

Transcatheter Pulmonic Valve Implantation

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Forssman ~1929



Hybrid lab - 2009



Transfemoral Edwards AVR

The Edwards SAPIEN
Transcatheter Heart Valve

Transfemoral Procedure Using the
RetroFlex Delivery System



Edwards

Transapical Edwards AVR

The Edwards SAPIEN
Transcatheter Heart Valve

Transapical Procedure Using the
Ascendra Delivery System

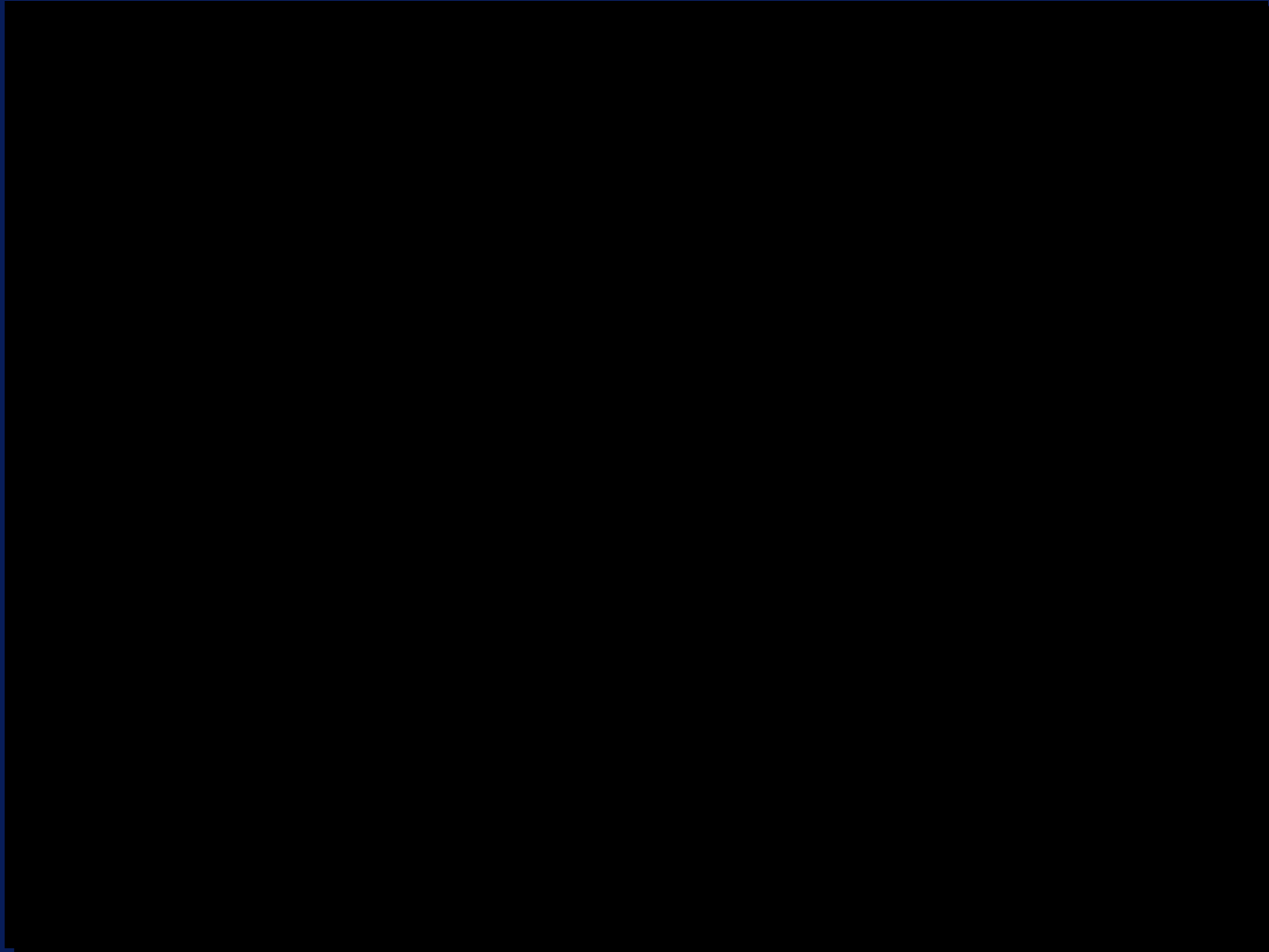


Edwards

E-valve Mitral Clip



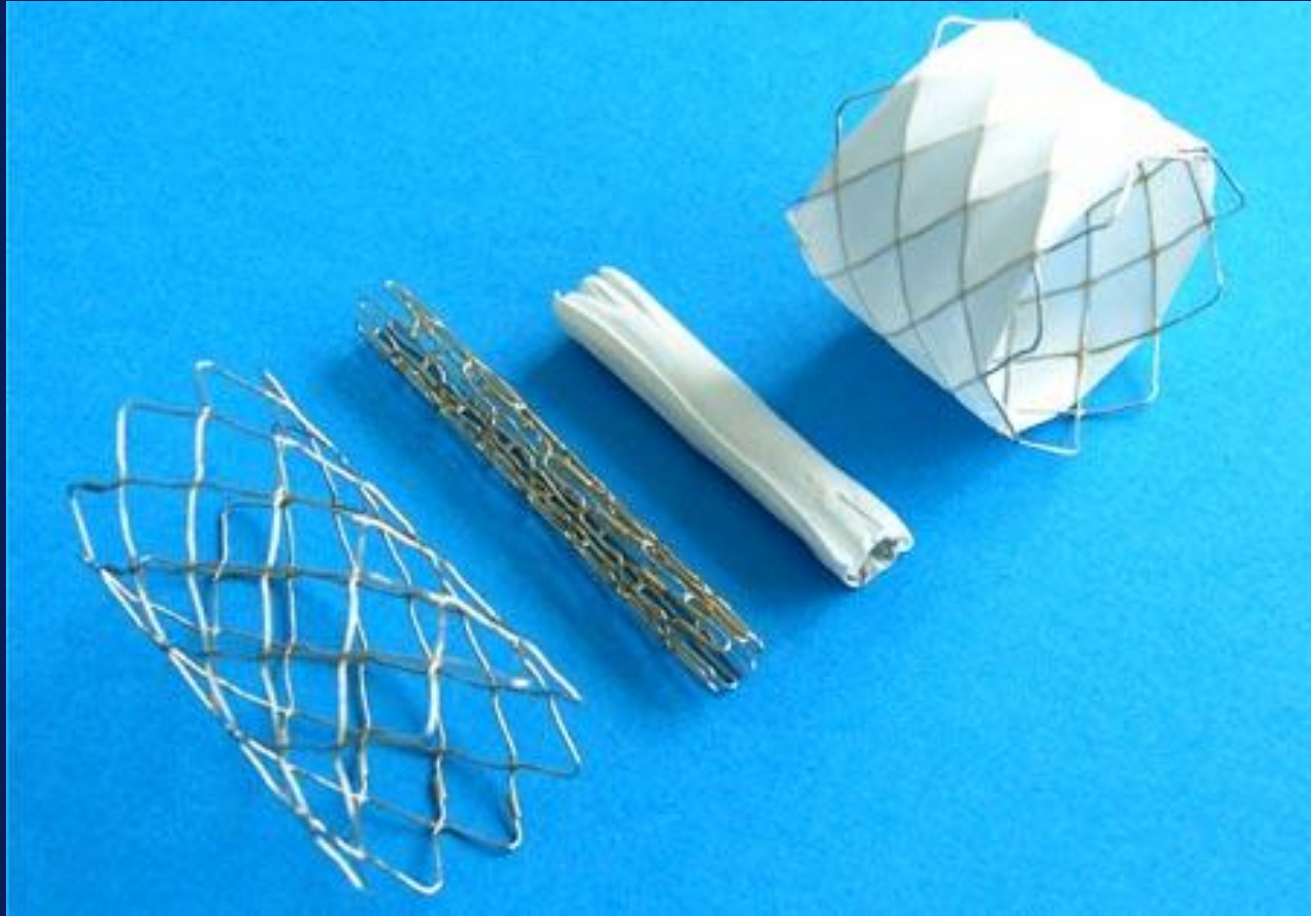
Medtronic Melody PVR



Melody valve for RVOT

- Bovine jugular vein
 - Stitched to a platinum iridium stent [CP]
 - Implantation in RV-PA homograft
 - One size valve for a 18-22mm* range
 - 22Fr delivery system – 18-22mm
 - Requires special equipment and personnel
-

Covered CP stent



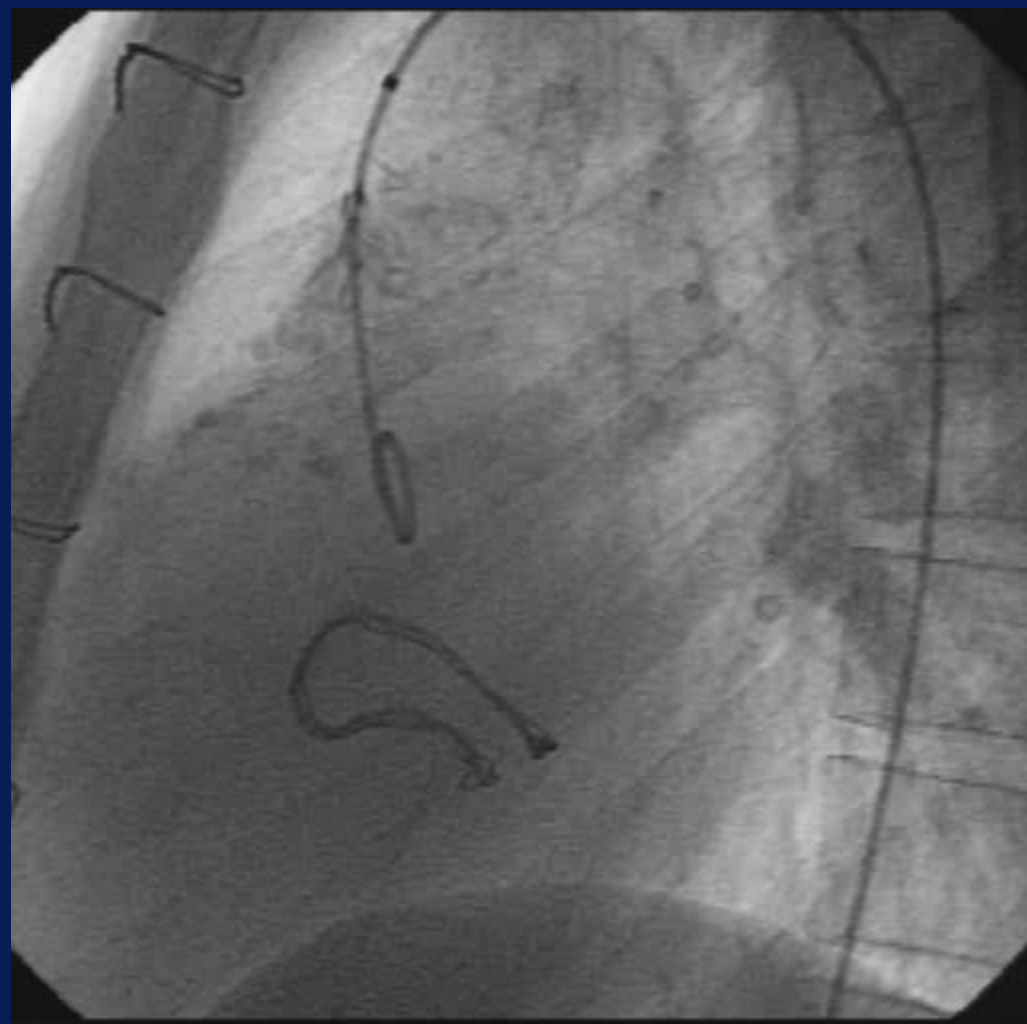
Methods

- General anesthesia
- Percutaneous access to femoral artery and vein*
- Heparin and Abx
- Hemodynamics and Angiography
 - diameters and length of conduit
 - relative position of coronaries
- Often requires pre-stenting

* [RIJ]

Methods

- 25 pts [15M, 10F] requiring intervention for homograft [RVOT] malfunction – stenosis / regurgitation
 - median age 16.9 years [10.5 - 32.4]
 - median wt 65 kgs [26-137]
-



