



UMC Utrecht

Difficult PPVI in ToF

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Associate Professor

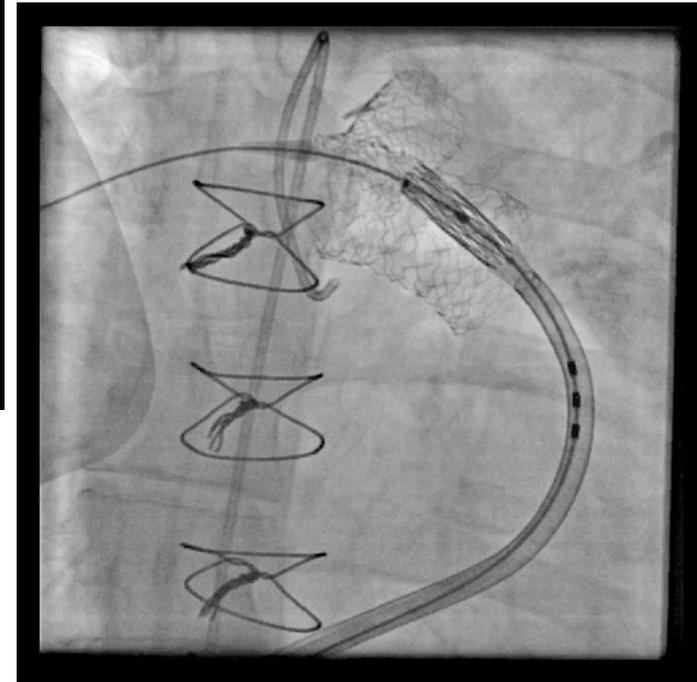
Dept of Cardiology

Outline

Background

Cases

Conclusion



History ToF

- Steno first described the defect in 1673
- Sandifort, 1777: autopsy “the blue boy”:
How great was the surprise of the onlookers, how great equally was my own surprise, when we saw the point of the finger to stretch into the aorta, which is not at all accustomed to maintain communications with the right ventricle, in conformity with the otherwise constant laws of nature !
- Fallot coined the term tetralogy in 1888
- First Blalock-Taussig shunt in 1944
- First cardiac catheterization in ToF in 1947
- First total repair by Lillehei in Minnesota in 1954
- First case series PPVI in ToF 2005 (Bonhoeffer)



Potential difficulties

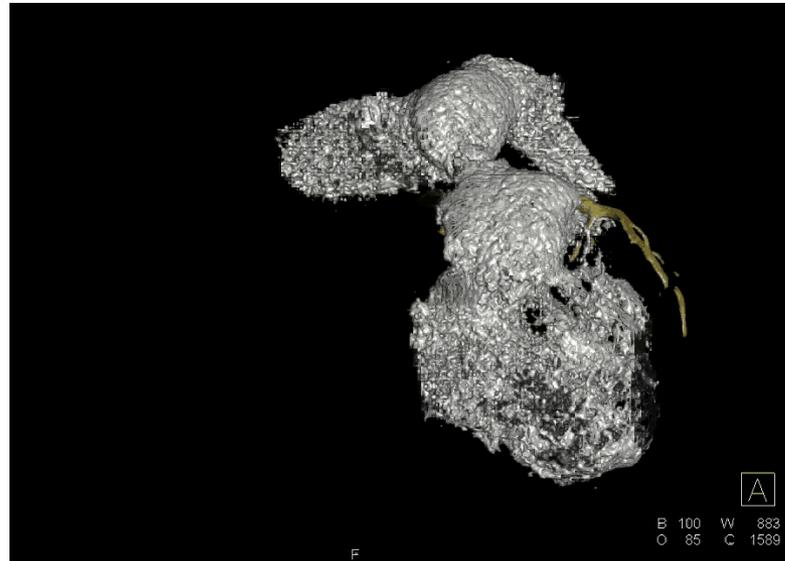
- Access
- Complex anatomy: landing zone, pulmonary (bifurcation), tricuspid abnormalities
- Material (diabolo, balloon rupture)
- Coronaries?
- Other: valve-in-valve yes/no?

My experience in 9 years congenital cath: 'expect the unexpected'



Access

- Patient ToF 25y of age
- 1995 surgical correction
- 2008 RV-PA conduit 21mm (aorta homograft)
- A/ not much complaints, not much exercise
- MRI/echo: narrowing homograft, flattening IVS, velocity PV 4m/s



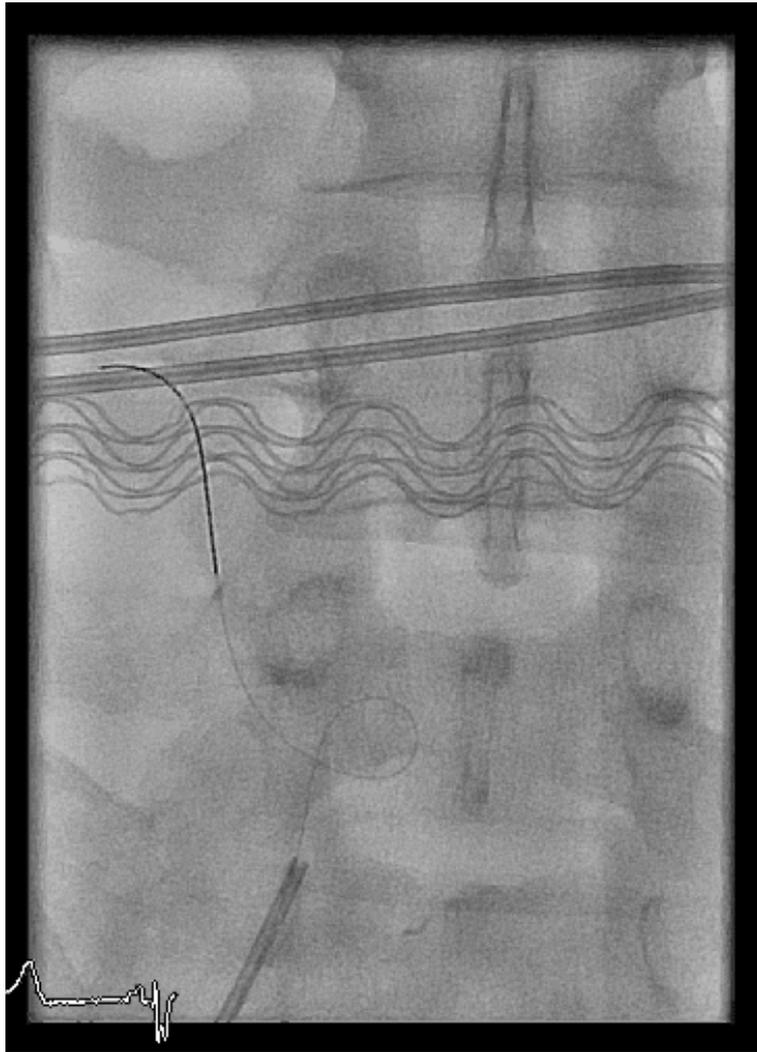
Groins



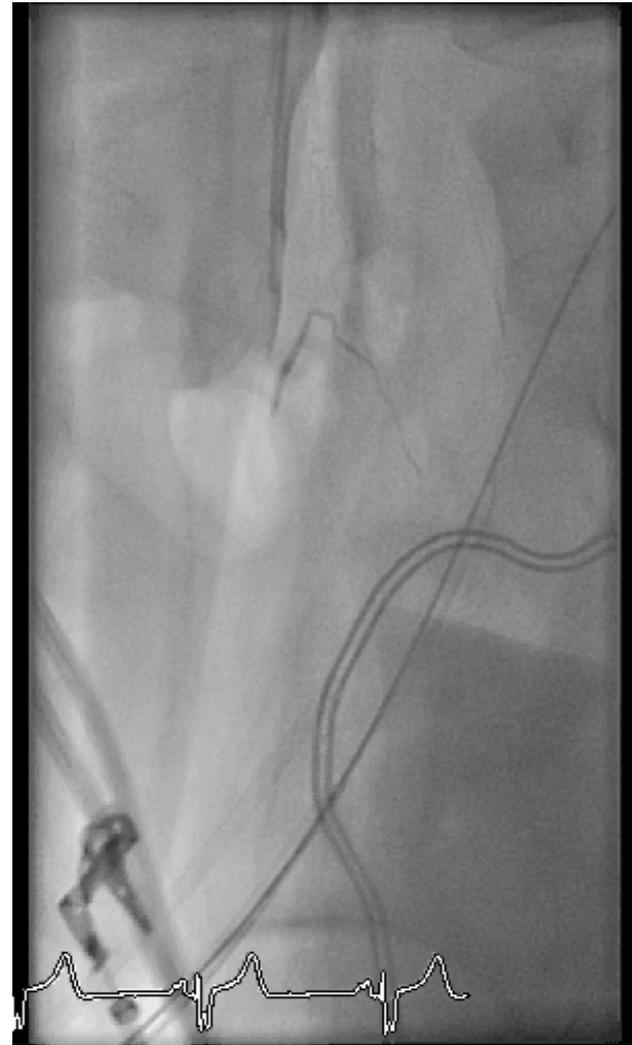
And now?

- Recanalize?
- Jugular?

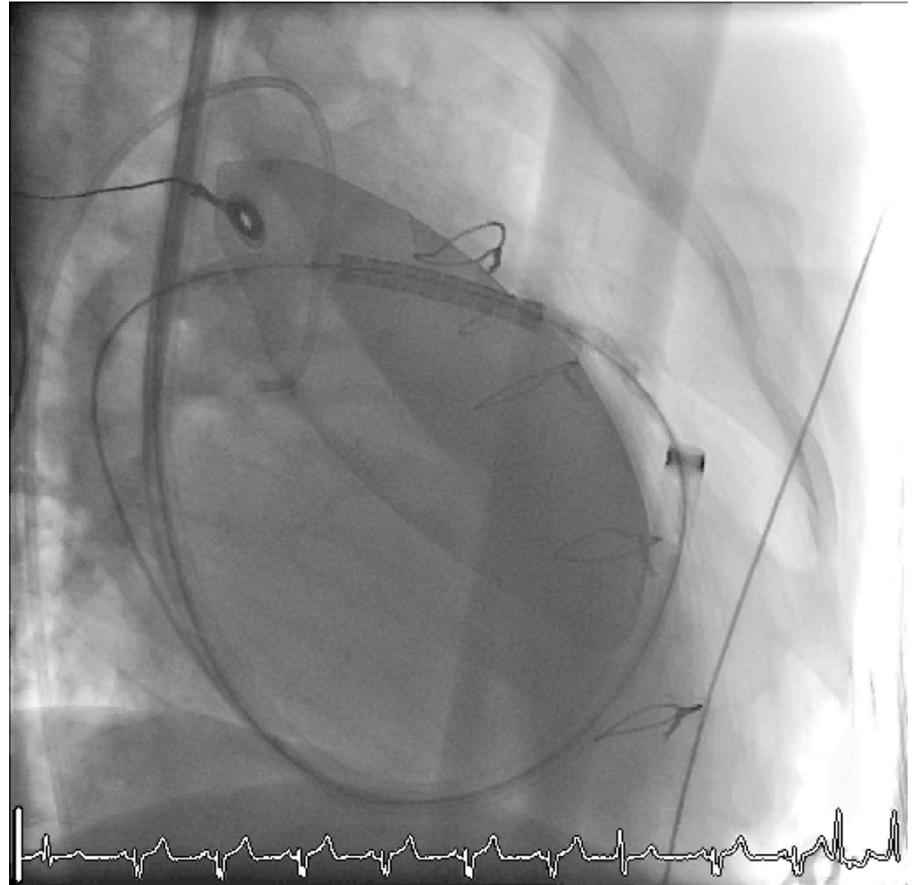
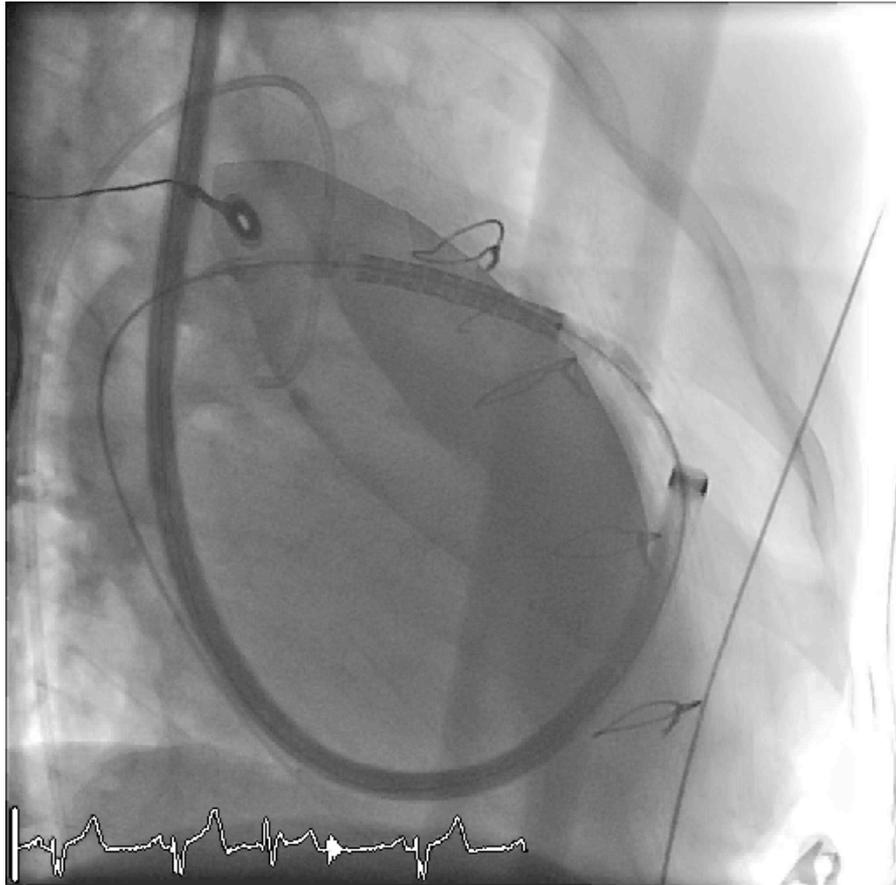
Attempt recanalization



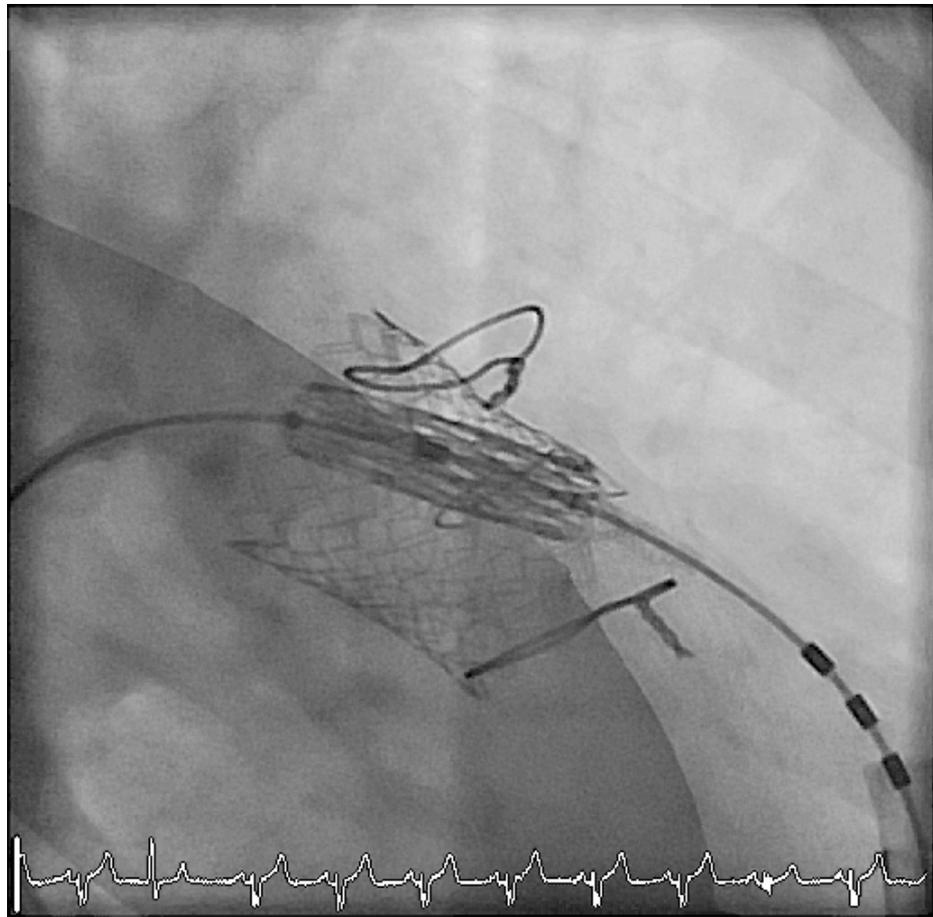
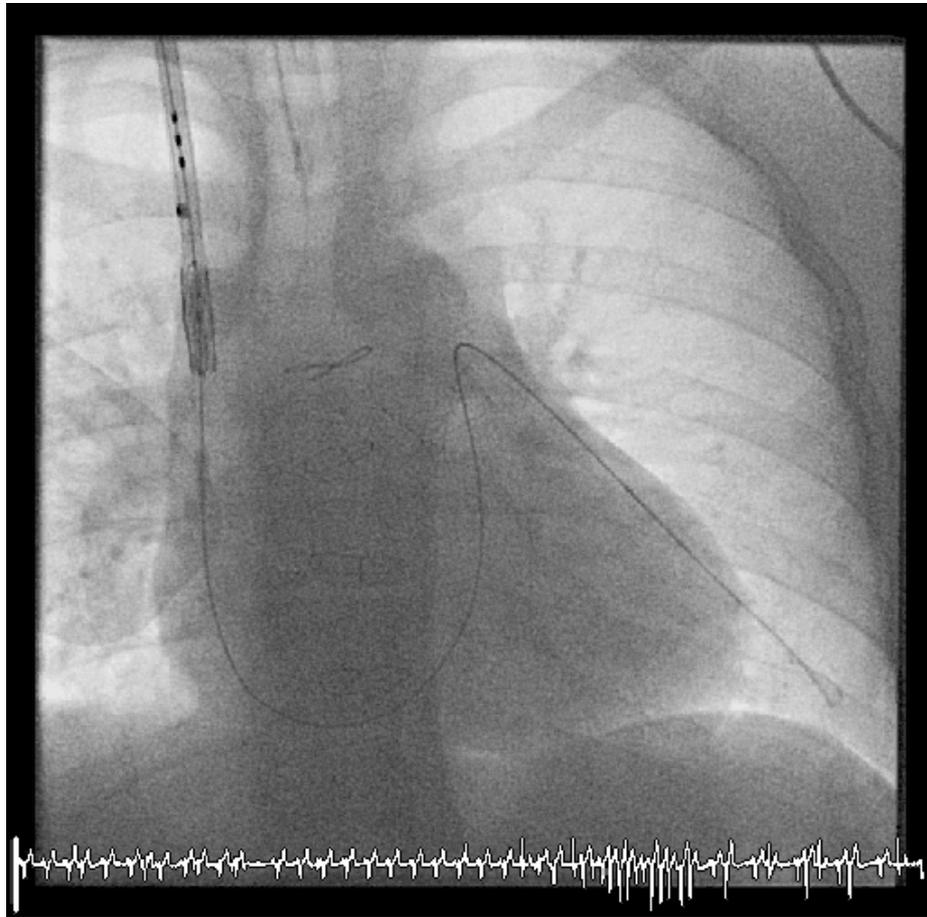
Jugular and Femoral access



