TAVI in bicuspid aortic valve and challenging transfemoral access

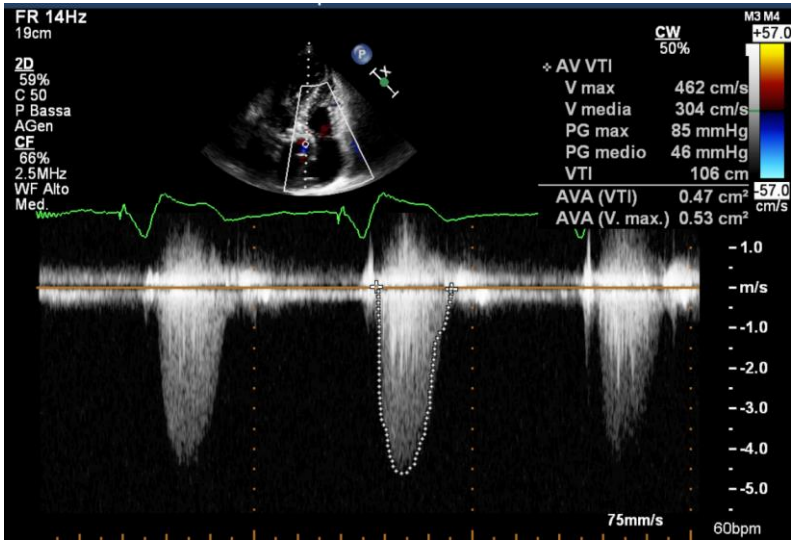
Clinical history

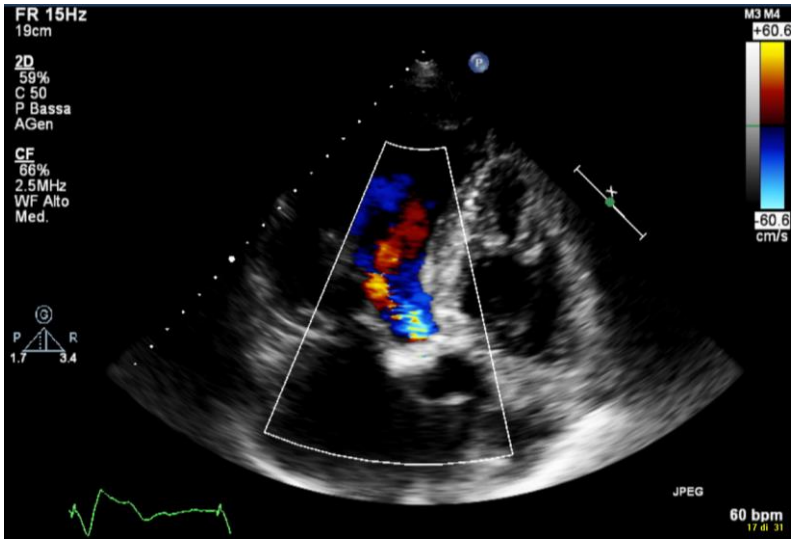
- Male, 81y
- Previous dual-chamber pacemaker implantation
- Chronic obstructive pulmonary disease
- Previous endovascular repair of abdominal aortic aneurysm (aortic endoprosthesis with iliac extension inserted via right femoral artery and left iliac branch inserted via left femoral artery)
- Paroxysmal atrial fibrillation
- Known calcific aortic stenosis

