

Percutaneous treatment of a subaortic membrane using a self-expandable TAVR Valve

Jafar Alzubi MD

Christian F Witzke MD



Clinical case

- 75-year-old male with a history of a type A aortic dissection requiring replacement of the ascending aorta with resuspension of the aortic valve and resection of a subaortic membrane in the year 2000.
- In 2017 he had a type B aortic dissection which was medically treated. He subsequently was found to have recurrence of the subaortic membrane stenosis, lesion complicated by development of moderate aortic regurgitation and severe subvalvular obstruction.
- Additional comorbidities include HTN; HIV on antiretroviral therapy, frailty.

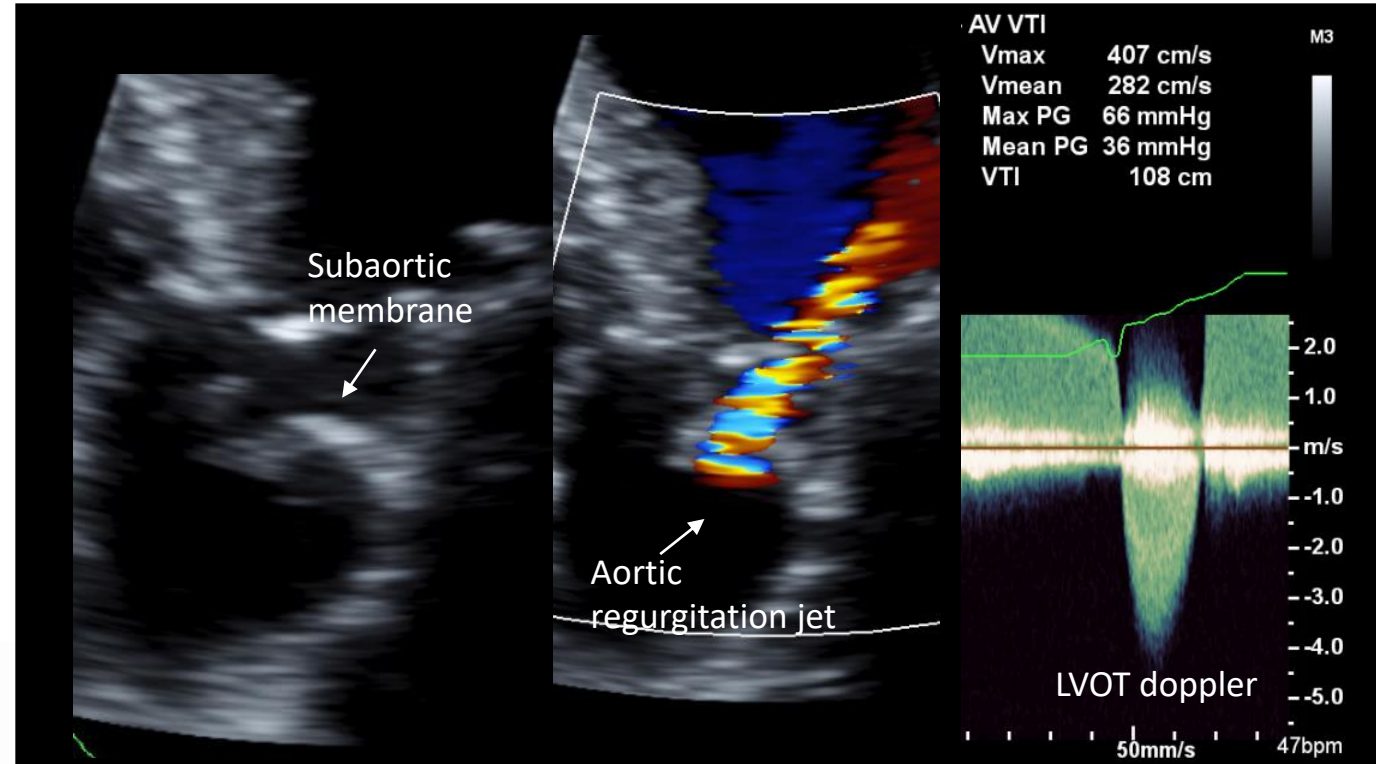


Clinical case

He was referred to our VHD for evaluation of worsening dyspnea, NYHA class III.