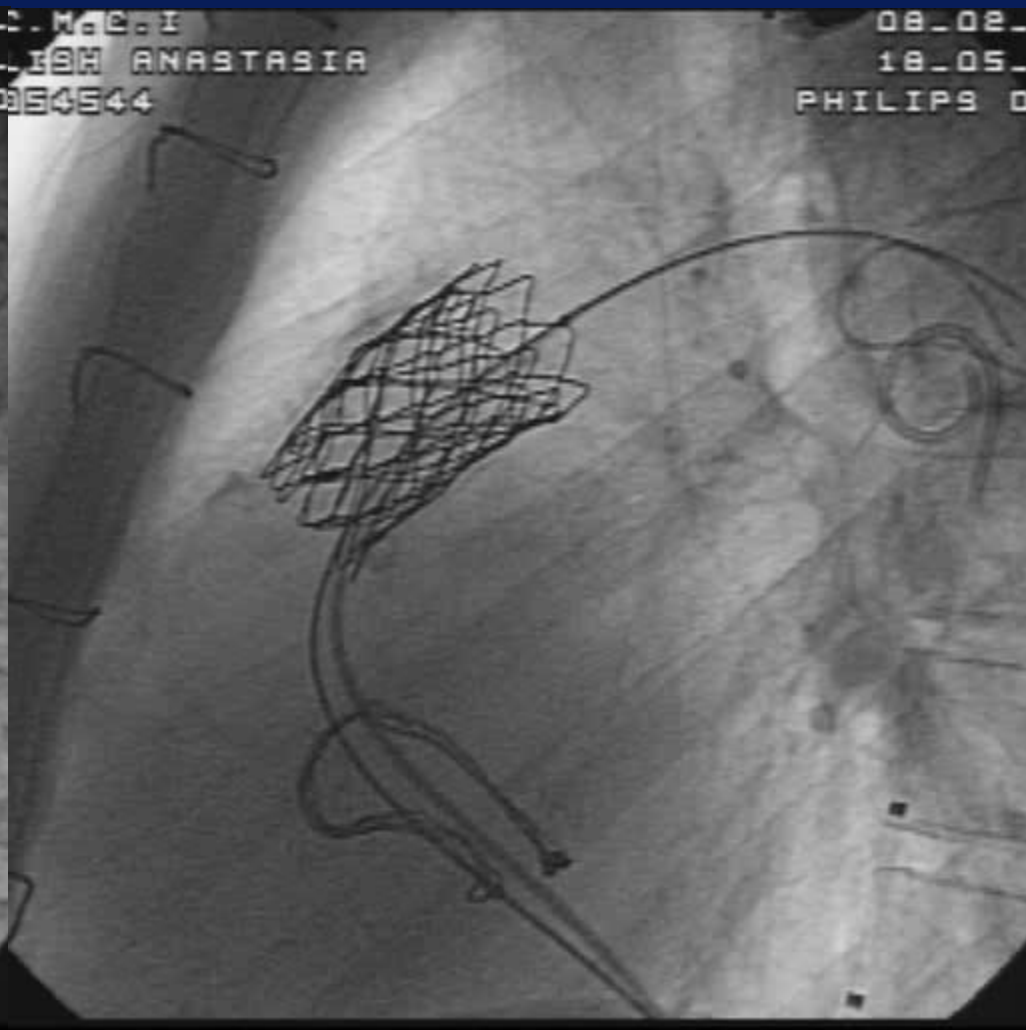
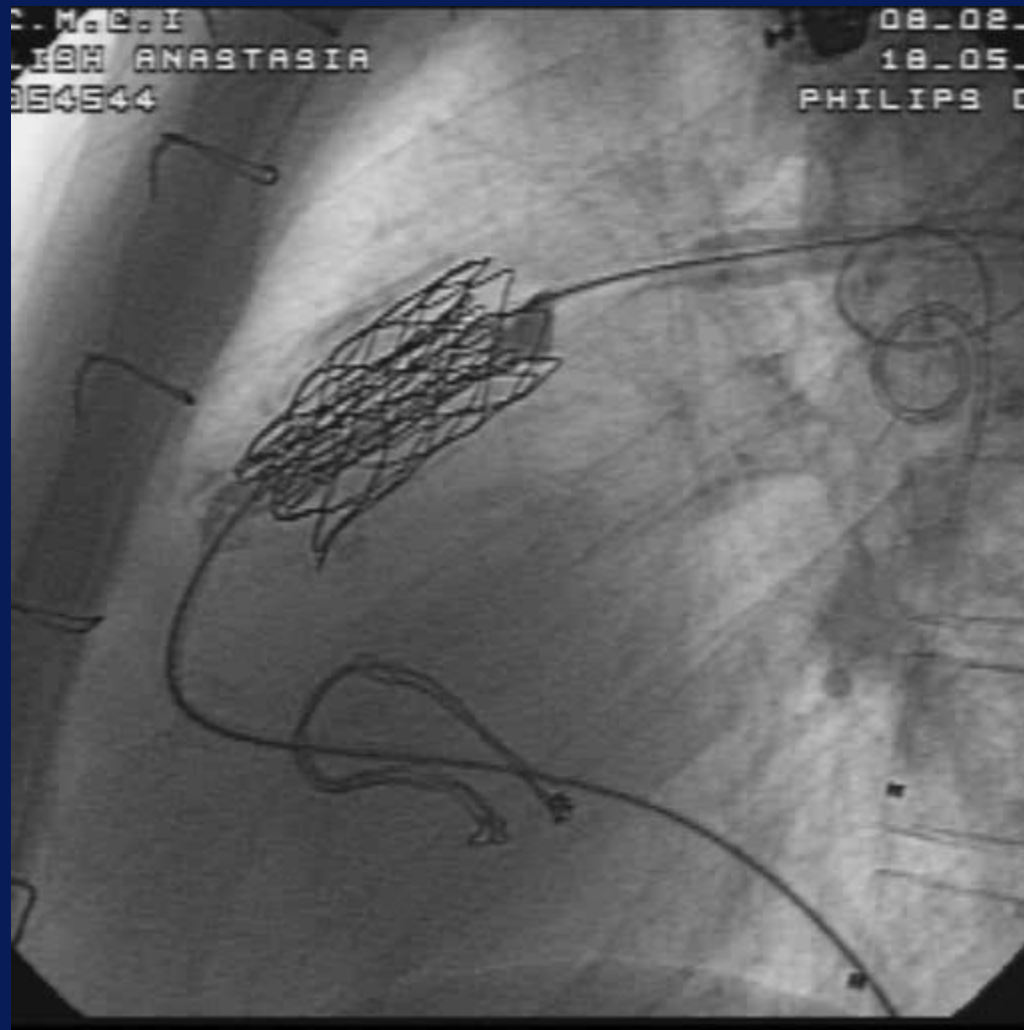
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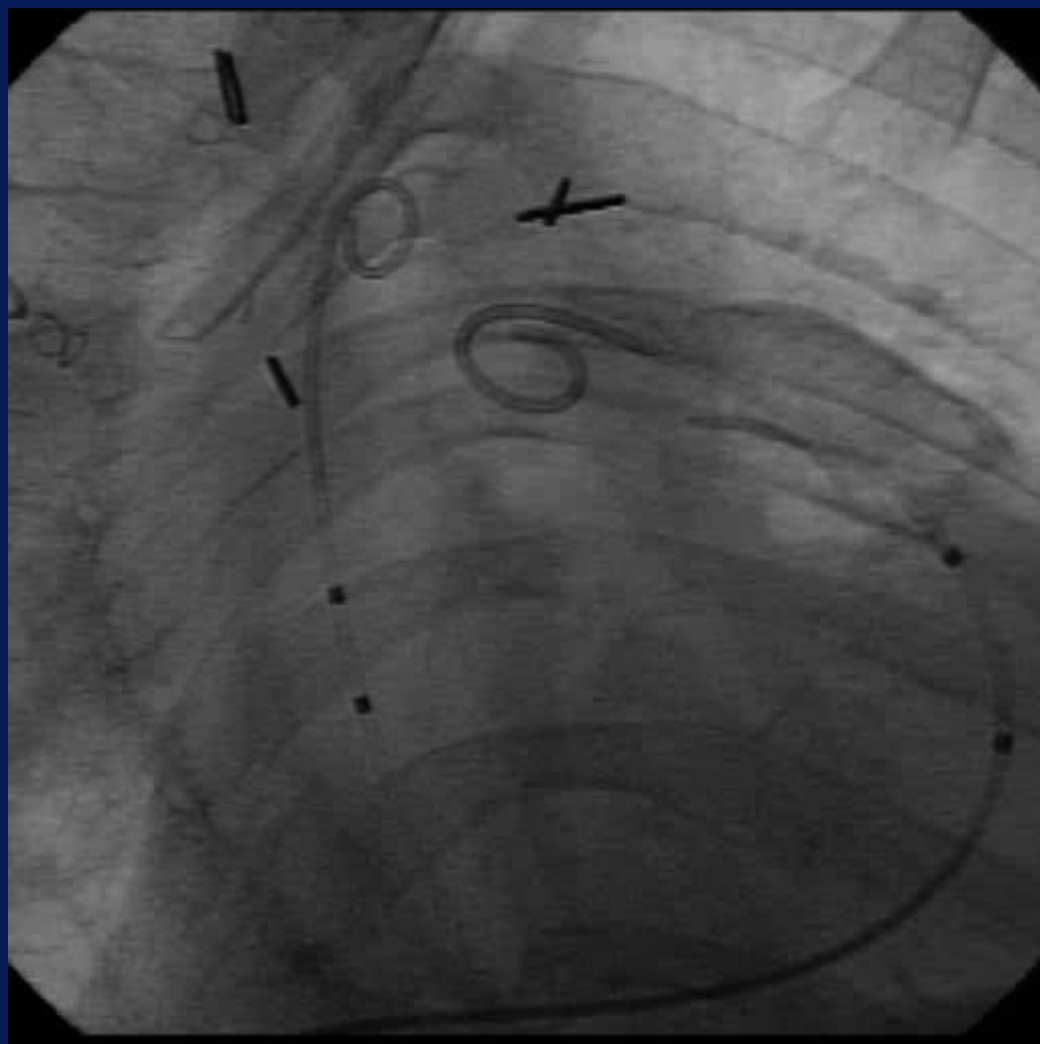
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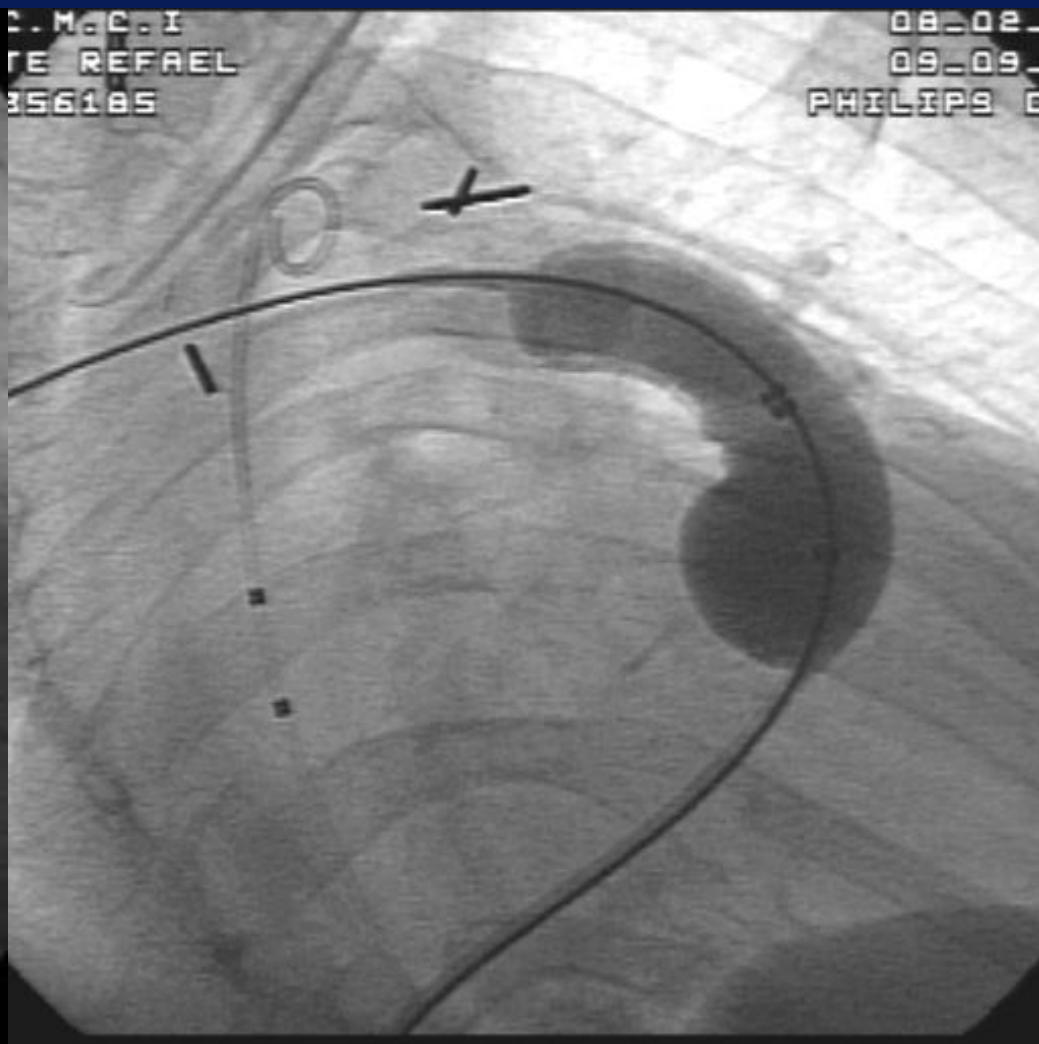
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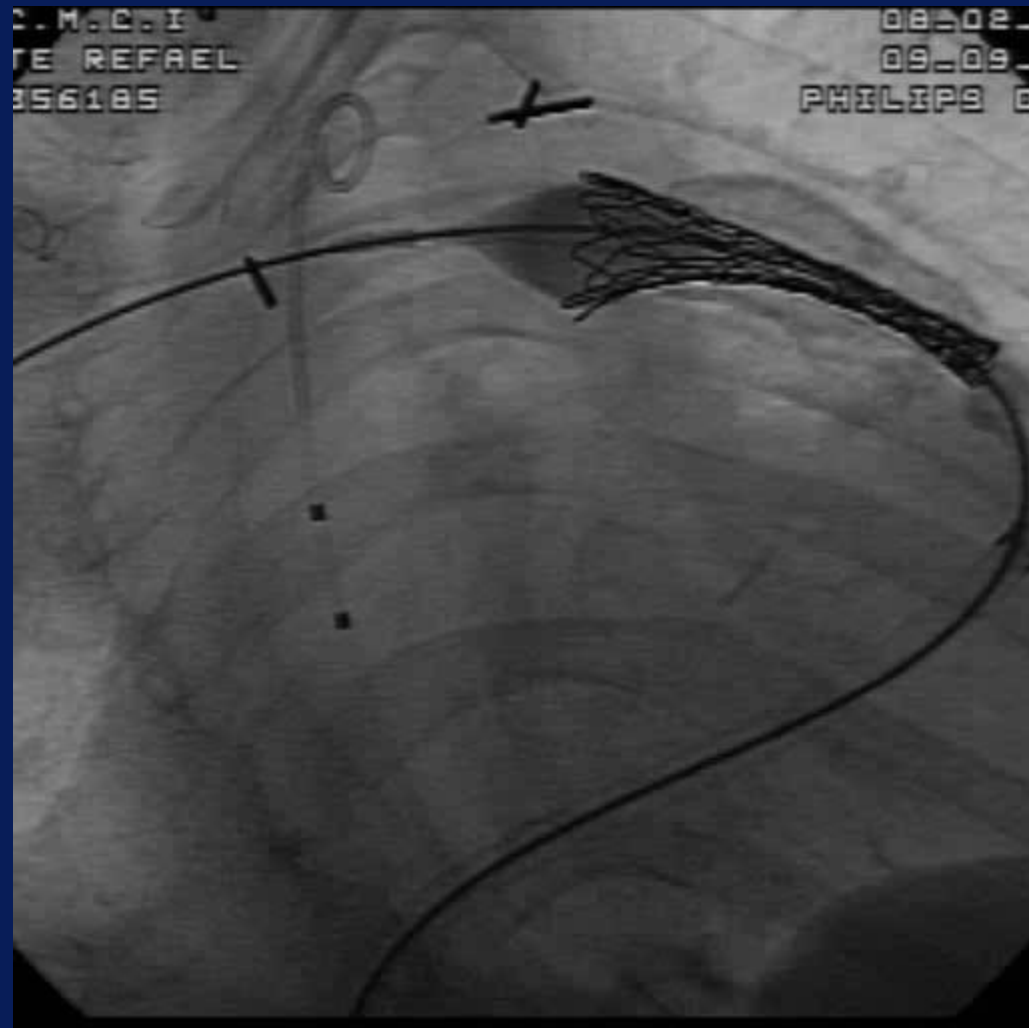
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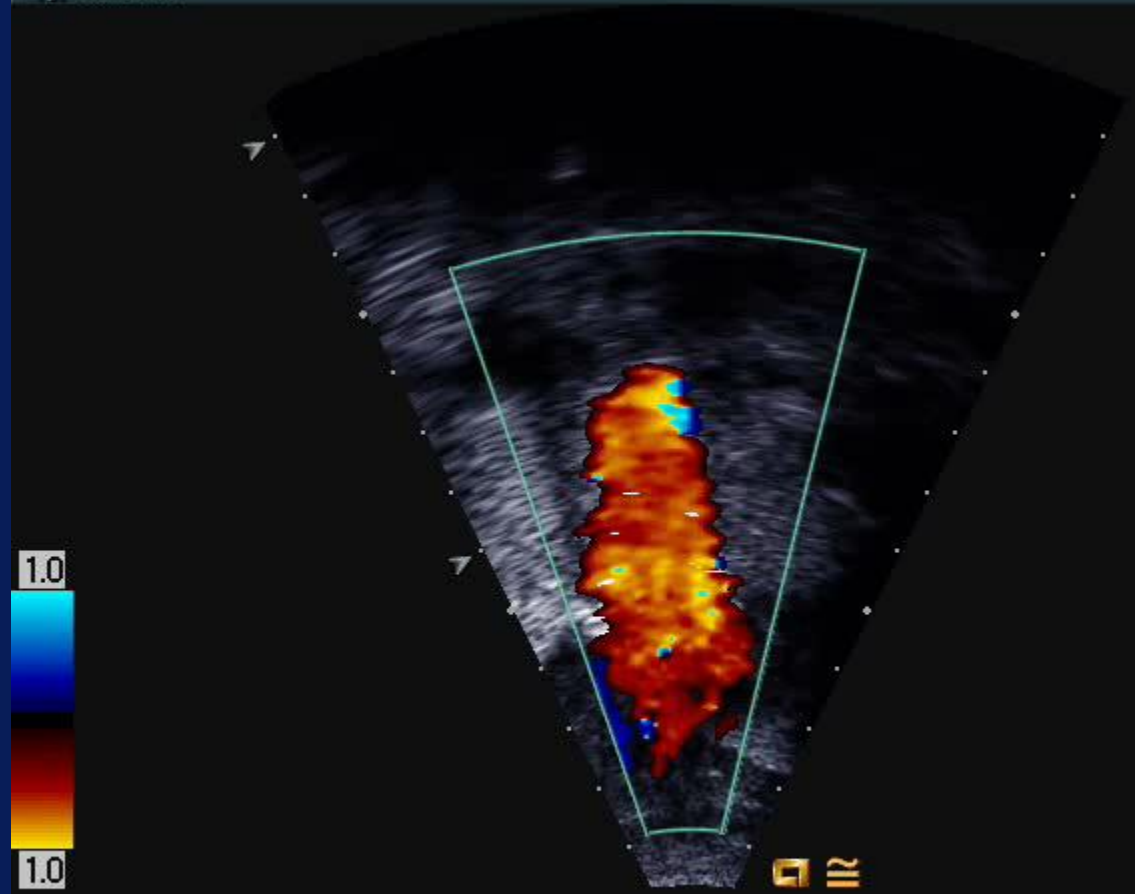
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BOTA REFAEL: 20356185
SCMCI

