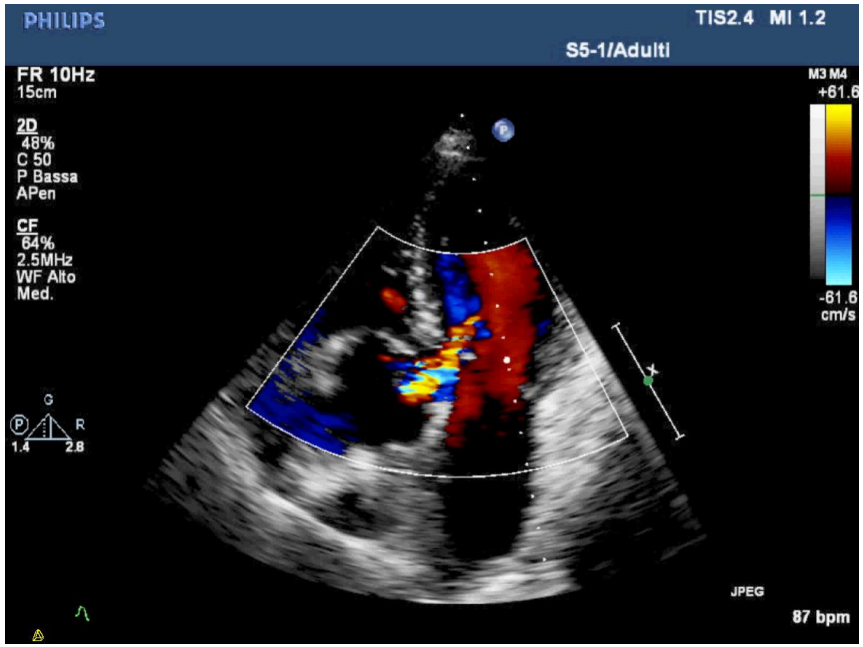
TAVI in severe aortic regurgitation and severely diseased thoracic aorta

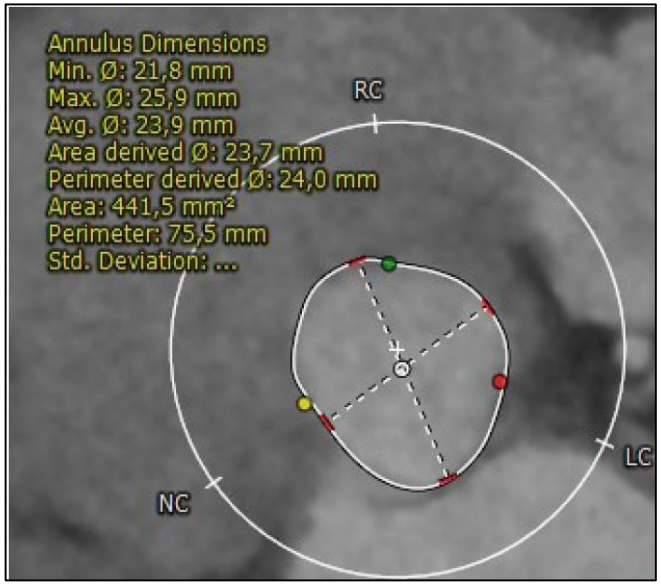
Clinical history

- Female, 75y
- Severe chronic obstructive pulmonary disease
- Previous lung cancer (1998)
- Thoracic aortic aneurysm (Ø 55 mm)
- Severe aortic regurgitation, preserved left ventricular ejection fraction
- NYHA II
- No coronary disease
- STS score 8%