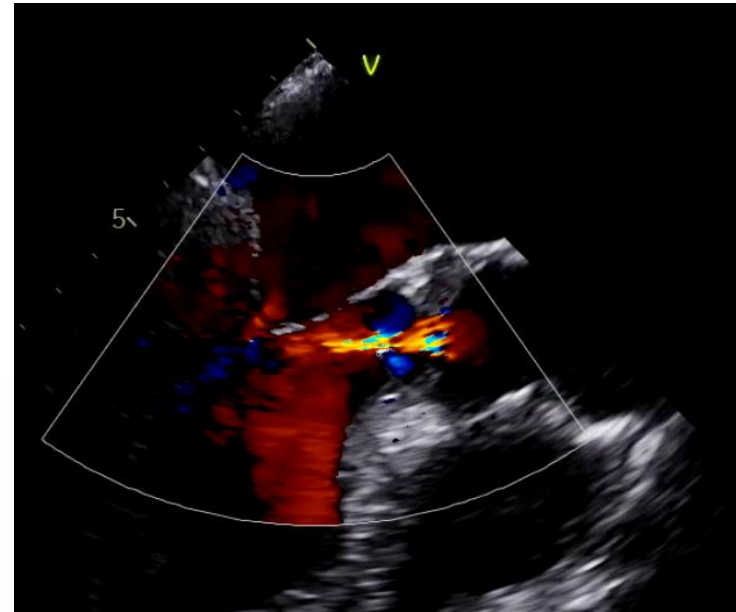
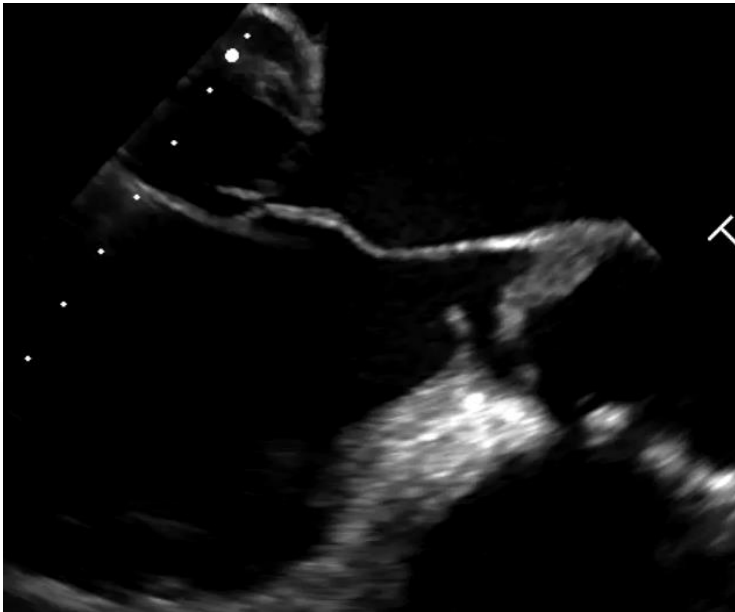


- Transthoracic echocardiography revealed a moderately restricted aortic valve with a fibromuscular ridge consistent with a subaortic membrane. There was moderate aortic regurgitation seen on color doppler with a peak gradient of 66 mmHg across the left ventricular outflow tract.

