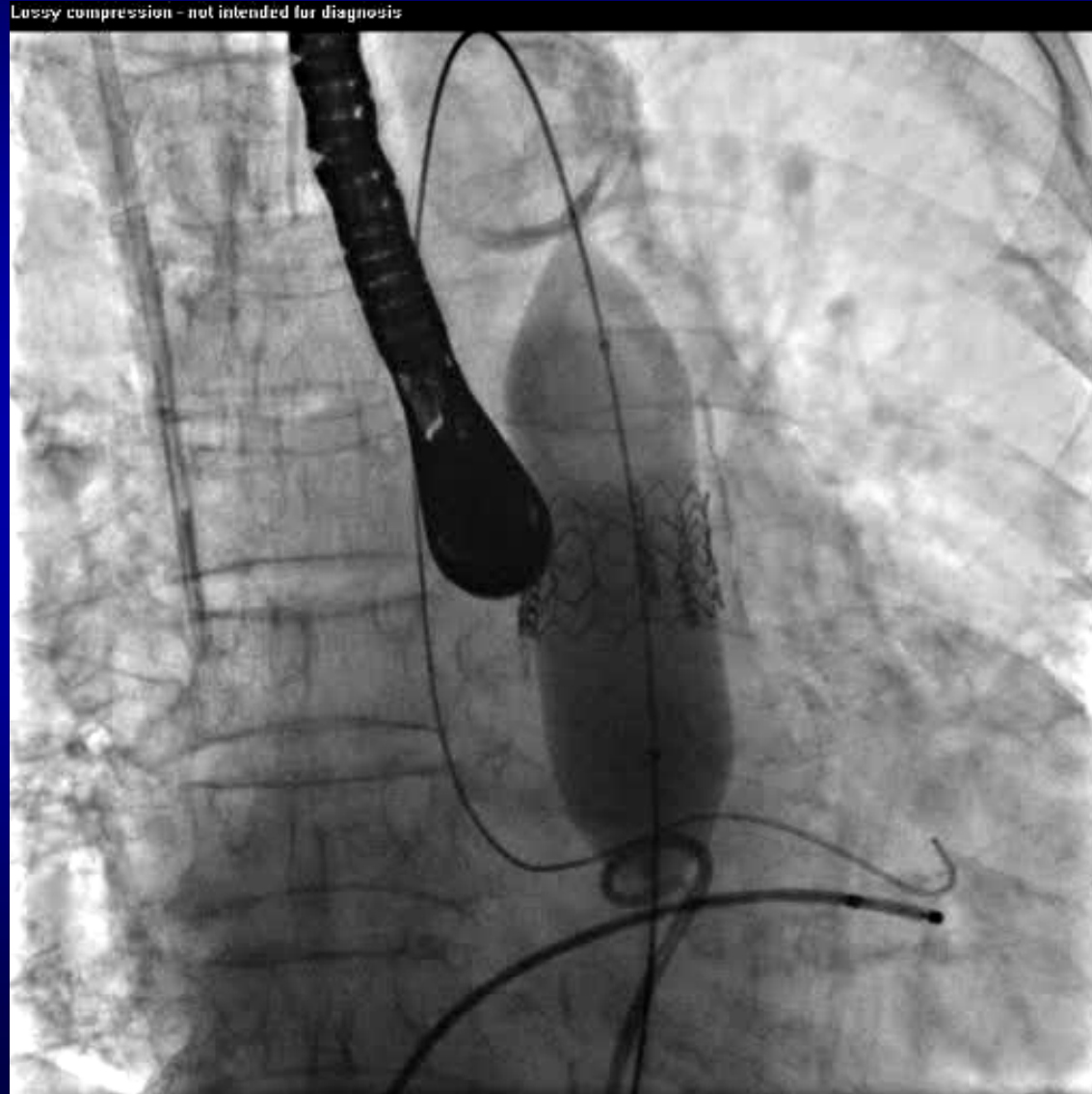
Thoracic aorta



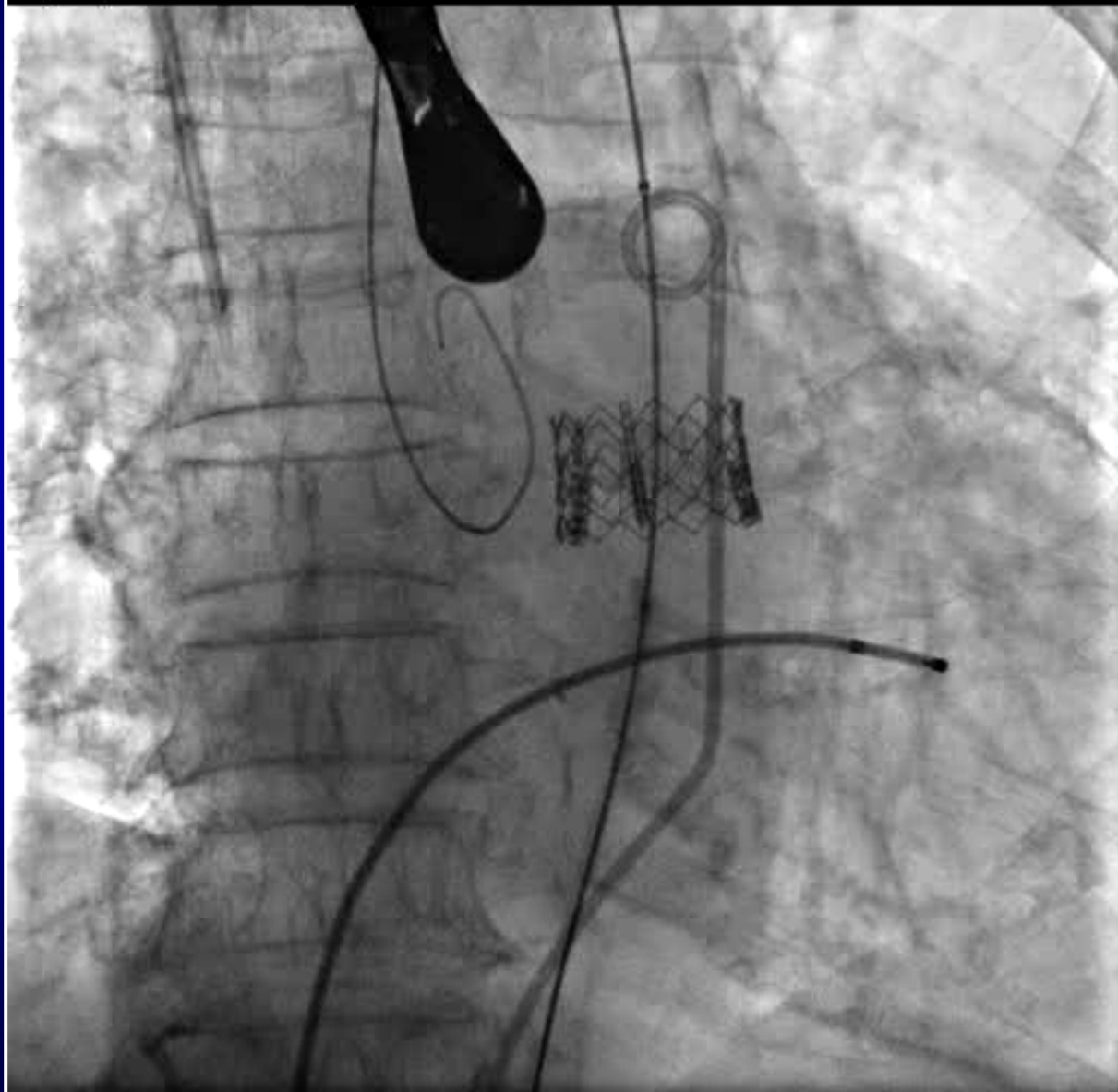
Check where you are deploying the embolized valve