ED admission for worsening effort dyspnea and paroxysmal nocturnal dyspnea

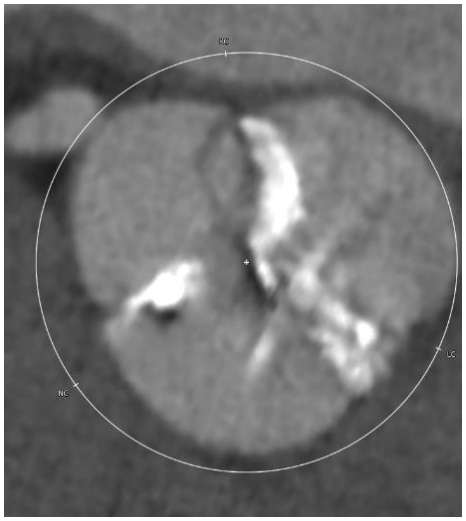
Transthoracic echocardiography

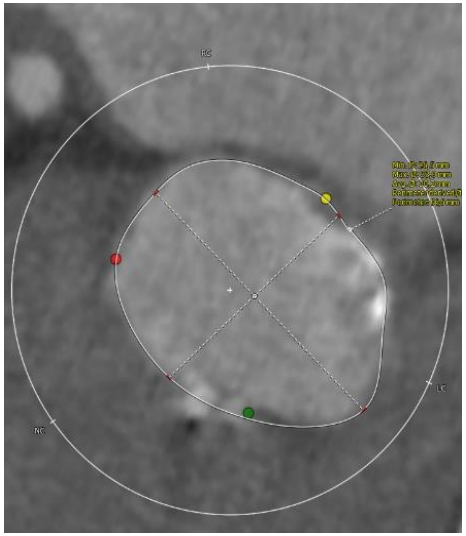
- Severe calcific aortic stenosis with mild-to-moderate regurgitation
- Valve anatomy highly suspicious for bicuspid etiology
- Preserved ejection fraction



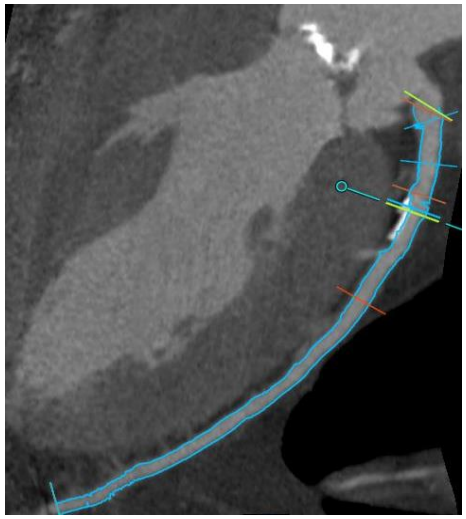


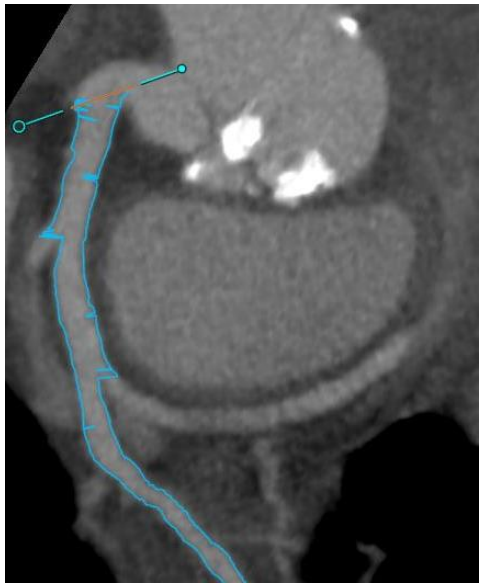
Multislice CT scan-aortic valve and coronary arteries