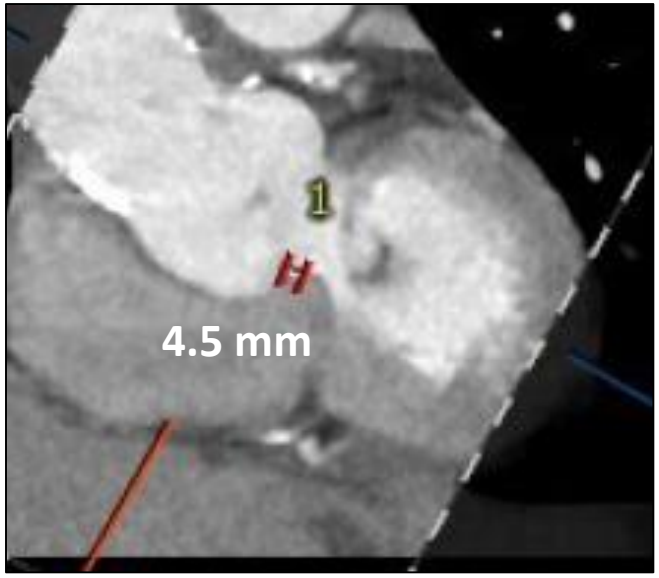


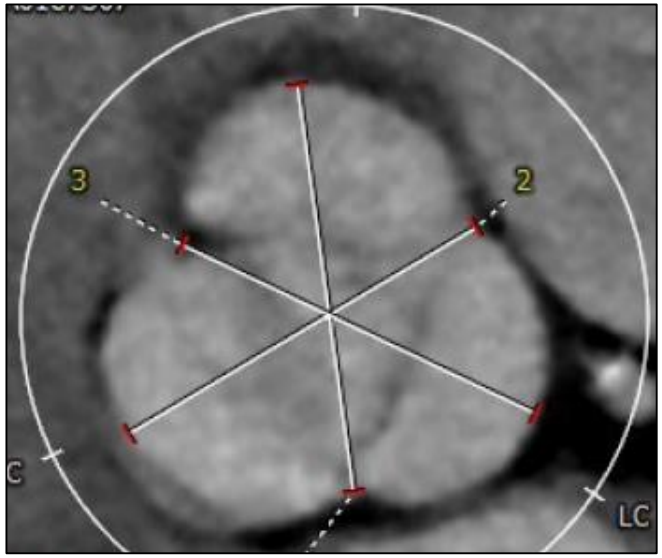
TAVI

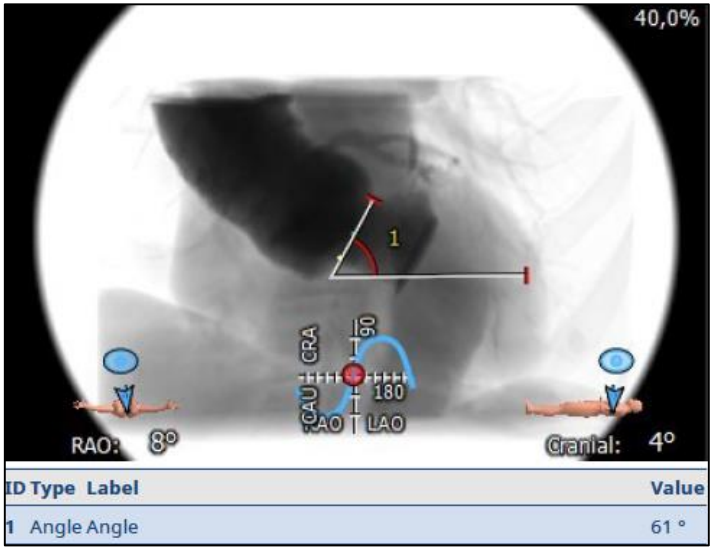
Multislice CT scan-aortic valve