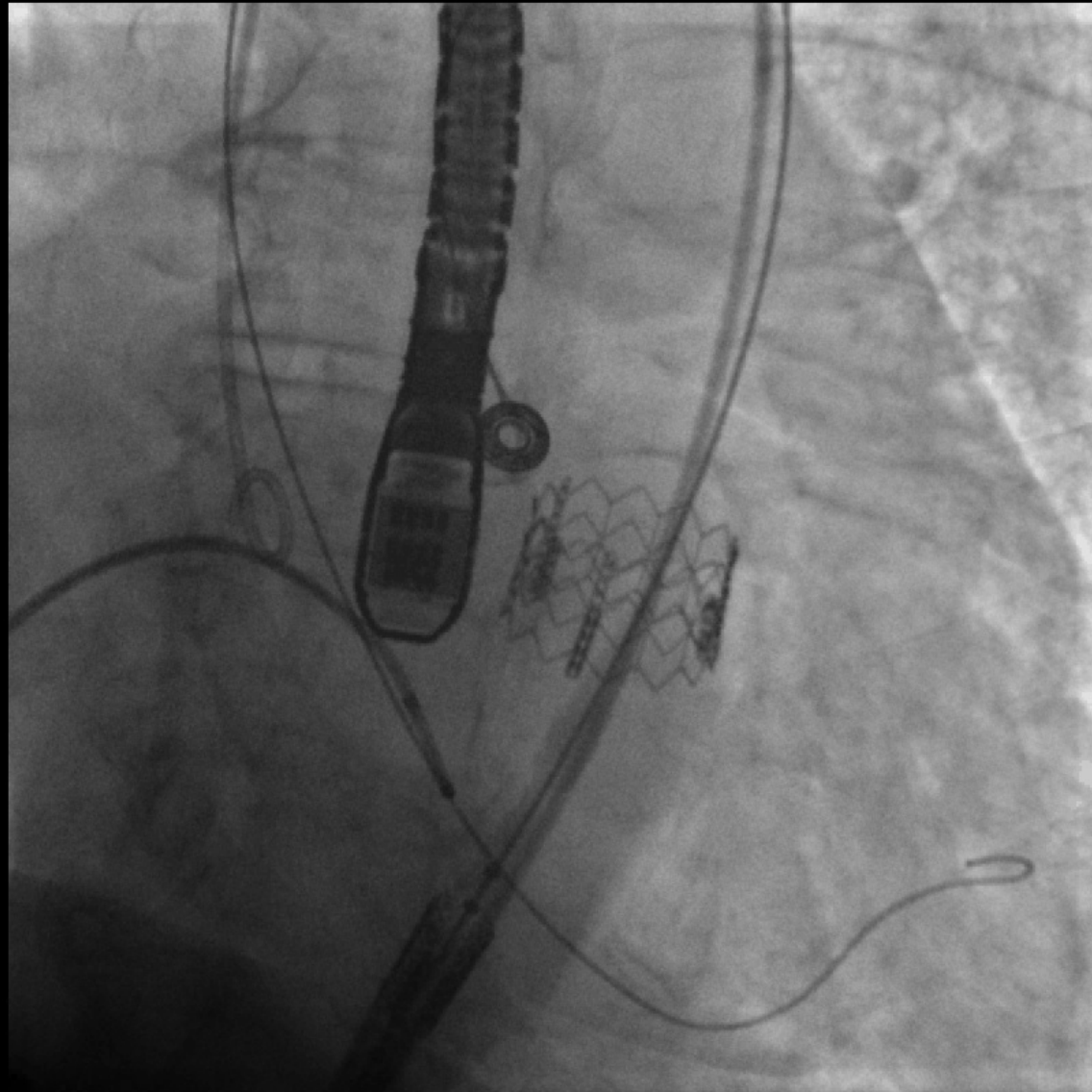
Deployment of device in thoracic aorta



Lusky compression - not intended for diagnosis



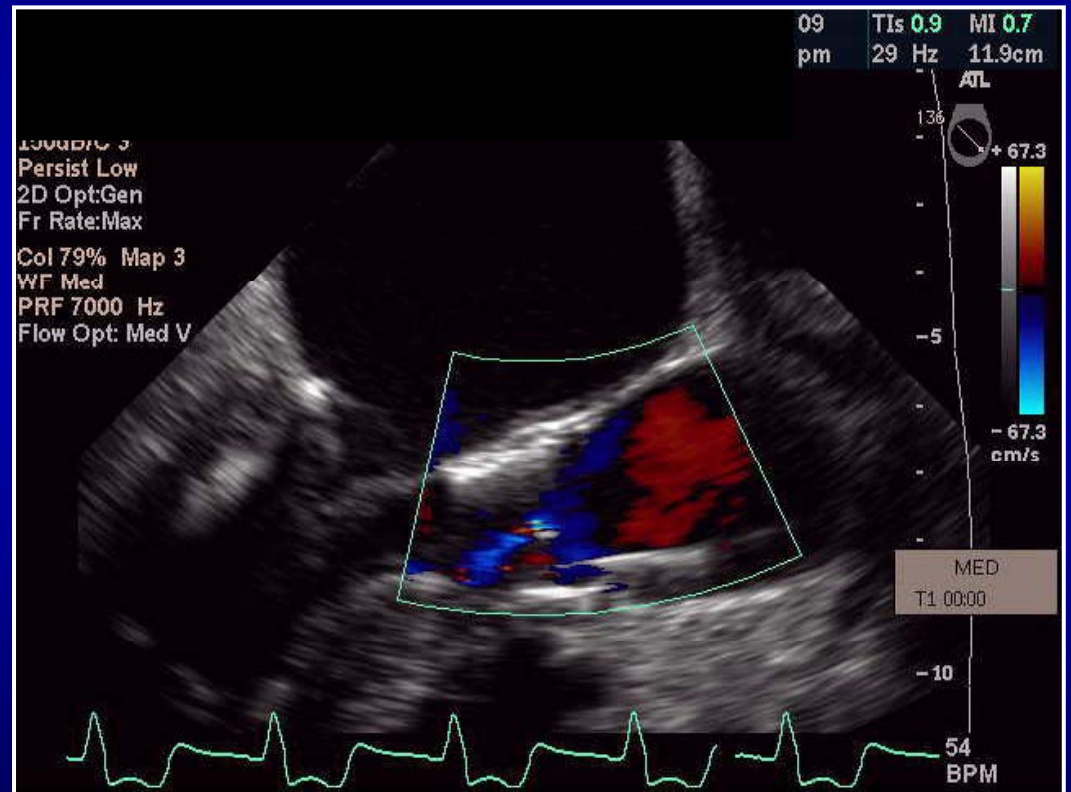
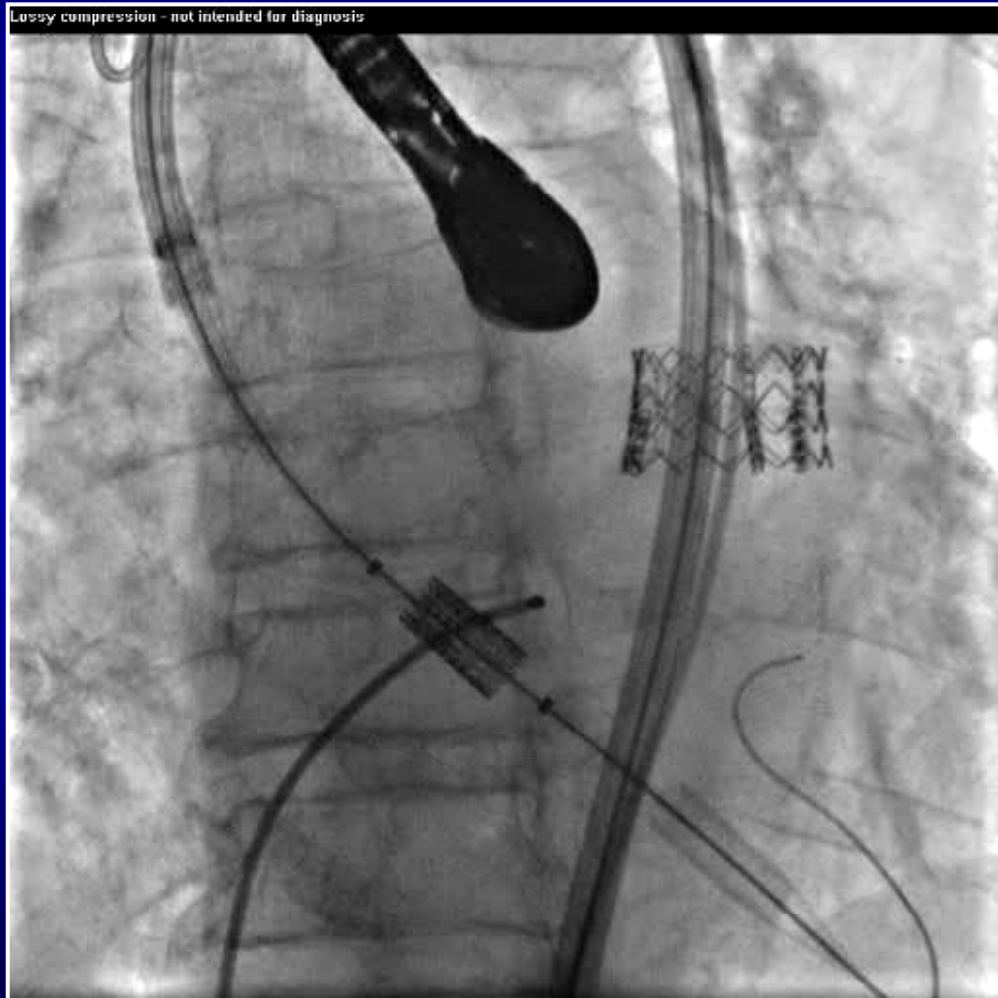
Lossy Compression - not intended for diagnosis