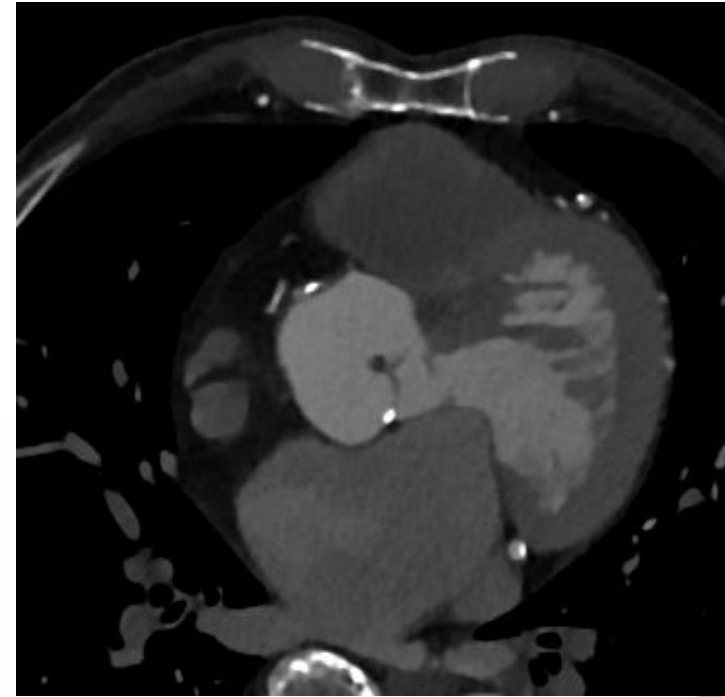
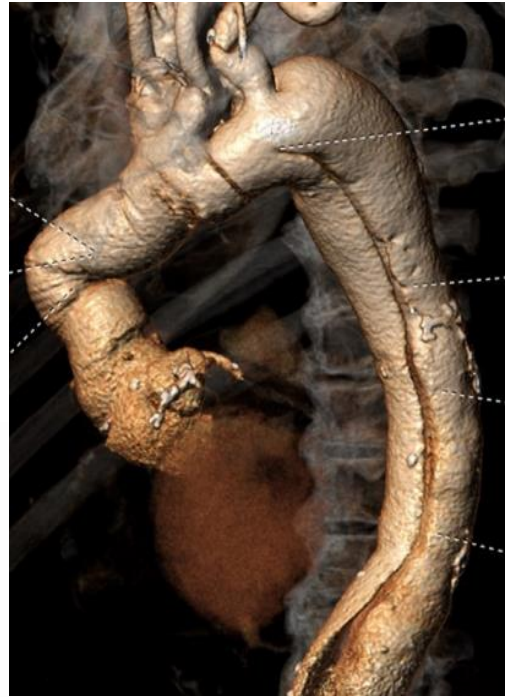
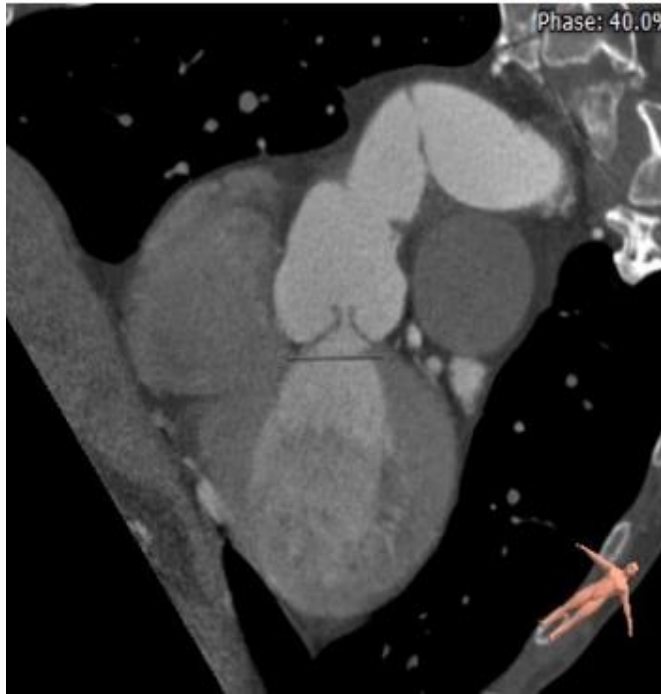