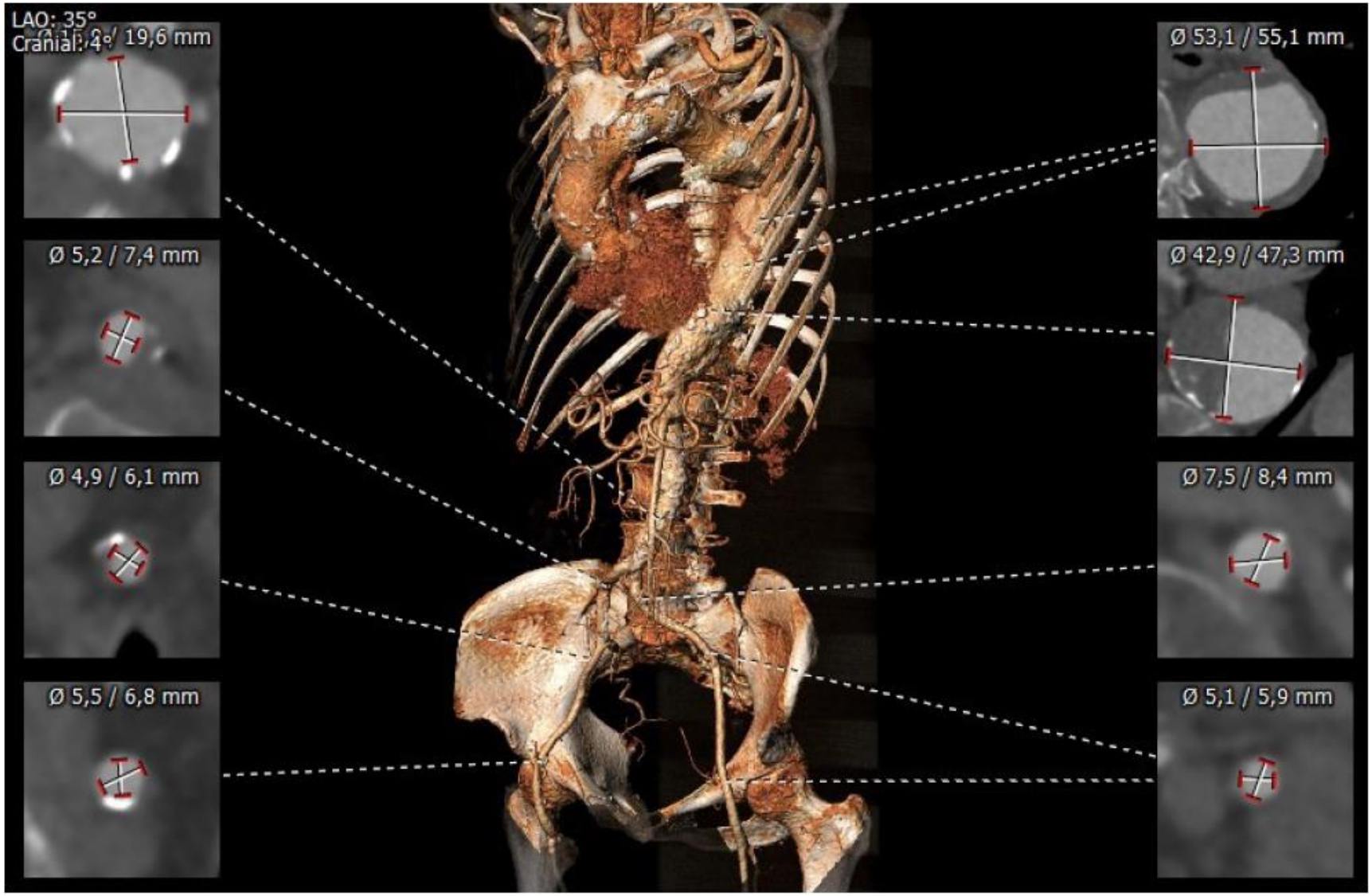
- Perimeter derived annulus Ø 24 mm
- Perimeter 75.5 mm
- Mean SOV Ø 38 mm
- Absent aortic calcifications
- Membranous septum length 4.5 mm
- Aortic angle 61°