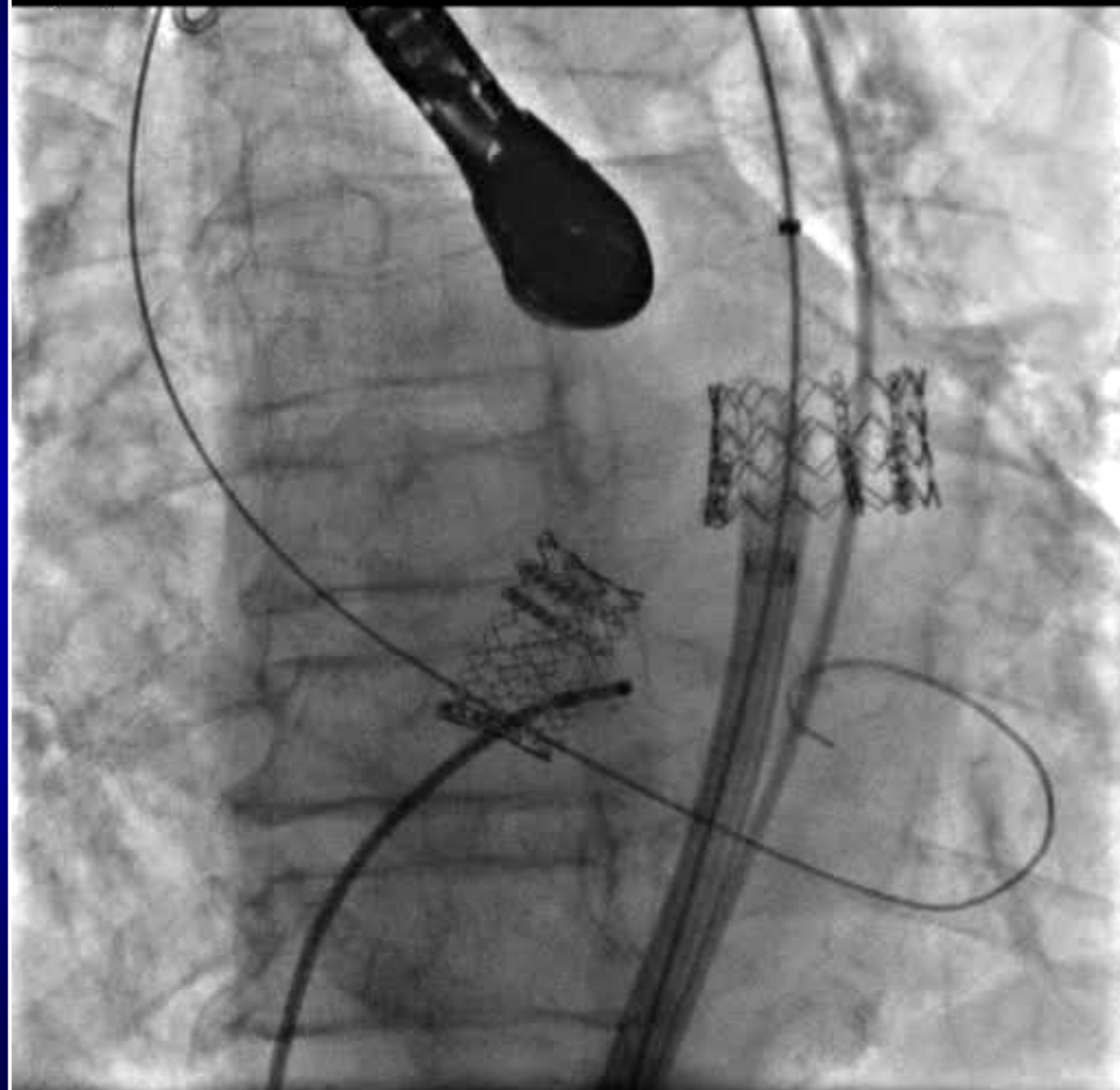
You can improve aortic angio by rapid pacing

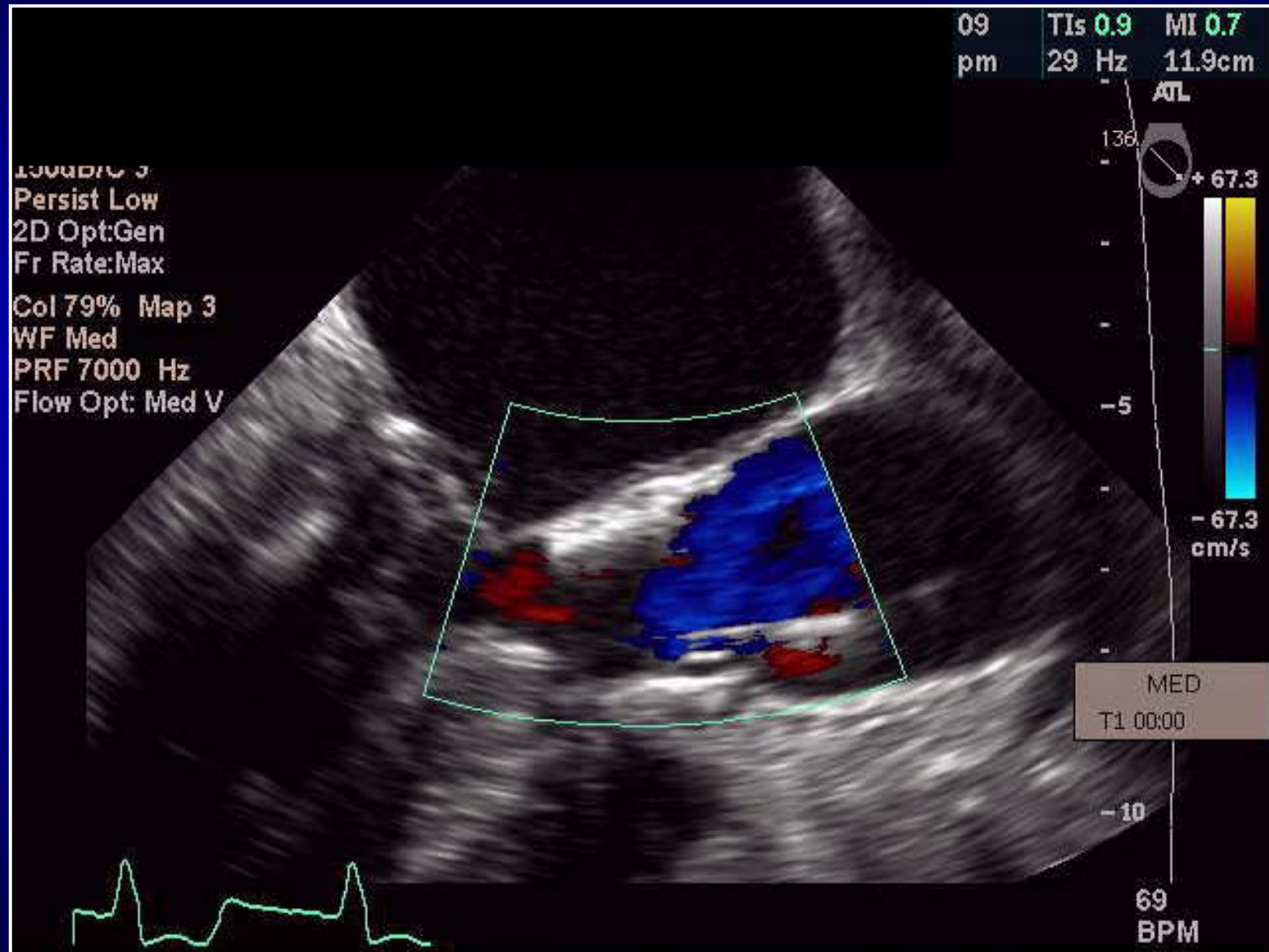


The second moment of truth..