TRANSESOPHAGEAL ECHOCARDIOGRAM

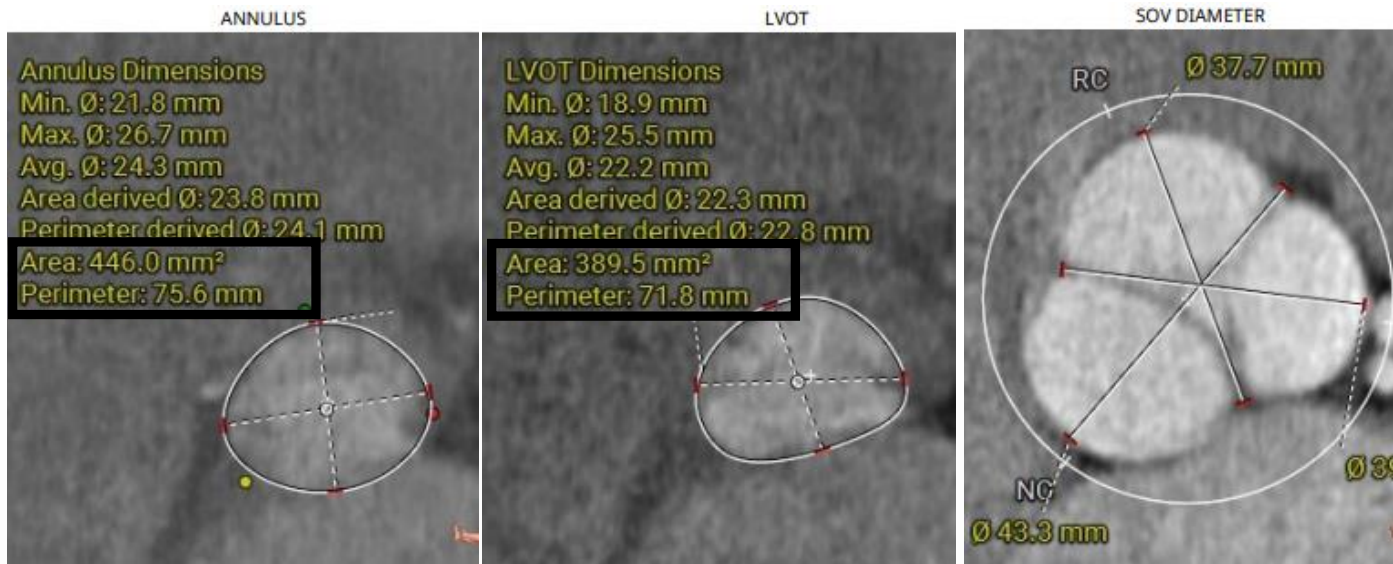
- Transesophageal echocardiography confirmed the presence of a fibromuscular sub-aortic ridge with normal opening of the aortic valve and mild aortic regurgitation



- Cardiac gated CT angiography revealed a tortuous aortic graft with a chronic type B dissection and a non calcified aortic valve. A fibromuscular subaortic ridge was noted approximate 3 mm under the aortic valve annulus.






- Considering the almost prohibitive high surgical risk for a re-do aortic surgery with resection of the subaortic membrane, the heart team decision was to proceed with percutaneous treatment using a self-expandable transcatheter valve.



