

Valve-in-Valve-in-Valve Rescue: Sequential Transcatheter Valve Deployment for Intraprocedural Valve Embolization

Bailout of valve embolization in a native annulus using a three-valve ViViV configuration

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TRANSCATHETER
CARDIOVASCULAR
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Disclosure of Relevant Financial Relationships

I, [Antigone Kostea](#) DO NOT have any financial relationships to disclose.

Case History

91-year-old, man

- H: 190cm
- W: 84kg
- BMI: 23.27 kg/m²

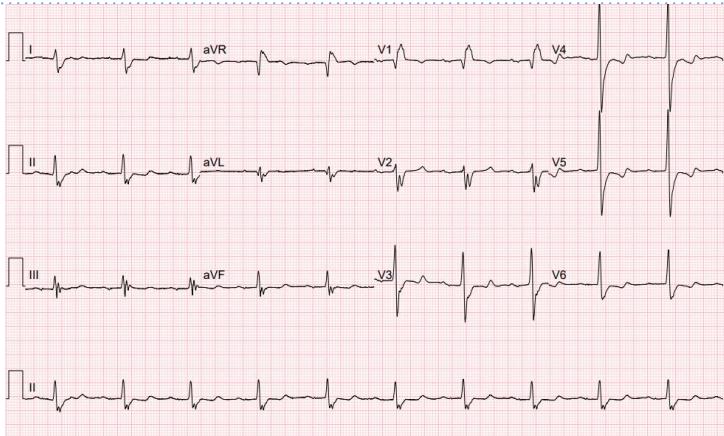
Cardiac Medical History

- Hypertension
- 2006 Stable AP, PCI LAD
- 2014 PCI LAD and RCA
- 2022 PCI mid-LAD, prox-Cx and OM
- 2022 Moderate aortic valve stenosis with reduced EF

Presentation

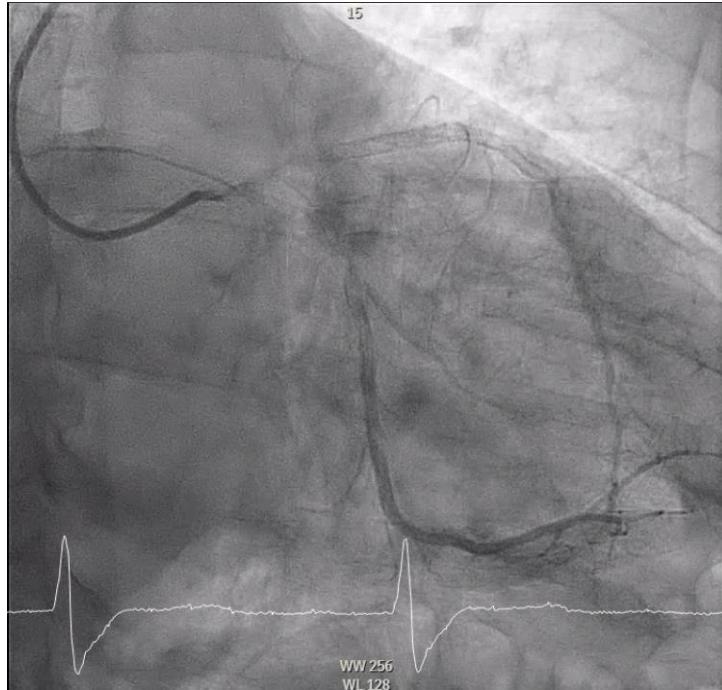
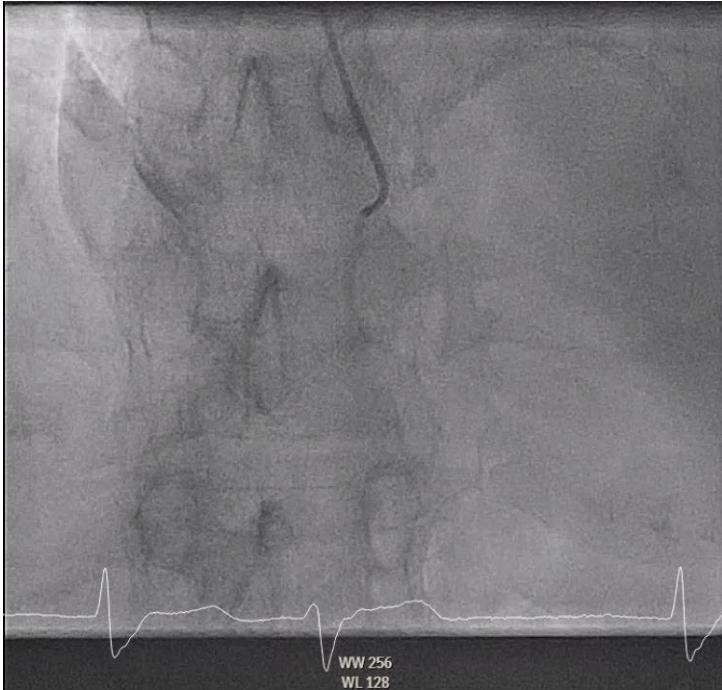
- Decreased functional capacity with exertional dyspnea
- NYHA II, CCS 0