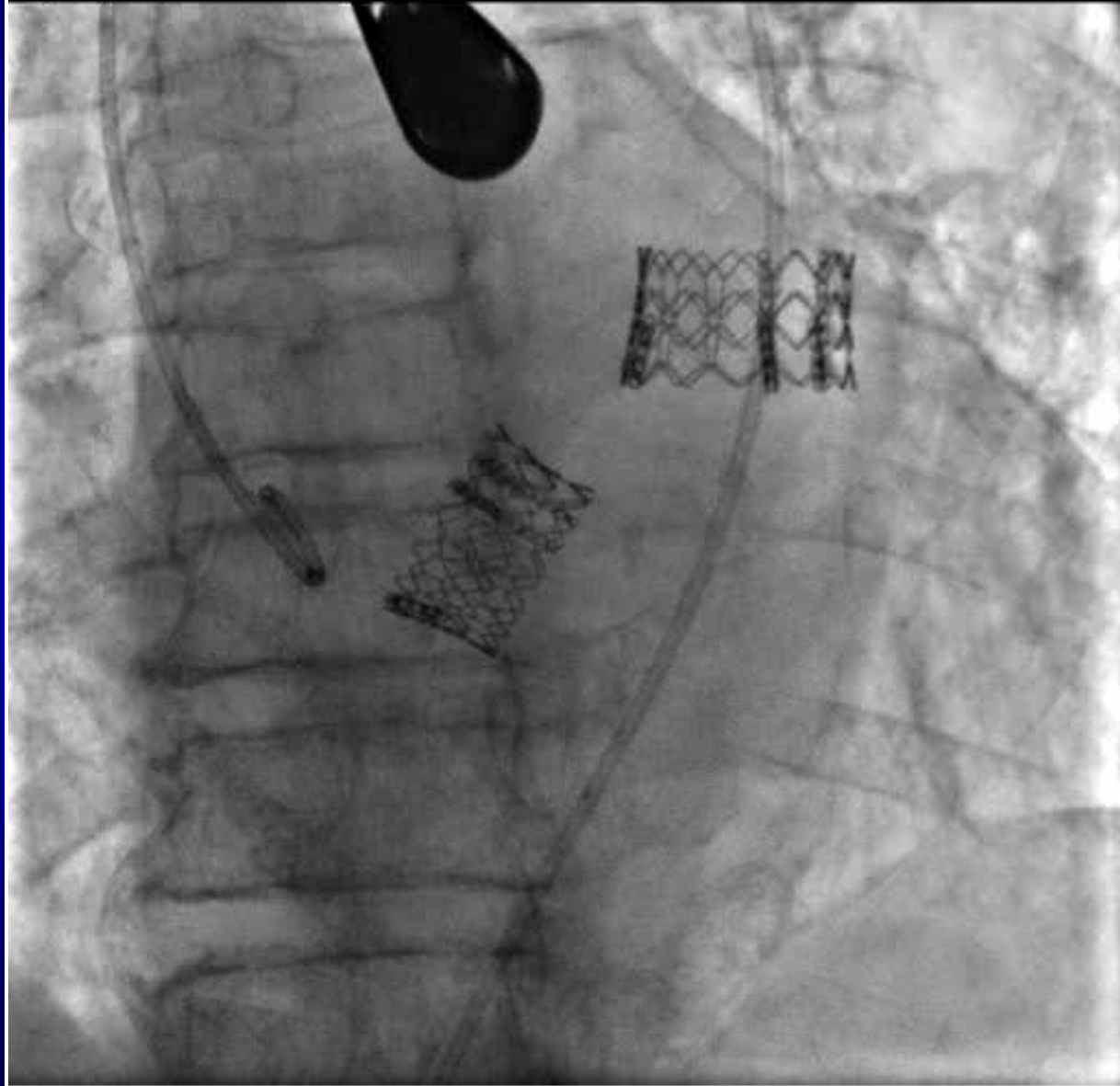


Lassy compression - not intended for diagnosis

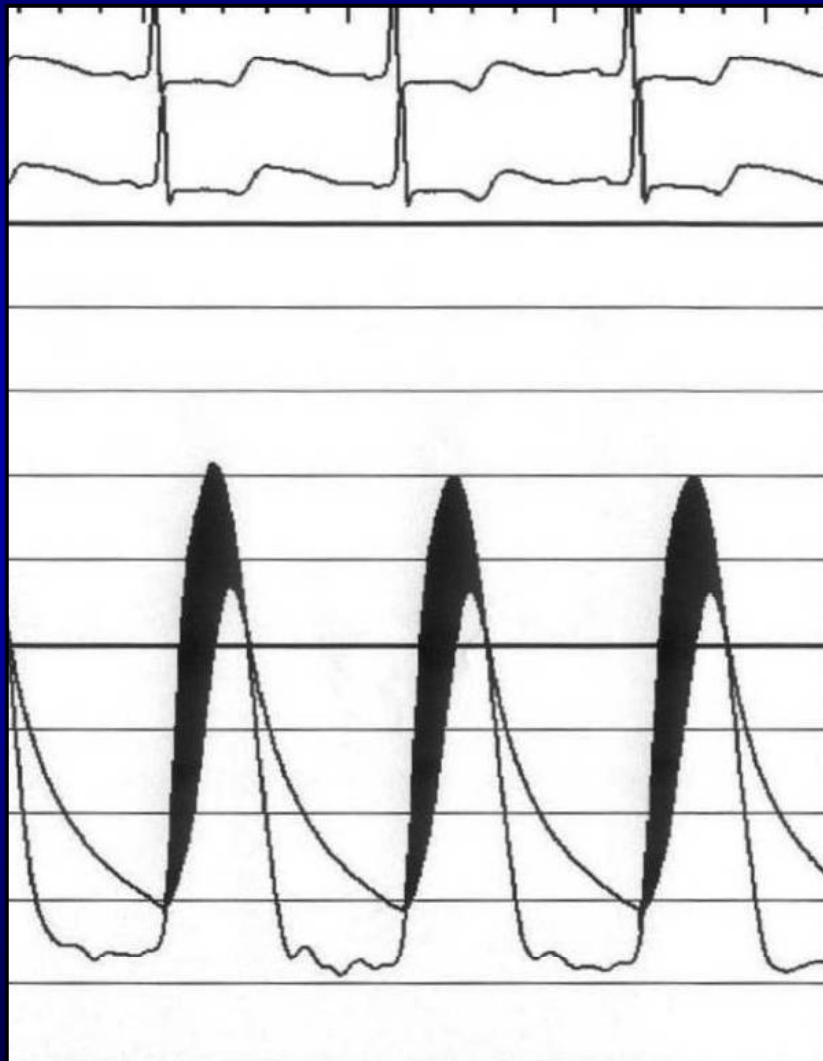




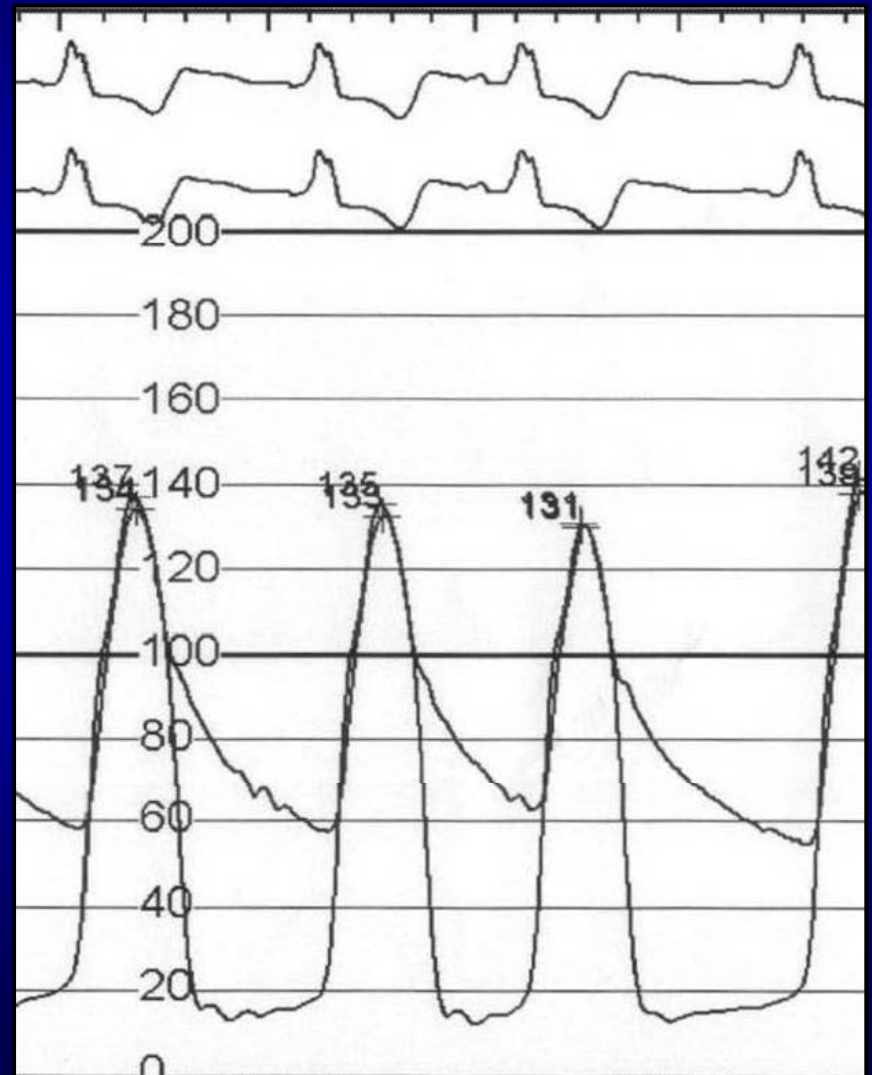
Lossy compression - not intended for diagnosis



Mean Gradient 35 mm Hg
Ao Valve Area 0.54 cm²



Mean Gradient 3 mm Hg
Ao Valve Area 1.7 cm²



Patient discharged home 40 hours after the
procedure

Causes of Valve Embolization

- Improper positioning-high start
- Inadequate reduction in blood and pulse pressure during rapid pacing
- Premature termination of rapid pacing
- Undersizing of the valve
- Insufficient calcium in the valve
- Thick bulging basal septum



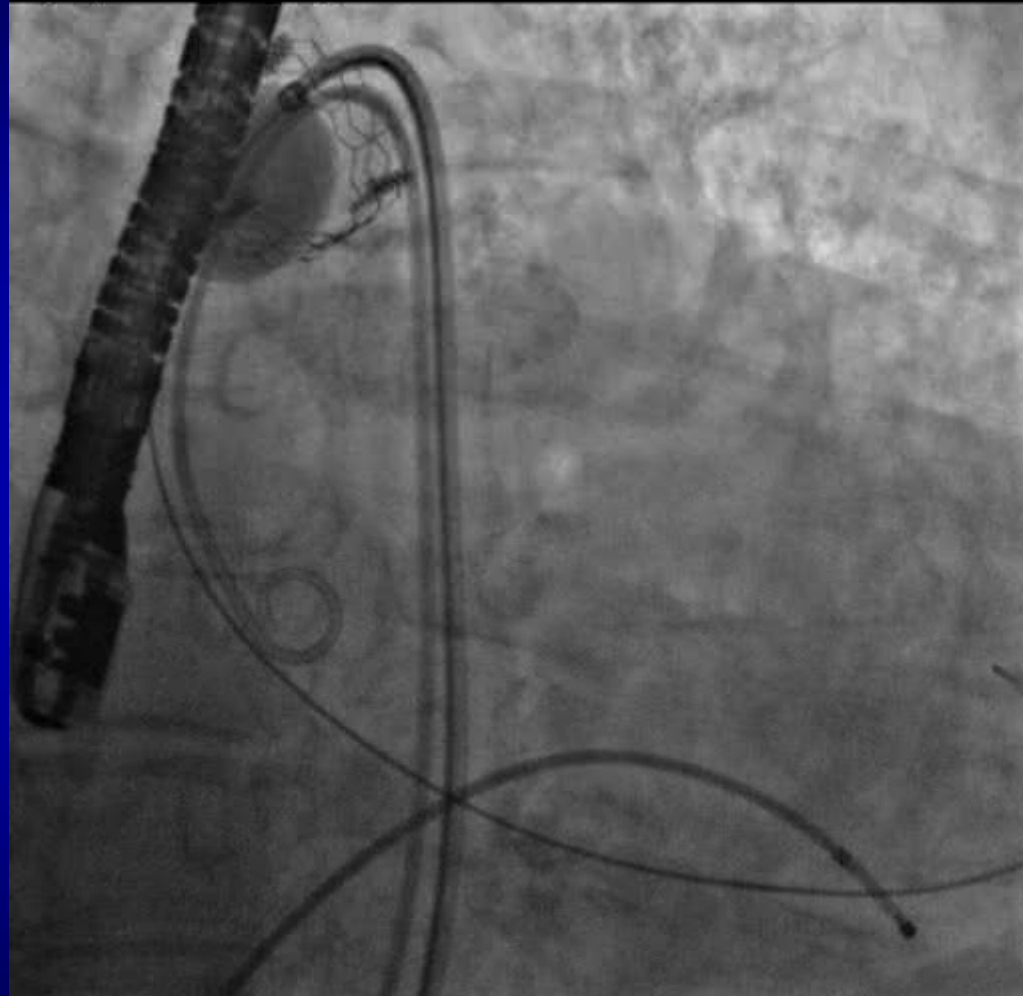
Take Home Points...