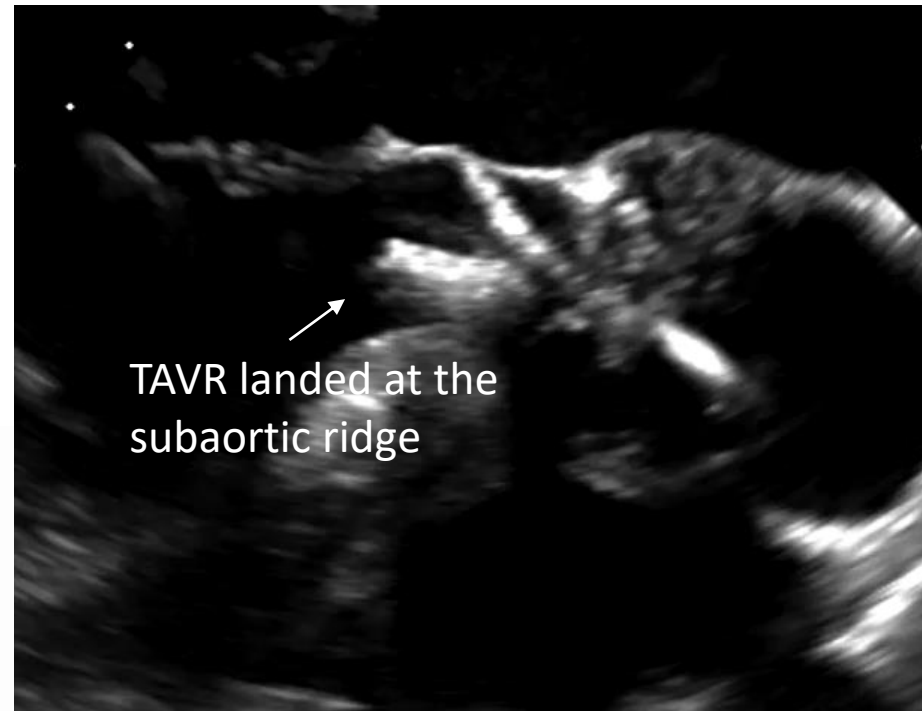
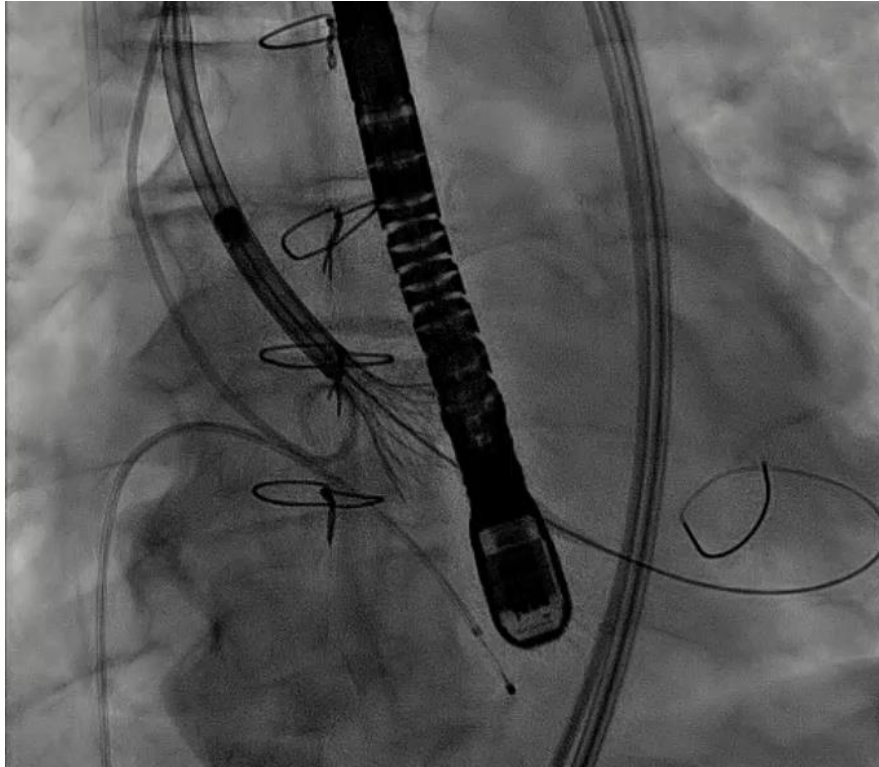
Gated cardiac CTA analysis