16 Dec 07

1:47:39 pm

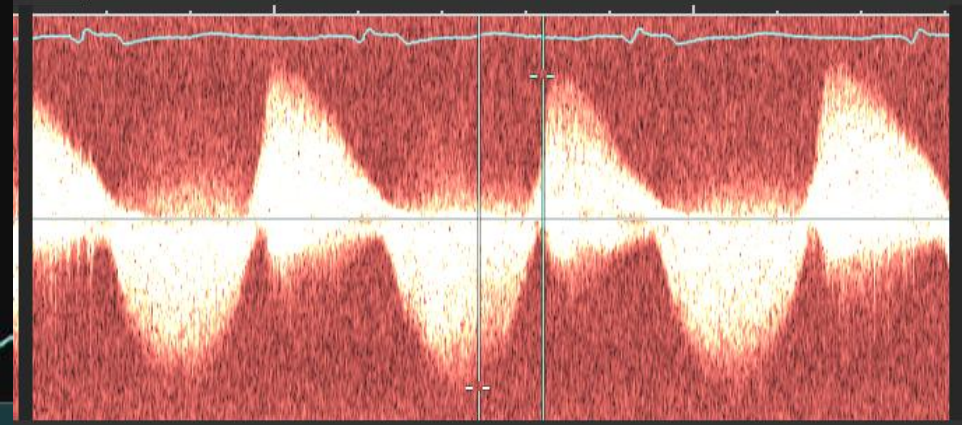


1 • /+1/0/ 2
Focus= 60mm
Gain= 12dB
= -3.22m/s
= 41.6mmHg
= 2.72m/s
= 29.5mmHg

2.5MHz



5V2c
H5.0MHz
Ped Echo SCMCI
General
Store in progress
HR= 91bpm
Sweep=100mm/s



CD Pan

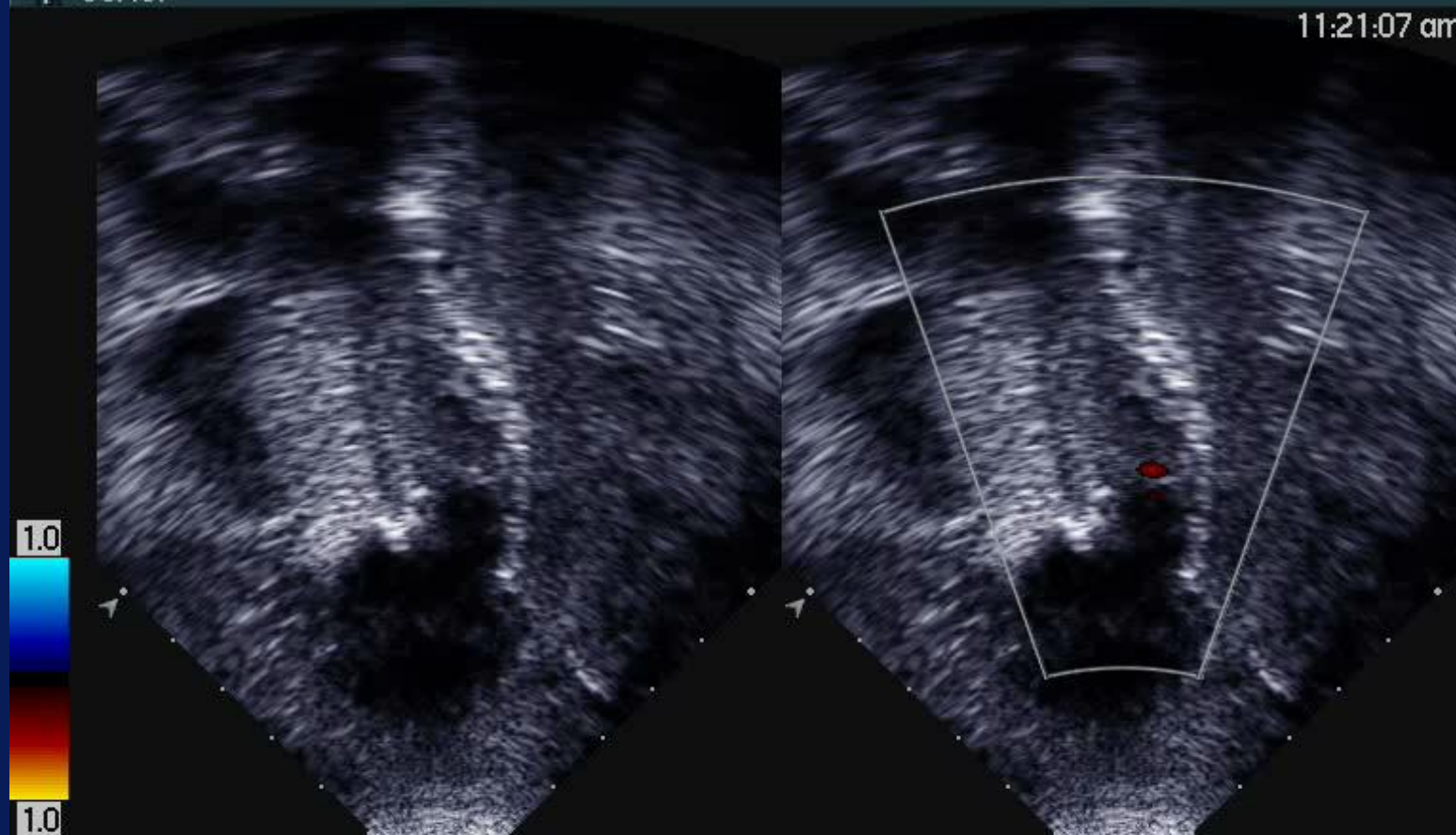
/ ΔDCal Delete Set Lock Set



BUTA REFAEL: 20356185
SCMCI

20 Feb 08

11:21:07 am



1.0

1.0



HR=120bpm



Speed ↑

Speed ↓

Normal

Run/Stop

Results

- 17 implantations were attempted
- 16 successful implantations performed with angiographic improvement, reduction in pressure gradient and no significant pulmonary insufficiency.