EKG



SR 61 bpm, RBBB, 1st degree AV block, PR 274 ms,
QRS 194 ms, QTc 515 ms

Coronary Angiography (CAG)



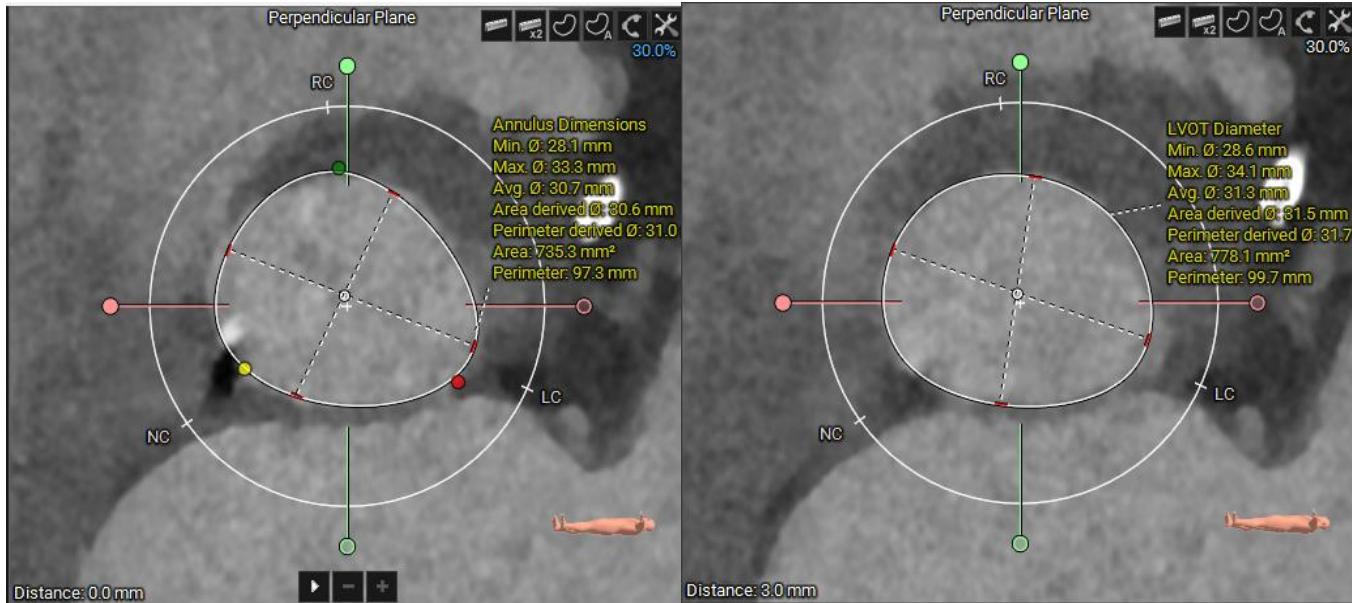
- Right dominant system, patent stent mid-LAD and proximal Cx. Intermediate residual lesions in LAD and Cx, intermediate lesion mid-RCA; managed conservatively