Patient Evaluation Criteria

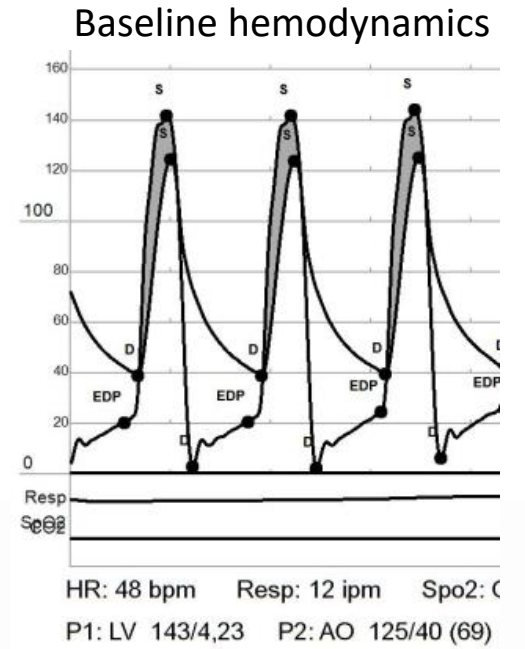
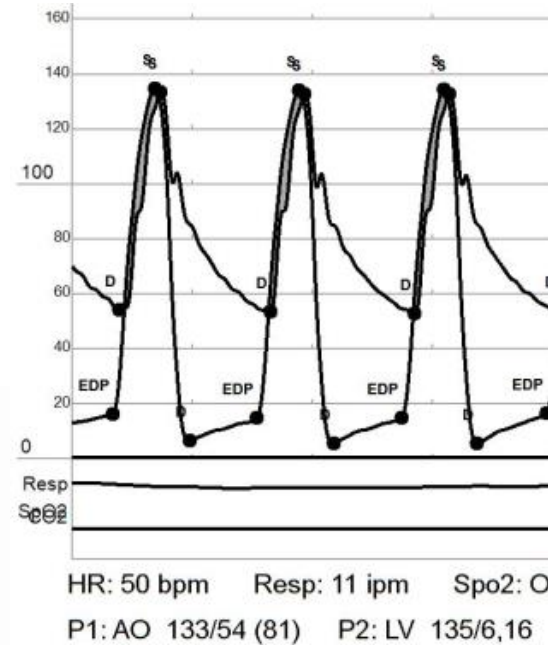
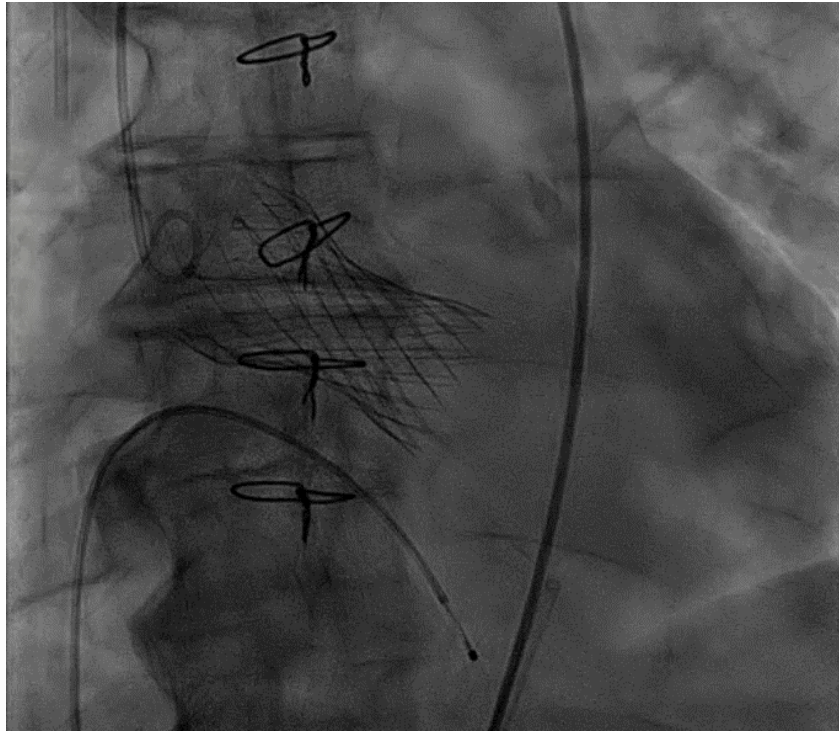
Valve Size Selection		Evolut™ PRO+ Bioprosthesis		
				