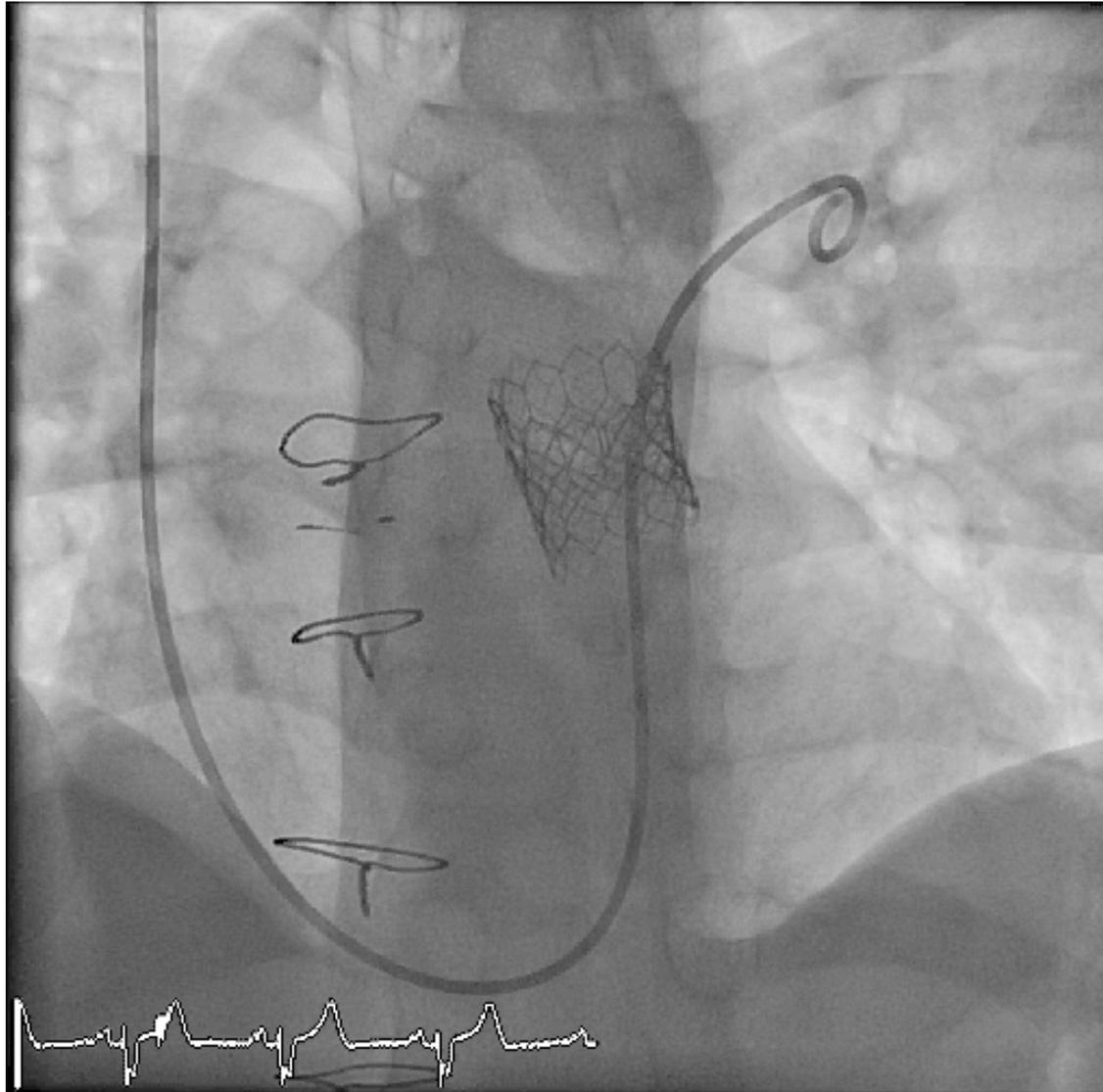
Pre-stent



Sapien valve



Result



Case bifurcation; short landing zone

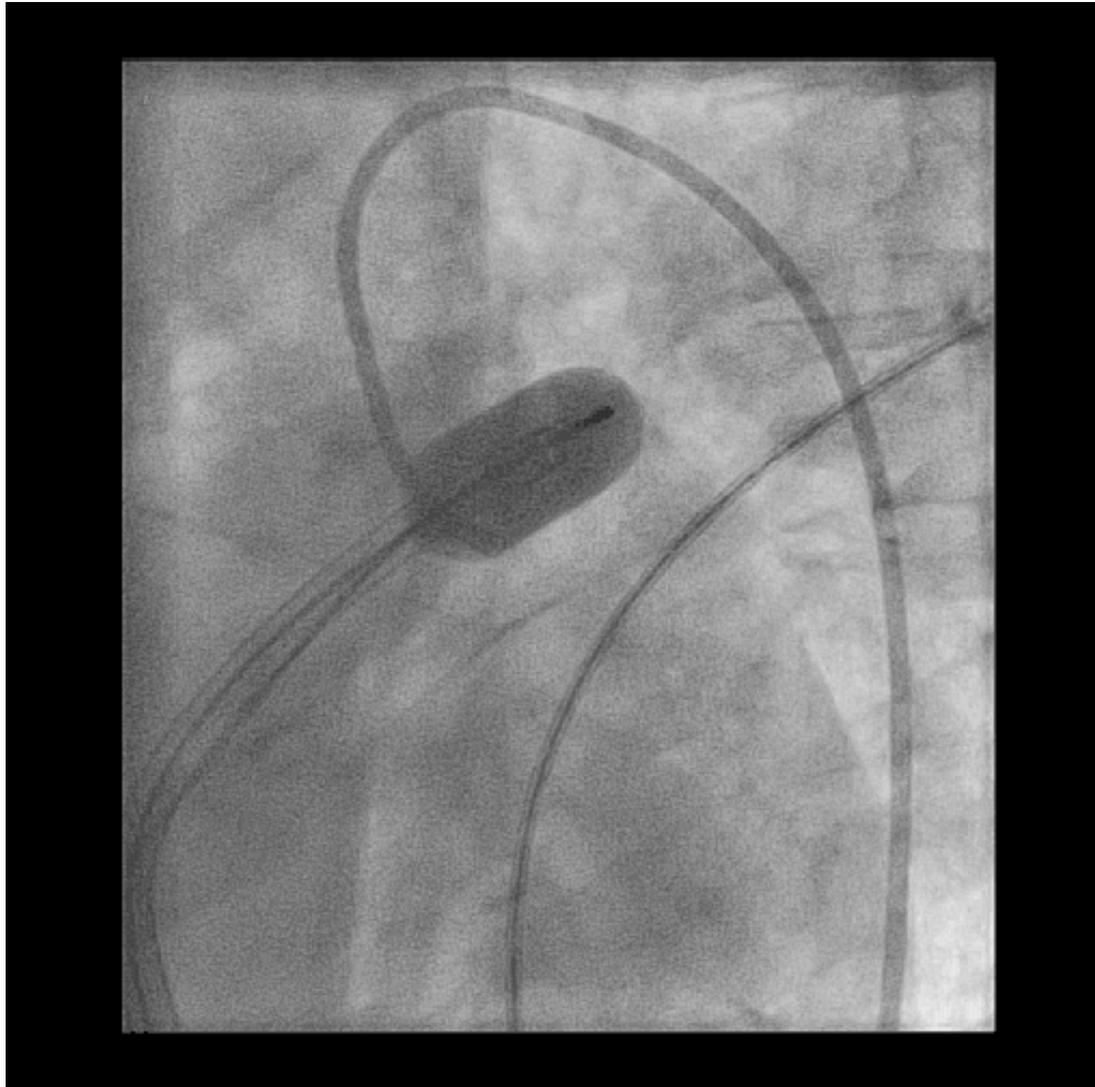
- Male, 35y age
- TOF with cAVSD
- 1999 AVSD correction with RVOT patch
- 1999 Bifurcation plasty, patch VSD
- 2009 Balloon dilatation MPA stenosis



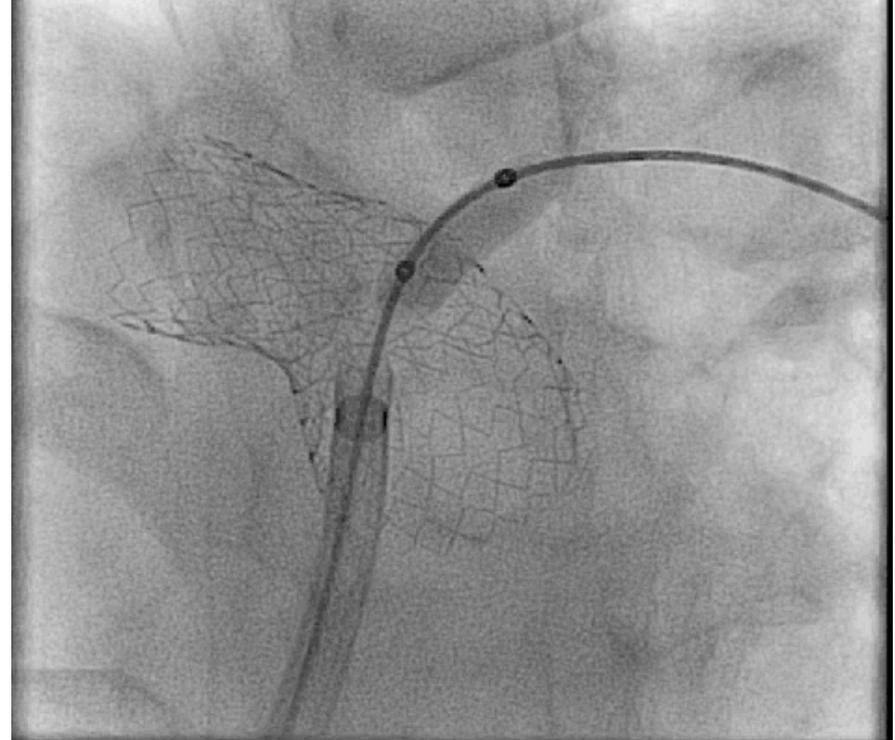
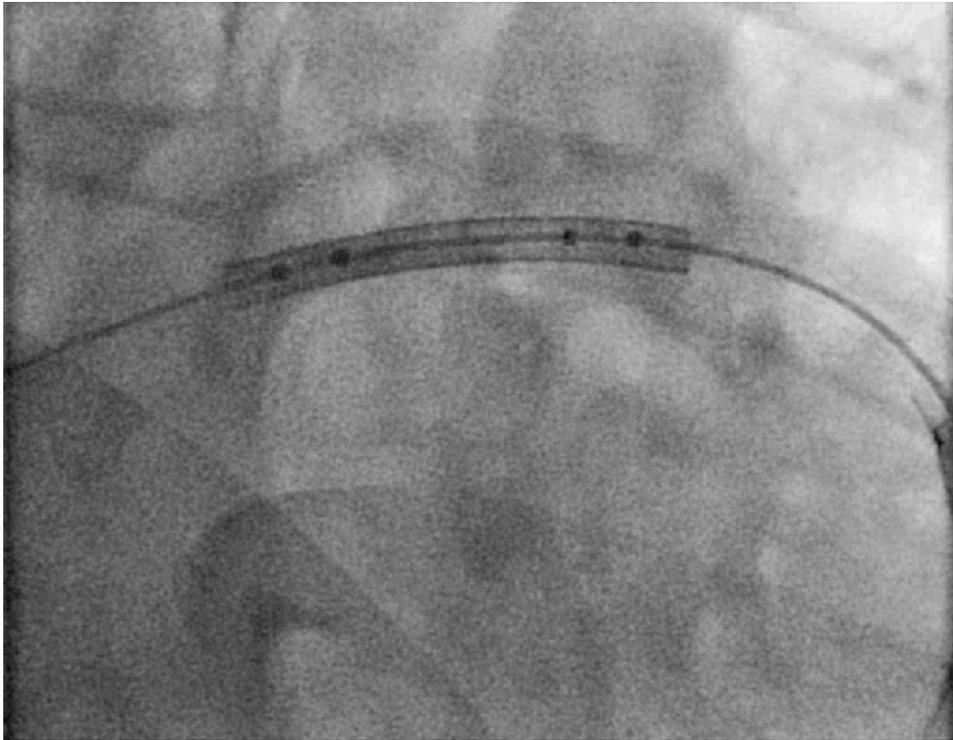
What would you do?

- Surgery?
- PPVI (short landing zone)? Pre-stent? Which valve?
Bifurcation stents?