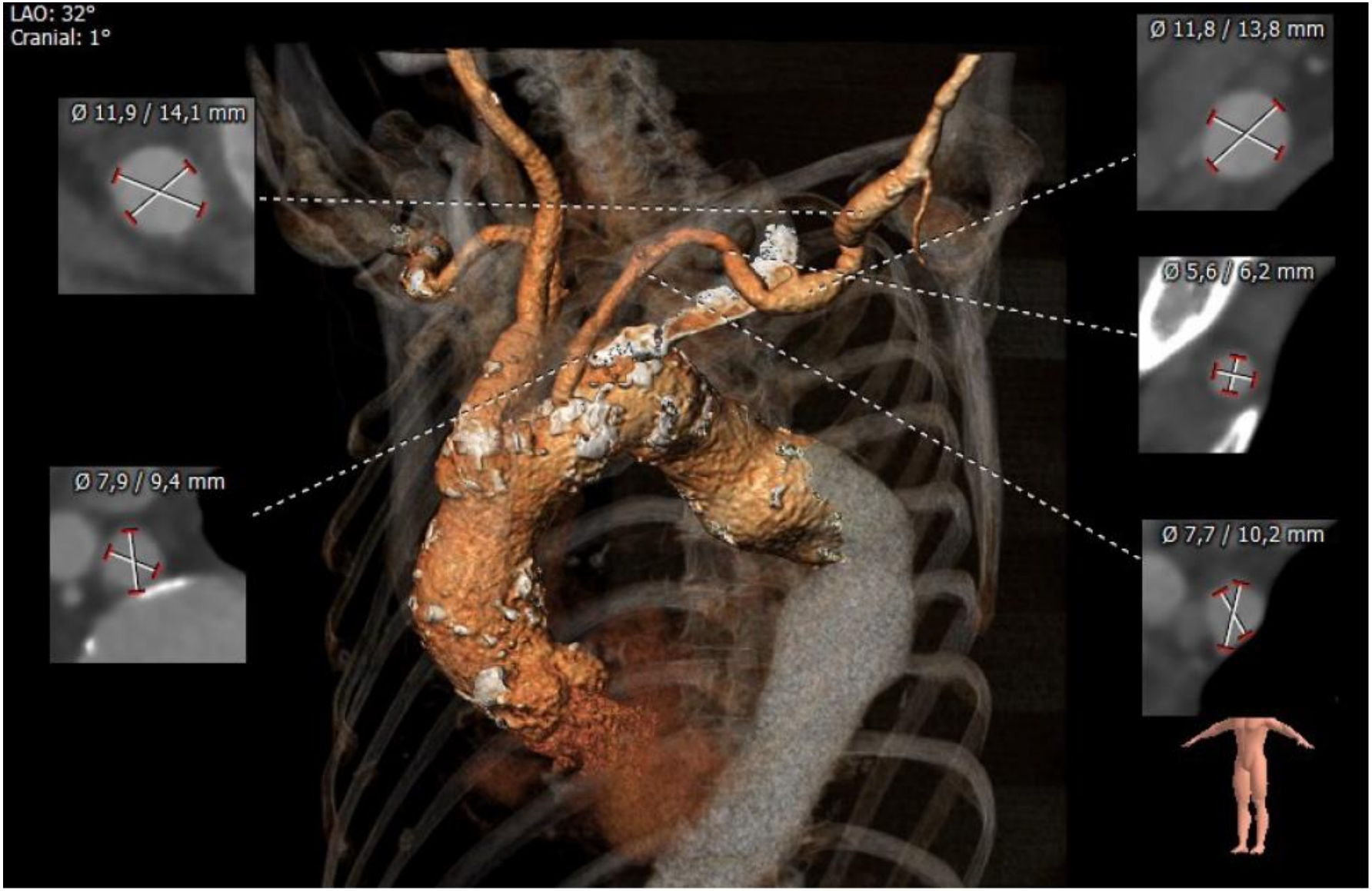




Multislice CT scan-aorta



Multislice CT scan-left subclavian artery



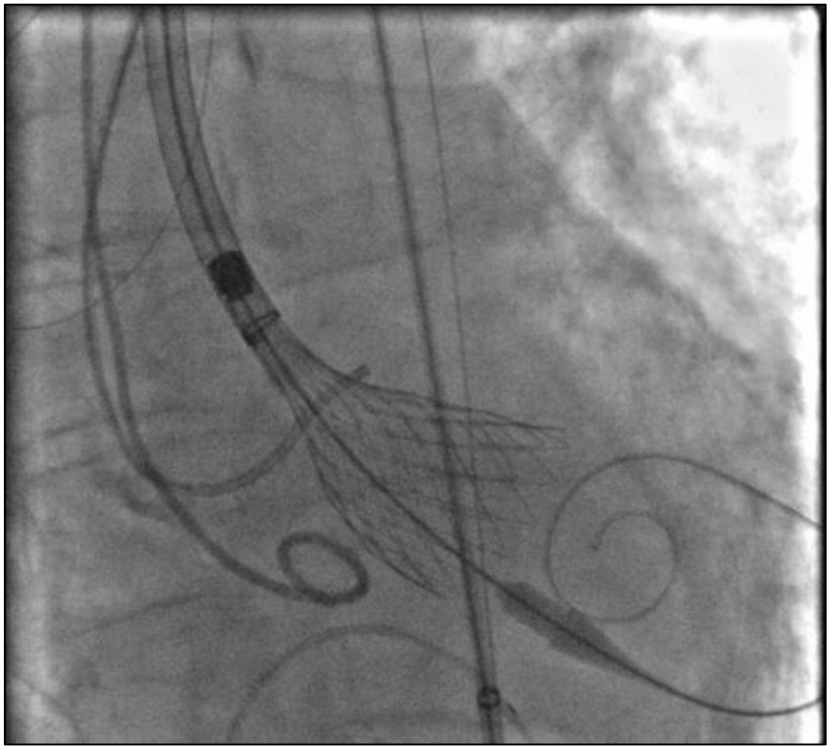
Challenges

- Pure aortic regurgitation, absent valvular calcifications
- Severely diseased thoracic aorta (thrombosed aneurysm, calcified walls and kinking)
- Horizontal aorta
- Short membranous septum length