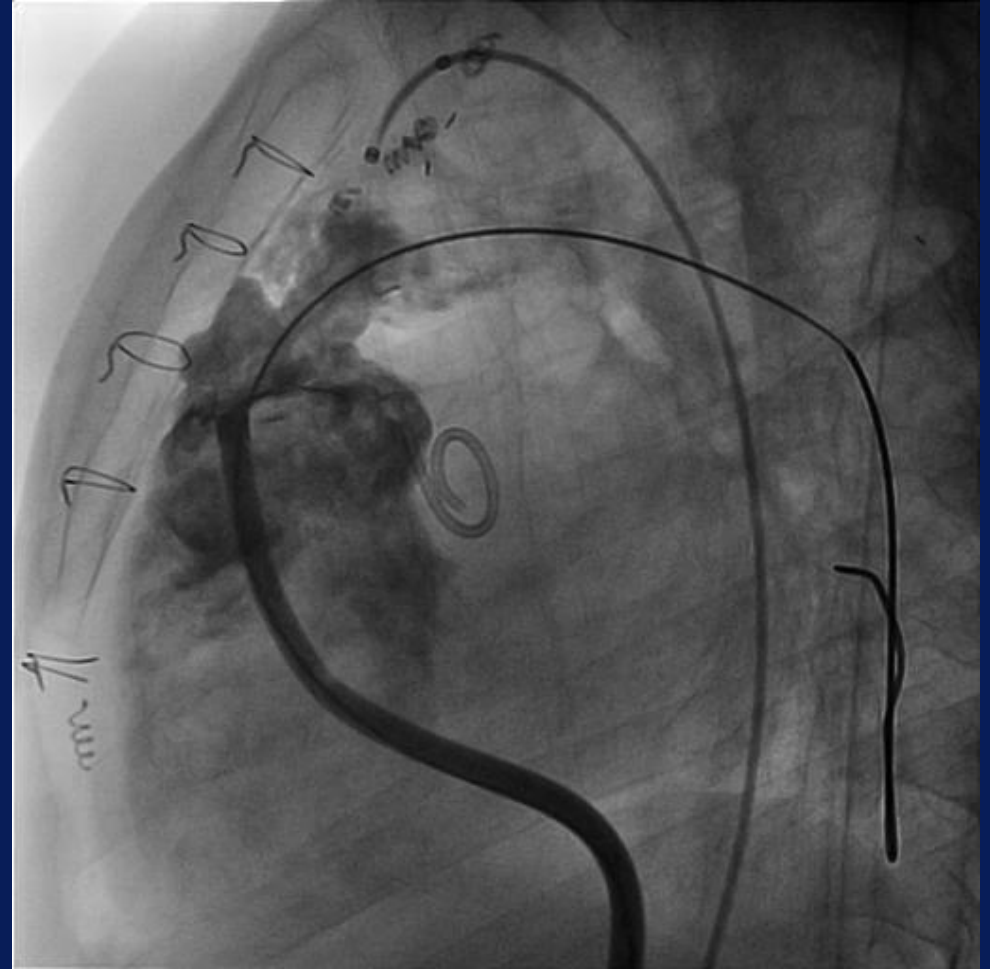
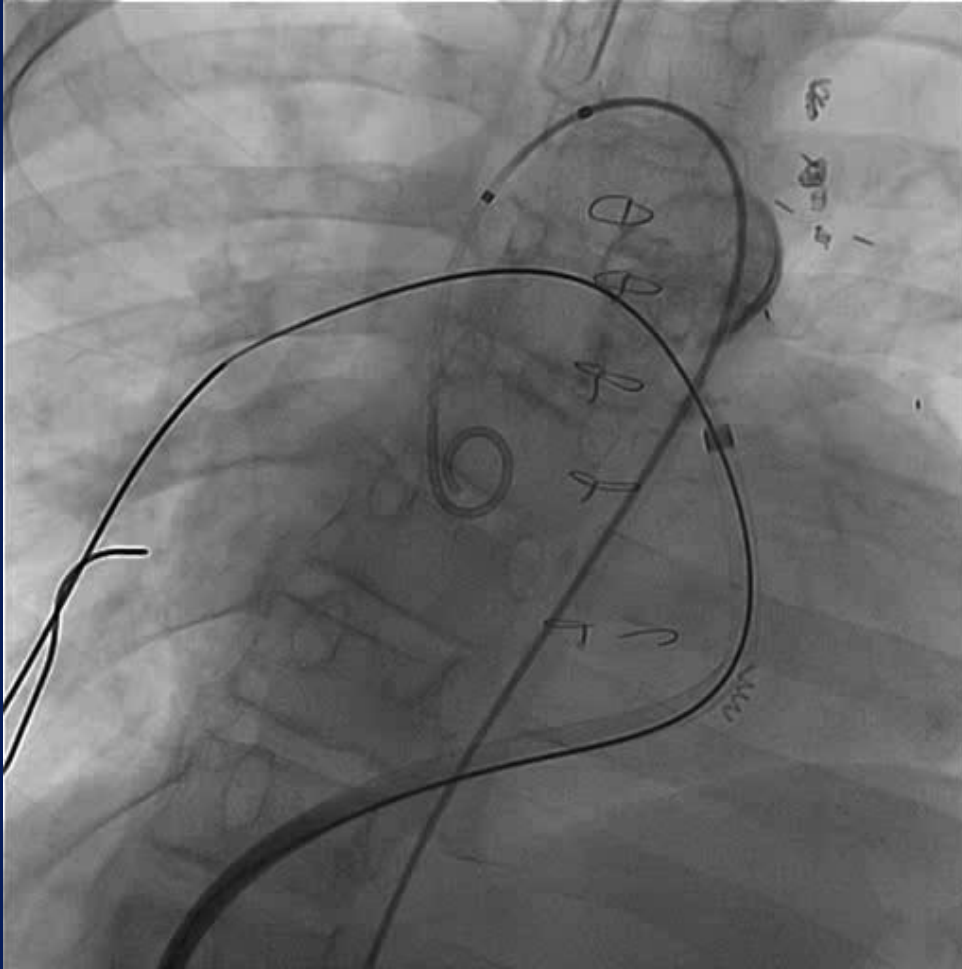
- Peak systolic Gradient :

| | |
|-----------------|-----------------|
| - Pre dilation | 44.5 ± 13.8mmHg |
| - Post dilation | 15.0 ± 7.3mmHg |
| | [p<0.001] |

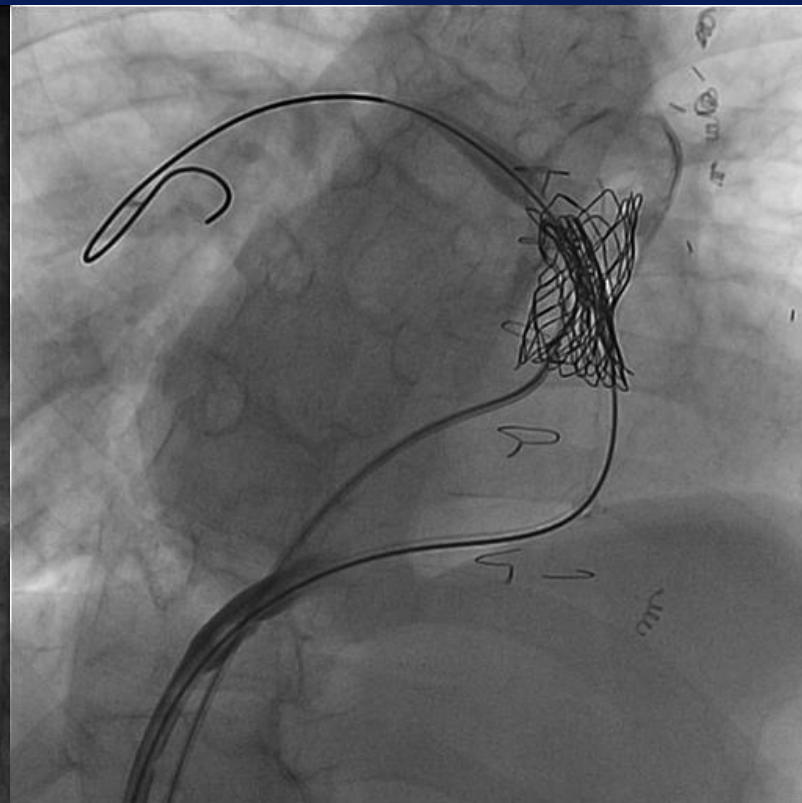
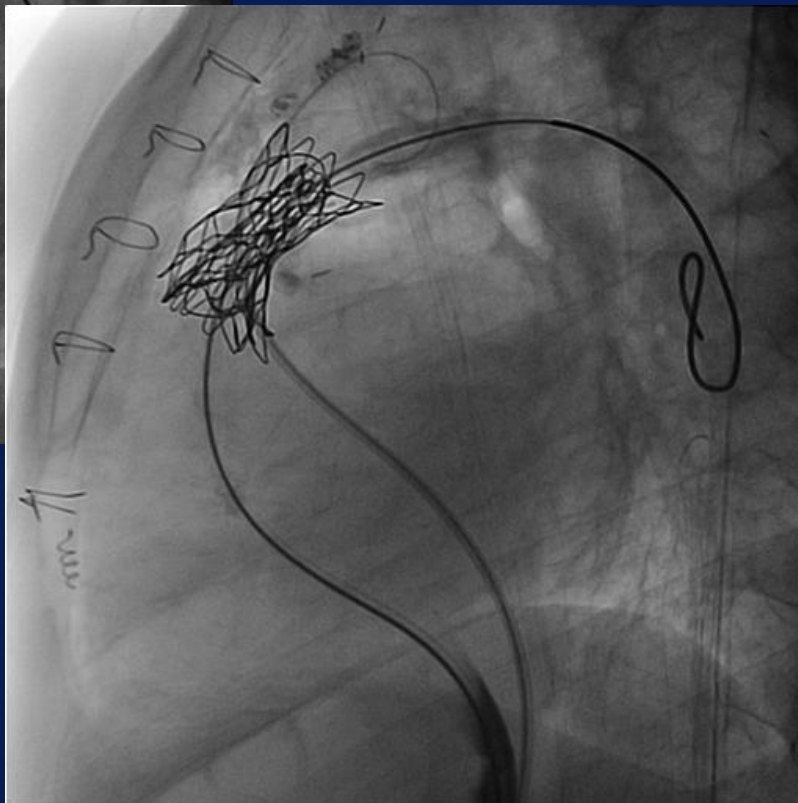
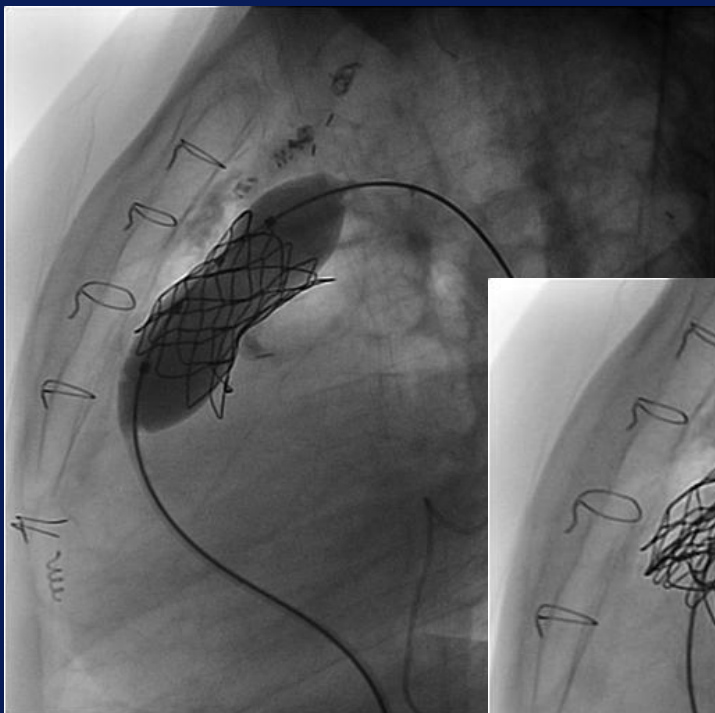
- RV : Ao pressure [%]

| | |
|-----------------|-------------|
| - Pre dilation | 73.1 ± 22.0 |
| - Post dilation | 40.4 ± 9.3 |
| | [p<0.001] |