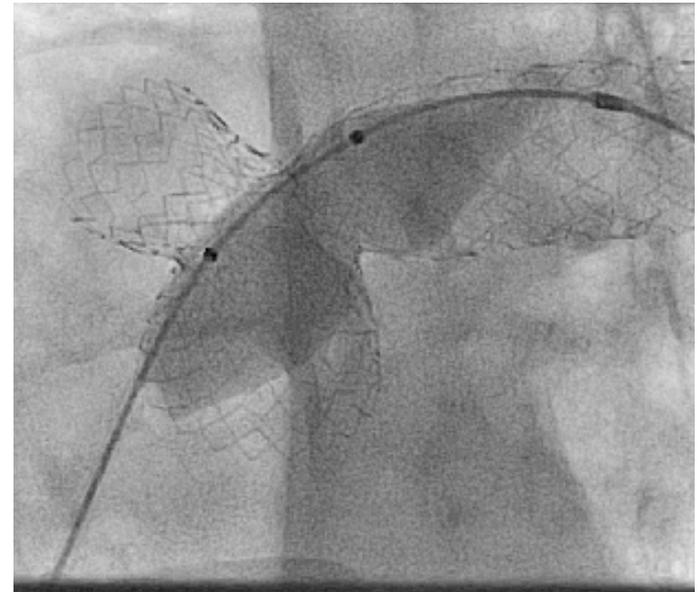
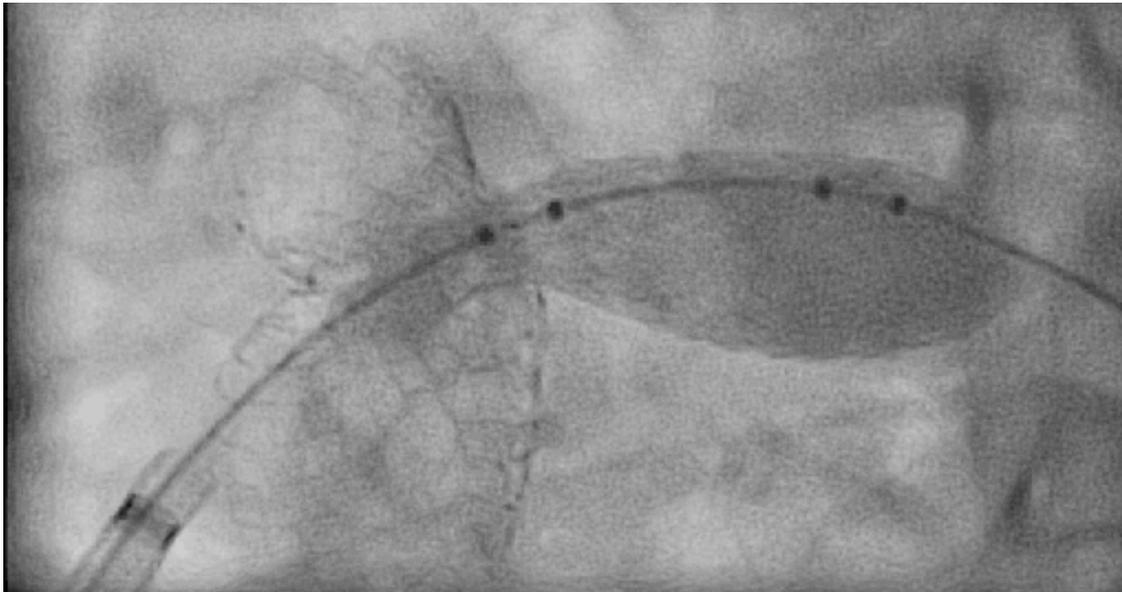
Balloon testing with LCA



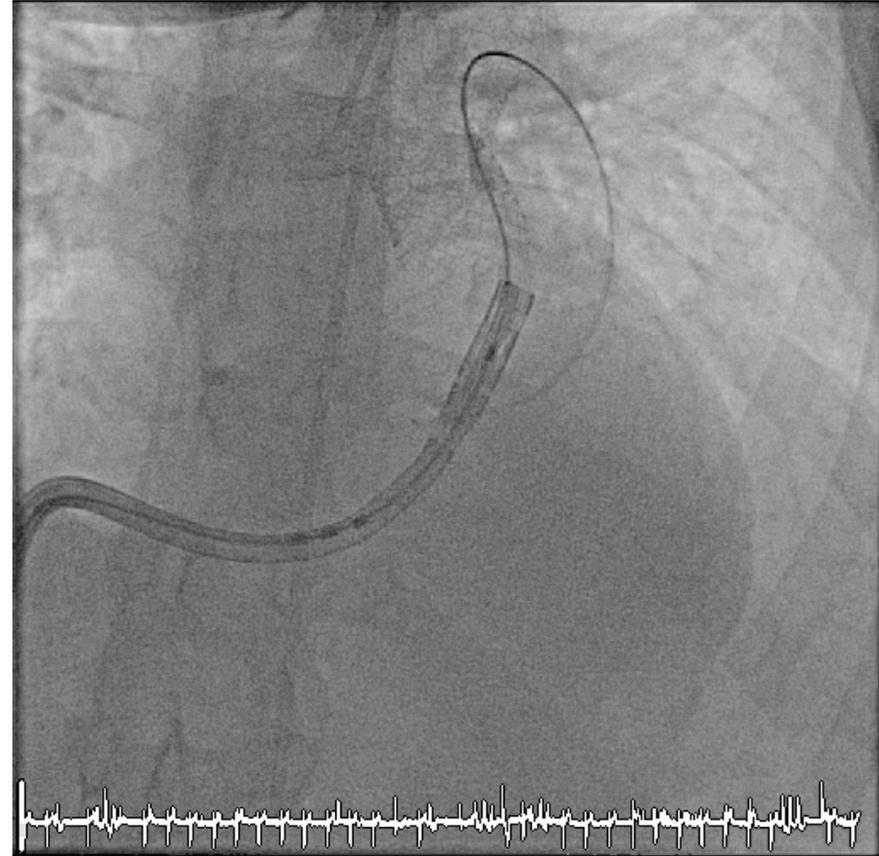
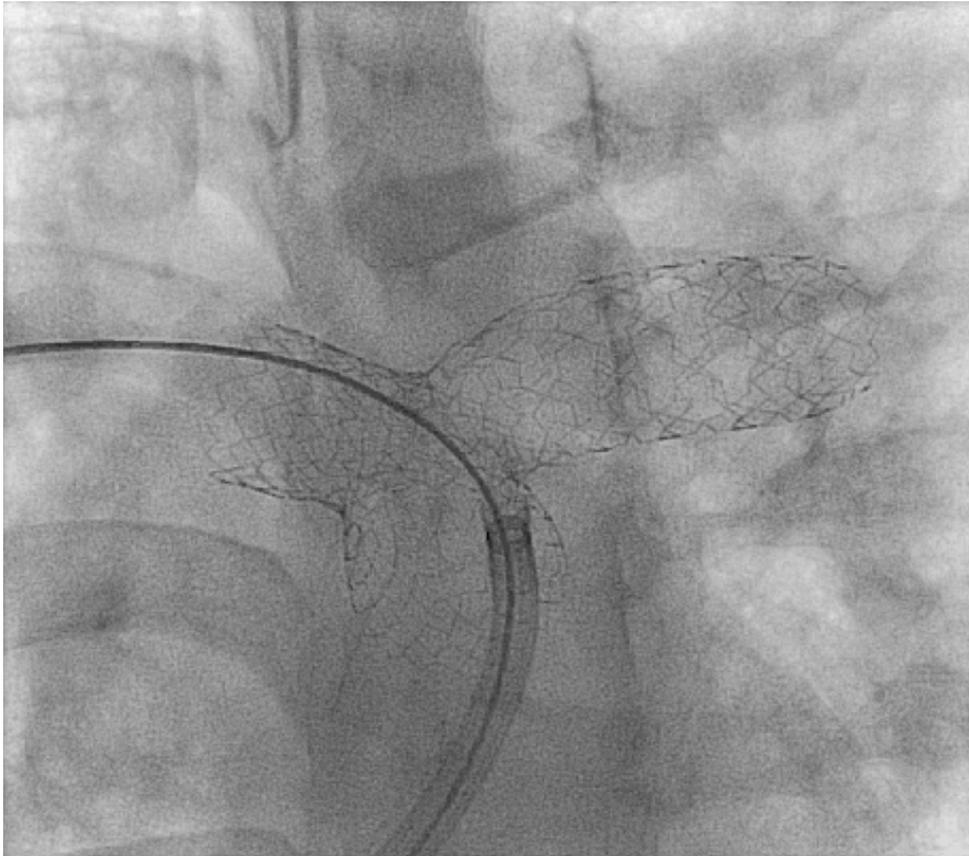
RPA stent and fenestration to LPA



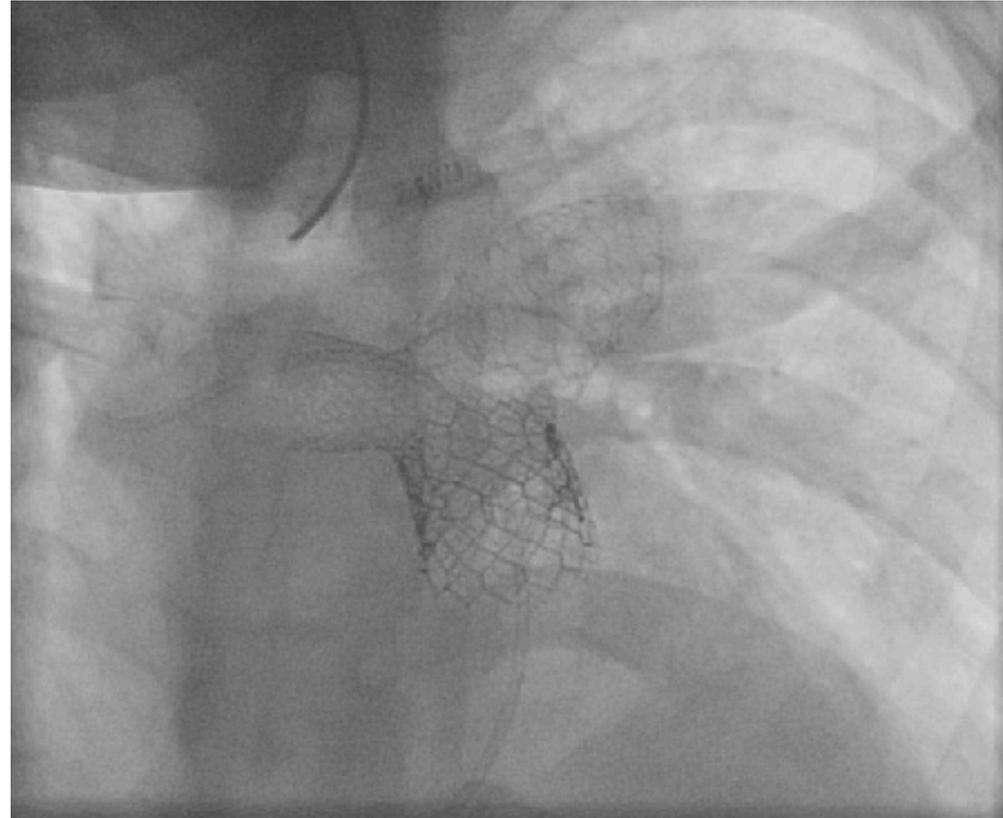
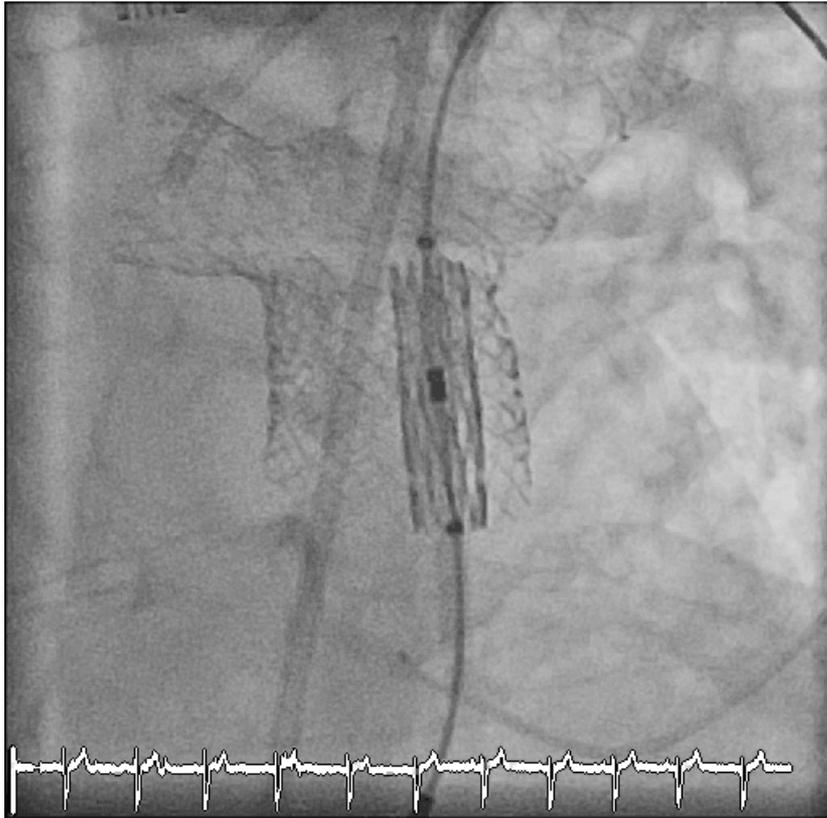
LPA stent and postdilatation



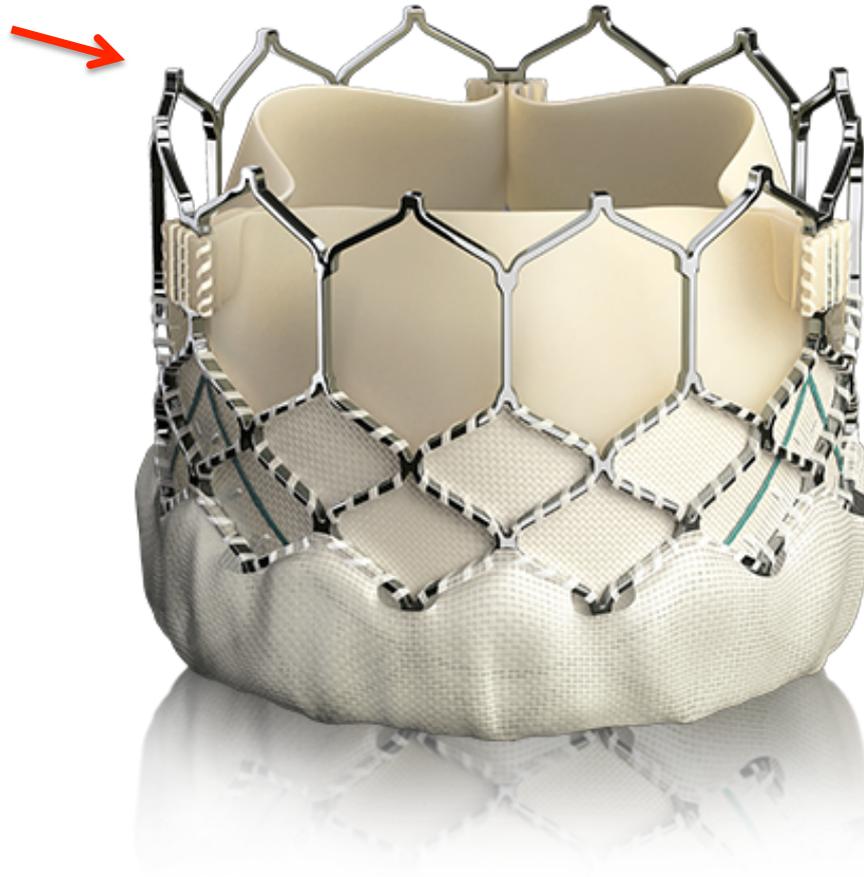
End result pre-stents; advancement Sapien



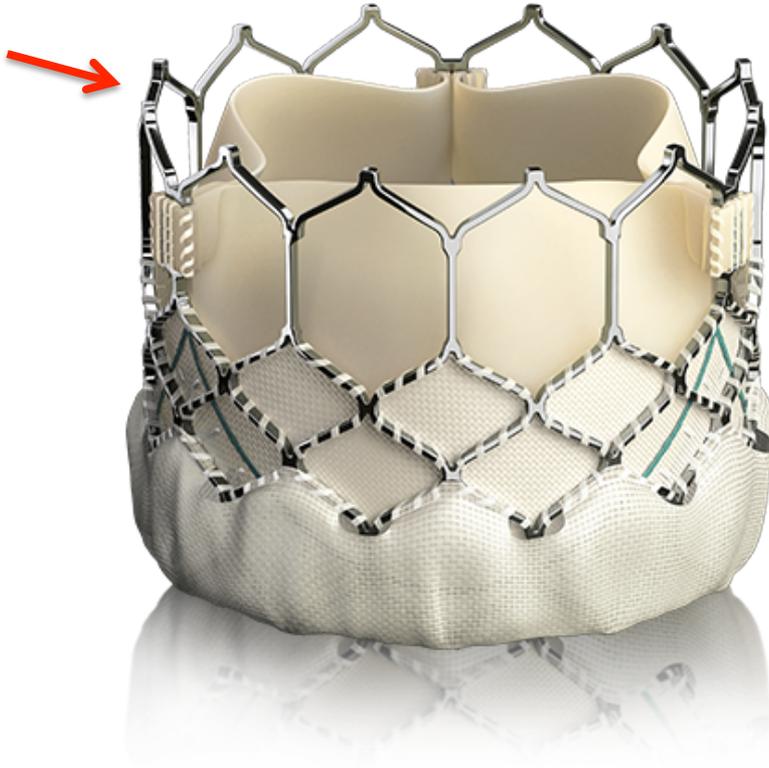
Sapien implantation; result ☹️



Paravalvular leak through struts; and now?



And now??

