Accurate Positioning of Ballon-Expandable Valve for Aortic Stenosis with Huge Left Ventricular Outflow Tract Calcification

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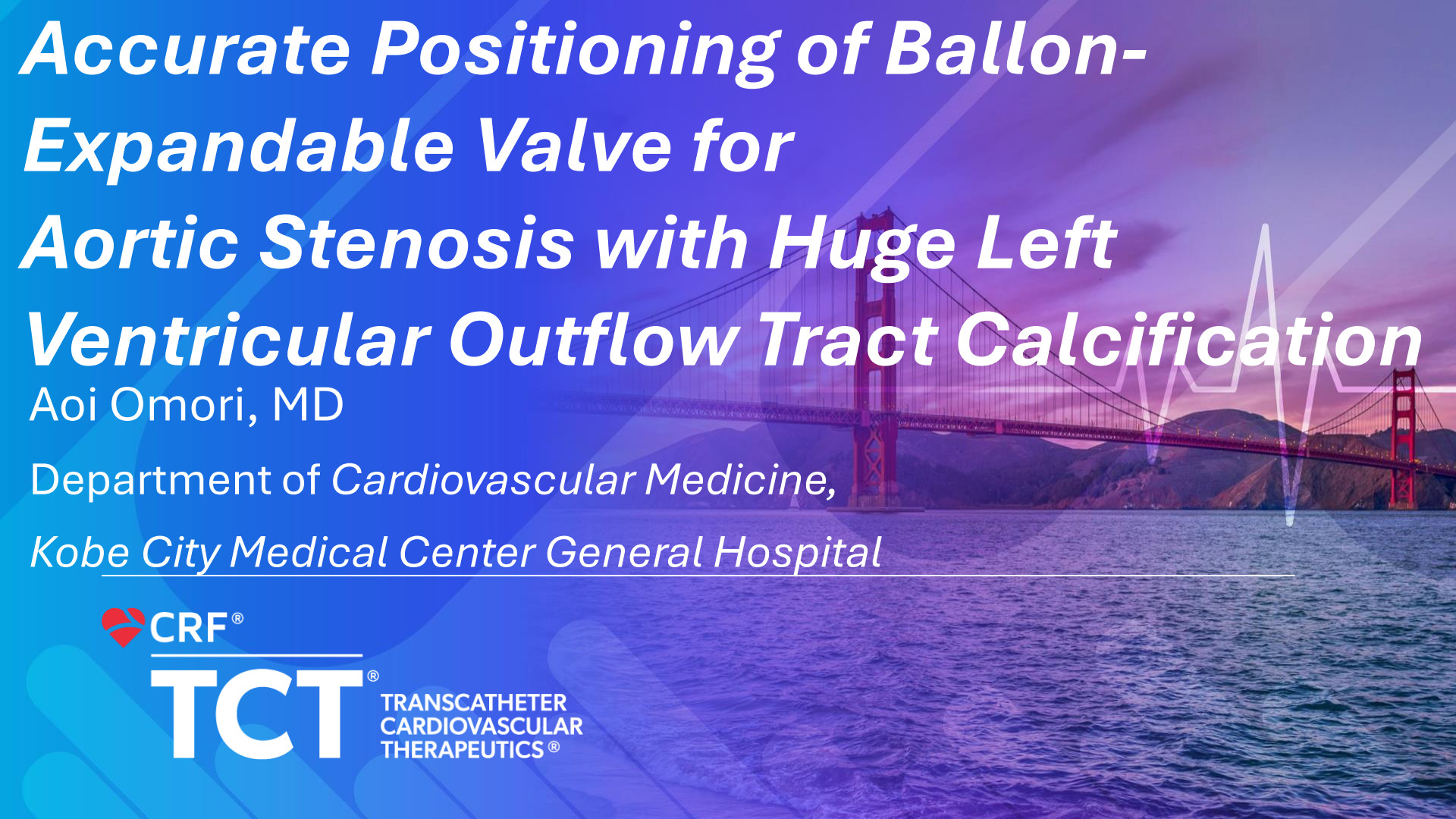

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Disclosure of Relevant Financial Relationships

Masanao Toma is a is a proctor of Edwards Lifesciences.

I, Hiroyuki Nakayama, Kazumasa Imamoto, Yukihito Sato, and Yutaka Furukawa do not have any financial relationships to disclose.

Masanao Toma, MD

This case was experienced at my previous institution,

Hyogo Prefectural Amagasaki General Medical Center.