Size		23 mm	26 mm	29 mm
Annulus Diameter	26.6 mm	17*/18-20 mm	20-23 mm	23-26 mm
Annulus Perimeter†	83.5 mm	53.4*/56.5-62.8 mm	62.8-72.3 mm	72.3-81.7 mm
Sinus of Valsalva Diameter (Mean)	40.0 mm	≥ 25 mm	≥ 27 mm	≥ 29 mm
Sinus of Valsalva Height (Mean)	29.0 mm	≥ 15 mm	≥ 15 mm	≥ 15 mm
Oversizing Percentage		-14%	-2%	9%



- A 29mm Evolut™ PRO+ TAVR was placed via transfemoral approach under general anesthesia, TEE guidance, with plan to land the valve at the subvalvular ridge.



- Final supra-avalvular aortography demonstrates a well seated TAVR with no evidence of aortic insufficiency and no significant gradient across the prosthesis.



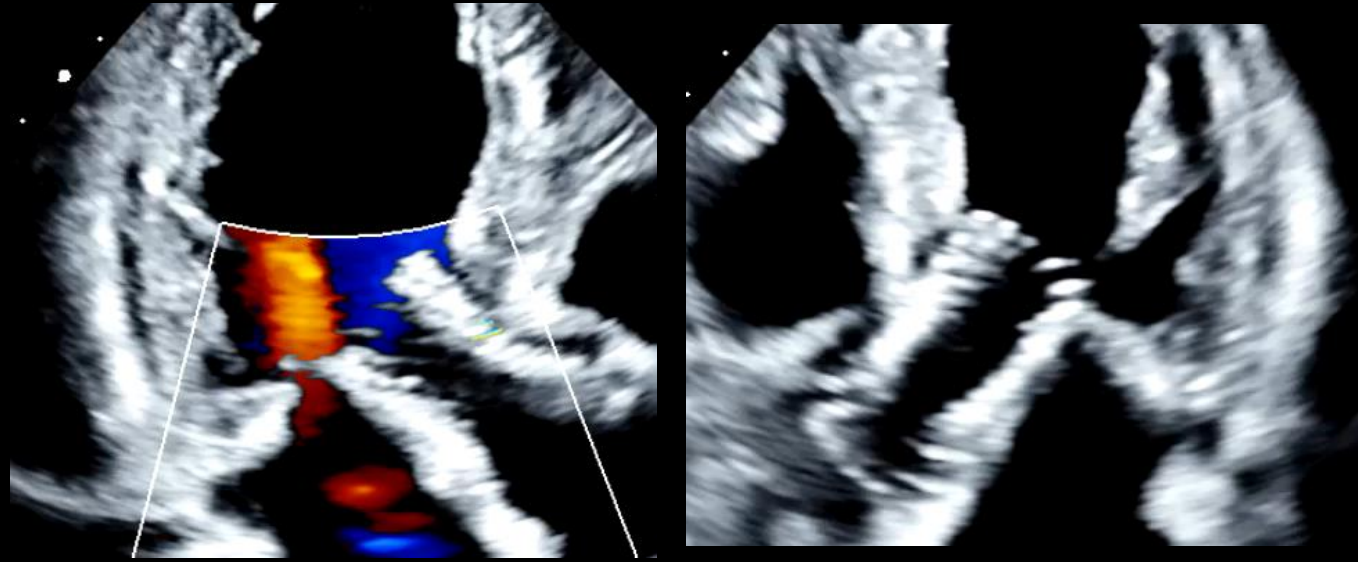
Immediate post-TAVR

- The patient was transferred to the CCU with a new LBBB with immediate improvement in dyspnea.
- Due to persistent LBBB, the patient underwent electrophysiological study that confirmed advanced infranodal conduction abnormality, requiring implantation of PPM.



45 days follow-up

- Follow-up TTE at 45 days revealed a well functioning TAVR