- Don't lose your wire position, very critical
- Take a moment and come up with a plan, don't panic. Pictures may look scary but the patient is generally stable
- Use a bigger balloon to drag the embolized valve as low as you can in the thoracic/abdominal aorta and deploy it
- Deploy another valve advancing the delivery system through the deployed embolized valve
- May or may not stent the embolized valve

“I got 2 valves for the price of 1”



Lousy compression - not intended for diagnosis

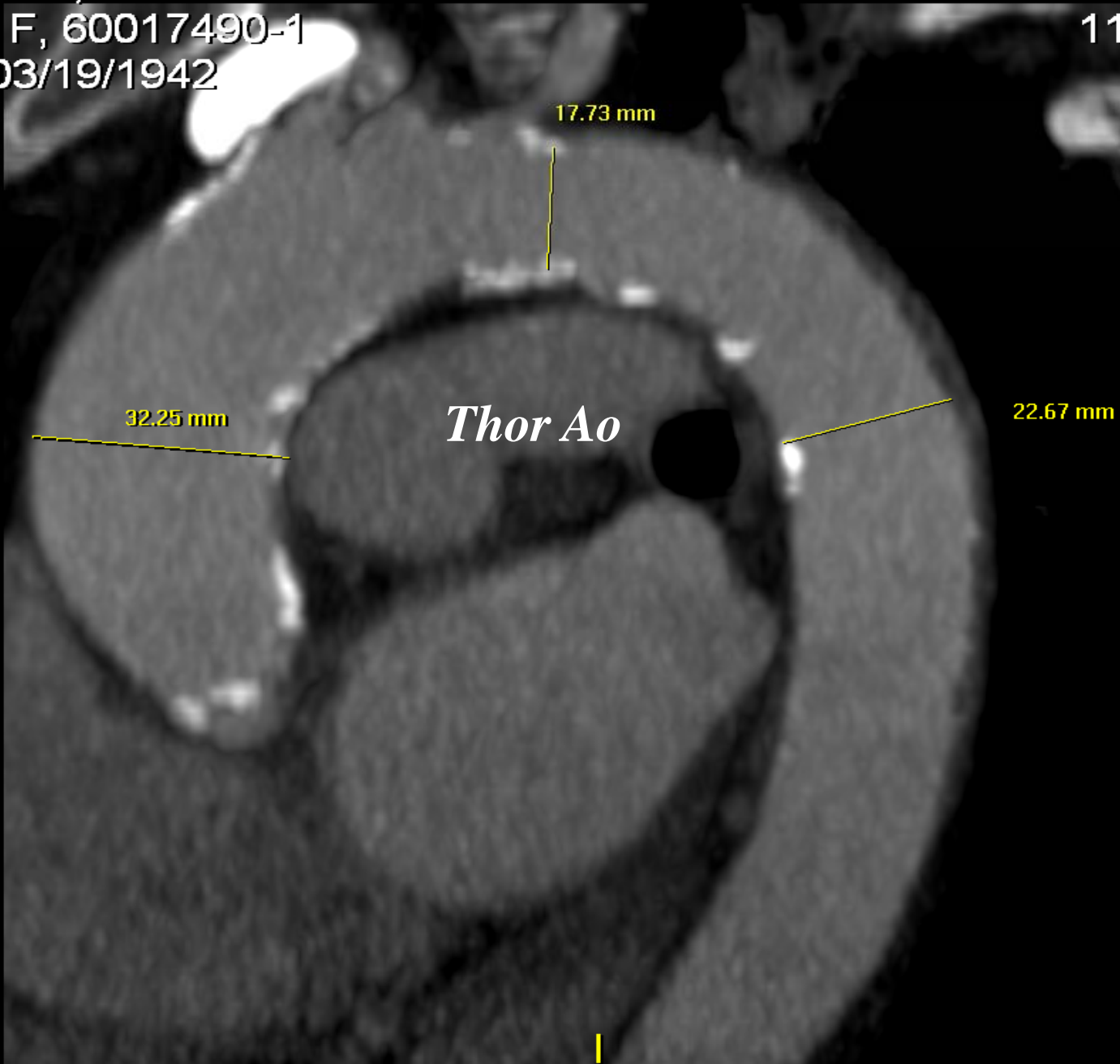


S

Westside Medical Imaging

11/17/2009

067Y, F, 60017490-1
DOB 03/19/1942



cm

5

P

A

W 958, L 398 73 bpm, 20 %, 164 ms/01_DrM_CTA_C_A_P/20% 2.0

Lossy compression - not intended for diagnosis



Lossy compression - not intended for diagnosis



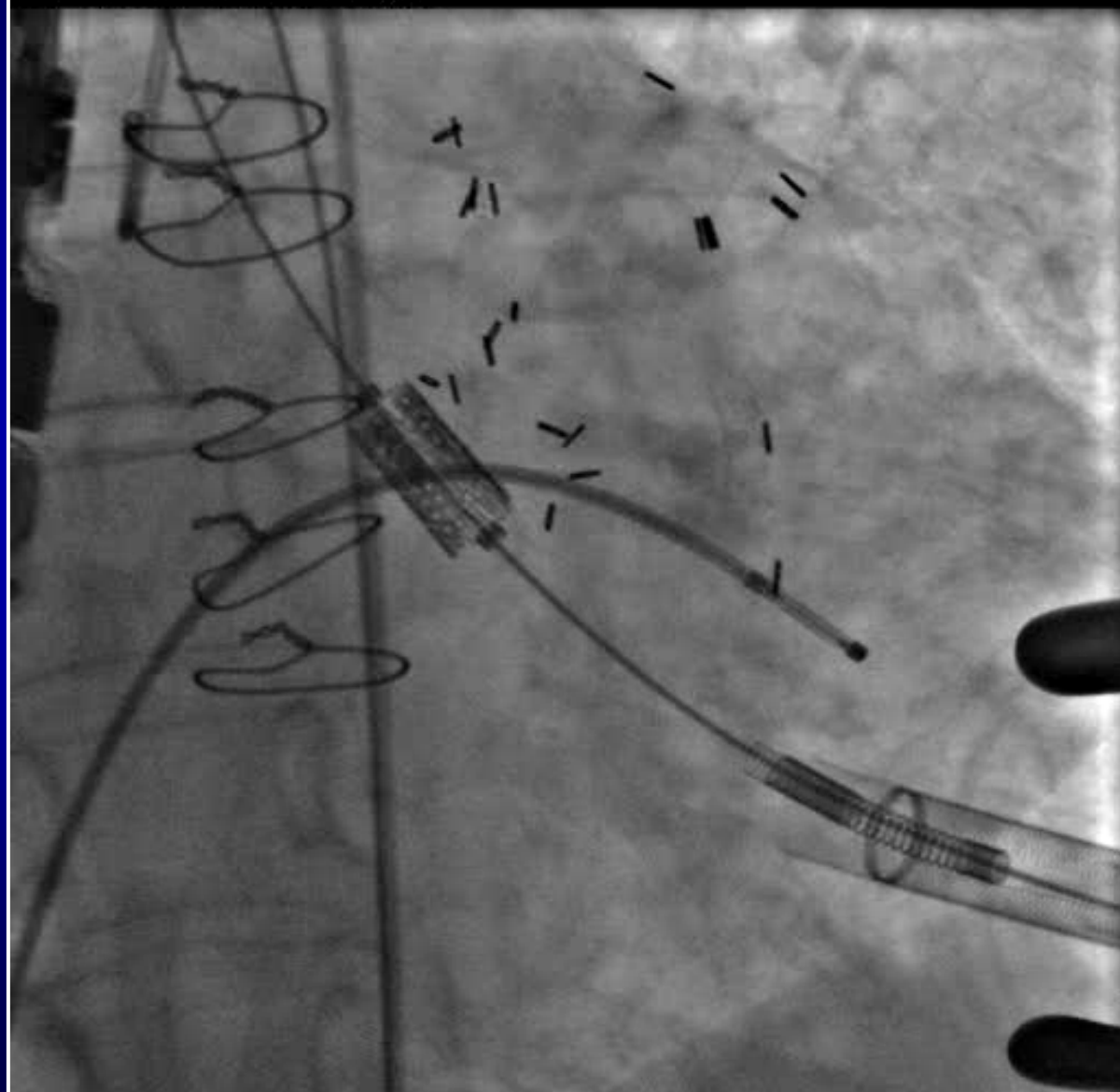
Lossy compression - not intended for diagnosis