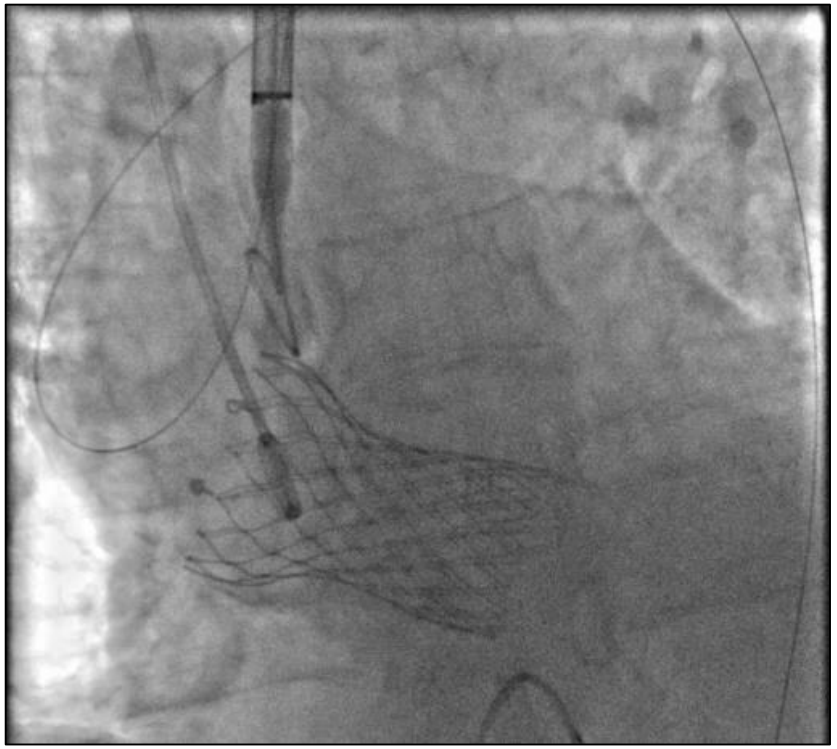
Procedure

- Local anesthesia
- Main access: left axillary artery (fully percutaneous access via armpit puncture)
- Secondary accesses: right radial artery (6F pig-tail catheter), right superficial femoral artery (6F Amplatz Left 1 catheter/safety wire)
- 34-mm (oversized) self-expandable transcatheter heart valve deployment during right ventricular pacing (140-180 ppm)
- Complete atrio-ventricular block after the first deployment attempt, subsequent severe hypotension and cardiocirculatory collapse
- Rapid restoration of spontaneous circulation after valve deployment
- Absent paravalvular leakage, no vascular complications

Angiography



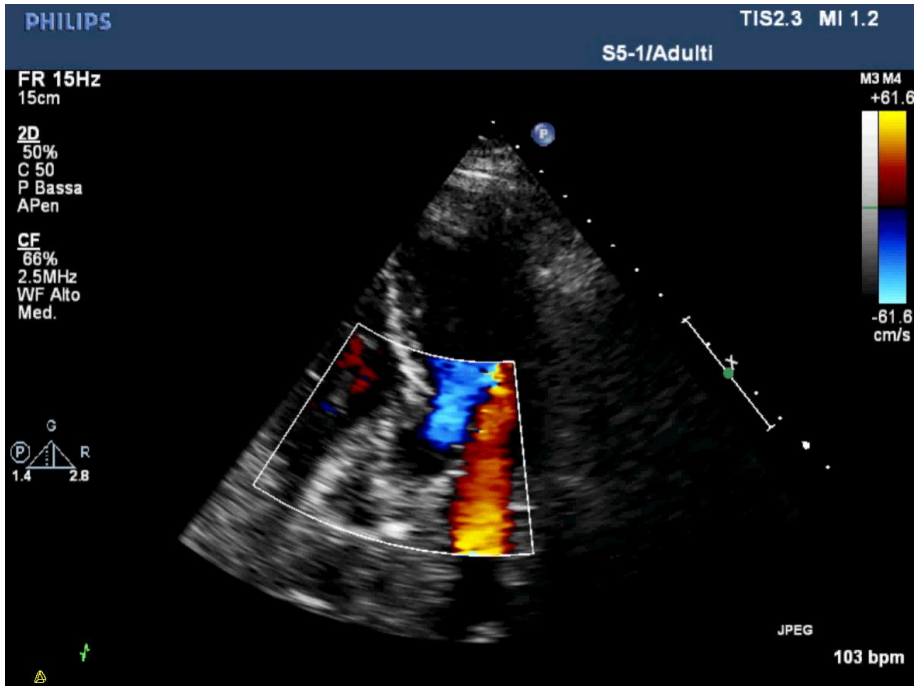
First deployment attempt with subsequent recapture



Final result

Clinical course

- Permanent pacemaker implantation (persistent high-degree atrio-ventricular block)
- Excellent valve performance, otherwise uneventful course



Take home messages

- Transcatheter replacement of purely regurgitant aortic valves represents a challenge, especially as regards correct prosthesis sizing and deployment
- Deployment during high-rate ventricular pacing may be useful for achieving correct prosthesis height
- Careful pre-procedural CT planning has a pivotal role in the selection of the right prosthesis type and size and in the evaluation of the access route