TTE pre-TAVR



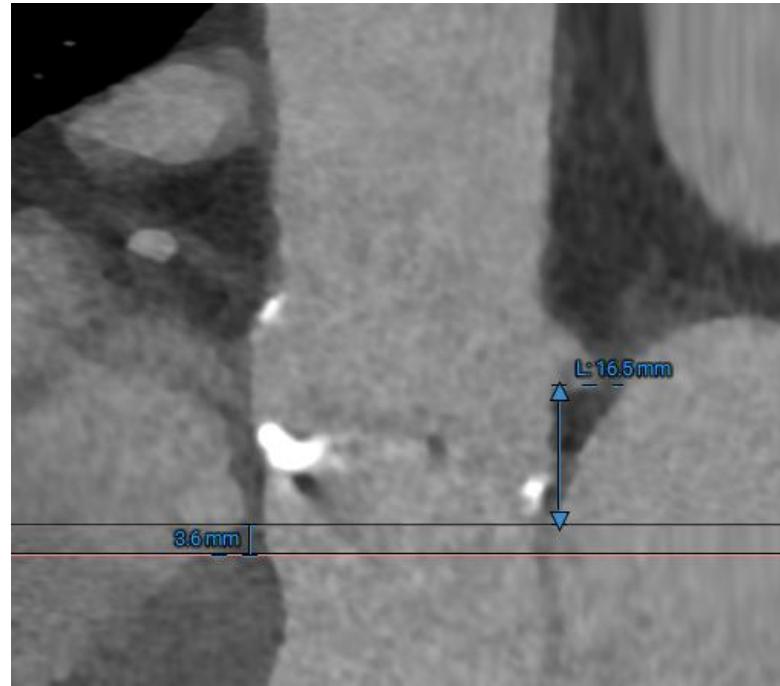
- Reduced LV function, dilated LA (LAVi 48.5 ml/m²)
- Severe cLFGLG aortic valve stenosis with moderate AR, MPG 34 mmHg, V_{max} 4.0 m/s, SV_i, 32.2 ml/m² and AVA_i 0.36 cm²/m²

Computed Tomography (CT)



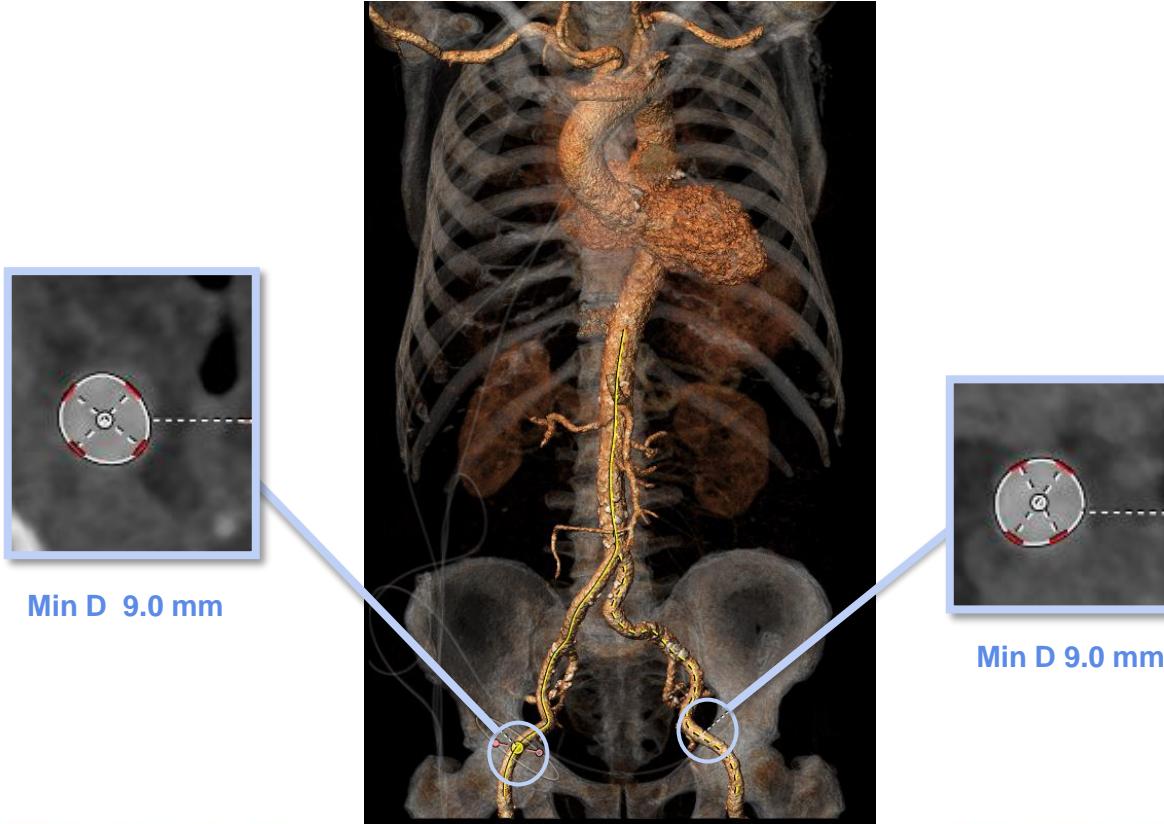
- Tricuspid valve, with severe calcification of the raphe and leaflets
- Agatson score: 3110
- Very large aortic annulus: Annulus area 735.3 mm², Annulus perimeter 97.3 mm