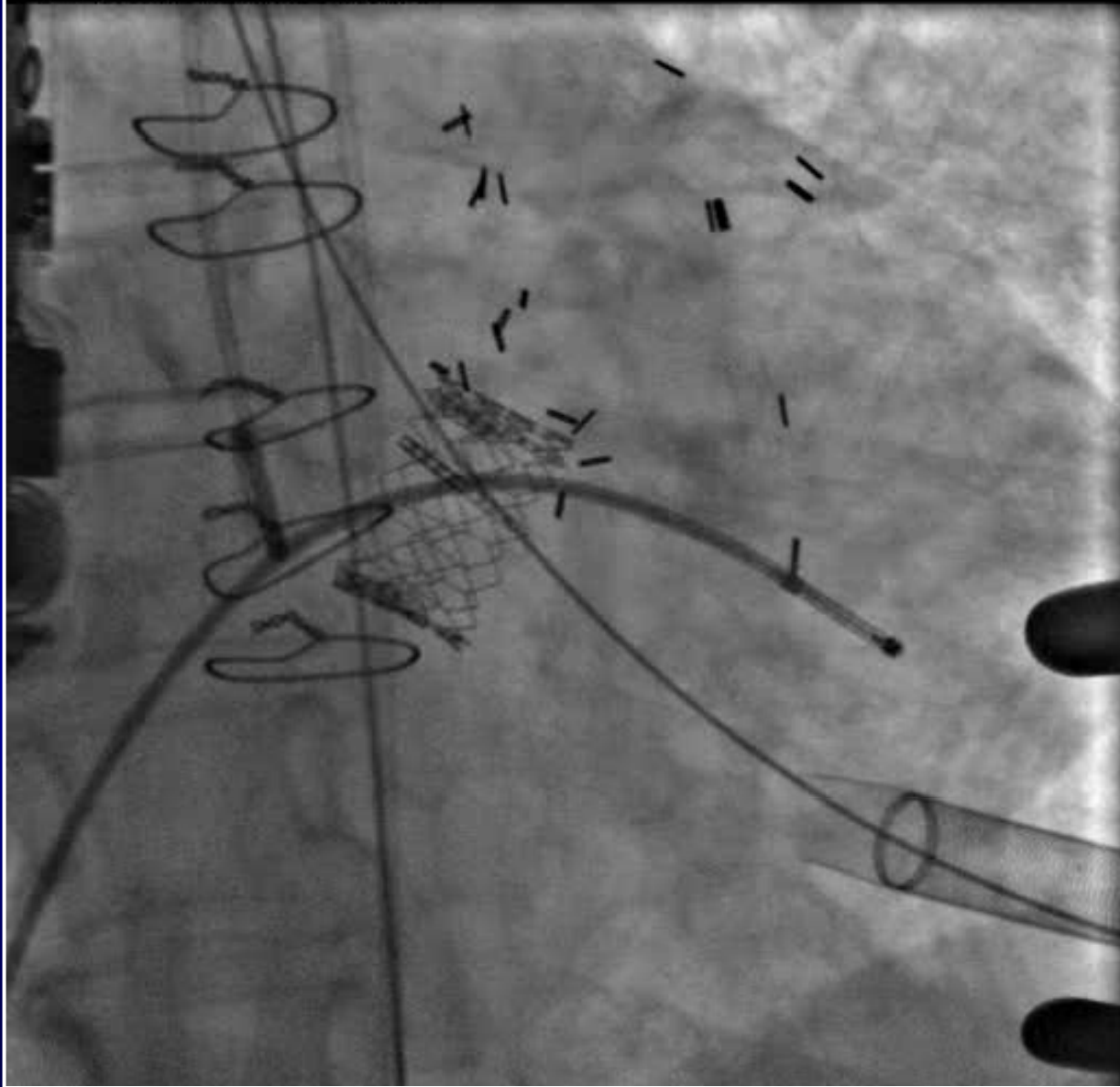
Take Home Points...

- Go back and look at the CT to get some clues
- Don't compromise the flow to the great vessels
- Important to anchor the embolized valve so it does not “tumble and reverse”
- Deploy the embolized valve with rapid pacing to minimize movement
- Poor visualization, lack of calcium are a setup for valve embolization
- Reliant balloon is a good device to have around

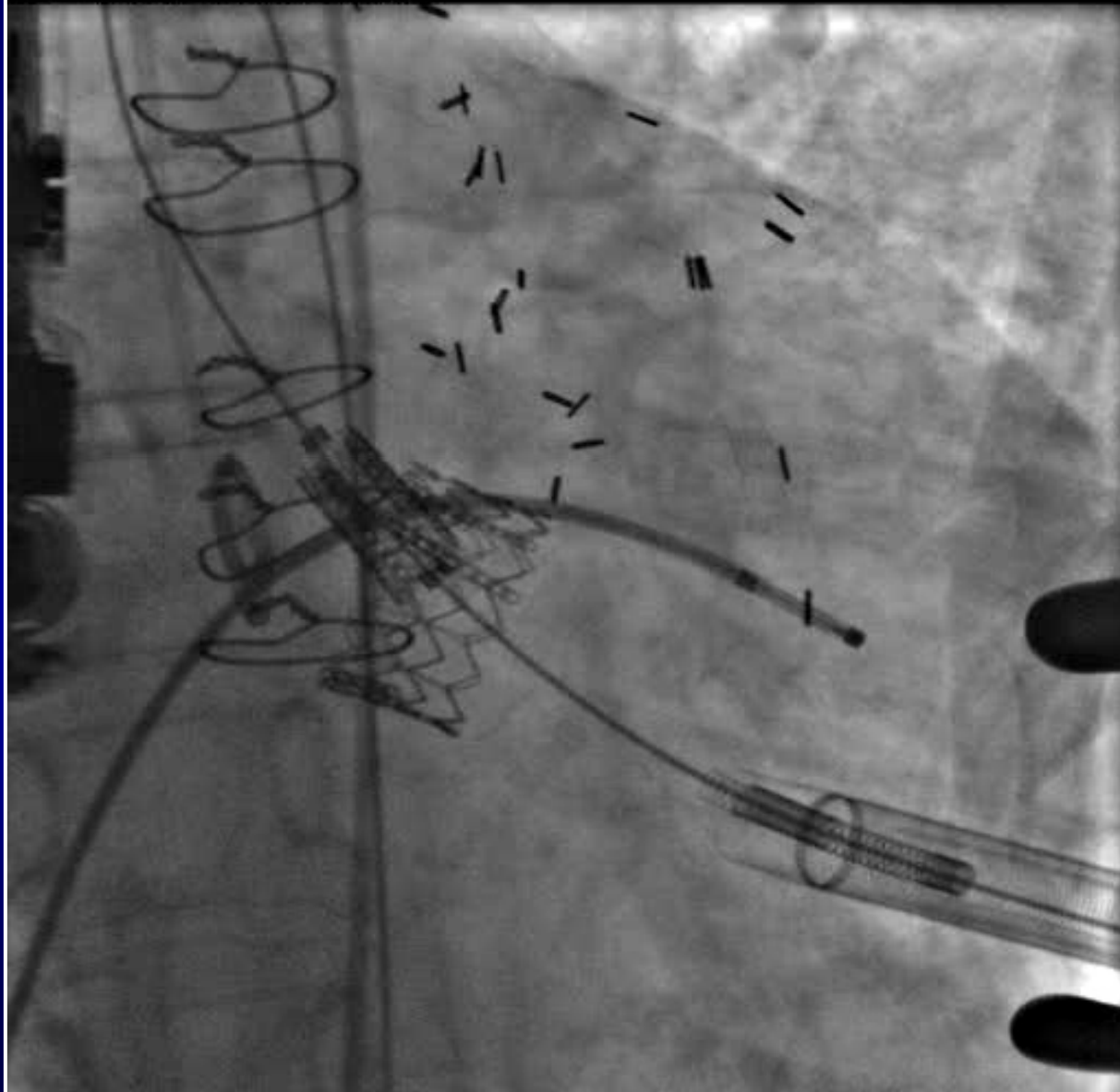
Lossy compression - not intended for diagnosis



Lossy compression - not intended for diagnosis



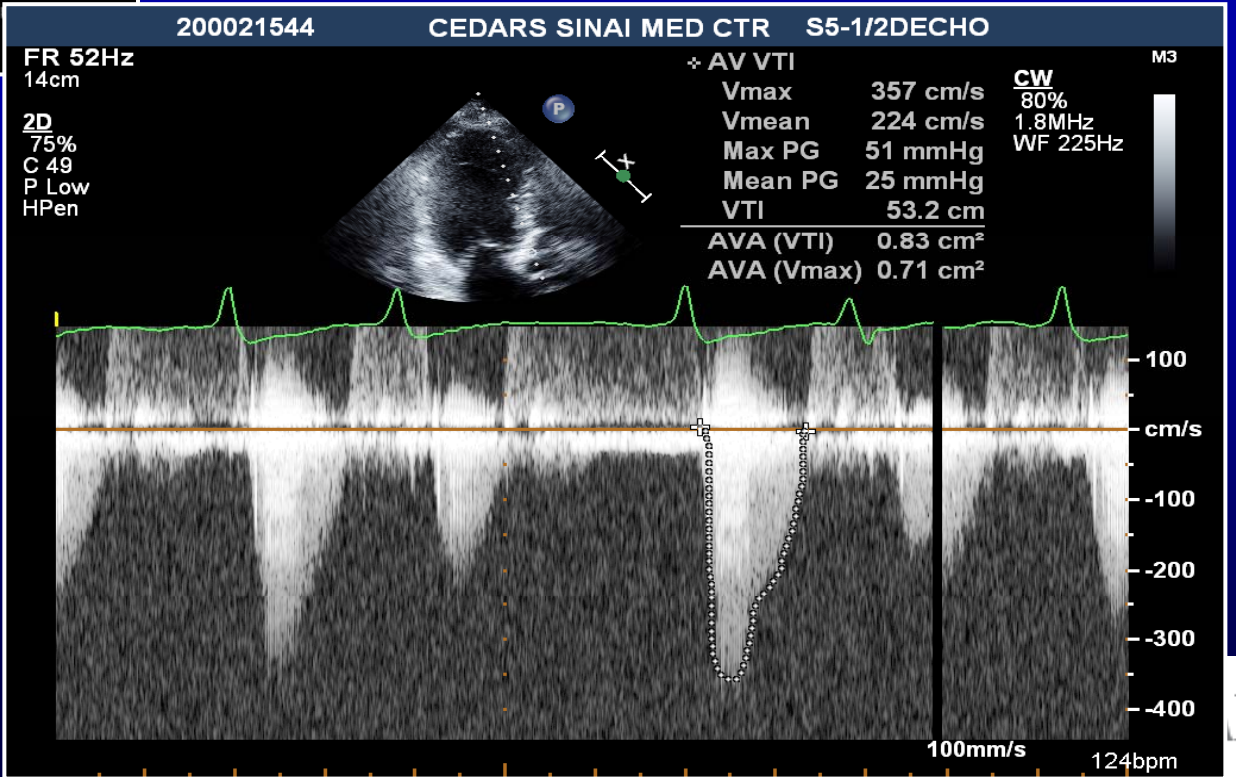
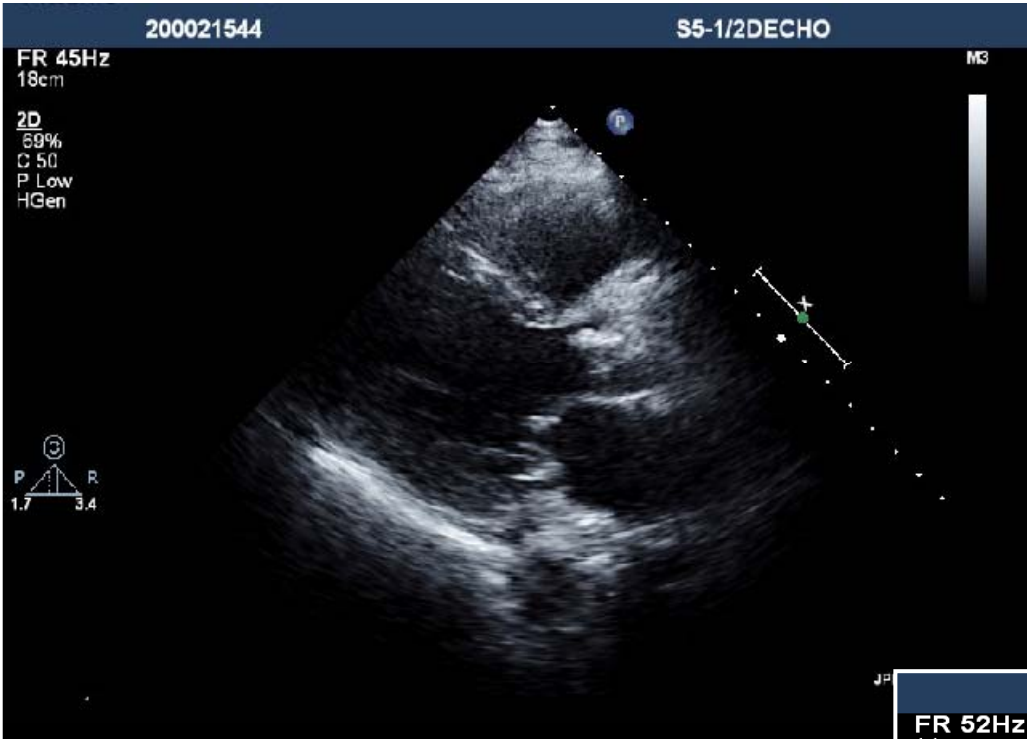
Lossy compression - not intended for diagnosis