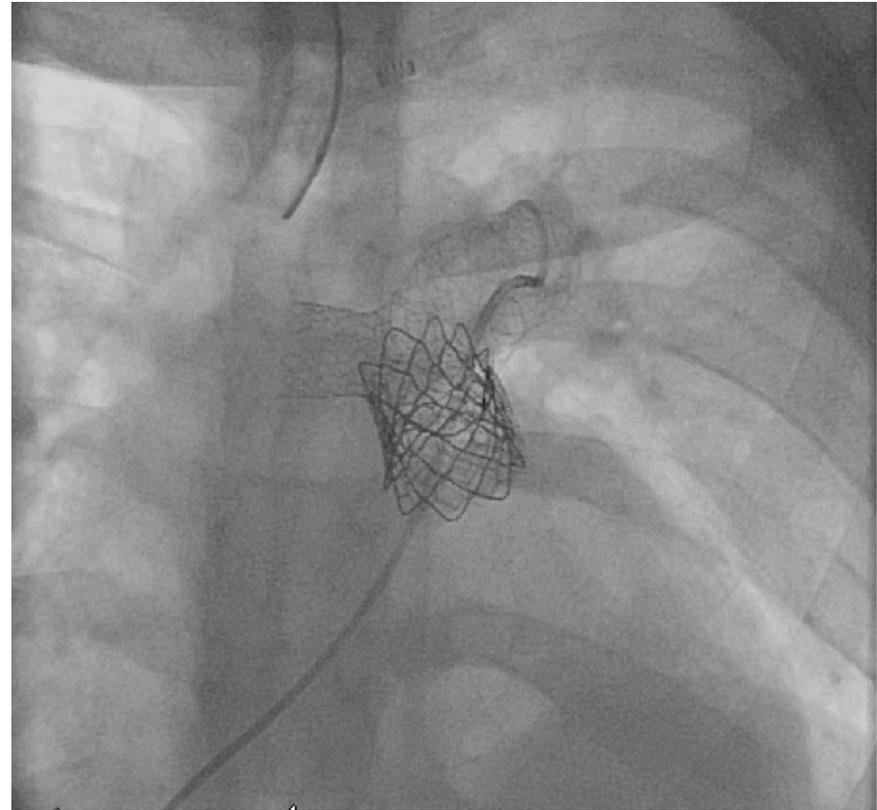
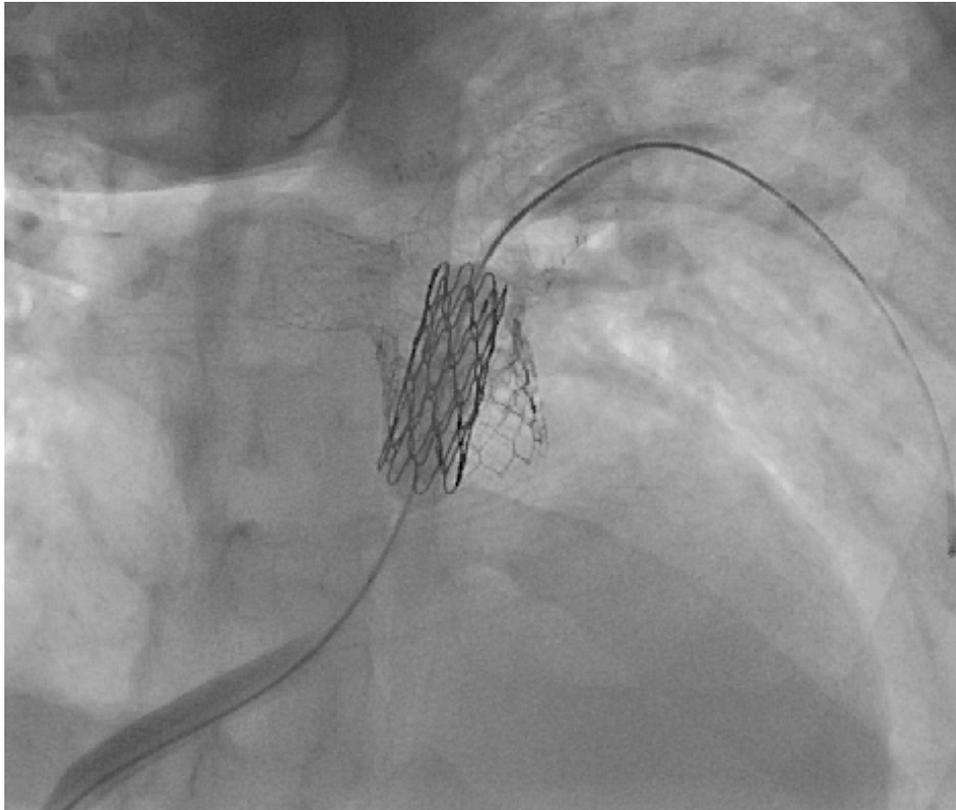


Sapien



Melody

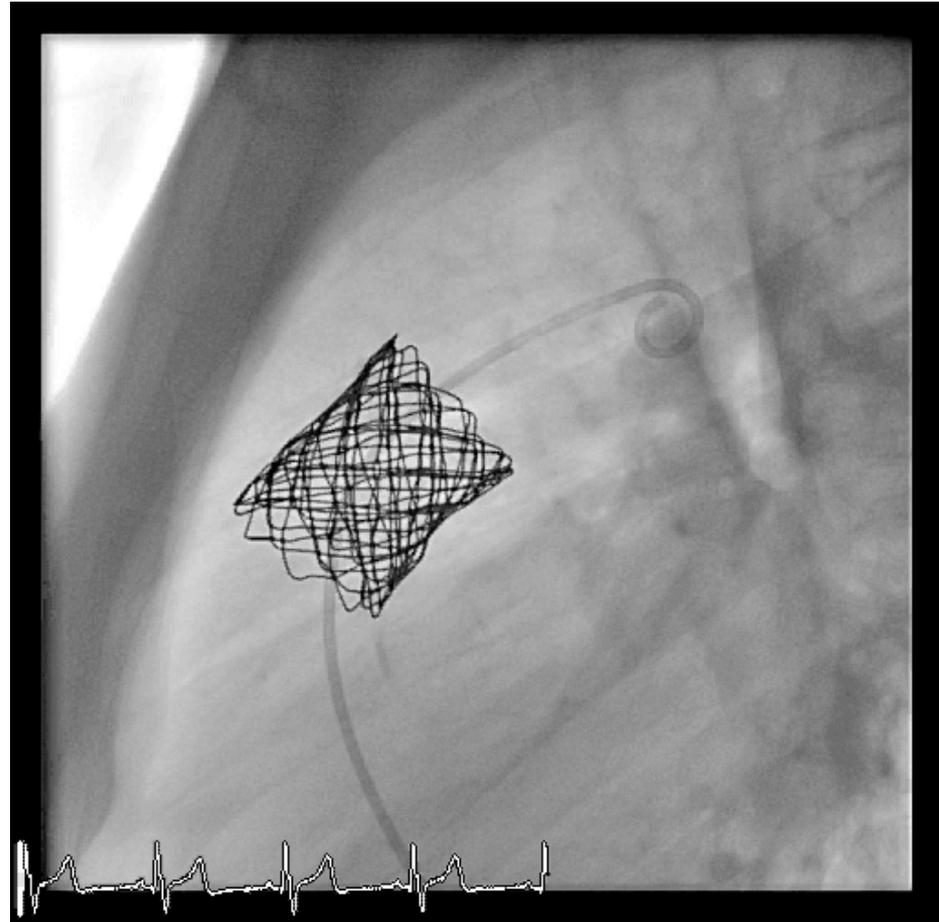
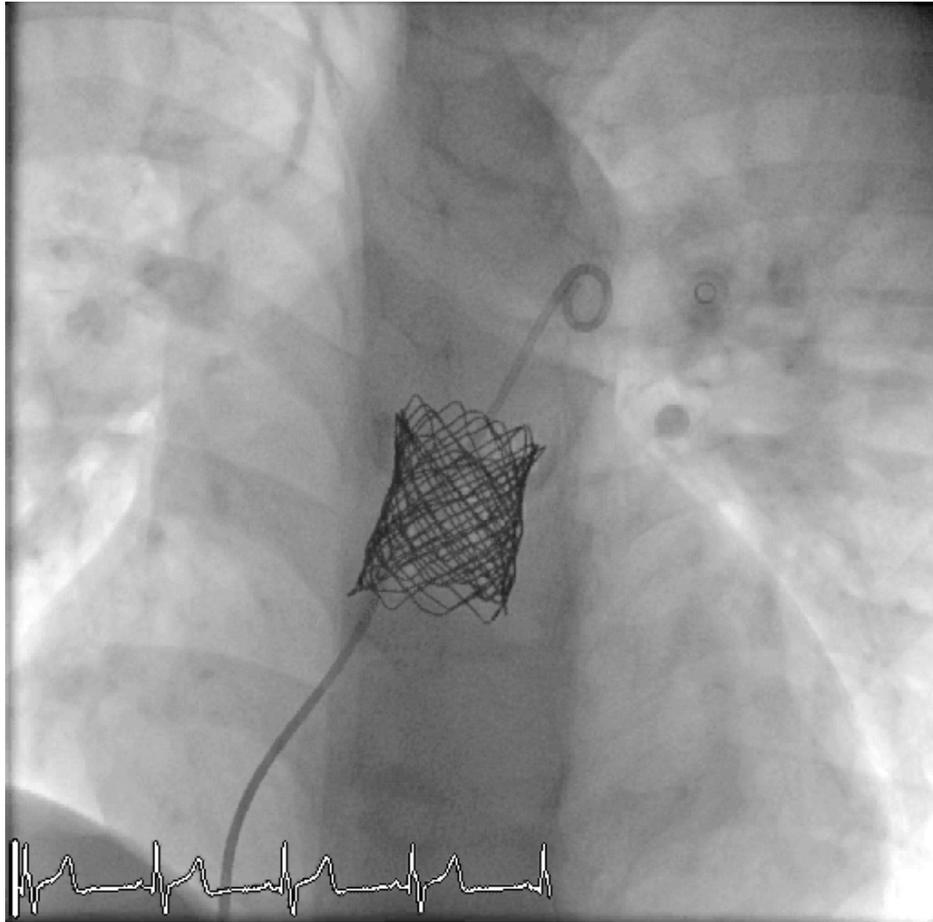
Implantation Melody; end result



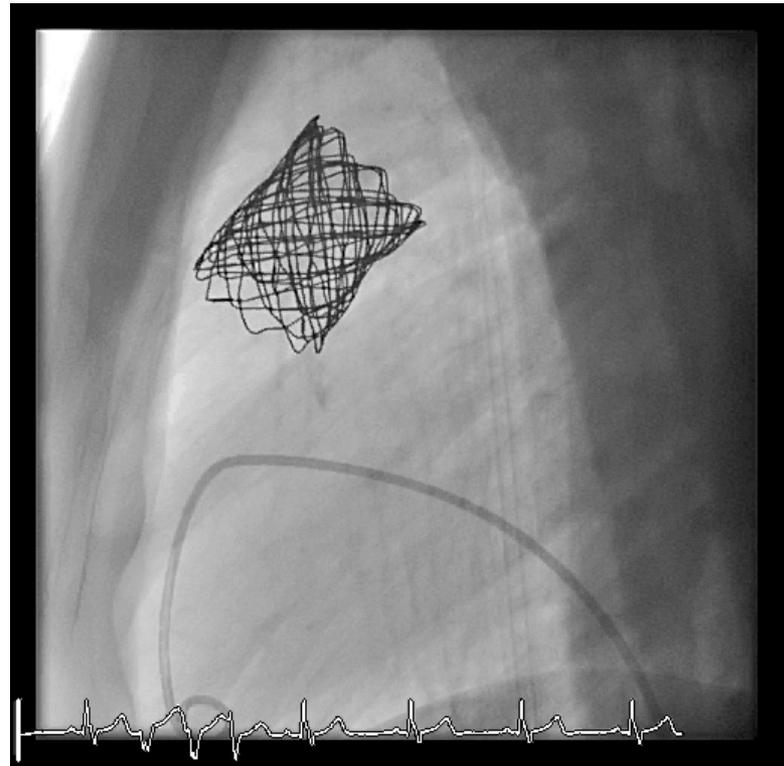
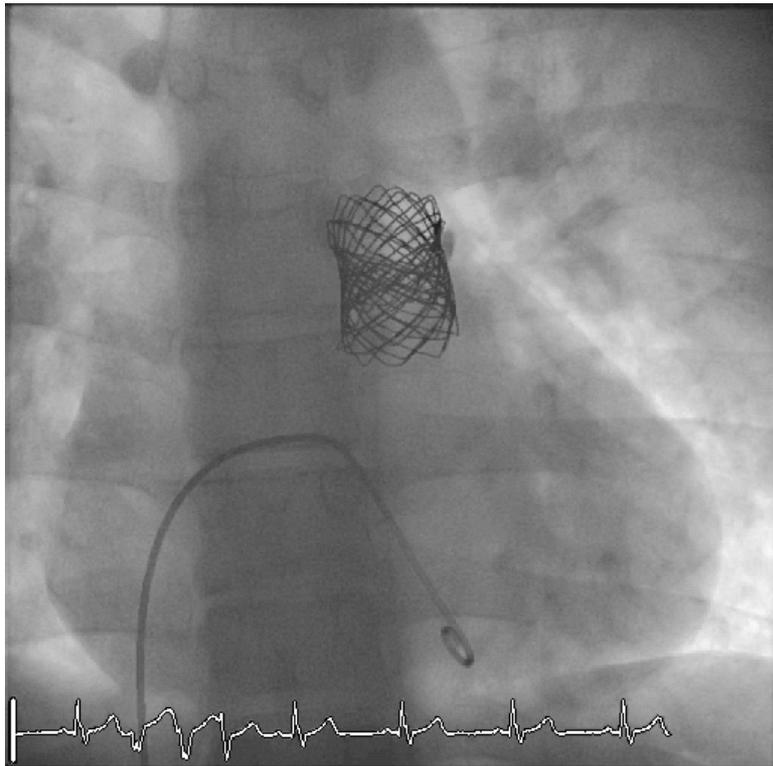
Valve-in-valve?

- 18 year old male patient with pulmonary atresia and VSD
 - 1999 central aortopulmonary shunt
 - 2000 VSD patch, closure shunt, 21mm homograft
 - 2014 Significant insufficiency homograft; gradient 14mmHg peak-peak: Melody valve implantation: pretesting with CP covered and non-covered 45mm on BIB 24x50mm balloon
- > Reduced exercise capacity; echo quality poor
- > Cath

Angio post Melody 2014

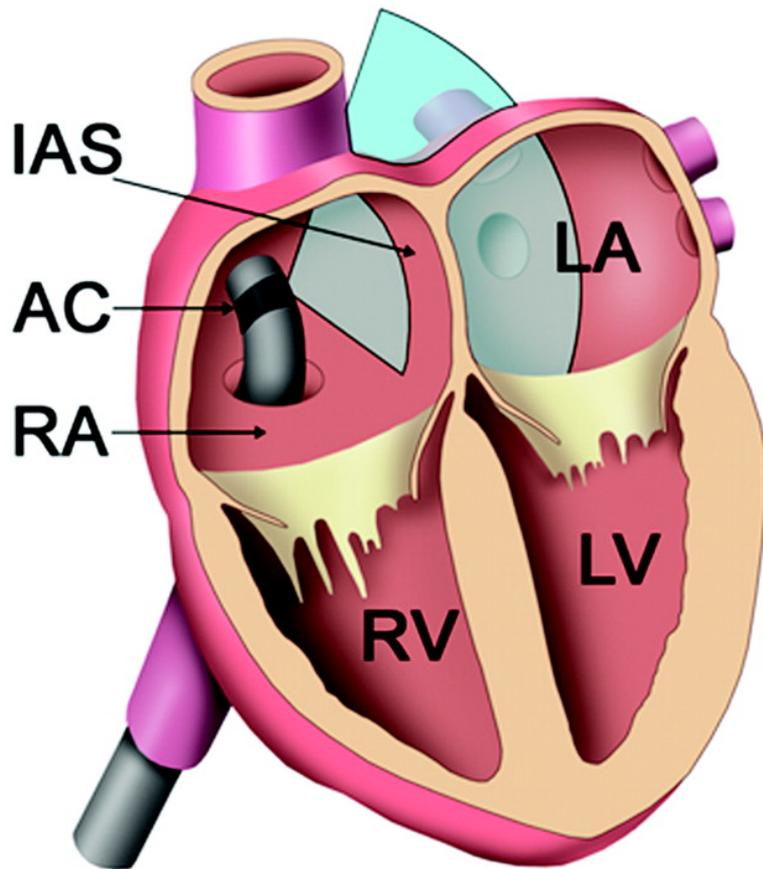


Reangiography 2017 -> valve-in-valve?