- Trace PVL and – TAVR mean gradient 9 mmHg
- Mild MS MV mean gradient of 5 mmHg



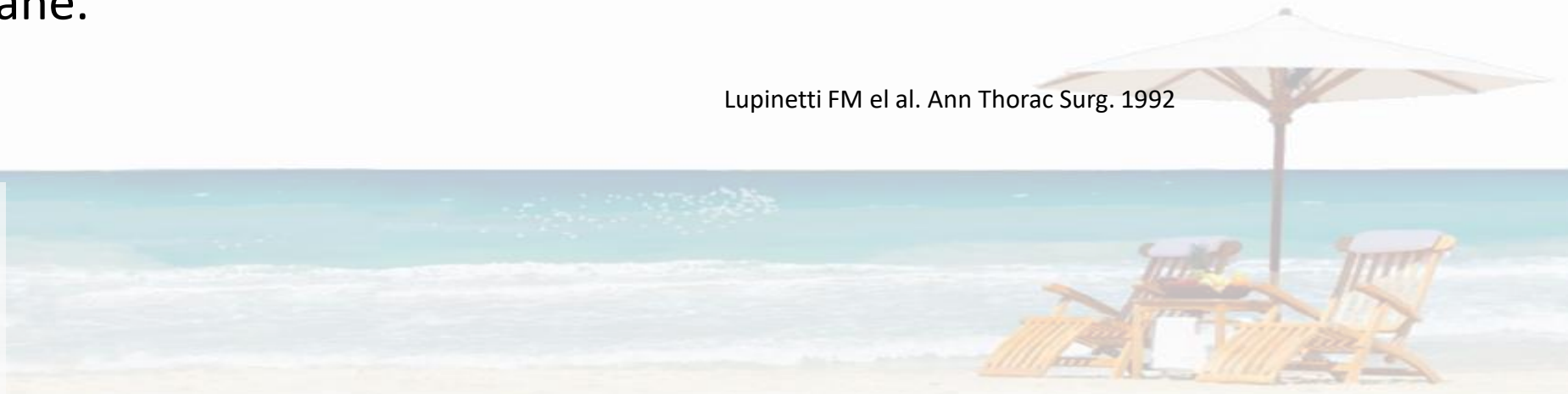
Patient reported considerable symptomatic improvement to NYHA II.



Subaortic Membrane

- Subaortic membrane is a rare form of subaortic stenosis in which the muscular membrane that lies underneath the aortic valve leads to obstruction of blood flow in the LVOT.
- In many patients, subaortic membrane may result in significant in aortic regurgitation.
- Surgical therapy is considered the definitive treatment for patients with symptomatic subaortic membrane.

Lupinetti FM et al. Ann Thorac Surg. 1992



Off-label Use of TAVI in Subaortic Membrane

- To the best of our knowledge, our patient is only the second reported case in the literature of successful and off-label treatment of severe subaortic stenosis with aortic regurgitation with TAVR.
- Future research may investigate the potential role of TAVR for subaortic stenosis caused by subaortic membrane in high surgical risk patients.

Finkelstein A et al. Catheter Cardiovasc Interv. 2010