Computed Tomography (CT)



- LCA height 16.6 mm and RCA height 22.5 mm
- MS length 3.6 mm

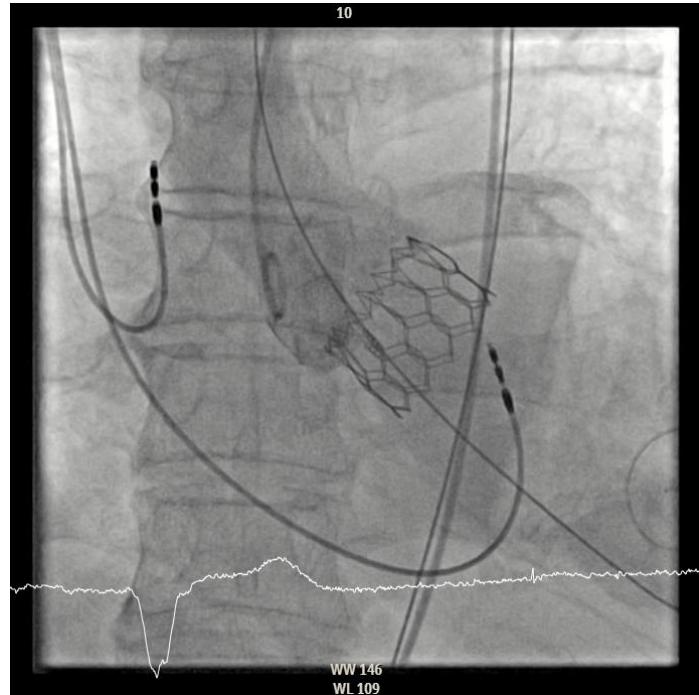
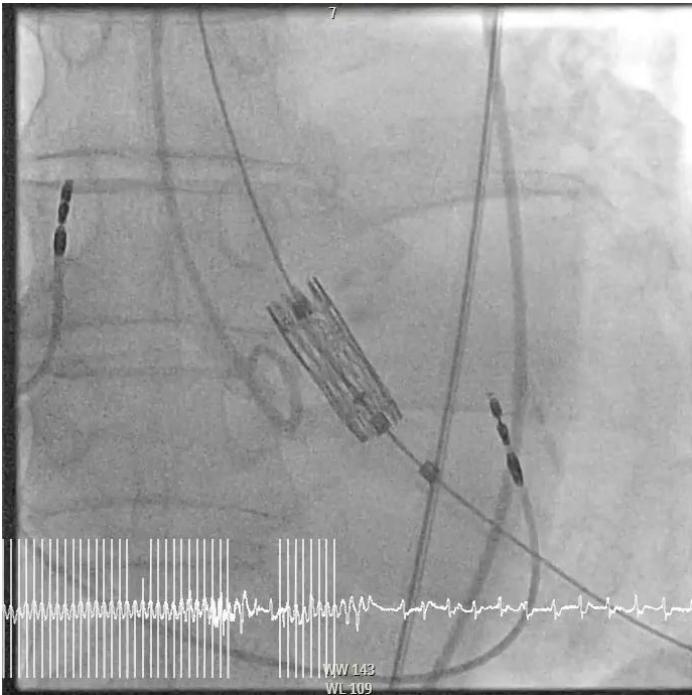
Computed Tomography (CT)