Patient: 89 y.o. female (BSA 1.44 m², CFS 4, STS 19.8%)

Chief Complaint: dyspnea on exertion

History of Present Illness:

Mar. 20XX Follow-up as mod-severe AS

Nov. 20XX+1 **Progression to severe AS**

After 1 week admission with heart failure

Past History:

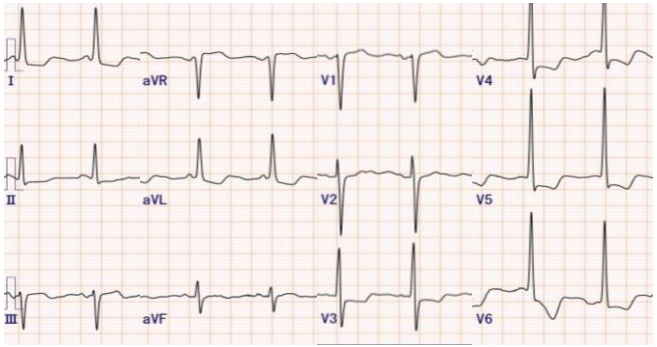
paroxysmal atrial fibrillation,

stenting for right carotid artery stenosis

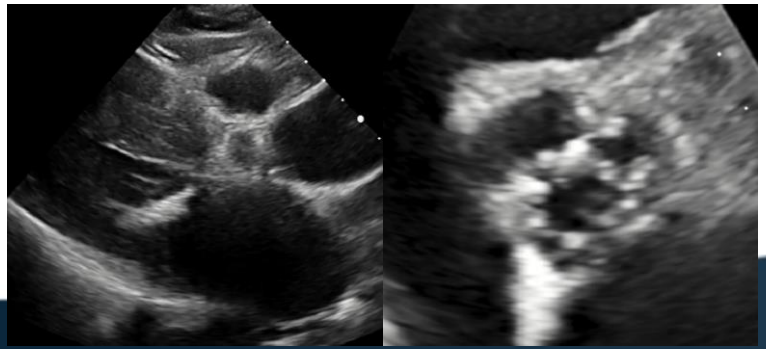
Lab:

Alb 3.2 g/dL, Hb 10.5 g/dL,
Cre 0.76 mg/dL, BNP 609 pg/mL

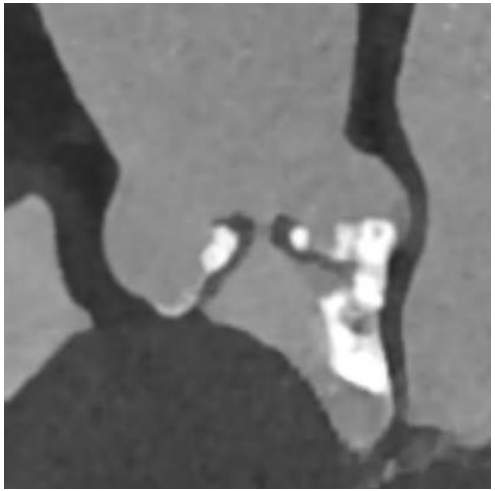
ECG: sinus, HR 89/min, LVH
conduction disturbance-

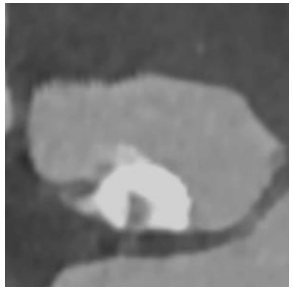
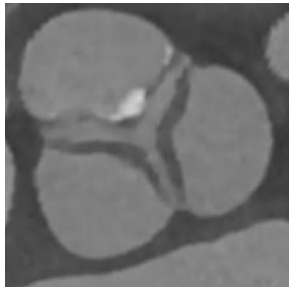
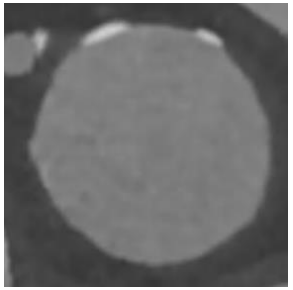


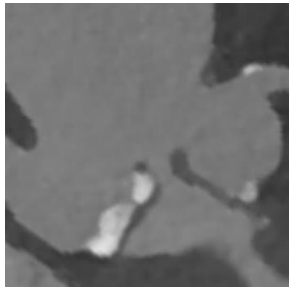
TTE: EF 68%, Dd/Ds 49/30 mm, AR trace,
AVmax **5.6** m/s, mPG **80** mmHg, AVA **0.95** cm²



TAVI-CT (annulus complex)