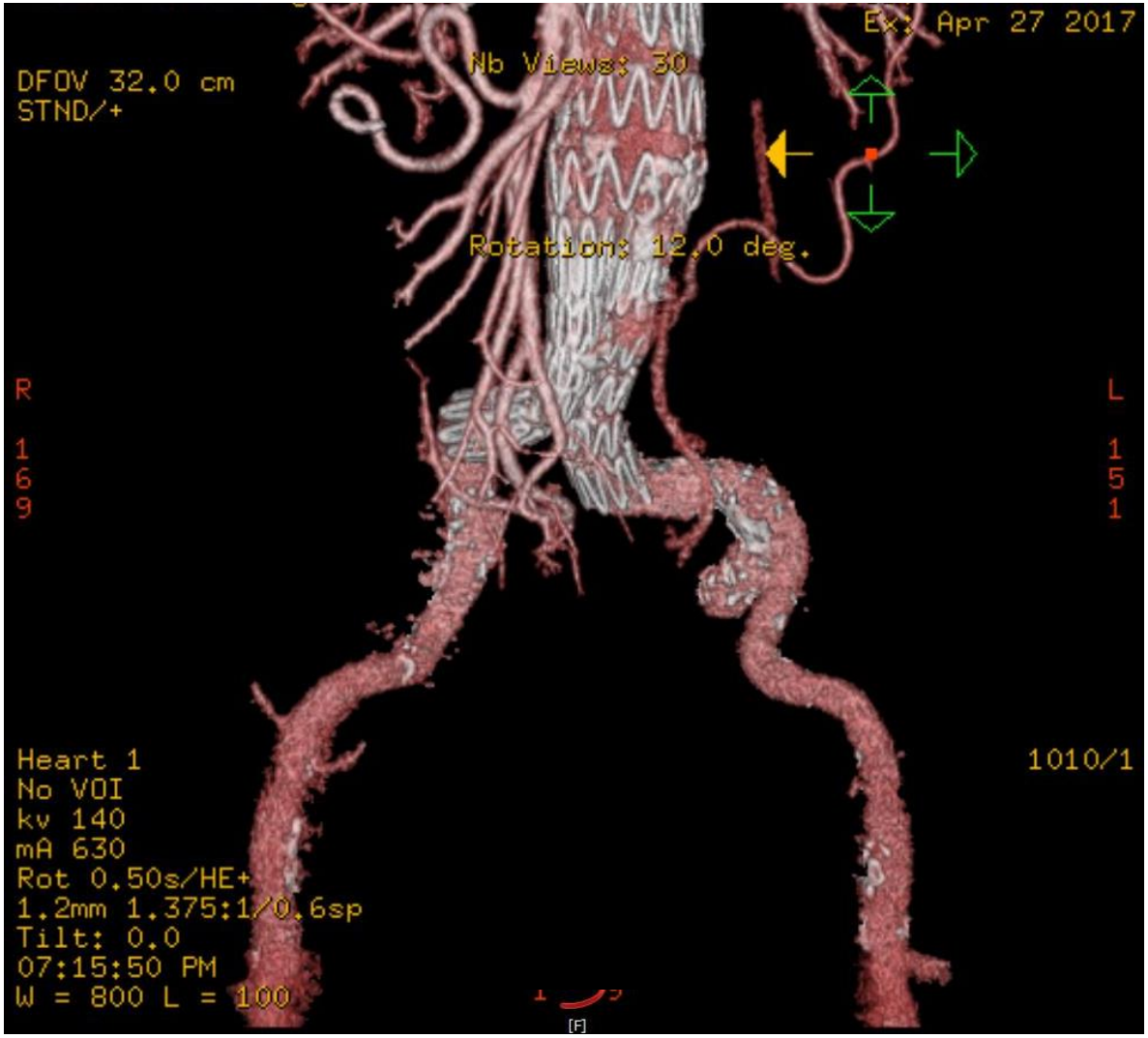


- Type I L-R bicuspid valve
- Perimeter derived annulus Ø 31 mm
- Perimeter 99.1 mm
- Area 740 mm2
- No coronary artery disease (left dominance)