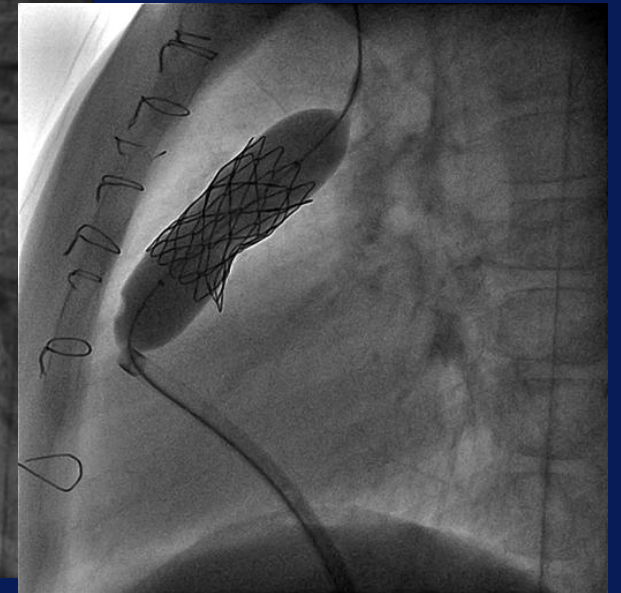
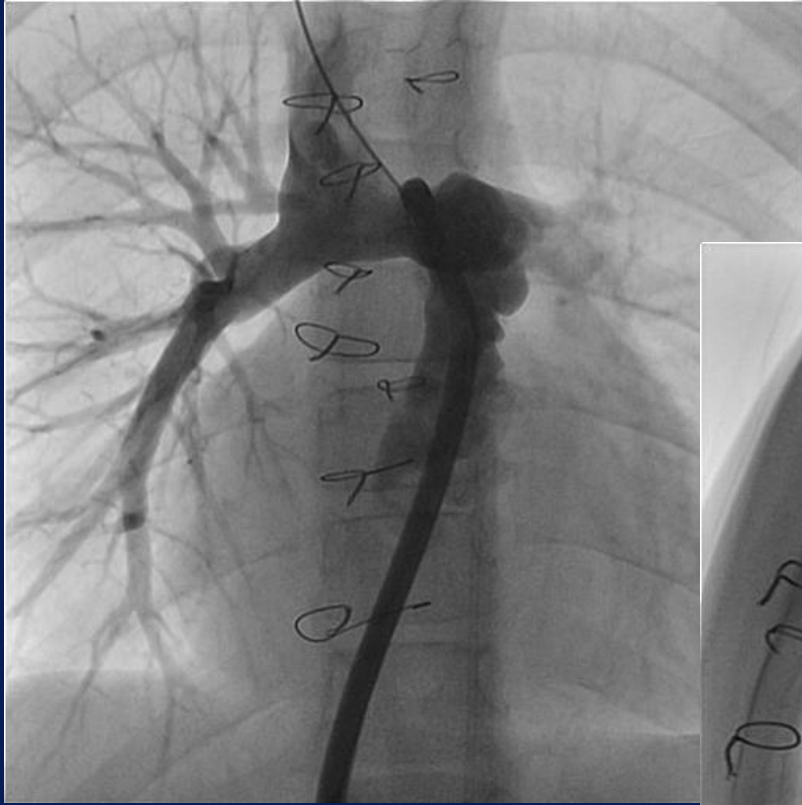
Results



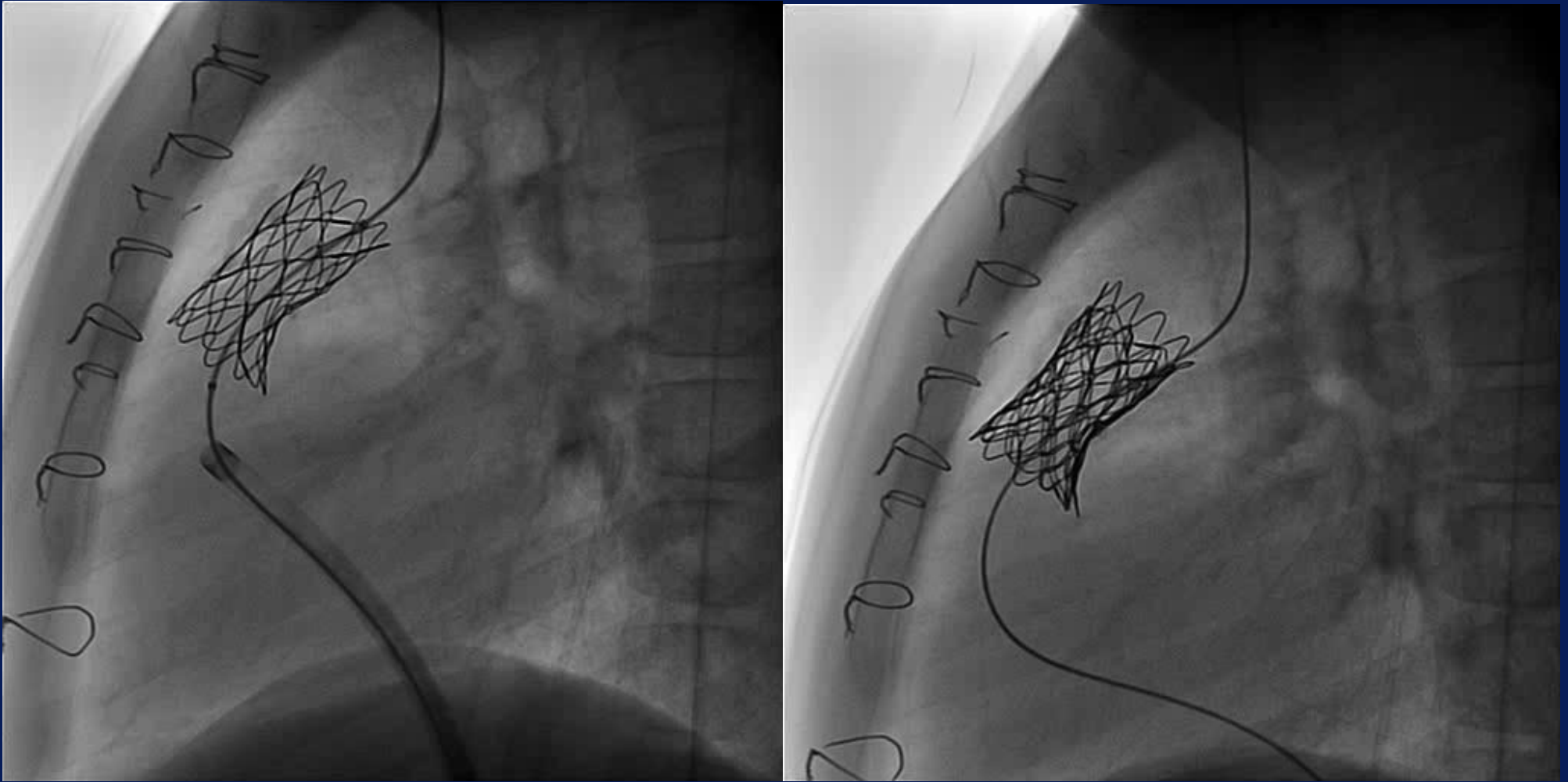
Results



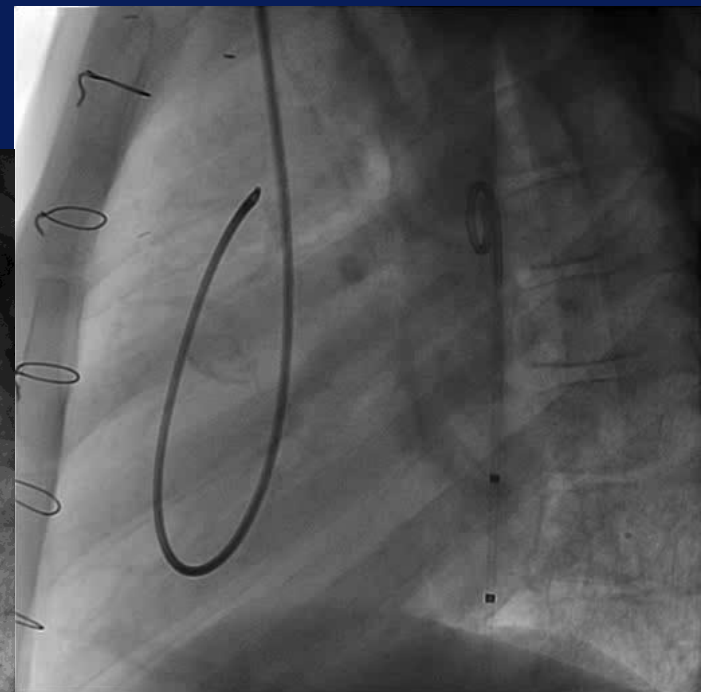
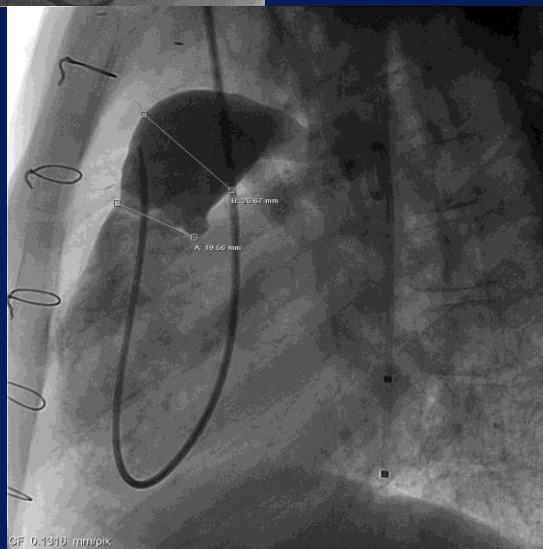
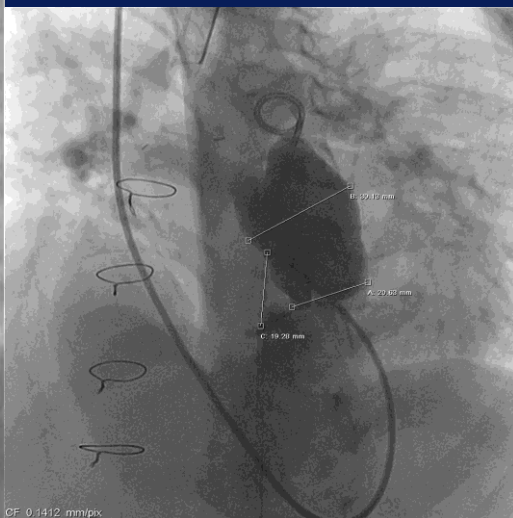
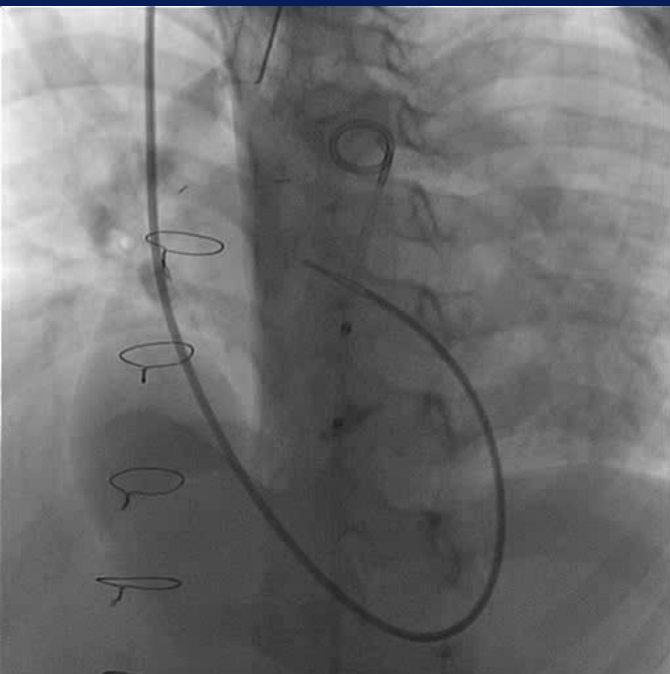
Results