Multidisciplinary Heart Team Decision

- Classified as [high risk](#) according to
 - Advanced age
 - Geriatric assessment: frailty, reduced functional capacity, and elevated risk of delirium
 - Surgical risk scores: STS 4.96%, EuroSCORE II 4.26%
- Conduction risk: prophylactic pacemaker due to high likelihood of post-procedural high-grade AV block (RBBB + QRS >160 ms + PR > 240 ms)
- Transfemoral TAVR with [32 mm Myval Octapro valve](#)

TAVR Procedure



- Misloading of the MyVal Octapro 32 mm with subsequent partial expansion during balloon inflation
- Backward recoil during balloon deflation, after which the valve shifts downward into the LVOT

TAVR Procedure



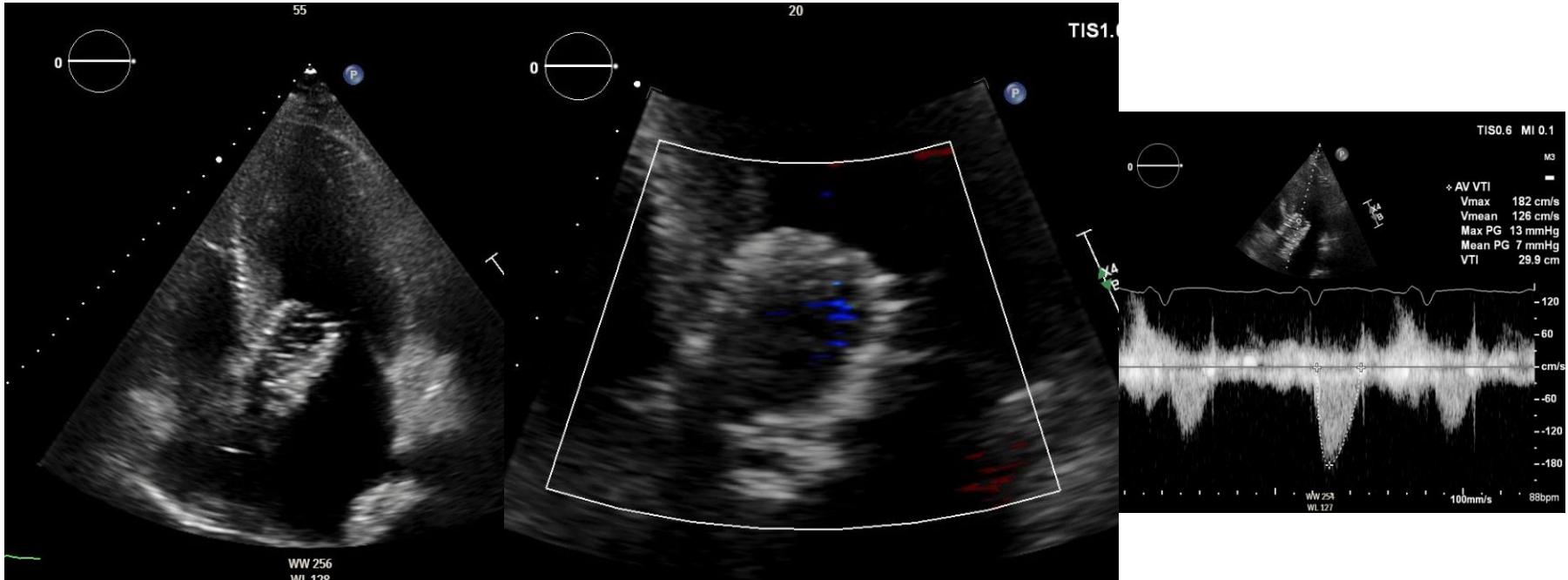
- Deployment of Navitor Vision 35mm for fixation
- Post dilatation to achieve full valve apposition
- Persistent PVL prompted implantation of an additional MyVal Octapro 32 mm valve

TAVR Procedure



- Successful deployment of new MyVal Octapro 32 mm
- No obstruction of the coronary arteries
- Invasive mean gradient: 0 mmHg