Multislice CT scan-accesses



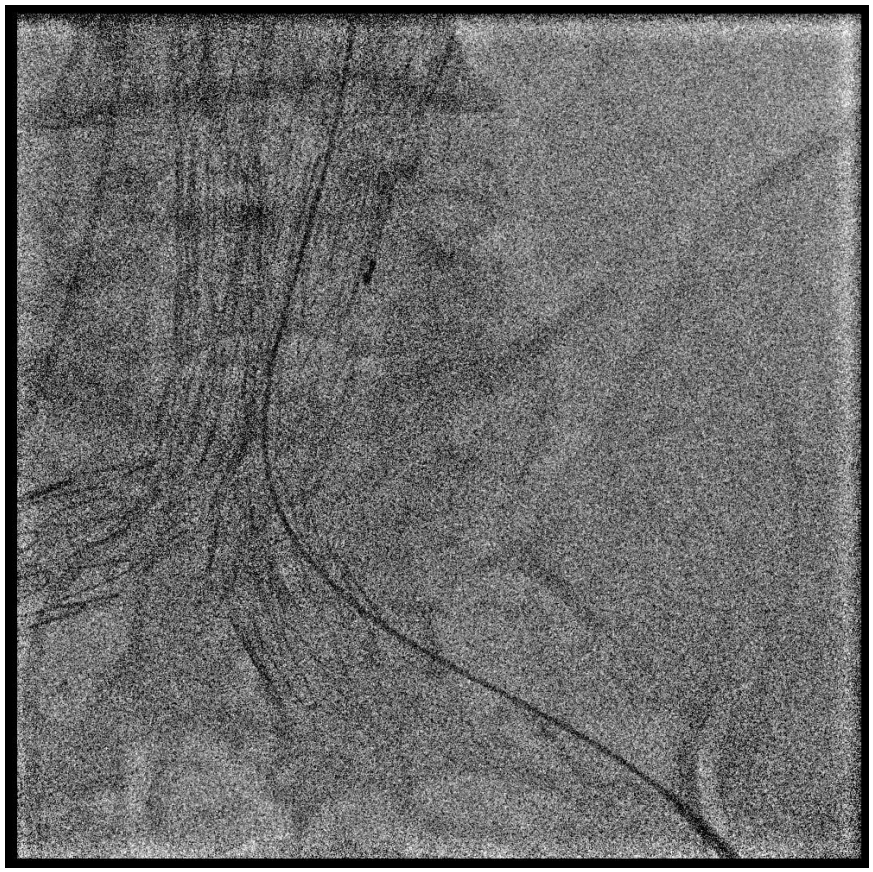
Challenges

- Large annulus
- Bicuspid anatomy
- Aorto-iliac prosthesis

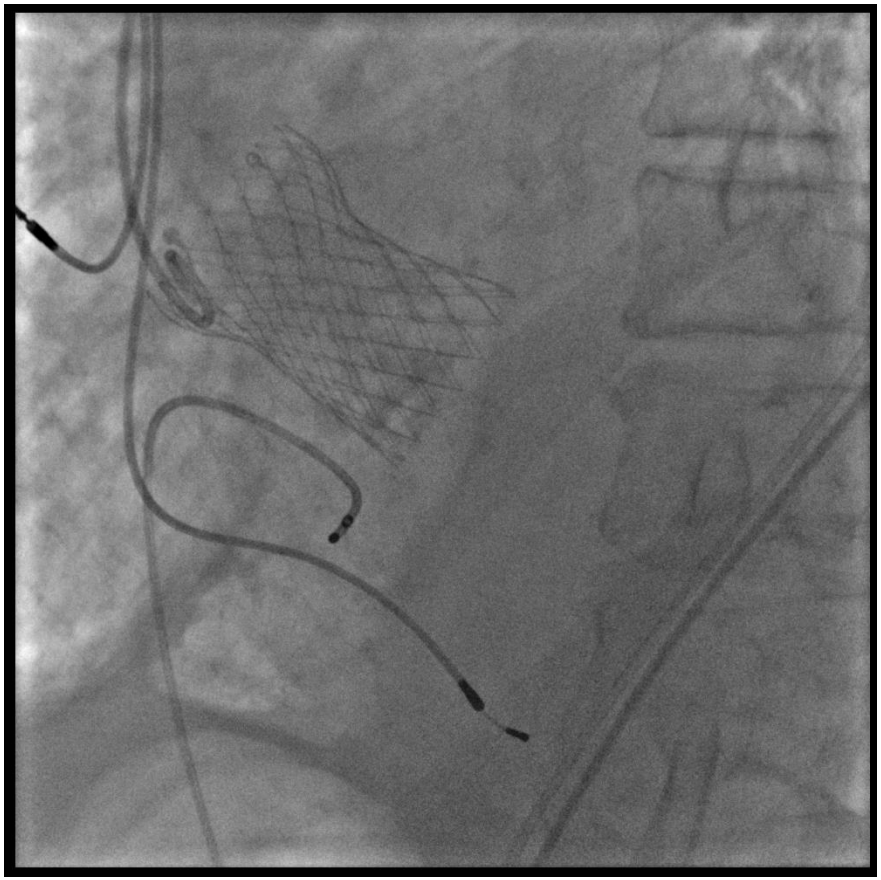
Procedure

- Local anesthesia
- Main access: left femoral access (right iliac artery with >90° angulation)
- 25-mm balloon predilation
- 34-mm self-expandable transcatheter heart valve deployment (undersized)
- 25-mm balloon postdilation
- Acceptable final paravalvular regurgitation, no vascular complications
- Absence of periprocedural complications, uneventful hospital stay

Angiography



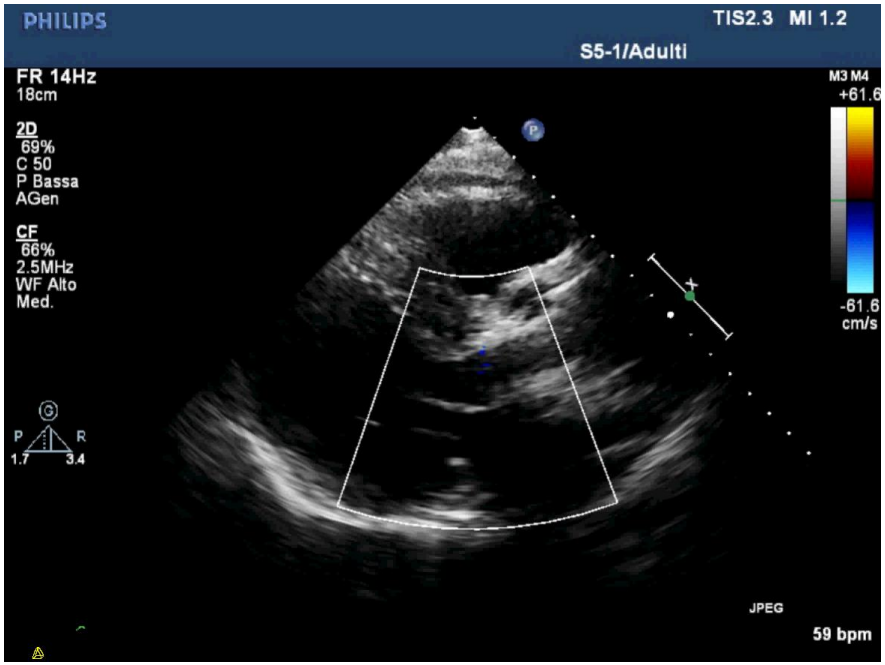
16-mm sheath insertion



Final angiography

Follow-up

- Marked improvement in NYHA class and clinical symptoms at 30-day and 1-year follow-up
- Excellent valve performance with mild paravalvular leakage and mean transvalvular gradient 7 mmHg
- No adverse events



Take home messages

- Transcatheter replacement of stenotic bicuspid aortic valves represents a challenge, especially as regards correct prosthesis sizing
- A downsizing could be indicated in heavily calcified bicuspid valves
- Multislice CT has a pivotal role in the selection of the right prosthesis type and size and in the evaluation of the access route