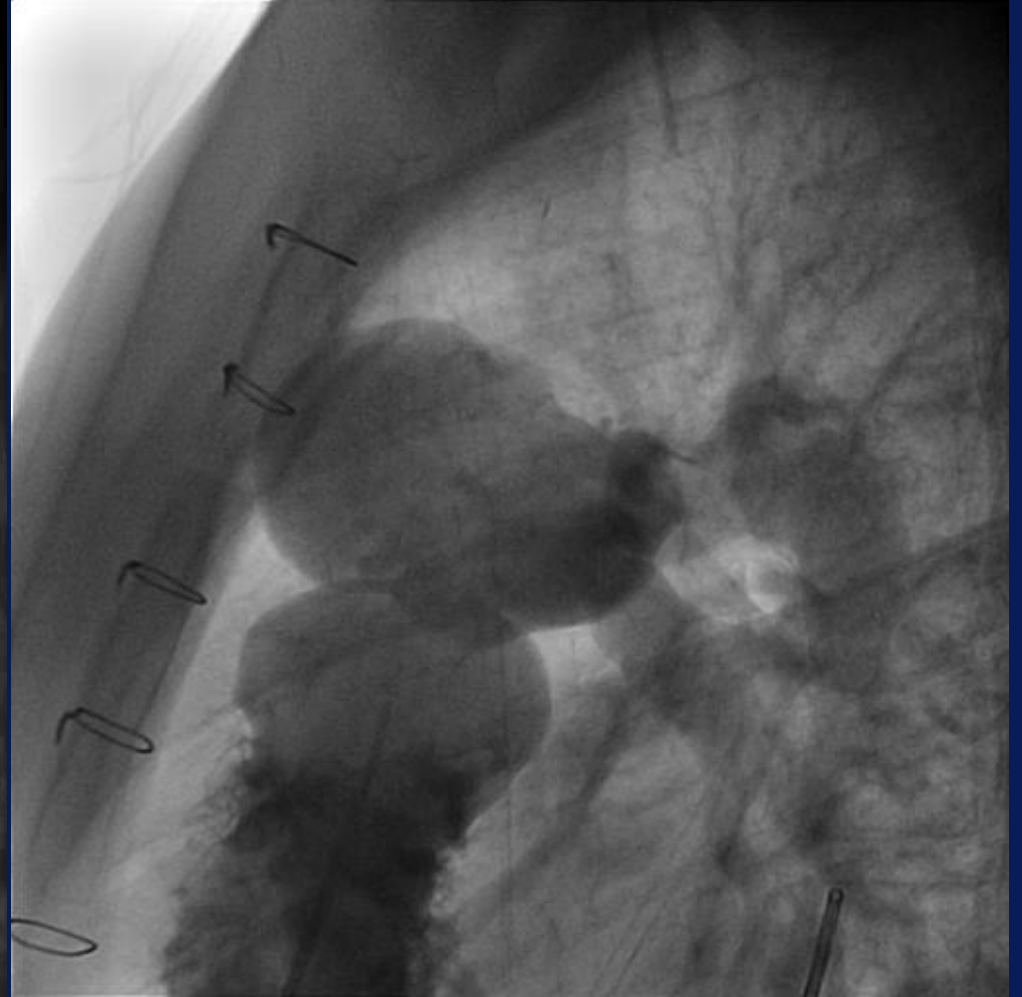
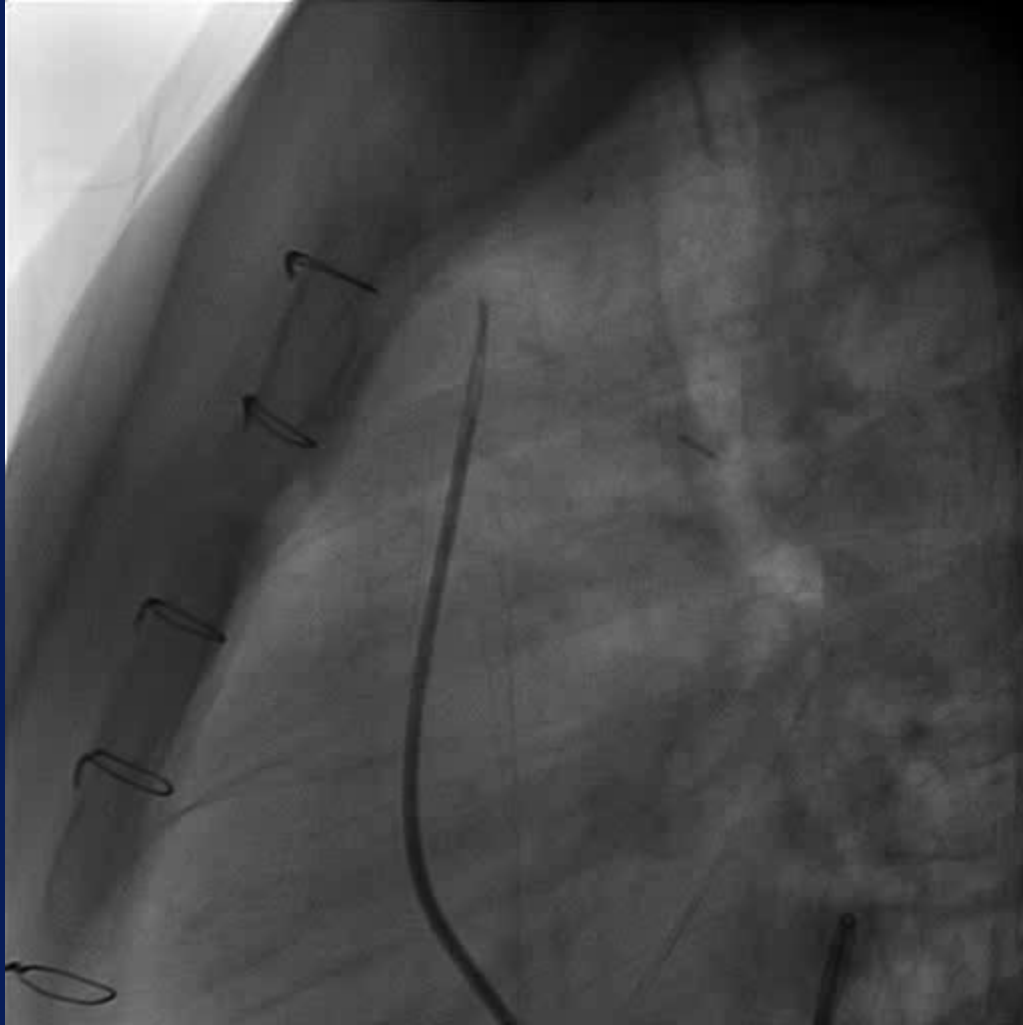
Results



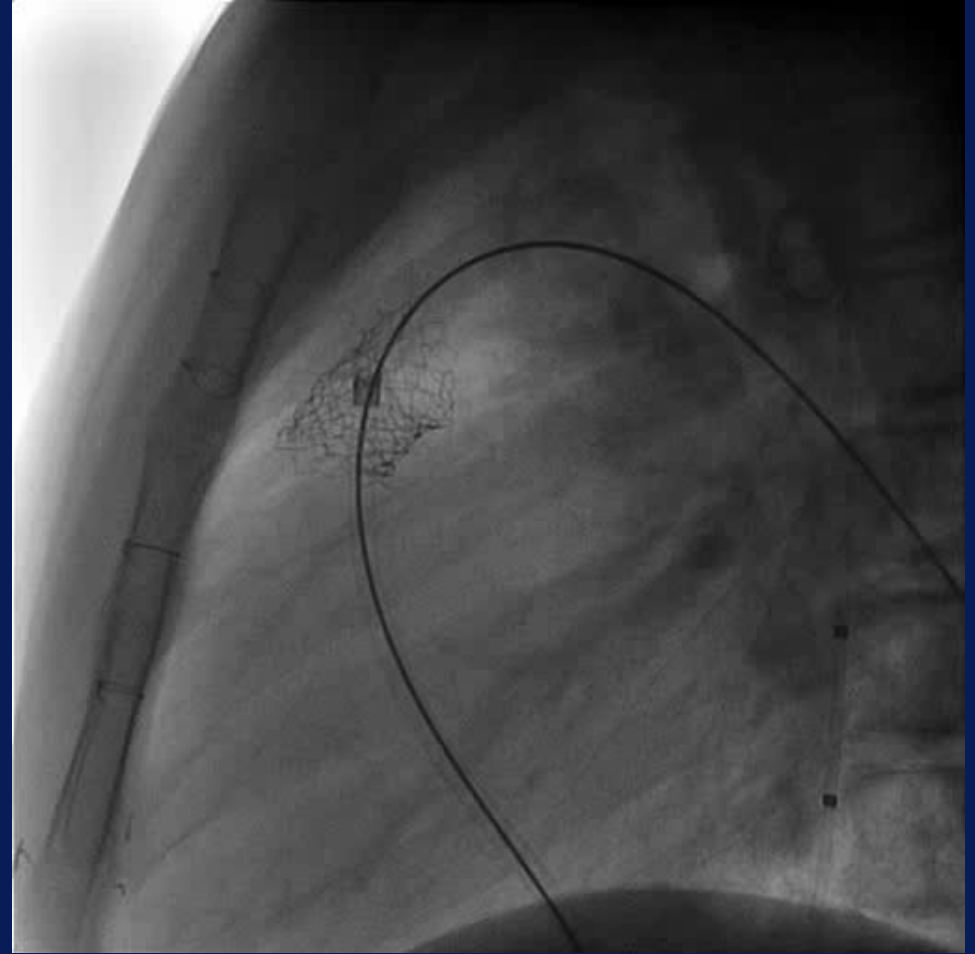
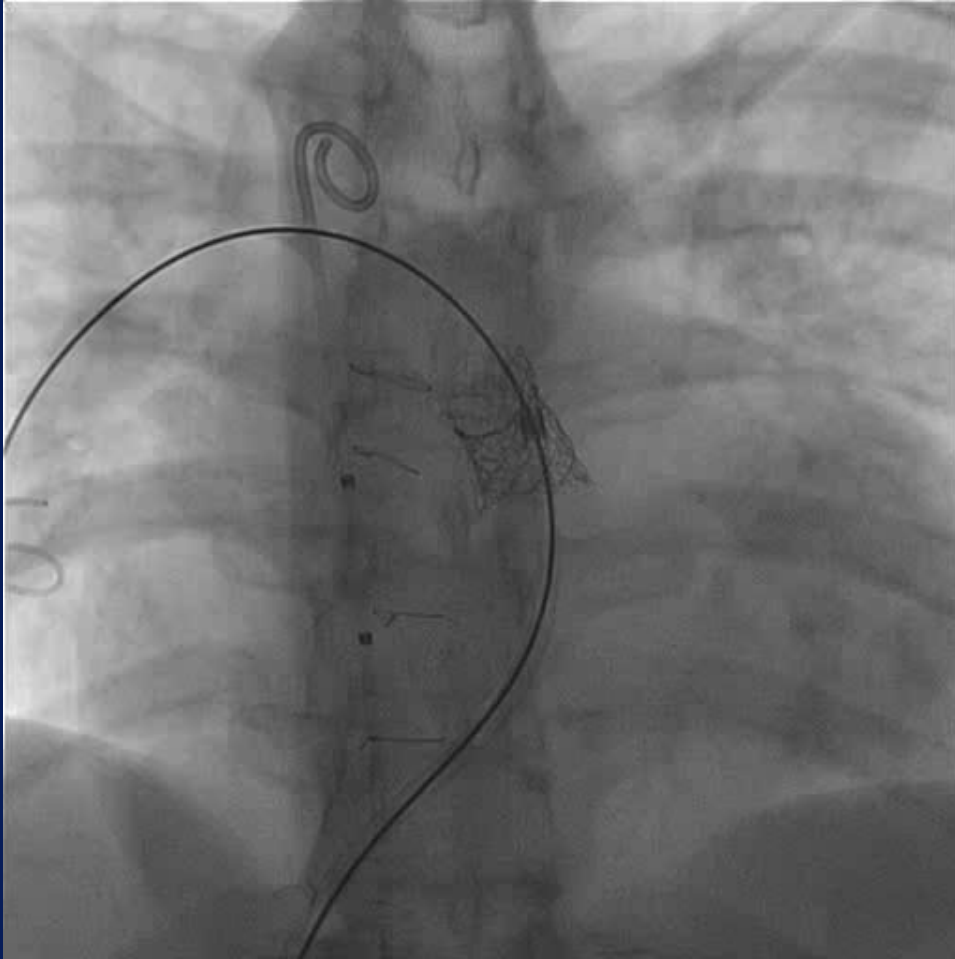
Results not implanted