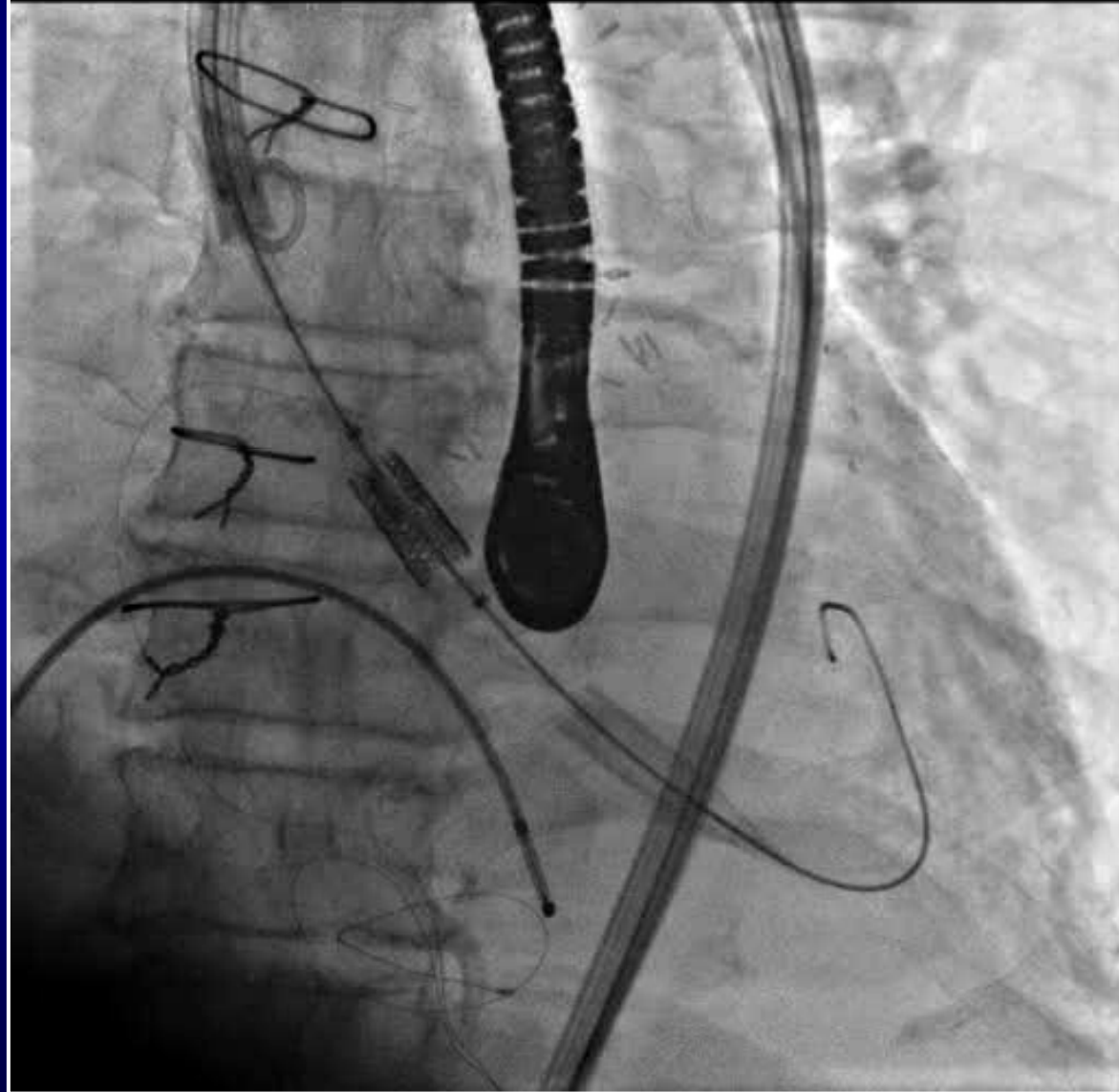
Lossy compression - not intended for diagnosis



81 y.o. male with history of severe AS, CAD s/p CABG, cardiomyopathy (LVEF ~20%), DM II.



Lossy compression - not intended for diagnosis



Hemodynamics: Severe AI

Baseline LV-Ao: Mean Gradient 25.3mmHg

Aortic Diastolic Pressure: 40 mm Hg

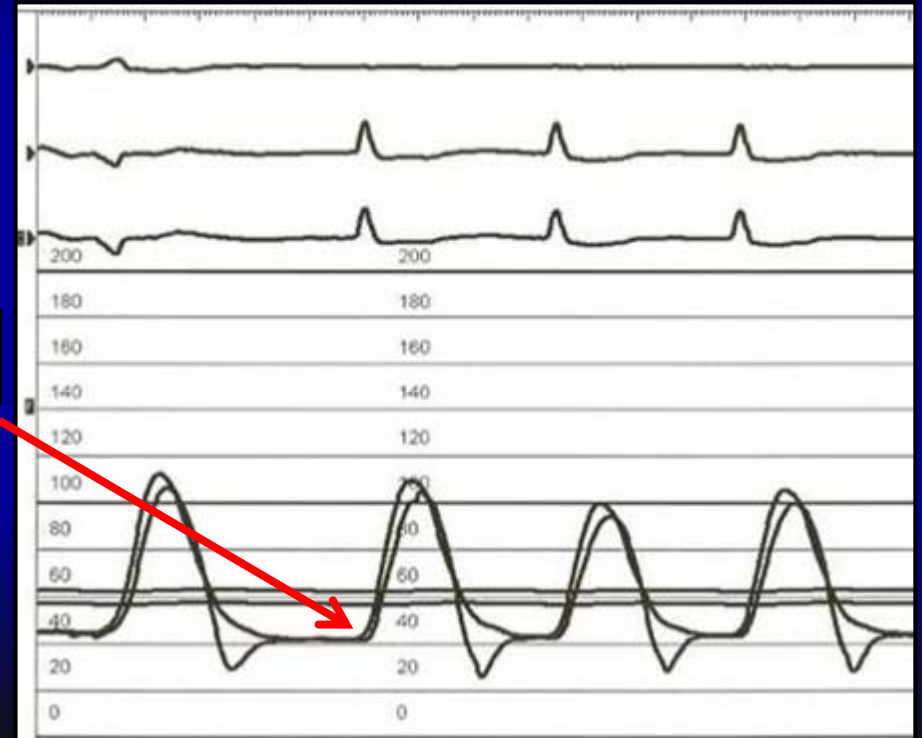
LVEDP: 20 mm Hg



Aortic Valve#1 Implantation:

Aortic Diastolic Pressure: 20 mm Hg

LVEDP: 20 mm Hg



**Diastolic
Pressure**

Map 3
150dB/C2
Persist Low
Fr Rate High
2D Opt:Res

BW 0 Pg 0
Col 0 Pg 0

ATL

47



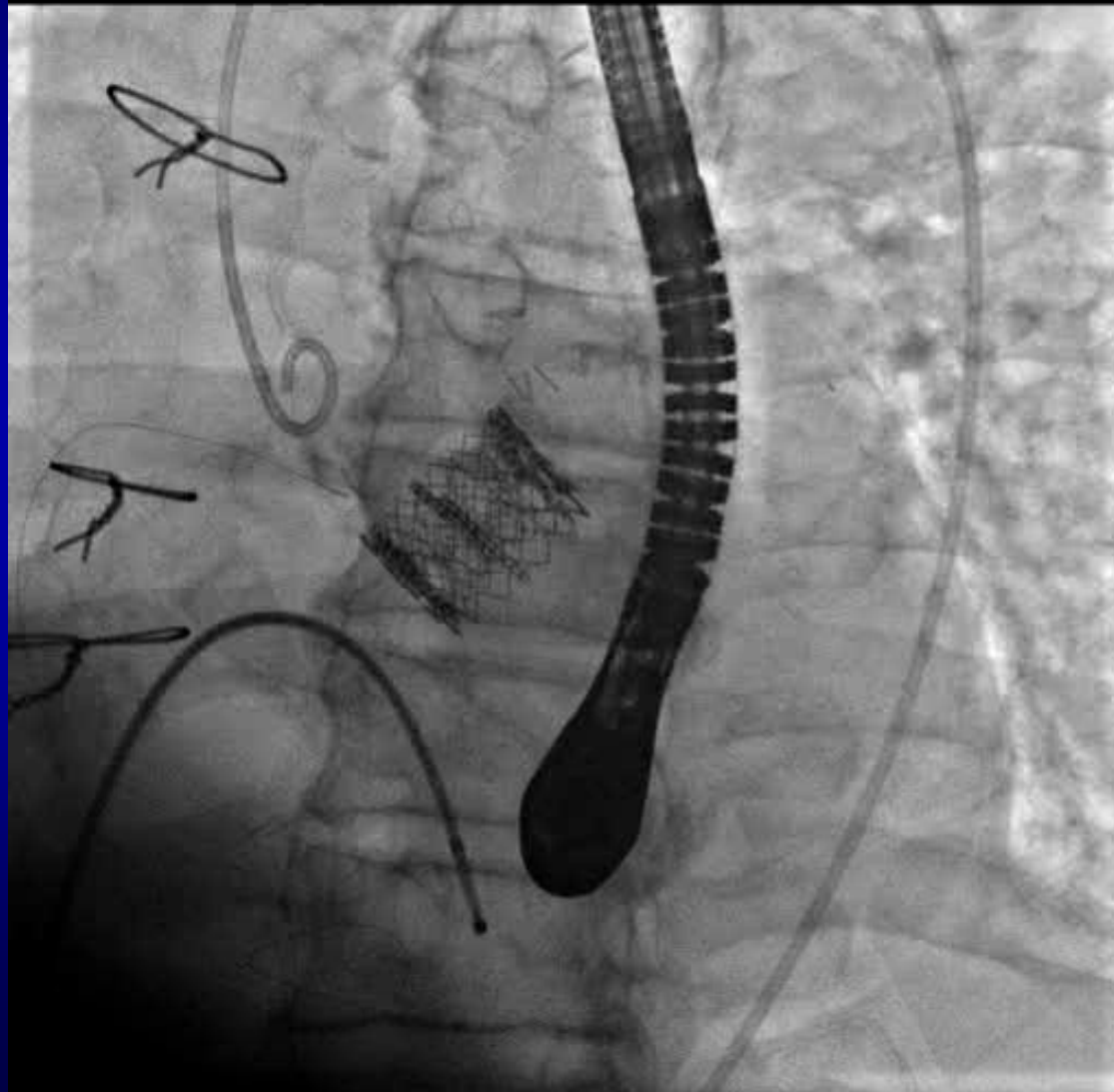
66
BPM

Lossy compression - not intended for diagnosis



After Valve-in-Valve

Lossy compression - not intended for diagnostic



Post Valve Deployment #2

Mean Gradient 2.44mmHg

AVA 2.99 cm sq

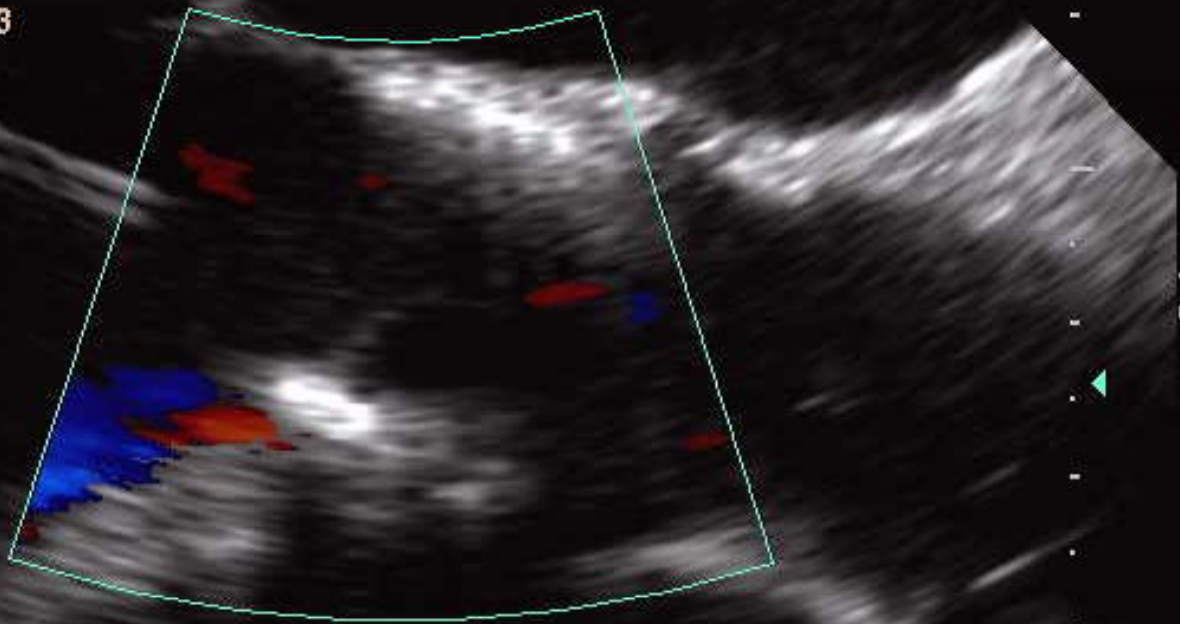


Map 3
150dB/C3
Persist Low
Fr Rate High
2D Opt:Res

BW 0 Pg 0
Col 0 Pg 0

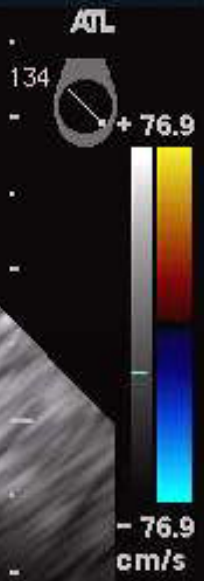
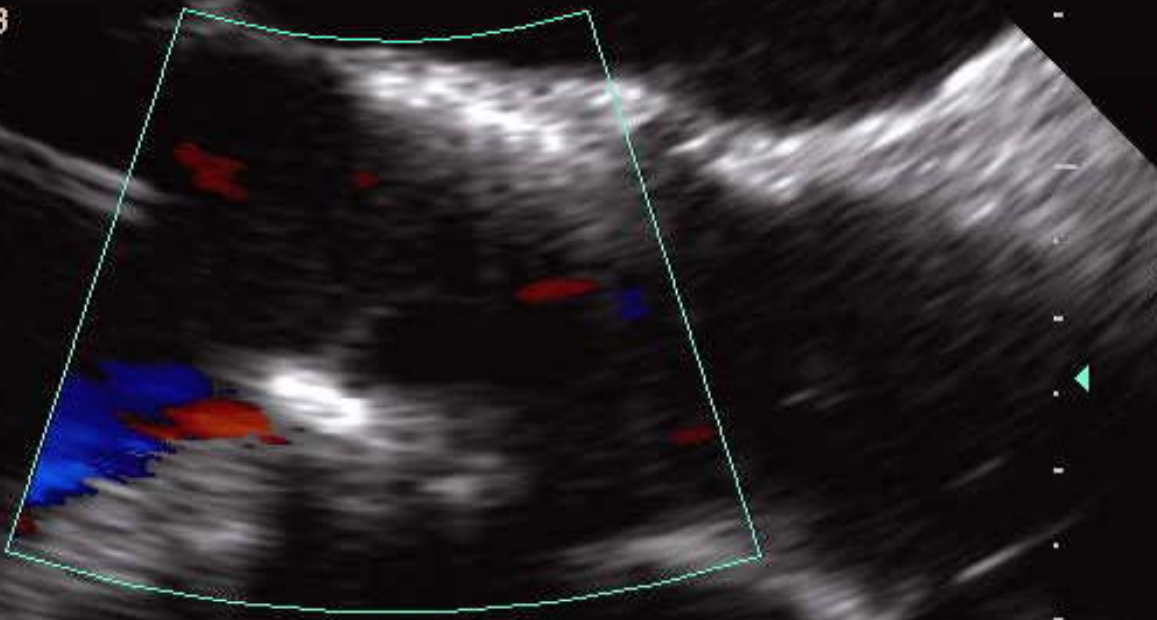


Map 3
150dB/C3
Persist Low
Fr Rate High
2D Opt:Res
Col 78% Map 3
WF Med
PRF 8000 Hz
Flow Opt: FR
BW 0 Pg 0
Col 0 Pg 0



68
BPM

Map 3
150dB/C3
Persist Low
Fr Rate High
2D Opt:Res
Col 78% Map 3
WF Med
PRF 8000 Hz
Flow Opt: FR
BW 0 Pg 0
Col 0 Pg 0



L

68
BPM

Take away..

- Look at the Echo, TEE is useful postdeployment
- Assess the hemodynamics-LVEDP and diastolic BP
- Think Valve-in Valve for rescue. Be quick..
- But careful and coaxial thru the first valve so you don't push the first valve down into the LV