Complicated valve-in-valve-in-valve treatment of a stenotic bioprosthetic aortic valve

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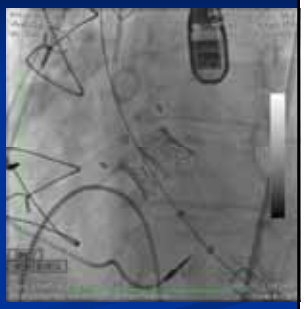
Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial Interest /arrangement or affiliation with the organization(s) listed below

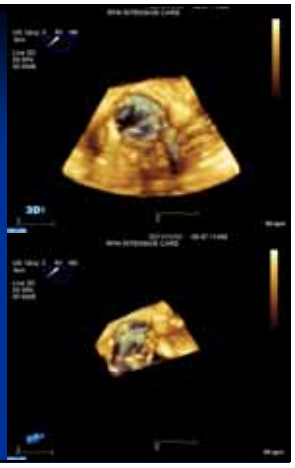
Affiliation/Financial Relationship	Company
Grant/ Research Support:	
Consulting Fees/Honoraria:	Edwards Lifesciences (consultant & proctor)
Major Stock Shareholder/Equity Interest:	
Royalty Income:	
Ownership/Founder:	
Salary:	
Intellectual Property Rights:	
Other Financial Benefit:	

- 84yo male
- Severe AS
  - 2004 - Bioprostetic AVR (Mosaic 27mm); Normal LV function.
  - 2009 – Asymptomatic severe bioprosthetic stenosis with moderate LV dysfunction (EF 35%)
  - 2011 – NYHA III symptoms; Severe LV systolic dysfunction.
- Co-morbidities
  - CAD - CABG 1993 (LIMA-LAD; SVG-OM1; SVG-RCA); Reimplantation of LIMA to aorta due to trauma in AVR 2004; Currently grafts patent
  - PPM – now V-paced 100%
- Logistic EuroScore: 40%
- Echo
  - Mean gradient 38mmHg; Severe LV dysfunction (EF 28%)
  - Mild aortic regurgitation
  - Internal diameter of Mosaic prosthesis – 23mm

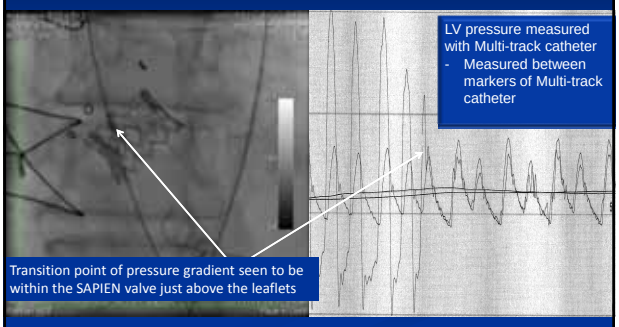
- Transcathter valve-in-valve via transapical route
  - Edwards SAPIEN 26mm
- Uncomplicated recovery, discharge on POD4
  - Aortic mean gradient 19mmHg
  - LVEF improved to 45%



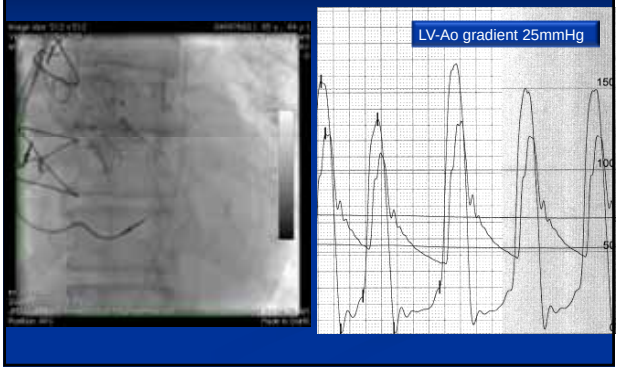
- 6 weeks later presented with cardiogenic shock needing IABP support
- EF 22%
- Aortic mean gradient 59mmHg!!
- Unclear mechanism
  - Restricted SAPIEN leaflet seen
  - Possible failure of SAPIEN to completely cover Mosaic leaflets, leading to potential nidus for thrombus



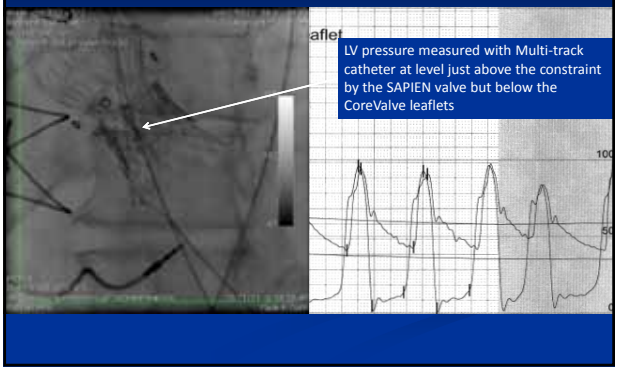
Hemodynamic assessment confirms mechanism likely secondary to stenosis of SAPIEN valve leaflet