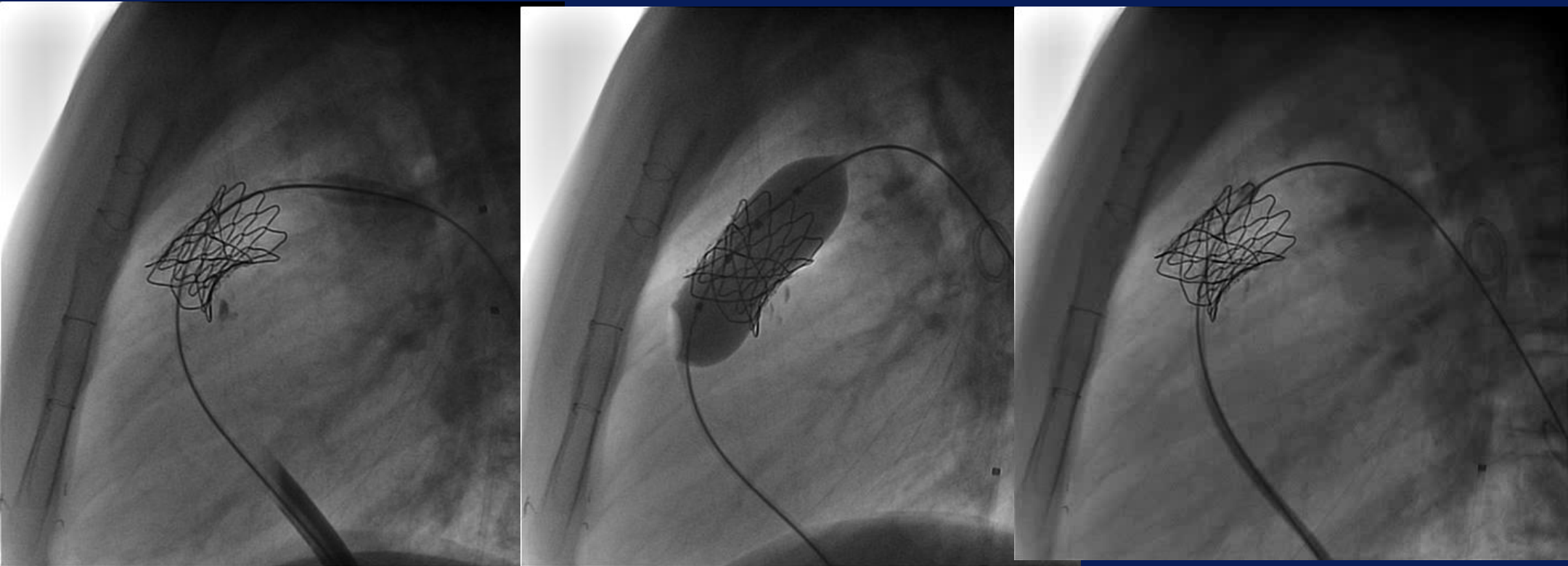
Results not implanted



Results non-homograft



Results non-homograft



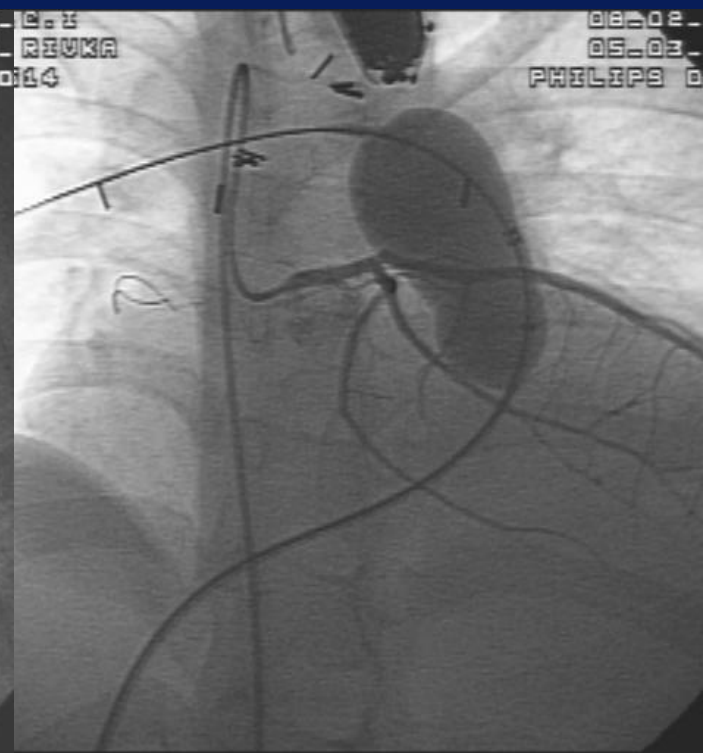
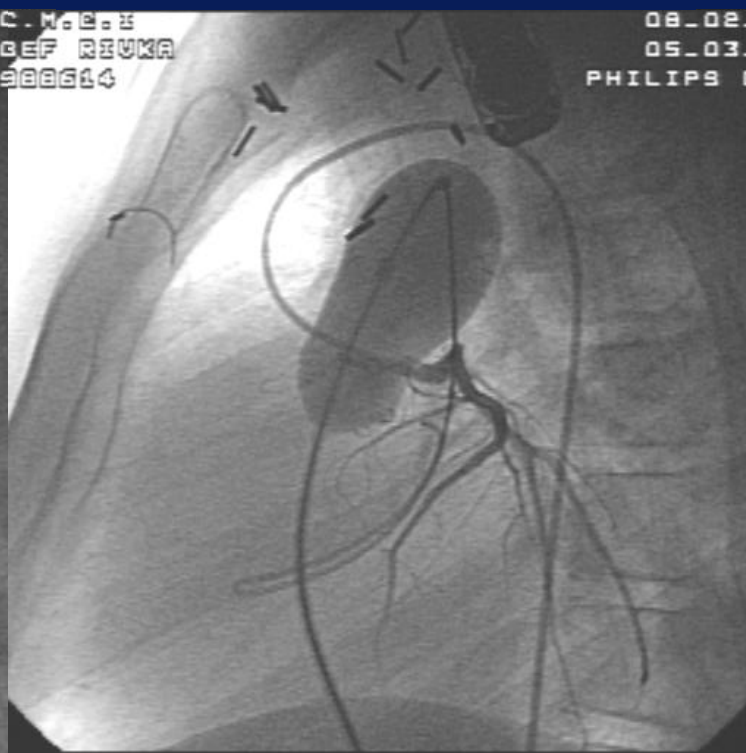
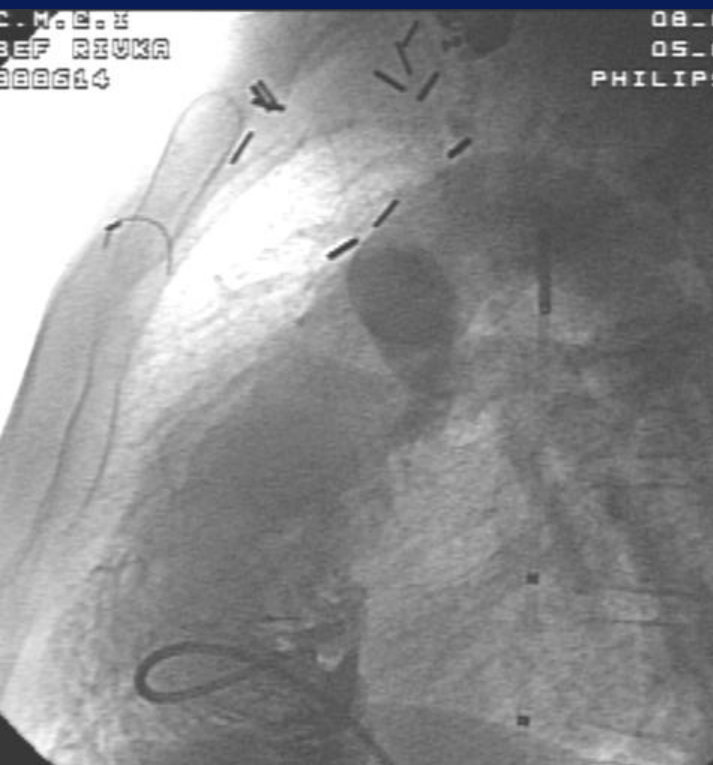
Results

- Complications – 1 patient
 - partial Melody migration off balloon
 - inability to fully inflate stent – hemodynamic instability
 - conversion to emergent surgery
 - mechanical ventilation -> tracheostomy
 - died from pulmonary hemorrhage 6 weeks later
 - 8 patients not implanted
 - homograft unsuitable – too large – too short [RPA jailing]
 - adjacent coronary
 - 23 patients discharged the following day
 - 1 patient had pneumonia – uneventful recovery
-

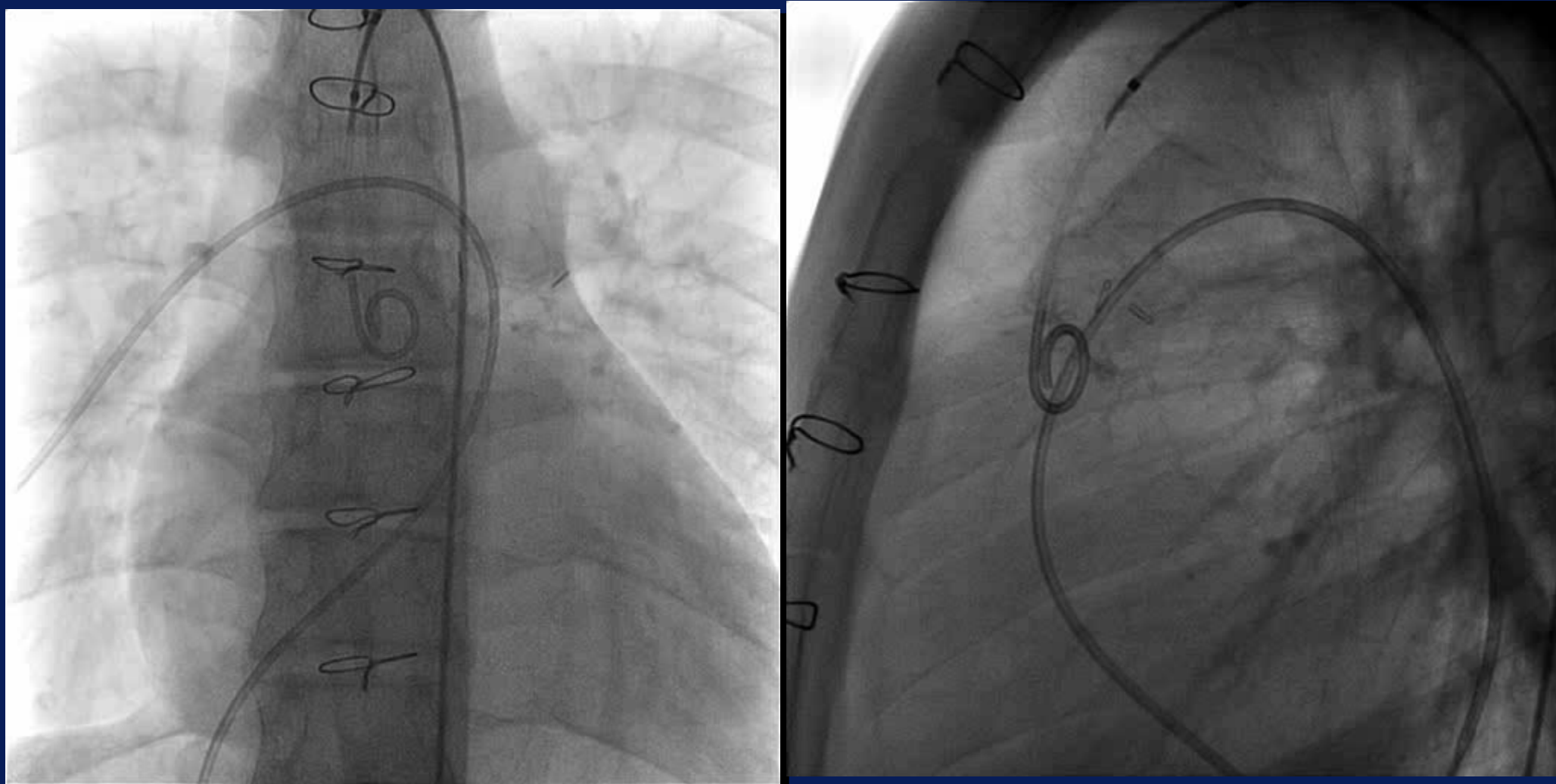
Results

- Median follow up 14 months
 - one reintervention for homograft stenosis
 - balloon dilation
 - mild PI
 - candidate for redilation
 - mild to moderate stenosis
 - trivial to mild PI
-