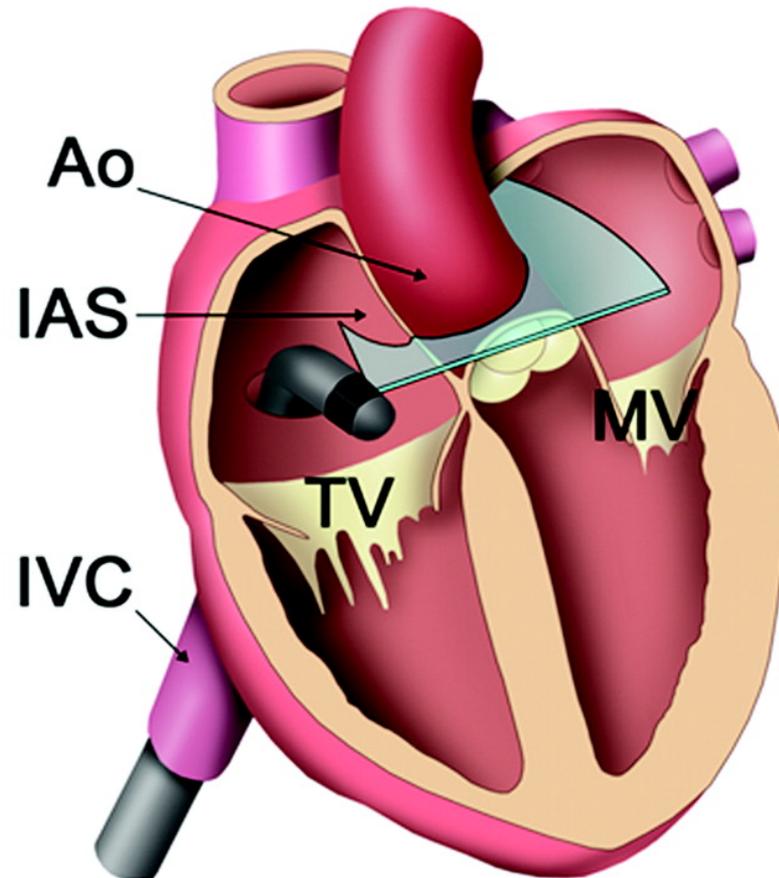


Cath May 2017 (reduced exercise capacity):
gradient 20mmHg without and >30mmHg with
adrenaline over Melody valve

Intracardiac Echo (ICE)

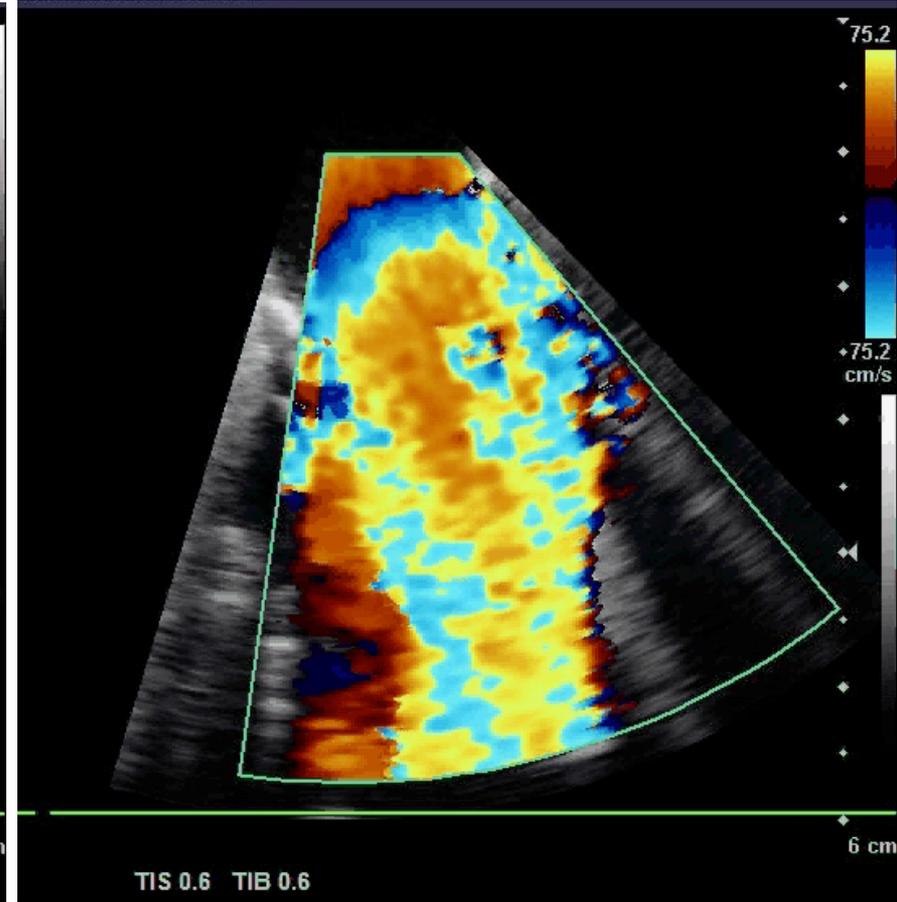
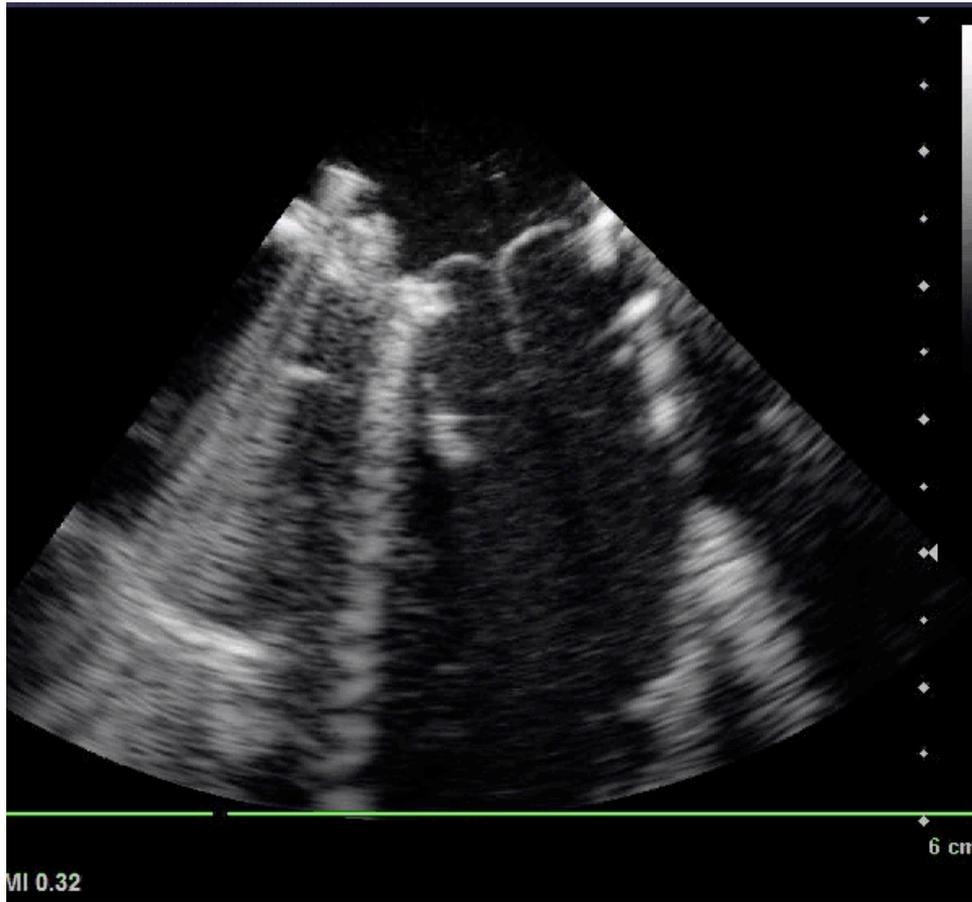


PFO/ASD closure



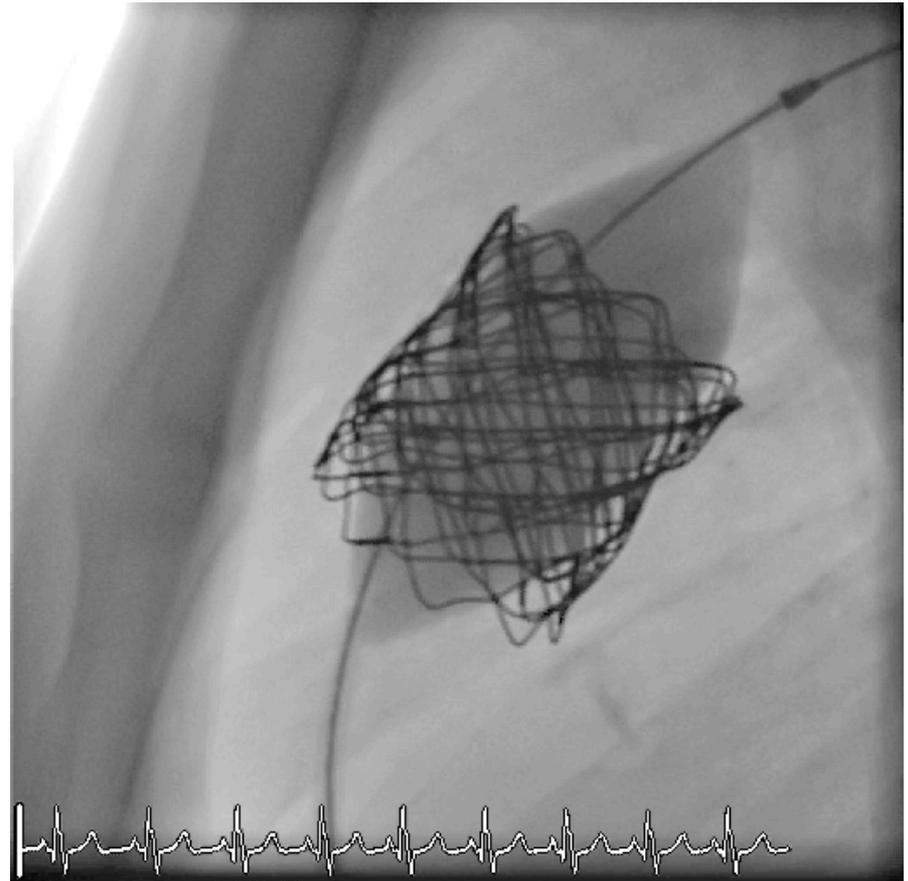
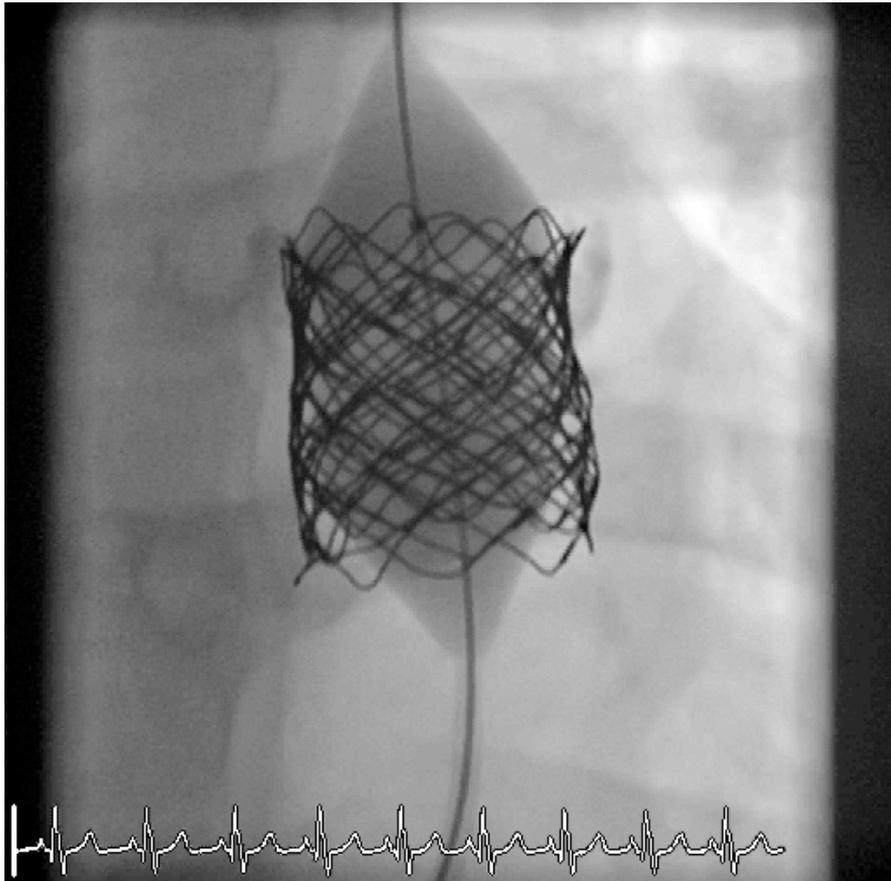
TAVI

Valve function? -> ICE

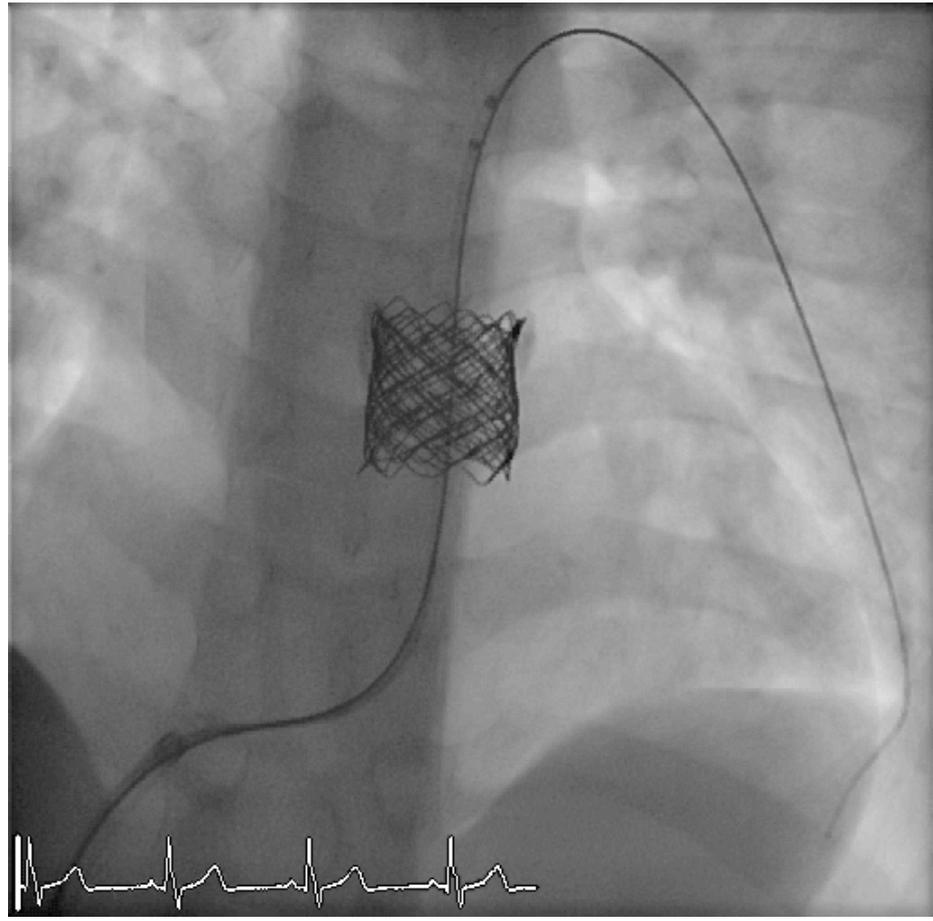
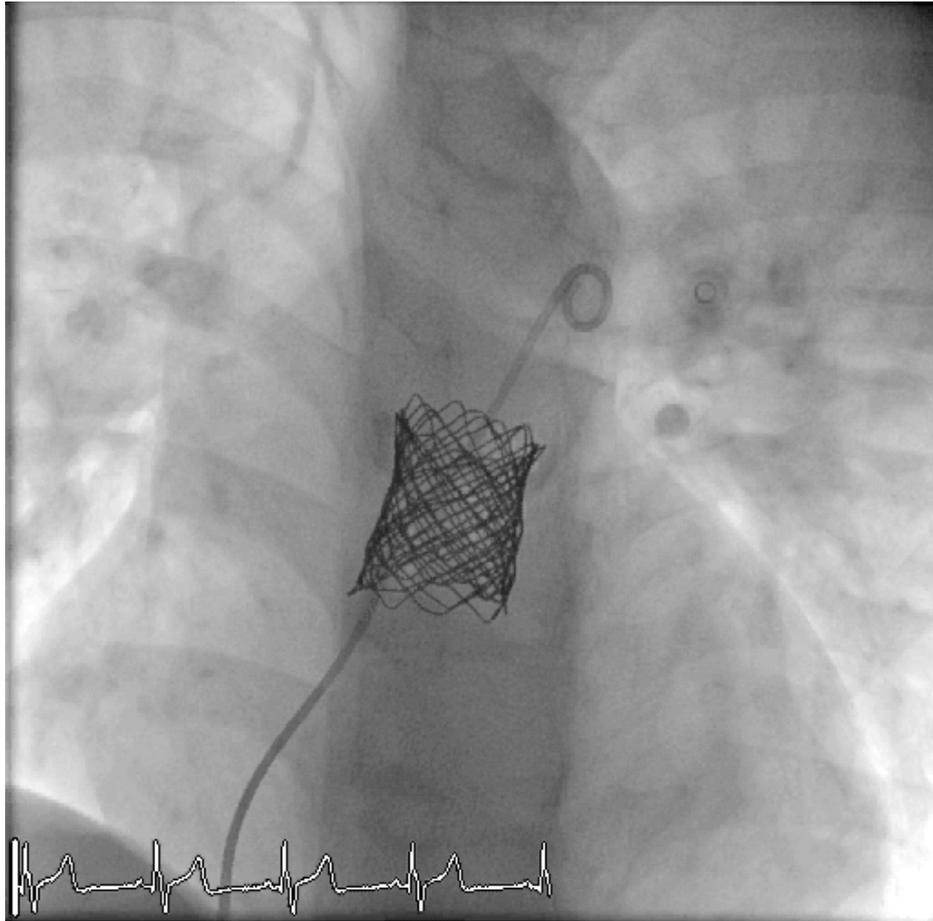