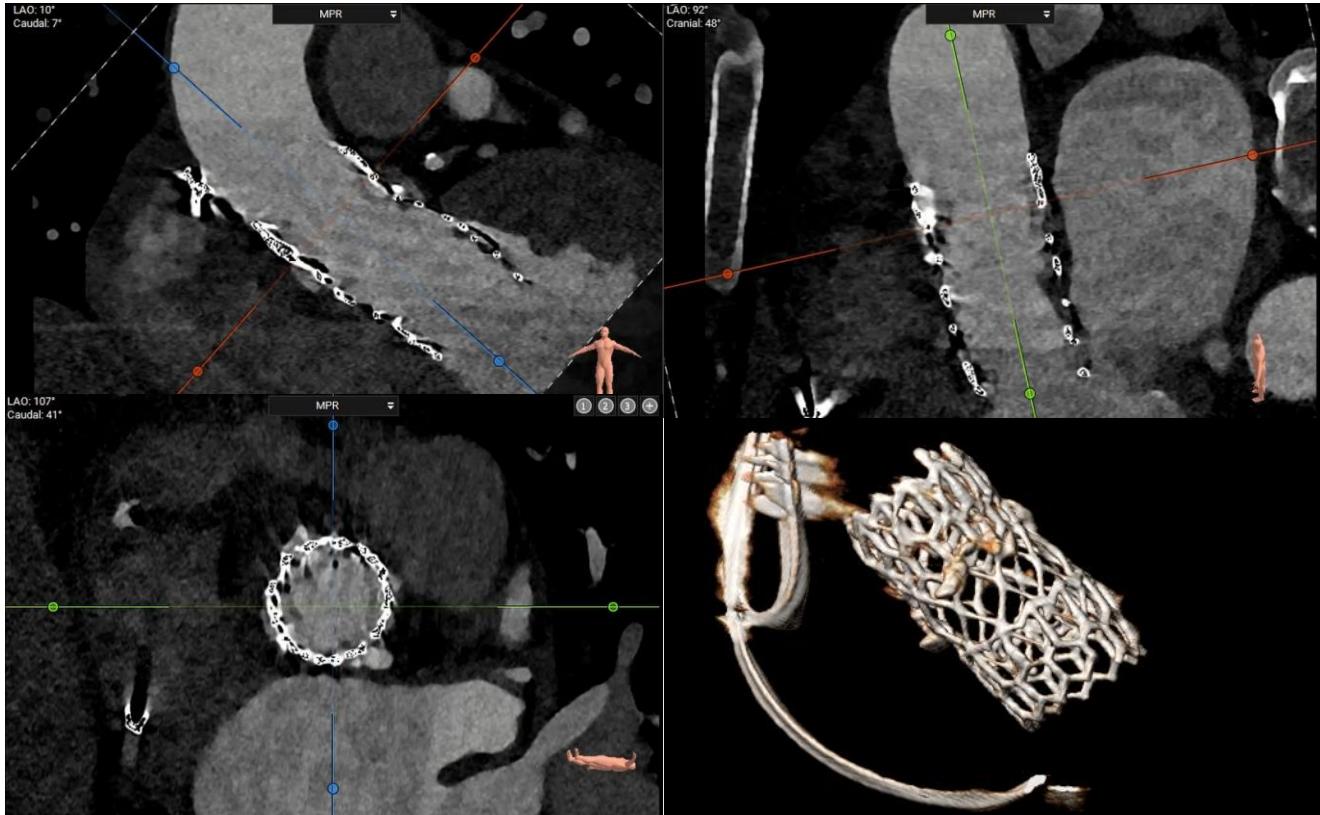
Post-TAVR TTE



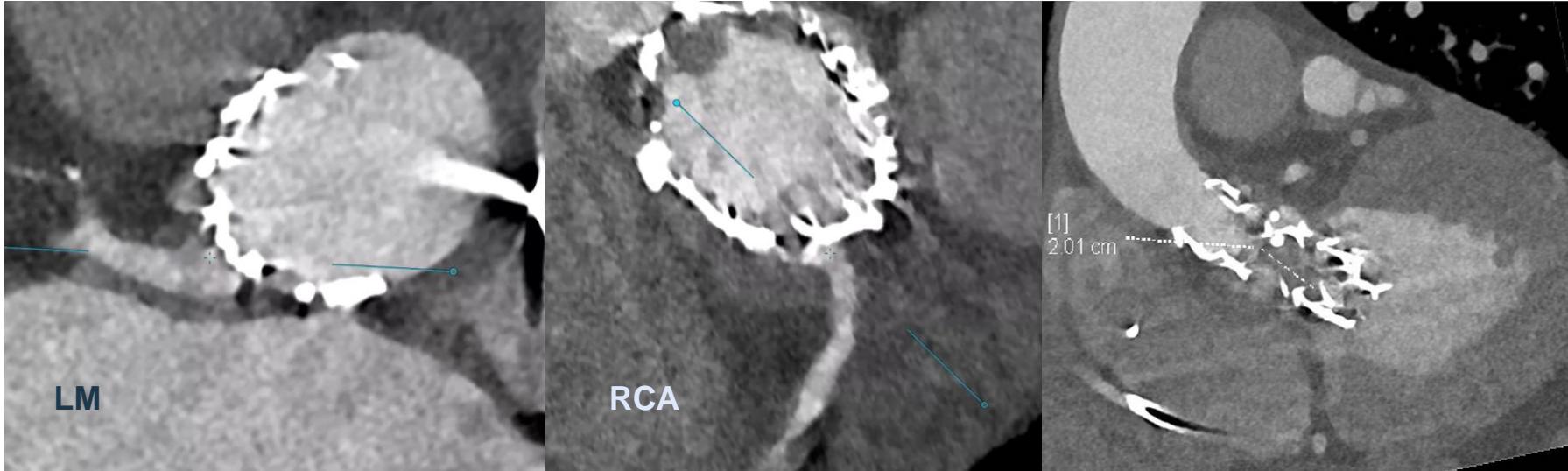
- Good functioning THV (no PVL, MPG 7 mmHg, V_{max} 1.8 m/s)
- Deeply implanted in the LVOT with visual obstruction of the AMVL, no gradient measured across the mitral valve

CT post-TAVR

- Satisfactory deployment of the transcatheter heart valves
- Deep position of the stent frame extending into the LVOT



CT post-TAVR

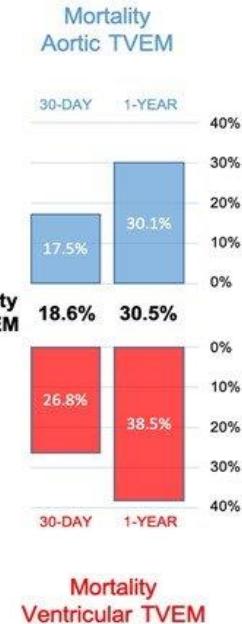


- Upper edge of the ViViV construct extends above the level of the coronary ostia; No evidence of coronary obstruction
- Subvalvular mural hypodensity (2 cm), thrombus or pannus, without causing obstruction

Post-TAVR

- The post-procedural course was clinically uneventful
- Therapeutic anticoagulation (apixaban) was initiated
- The patient was discharged in stable condition on day 4 post-TAVI

Conclusion (1)



- THV embolization into the LVOT is a rare but dreadful complication
- This is a case of valve embolization precipitated by misloading of the balloon expandable valve

Kim WK, Schäfer U, Tchetché D, Nef H, Arnold M, Avanzas P, Rudolph T, Scholtz S, Barbanti M, Kempfert J, Mangieri A. Incidence and outcome of peri-procedural transcatheter heart valve embolization and migration: the TRAVEL registry (TranscatheteR HeArt Valve EmboLization and Migration). European heart journal. 2019 Oct 7;40(38):3156-65.

Frumkin D, Pietron M, Kind A, Brand A, Knebel F, Laule M, Leistner DM, Landmesser U, Krackhardt F, Sherif M, Sündermann SH. Valve embolization during transcatheter aortic valve implantation: incidence, risk factors and follow-up by computed tomography. Frontiers in Cardiovascular Medicine. 2022 Jul 22;9:928740.

Conclusion (2)

- Stepwise bailout strategy to ensure structural stability and preserve hemodynamics
 - The 35mm Navitor SEV features the NaviSeal skirt, which contributes to improved sealing and fixation in large anatomies
- Long-term outcomes and durability of triple valve (ViViV) constructs remain unknown