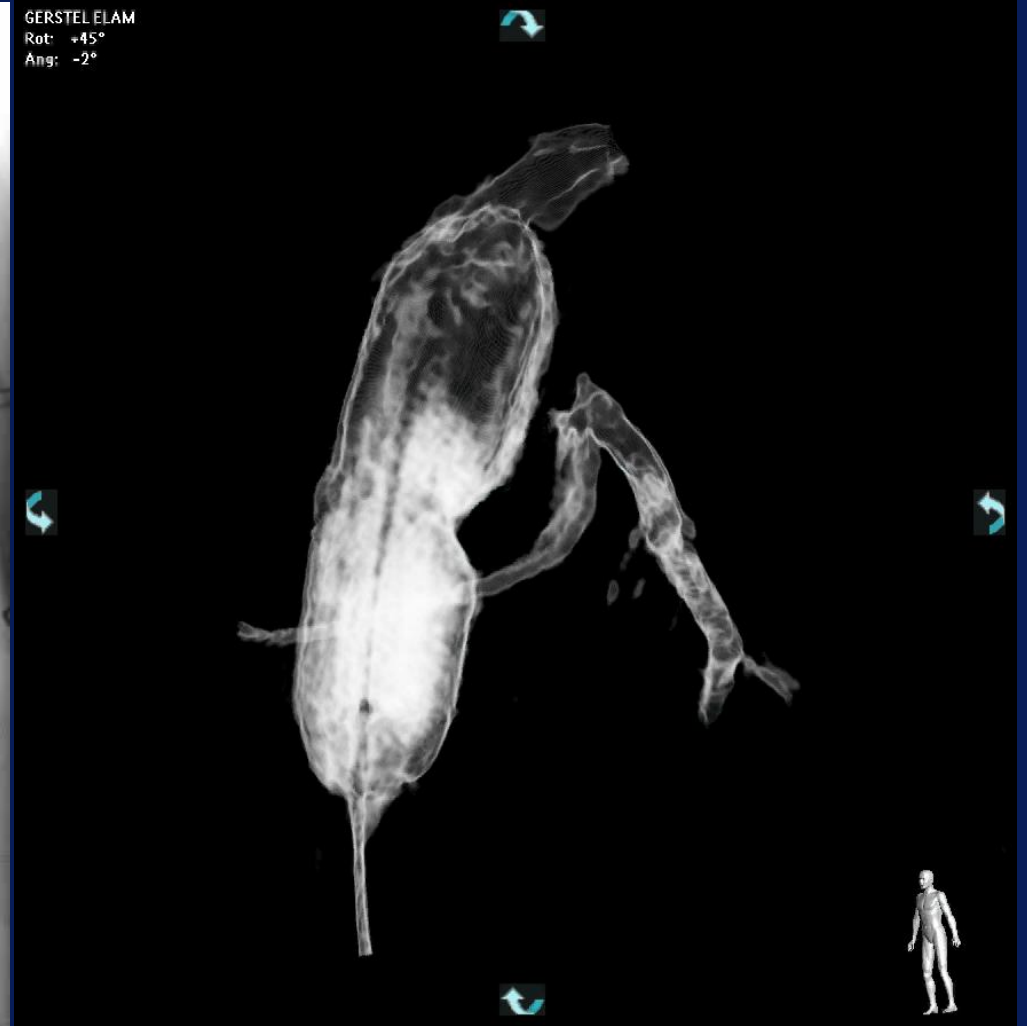
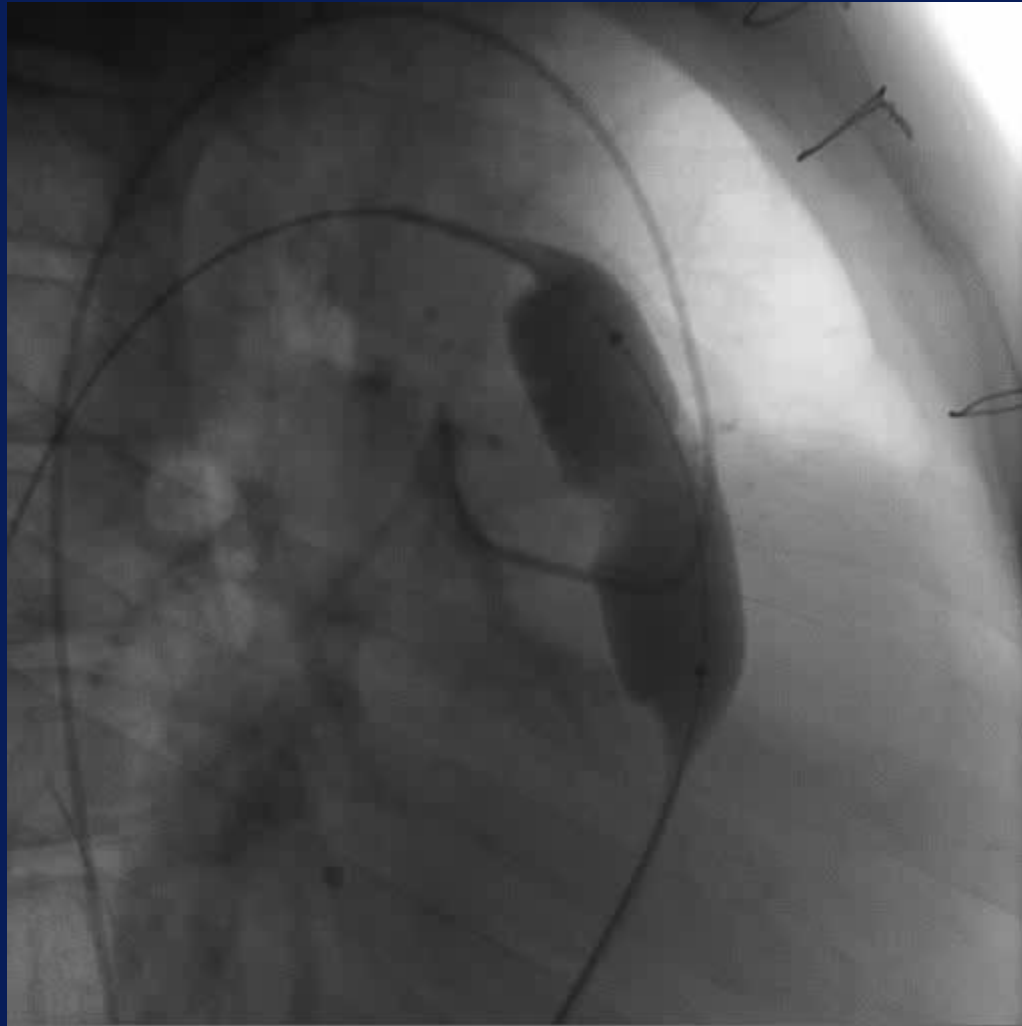
Watch out!



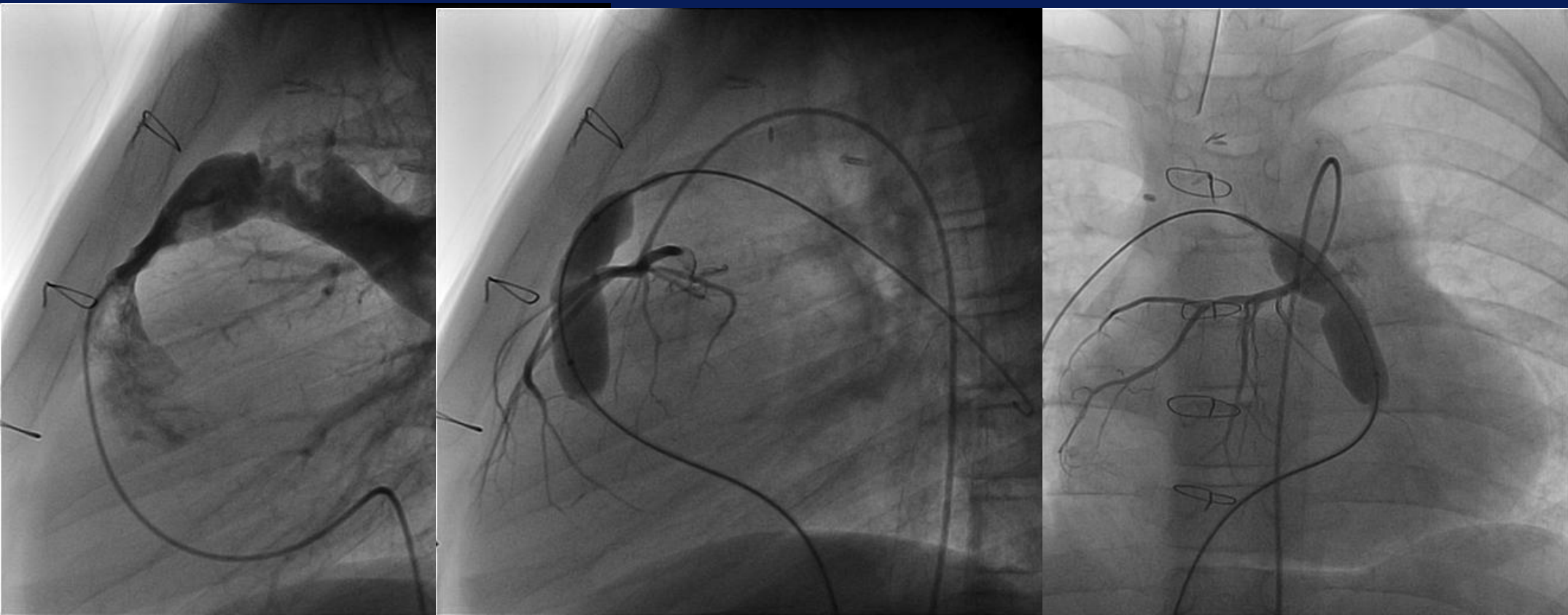
Coronary imaging – 3dRA



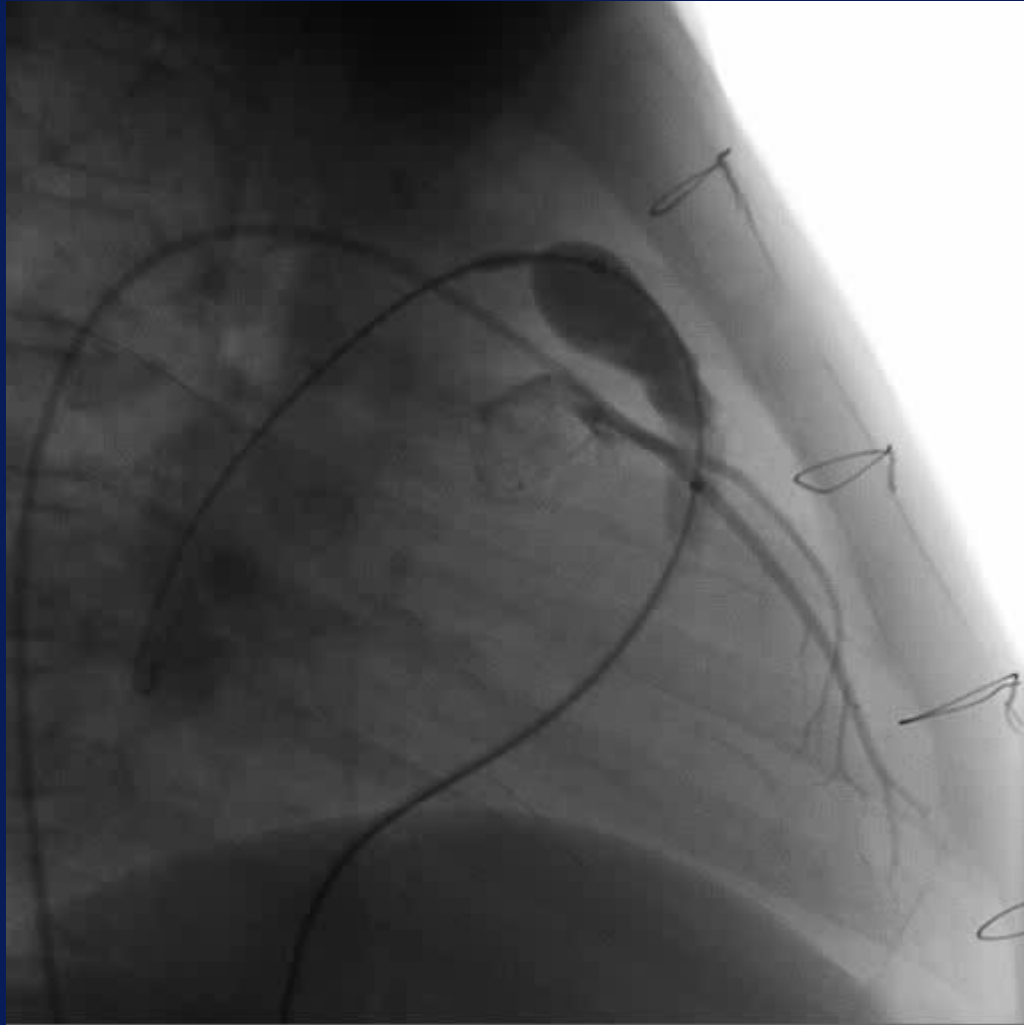
Coronary imaging – 3dRA



Coronary imaging – 3dRA



Watch out!



Edwards for RVOT

- Size range 20 – 26mm
 - Prestenting of the homograft / RVOT is essential
 - Does not require homograft
-

Considerations

- RV outflow tract reconstruction has no ideal solution with homograft failure requiring reintervention being reported at up to 60-90% at 5 years
 - Bonhoeffer reported [155 patients] reintervention for Melody up to 30% at 5 years
 - related to “hammock effect” and stent fracture
 - 2/155 patients have moderate PI at median F/U 18 months related to endocarditis – otherwise PI absent or mild.
-

Conclusions

- Non-surgical valve replacement is a reality [Israelity]
 - Transcatheter pulmonary valve implantation is a feasible and a very effective percutaneous method for the treatment of homograft failure in selected patients.
 - Careful patient selection – different valves for different patients
 - Prestenting of the homograft – very helpful – needs formal evaluation*
 - Intermediate and long term results need to be evaluated
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