Postdilatation Melody valve

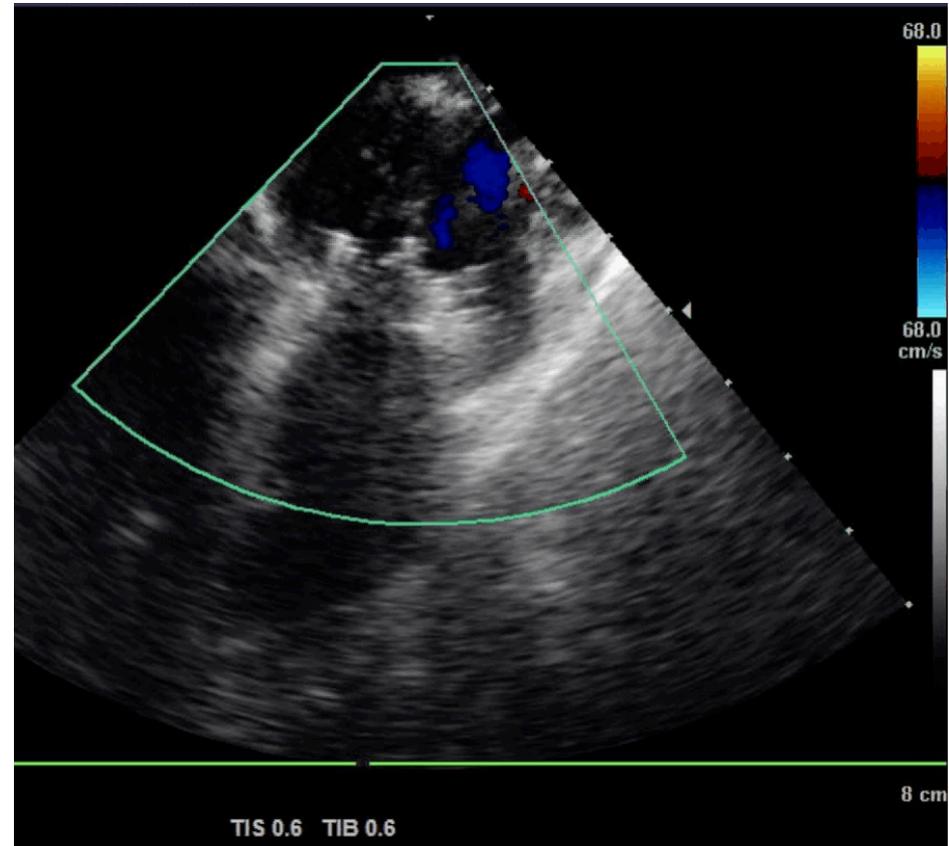
Atlas 22mm at 20atm



Final angiography – comparison



ICE post balloon



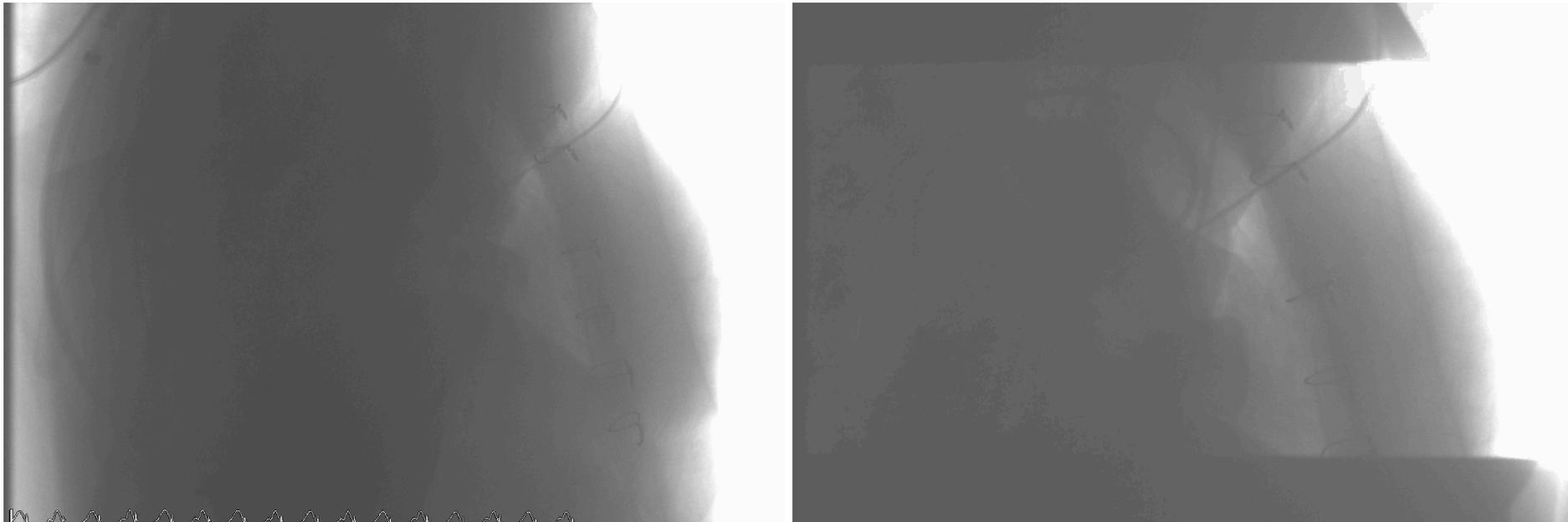
Diabolo

- Female, 23y of age
- TOF
- 1996: valvulotomy PA
- 1997: correction, TAP, LPA patch
- 2008: RV-PA conduit (Freestyle 21mm)
- 2009: Stent LPA ev3 Mega LD

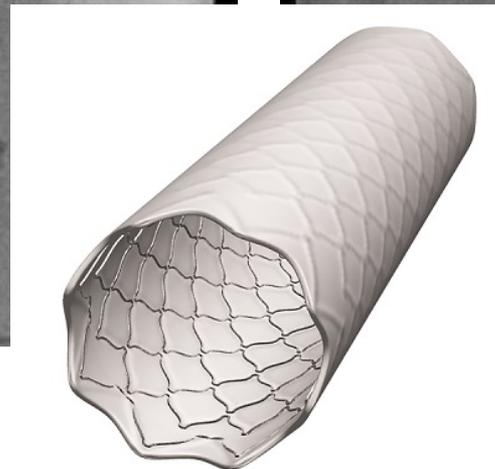
- 2016: MRI: severe PS 4,9 m/s, RV overload, paradoxal septum movement



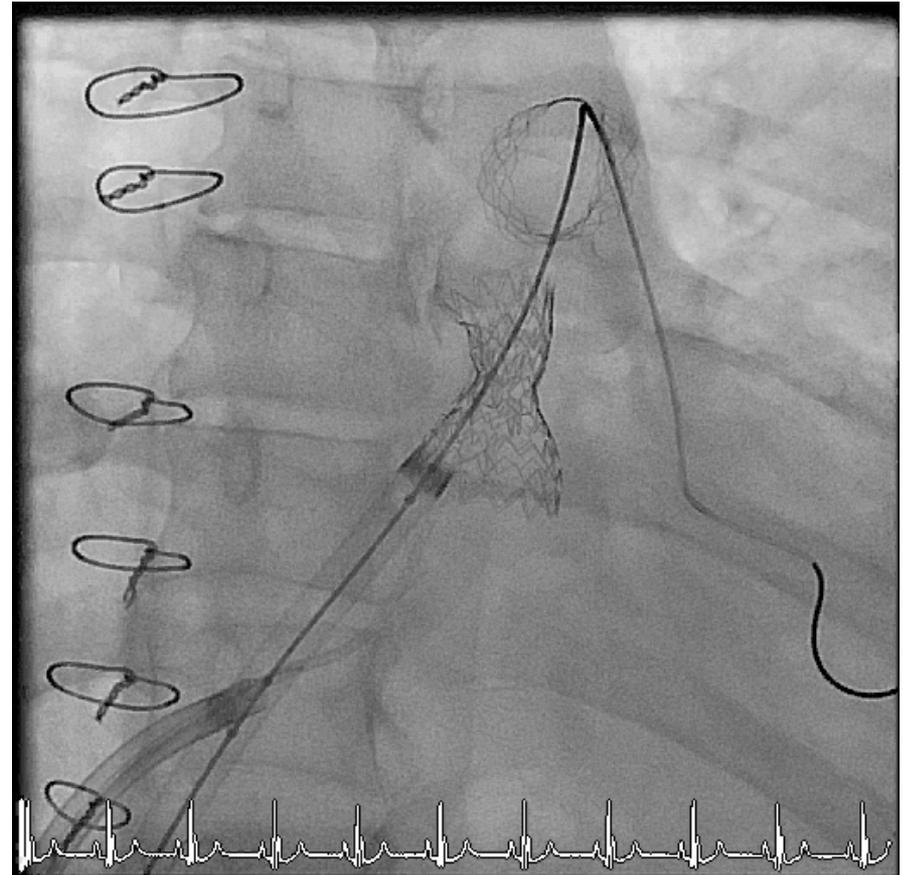
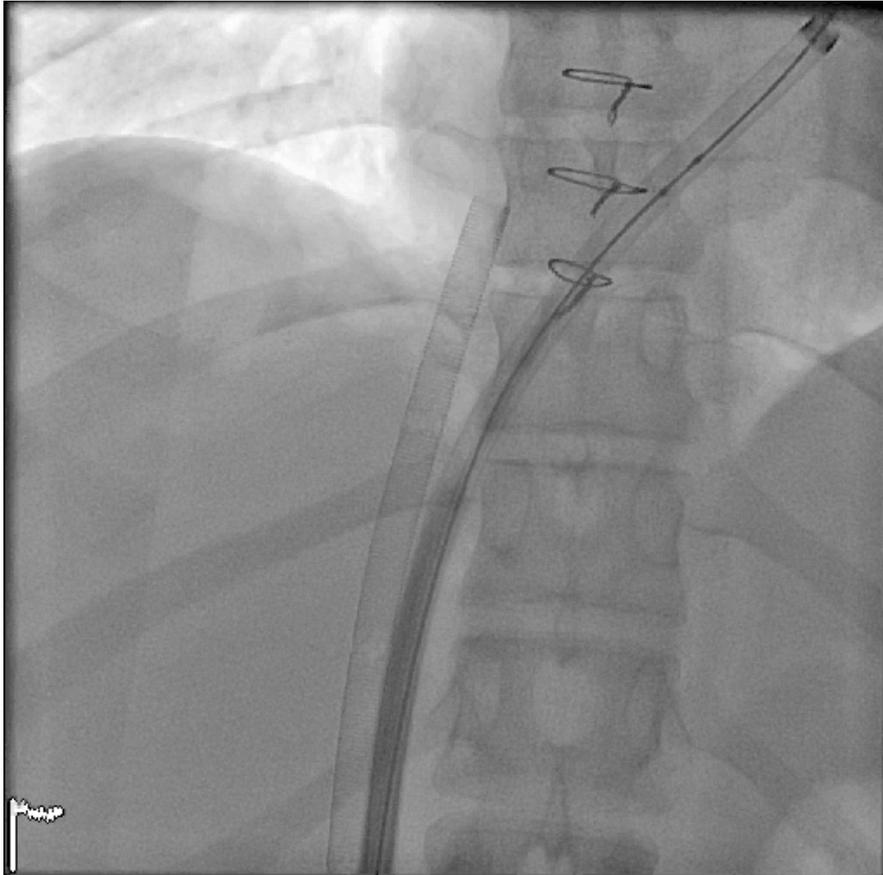
3DRA; 'plain' and with balloon/LCA



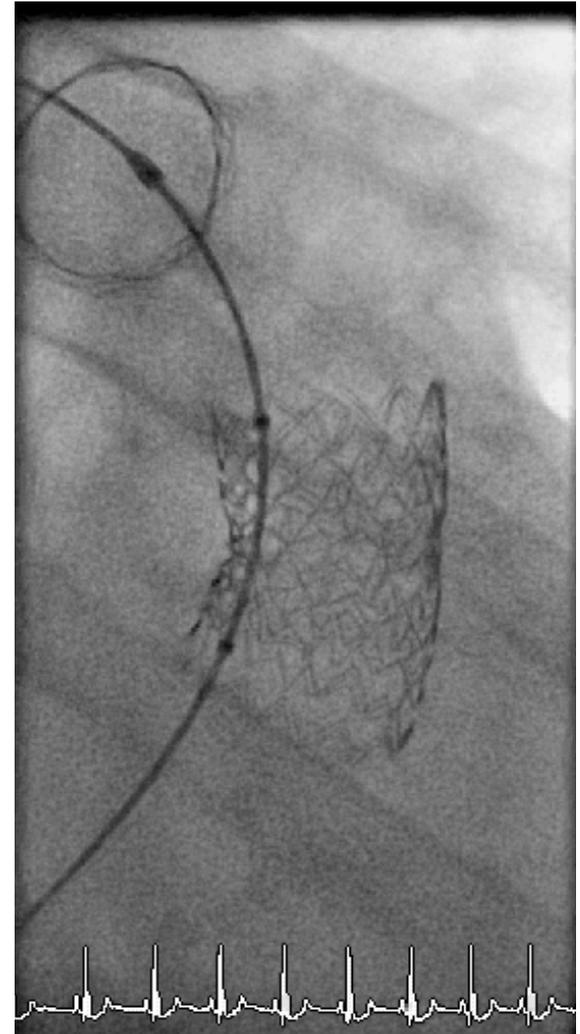
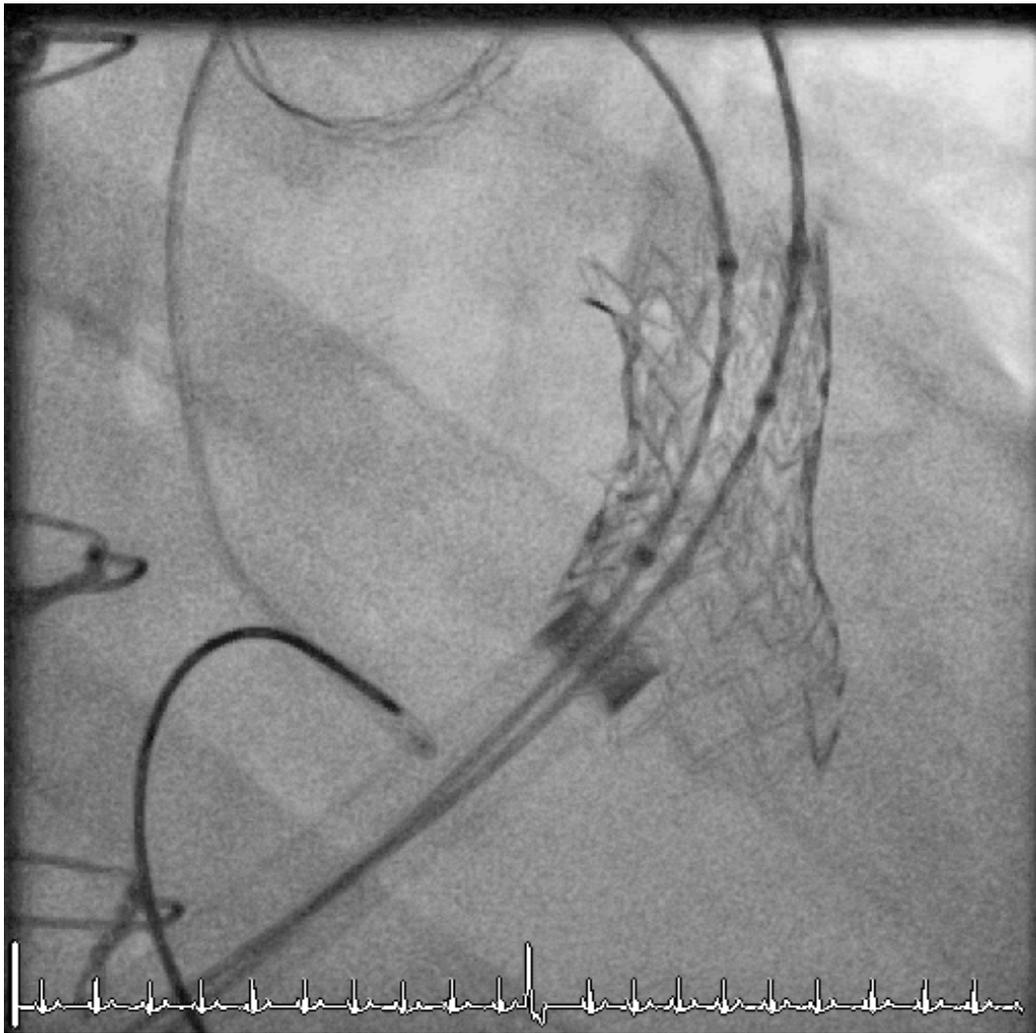
Dogboning stent: block RVOT: HD instability