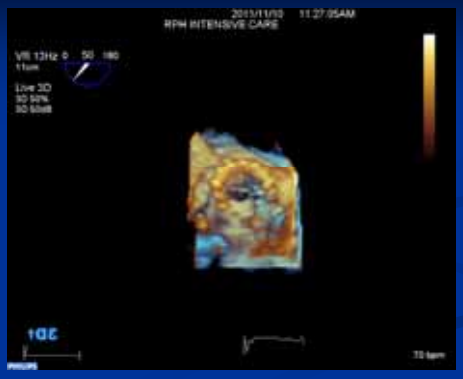


26mm CoreValve Implanted via Transfemoral Route
Significant residual gradient in setting of severe LV dysfunction
1+ AR

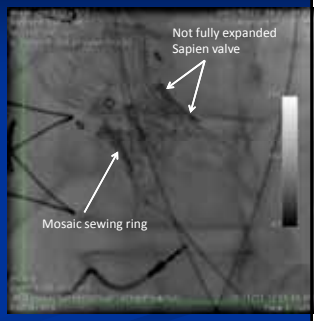


Predominant residual pressure gradient is at level of "constraint" by SAPIEN valve





- Decision made to post-dilate
  - Aim to dilate the SAPIEN valve which aim to reduce the contraint
  - Goal to reduce the residual gradient
- Wire re-introduced into LV
- 25mm Nucleus balloon passed without difficulty

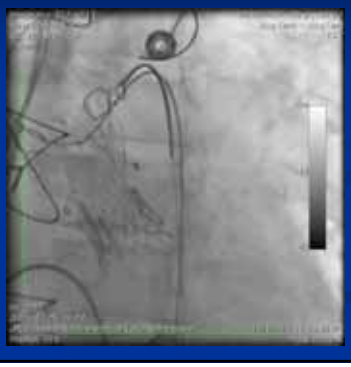


Post-dilation

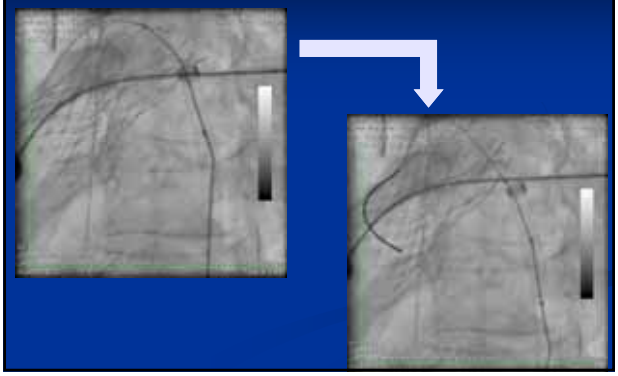
Deformation of upper struts of CoreValve by balloon

ie. Wire & balloon passed through upper struts of CoreValve!!!

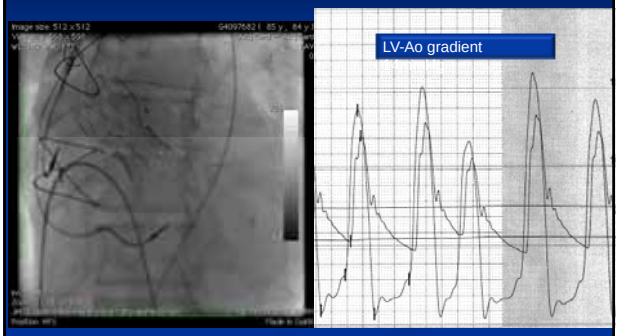
Attempts to Retract Balloon…..



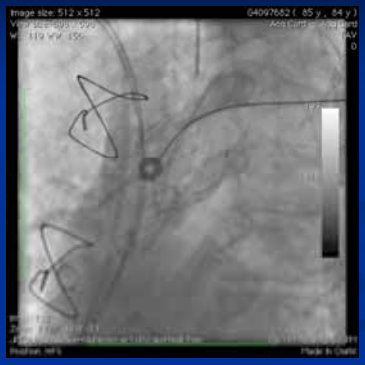
Successful Retraction of Balloon using a 60cm 14Fr Sheath



26mm CoreValve Implanted via Transfemoral Route Residual gradient improved



1st (embolised) CoreValve in ascending aorta with no obstruction of great neck vessels



Progress

- Uneventful recovery, discharged POD8
- Due to possibility that SAPIEN leaflet stenosis was secondary to thrombosis, he was commenced on warfarin
- After six month
  - NYHA 1
  - Aortic valve gradient 11mmHg
  - LVEF improved to 41%

Discussion

- Mechanism of stenosis of SAPIEN leaflet
  - Possibility that SAPIEN deployed too low failing to cover the entire Mosaic leaflets, leading to a potential "low-flow" region between the Mosaic leaflets and SAPIEN leaflets as nidus for thrombus
- Complicated "valve-in-valve-in-valve" procedure performed successfully even in critically ill patient with cardiogenic shock on IABP support
- When post-dilating CoreValve, it is important to ensure wire is not through a strut
  - Use a pigtail rather than wire to pass through the CoreValve complex into the LV