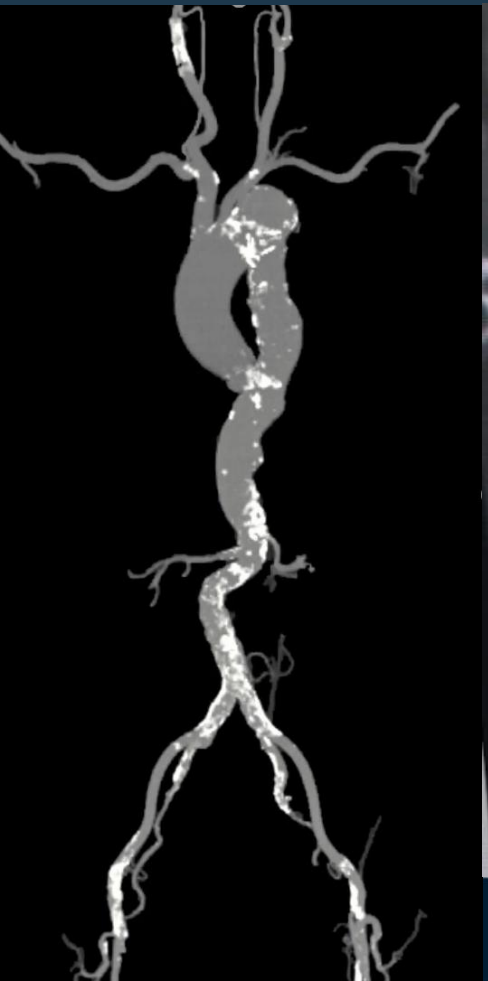


annulus	LVOT	SOV	STJ
			
area **312** mm²	26.4*9.1 mm	R 29.4 mm	24.5*24.0 mm
peri **64.7** mm		L 29.2 mm	
23.0*13.6 mm		N 28.9 mm	

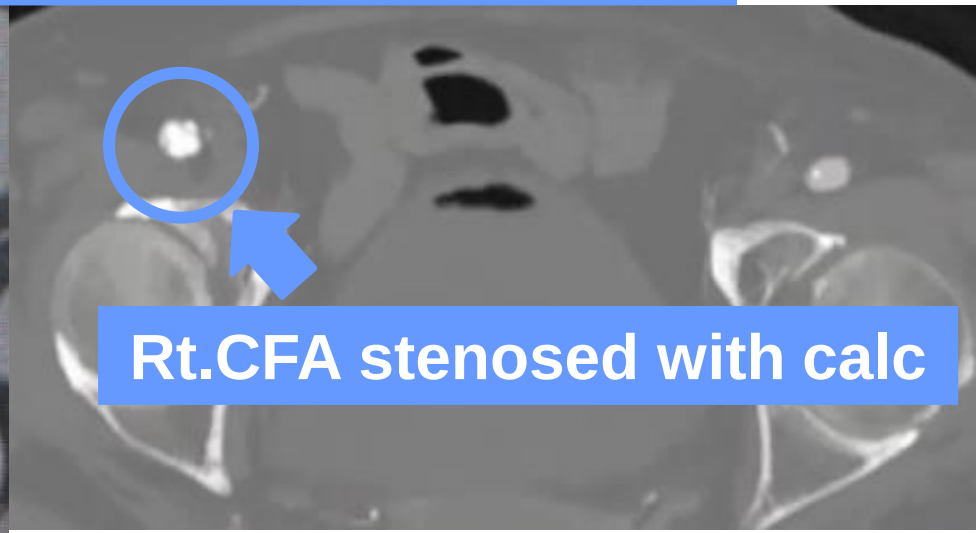


Coronary height	R 12.5/L 12.1 mm
STJ height	**R 16.4/L 15.0/N 15.9** mm
MS length	5.2 mm
Root angle	45°

TAVI-CT (access etc)



Lt.SCA ostium with calc



Rt.CFA stenosed with calc

brain MRI : no remarkable findings
coronary artery : no significant stenosis

3 strategies for accurate positioning of BEV

BEV (SAPIEN 3 Ultra RESILIA) was selected, with concerns about **infolding** or **pop-up / sinus sequestration** with SEV.

→ ***accurate positioning just above the annulus*** was essential.

1. valve size

Inadequate expansion at the annulus

→sealing **above the annulus** with **the *larger* valve**

2. slow inflation

LVOT calc will displace the balloon upwards

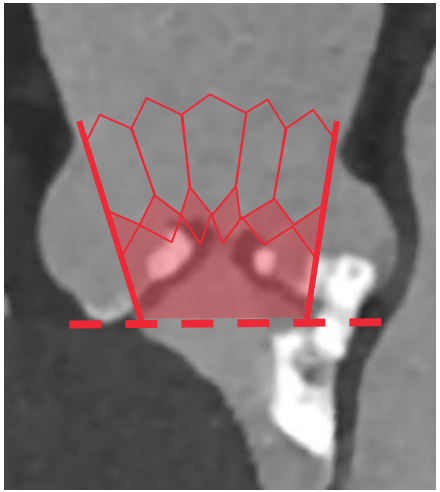
→**slow inflation** with ***long rapid pacing***

under VA-ECMO (for hemodynamic stability)