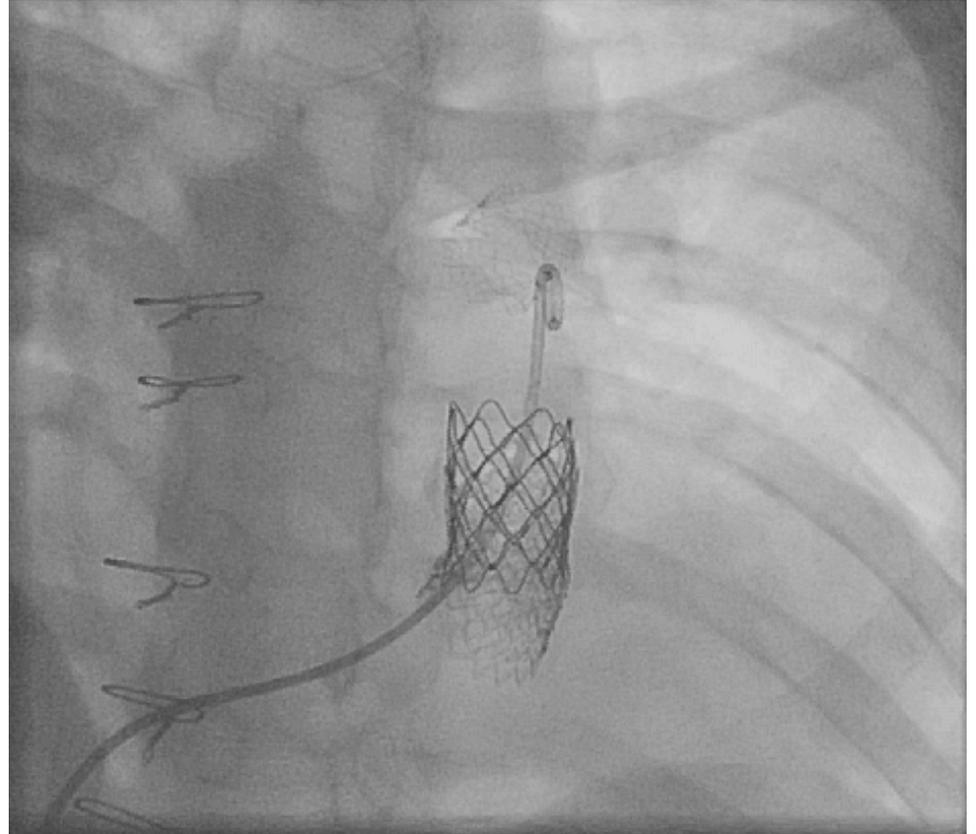
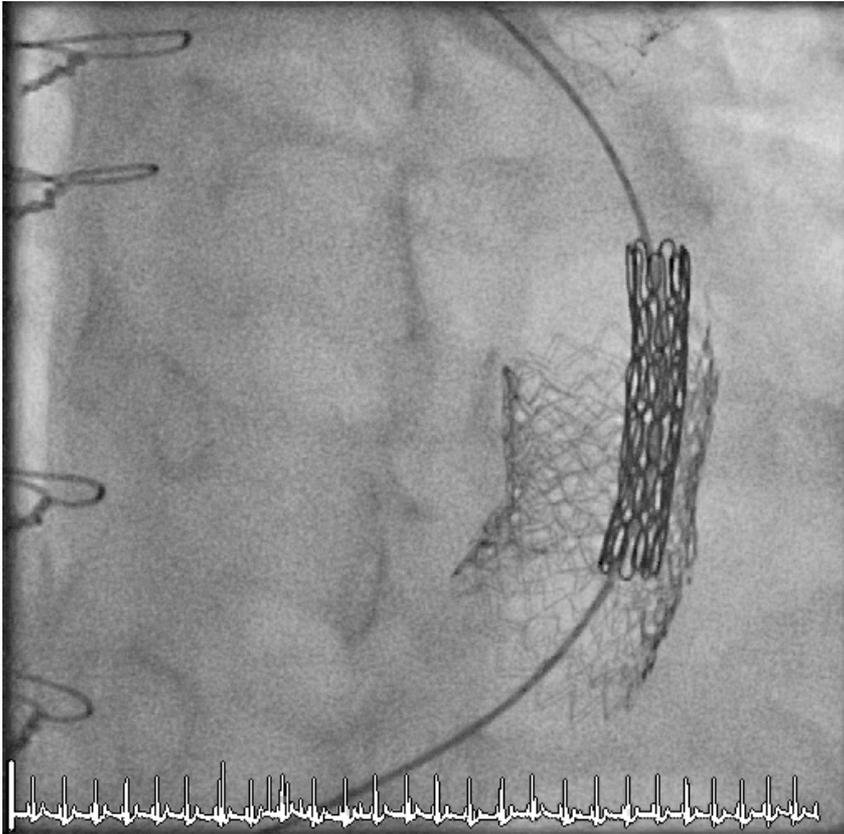
ECLS; trying to pass stent



Balloon passage and postdilatation Atlas



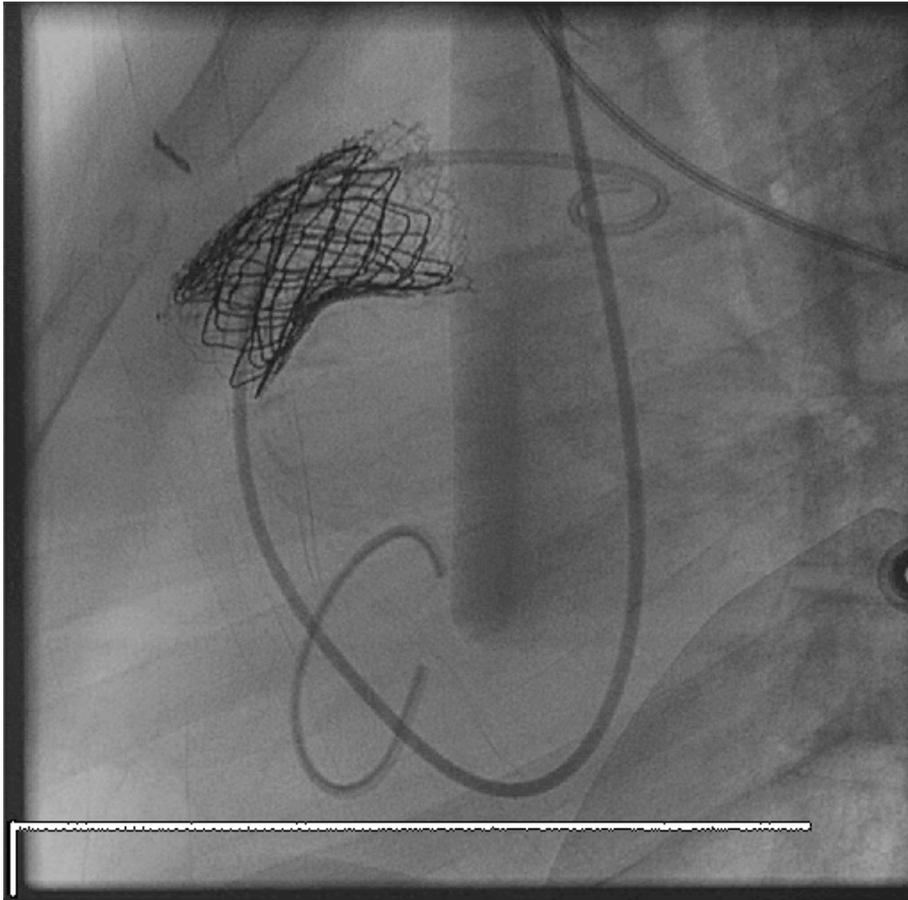
Melody implantation



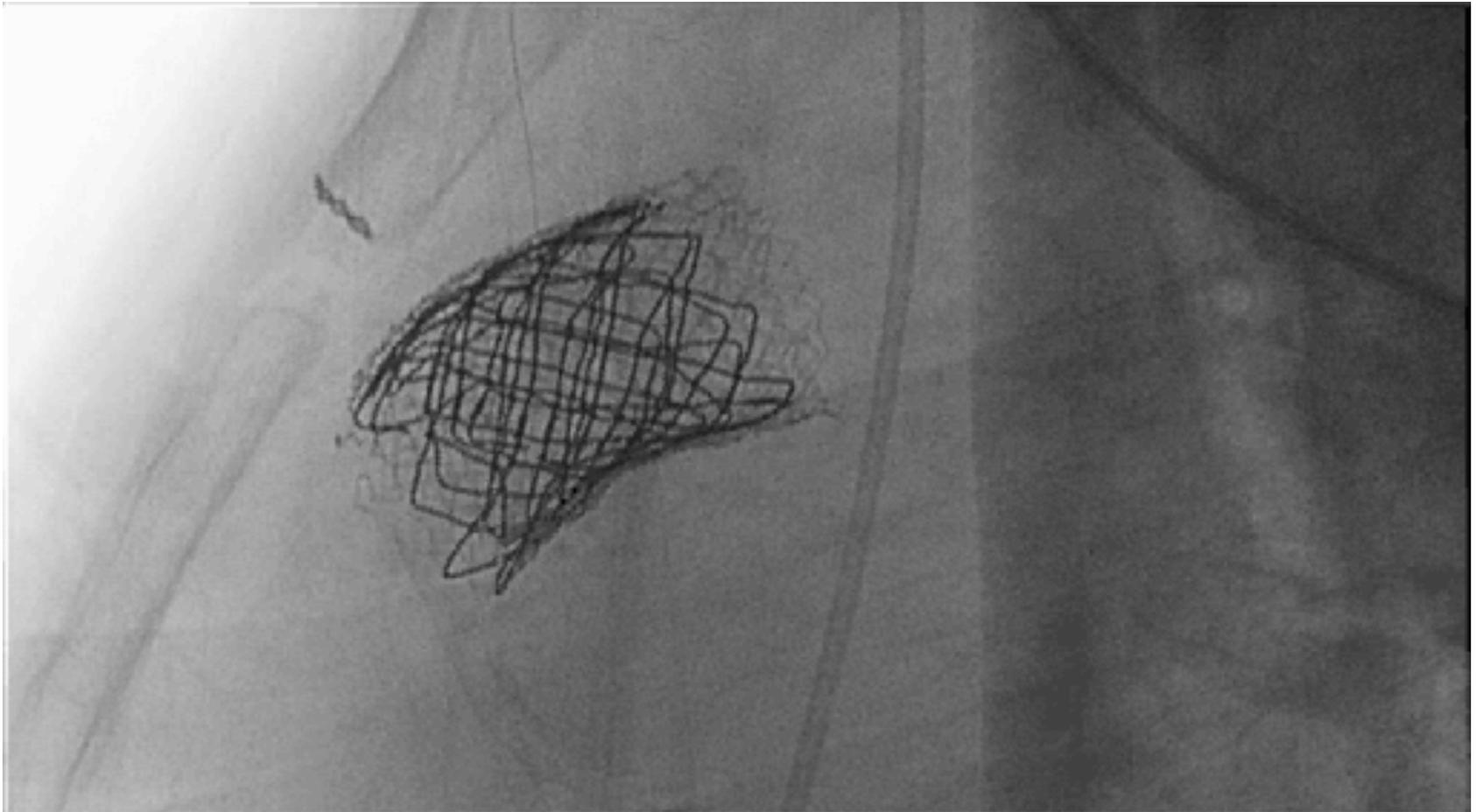
Old Melody, tricuspid repair

- Female, 27y of age
 - DORV, dTGA, VSD, subvalv PS
 - 1992 shunt, two x revision
 - 1995 Rastelli (homograft 18 mm)
 - 2007 Implantation Freestyle + TV-plasty
 - 2008 3 x pre stents and Melody valve (Bonhoeffer)
 - 2011 Balloon dilatation Melody; endocarditis?
-
- Hemiplegia after CVA
 - Diabetes mellitus type 1
 - Chronic Q fever

Postdilatation Melody valve 2011



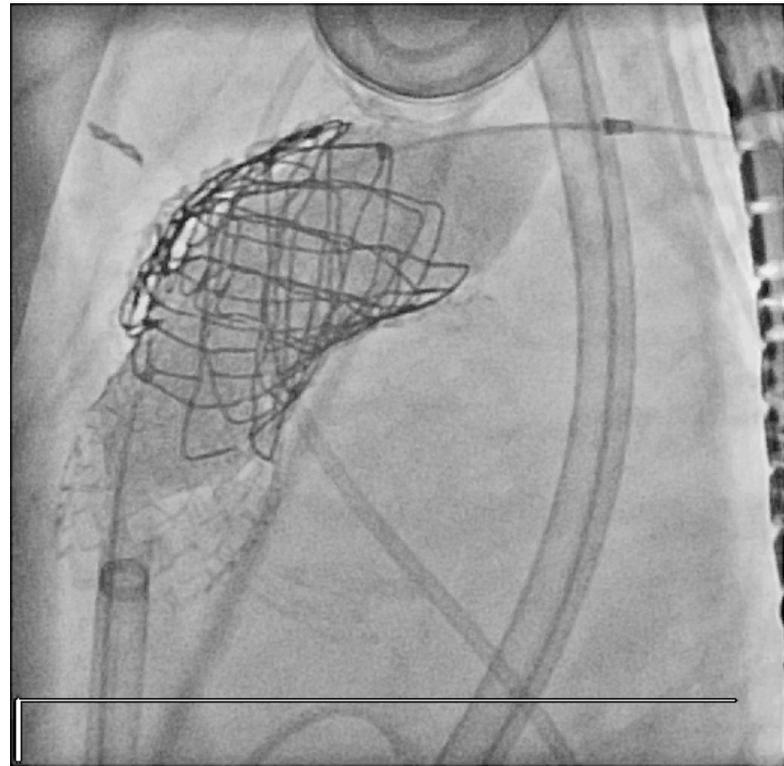
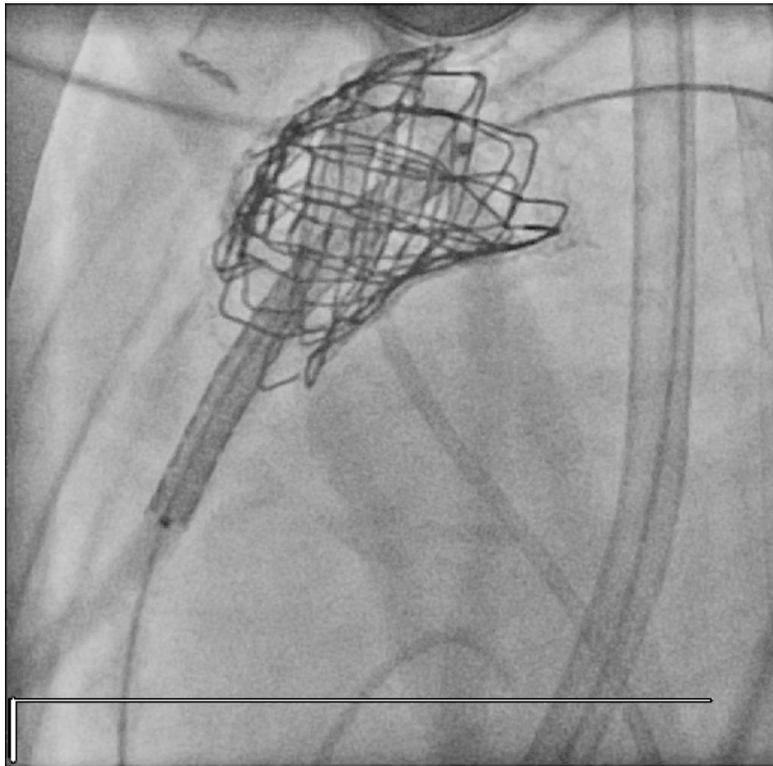
Broken stent strut, slight/mild PR



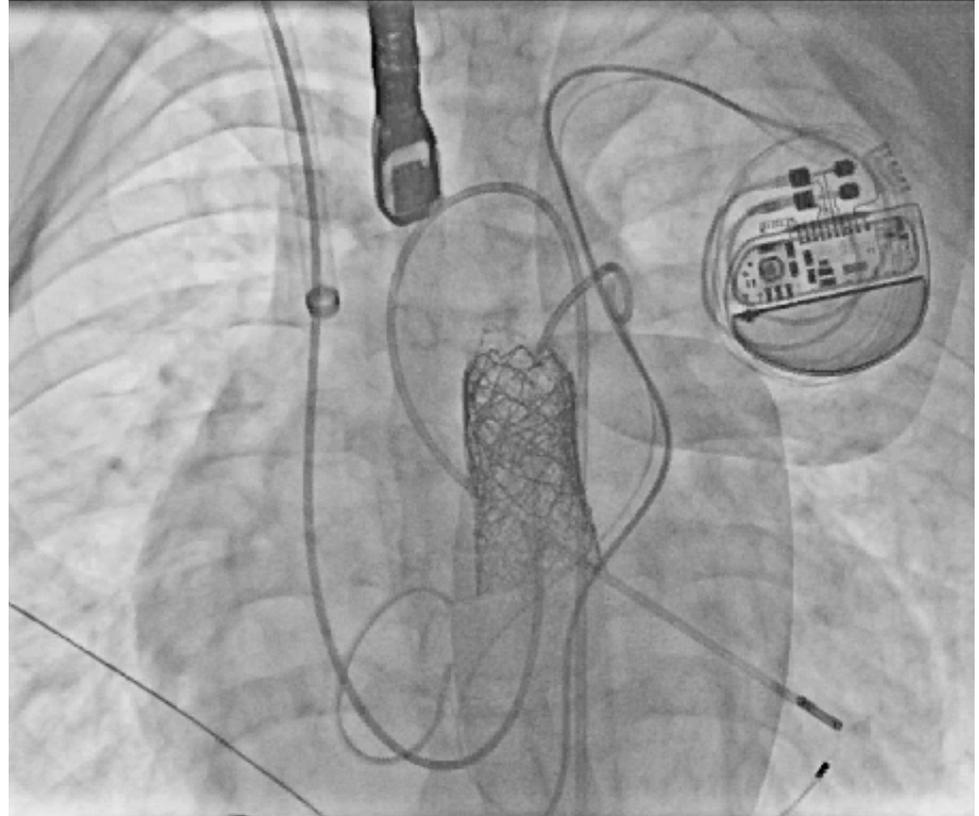
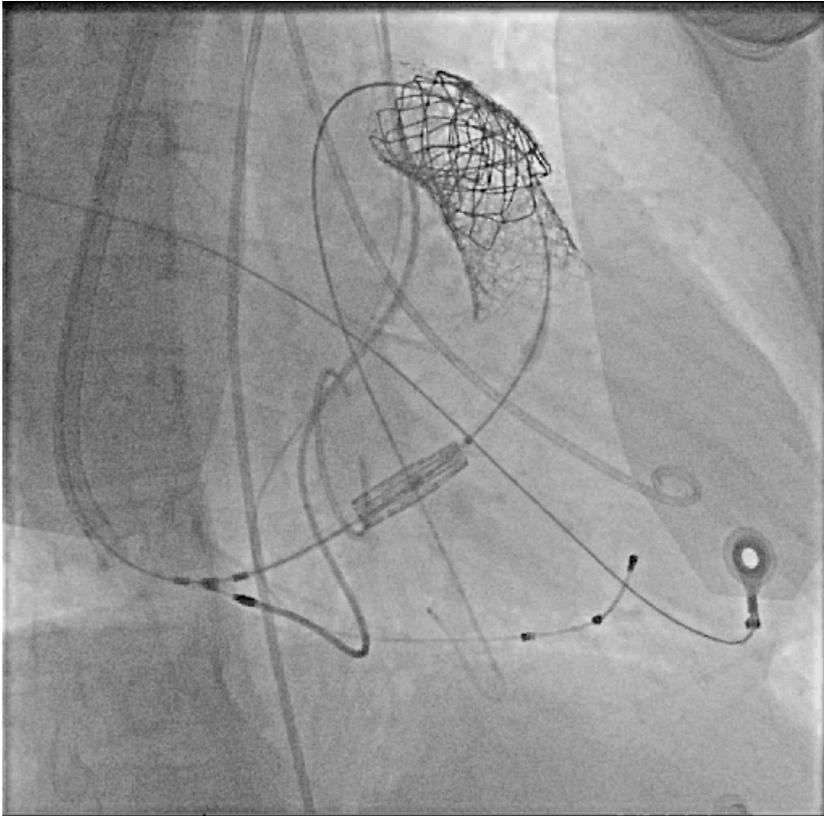
Admission

- Admission with intermittent AV block and decompensation with combined PR and PS on echocardiography; RV dysfunction and dilatation
- > Pacemaker
- > Difficult groin access; TVP in history
- > Surgery? PPVI?

Overstenting old stents / Melody (Jugular)



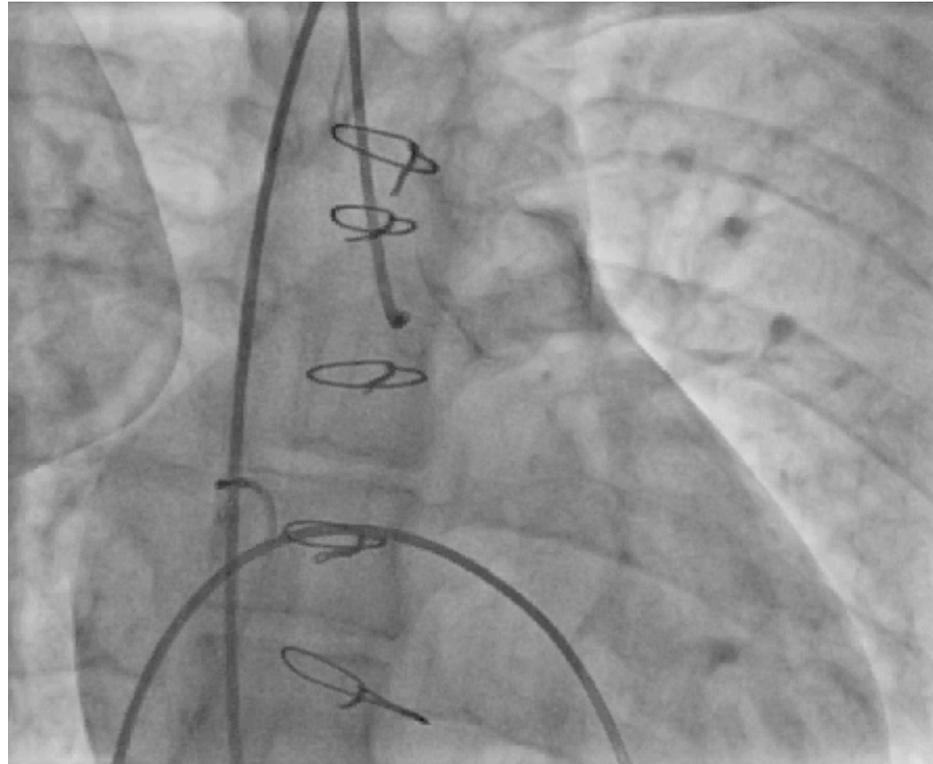
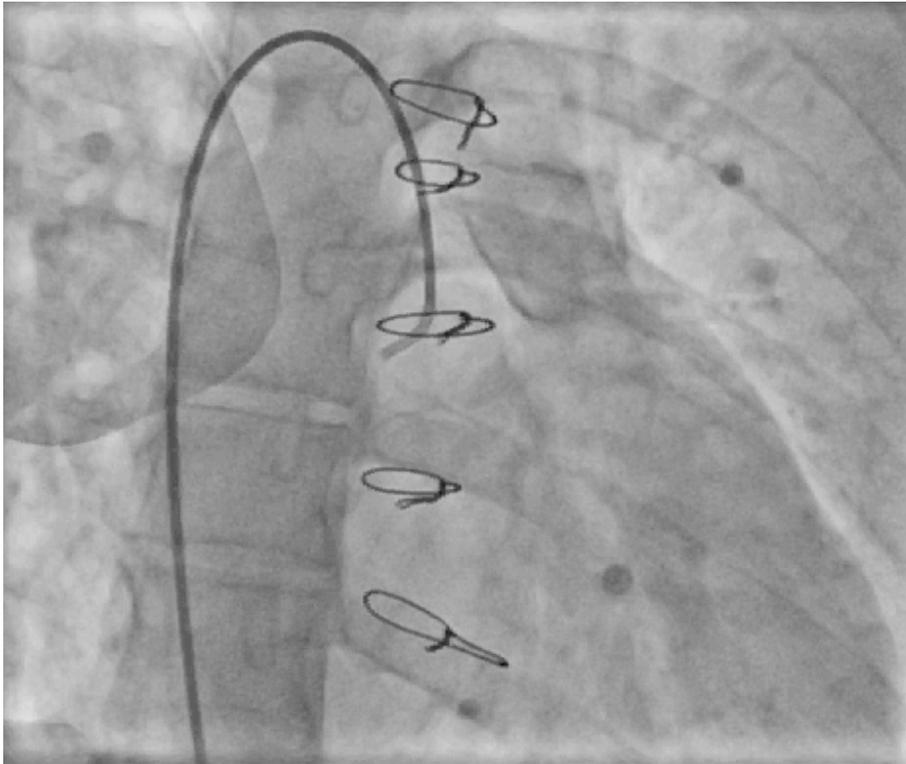
TVP passage, placement Sapien (endocarditis)



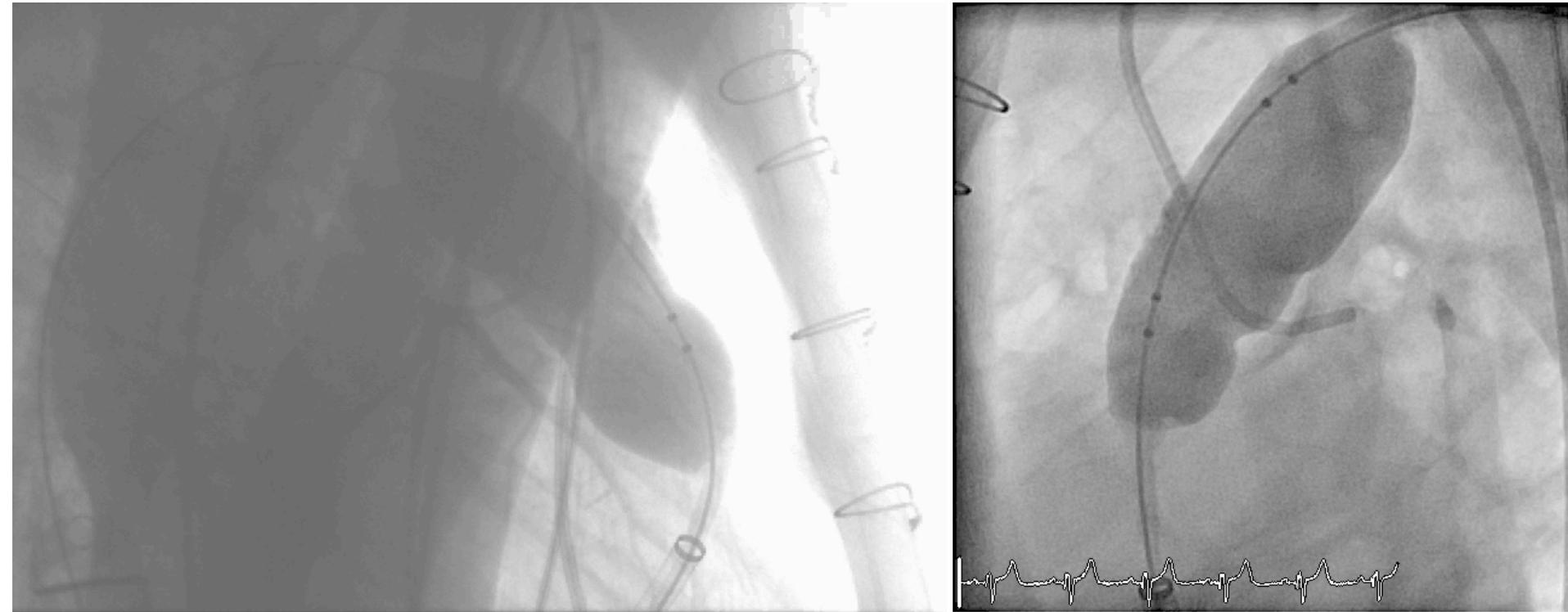
Coronaries no problem?

- Male, 20y of age
 - Tetralogy of Fallot, right descending aorta
 - 1998 shunt
 - 1999 correction with transannular patch
 - 2003 correction double chambered right ventricle
 - 2009 RV-PA conduit (21 mm Freestyle)
- > RV-PA conduit failure en RV dysfunction

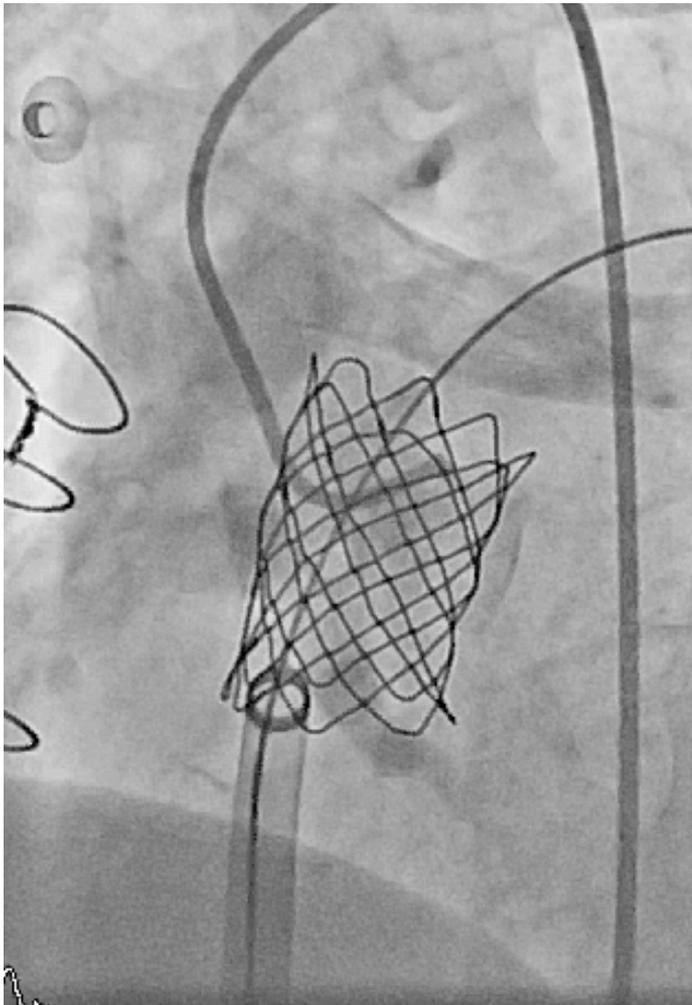
Coronary arteries



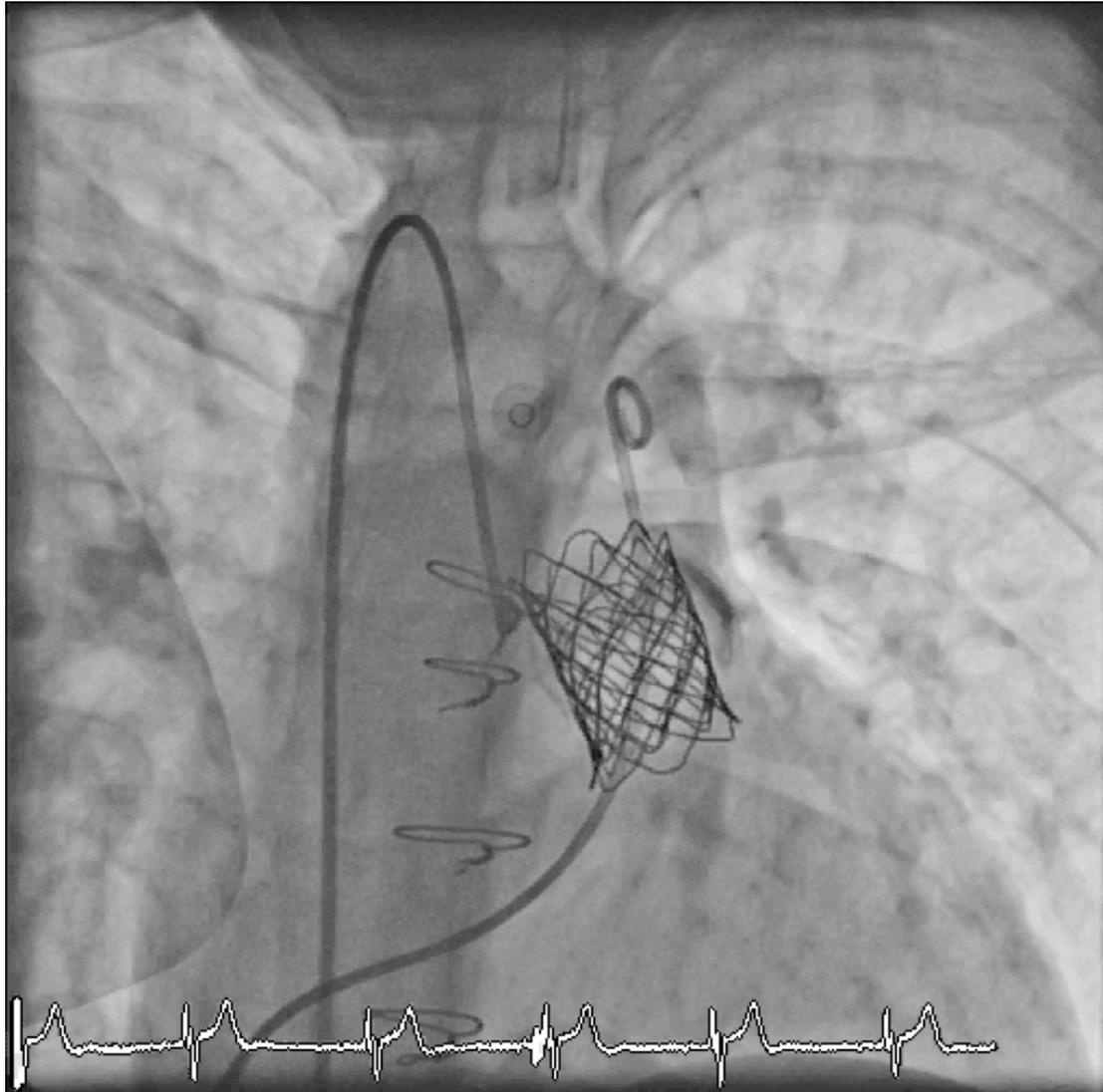
Balloon interrogation with LCA



Pre-stent and Melody implantation



Result



The future for complex interventions: Fiber Optic RealShape (FORS) Technology

glasvezelkabels bij
vaatbehandelingen

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