3. transcarotid

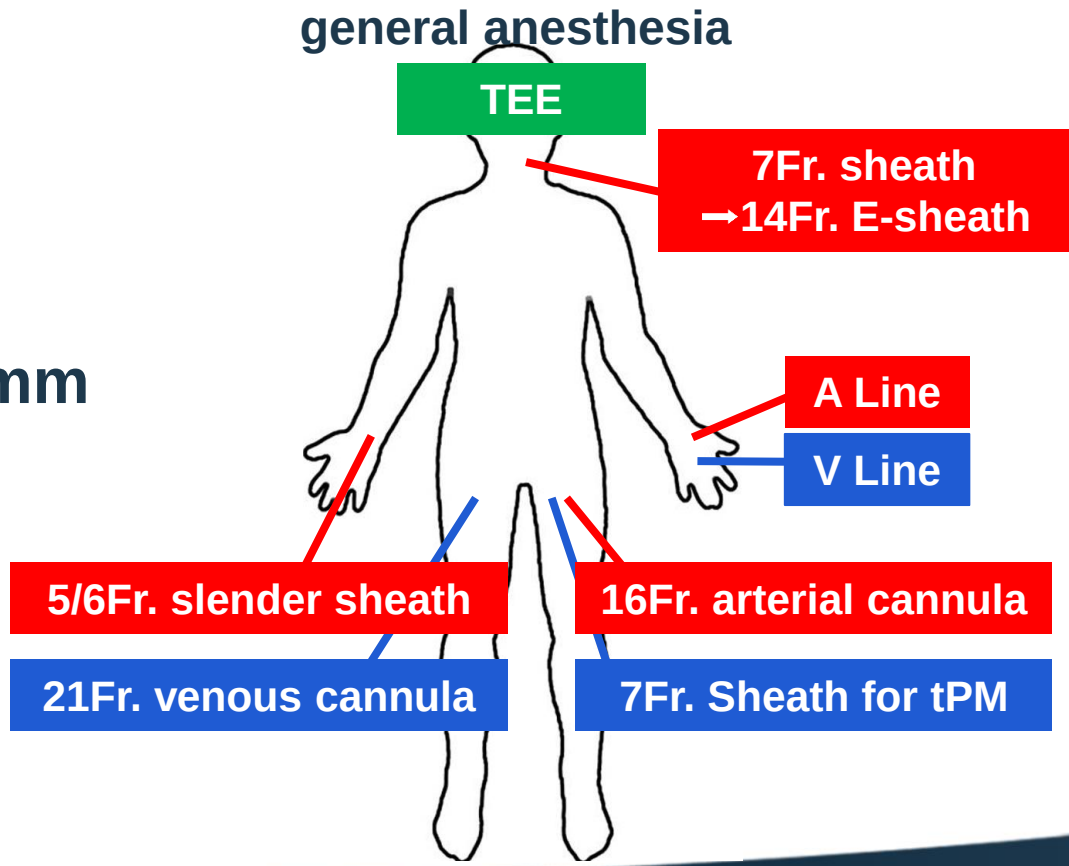
Left TF or left TC approach

→**a stronger coaxial force** to the valve

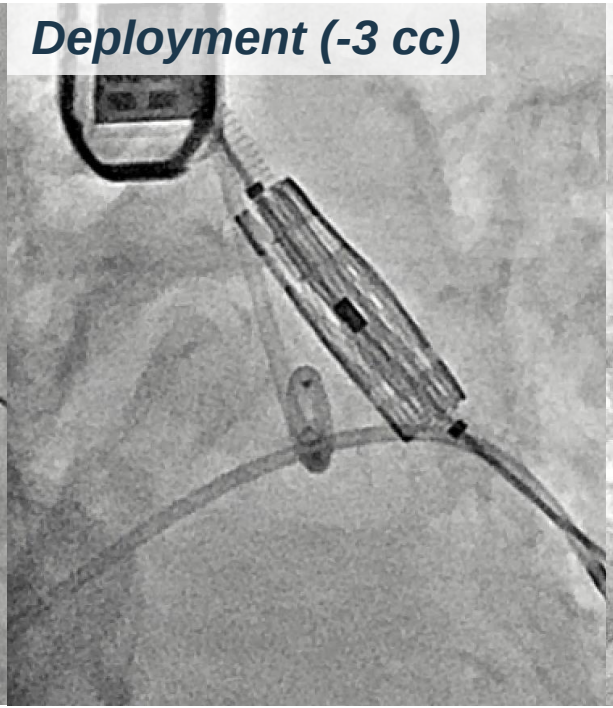


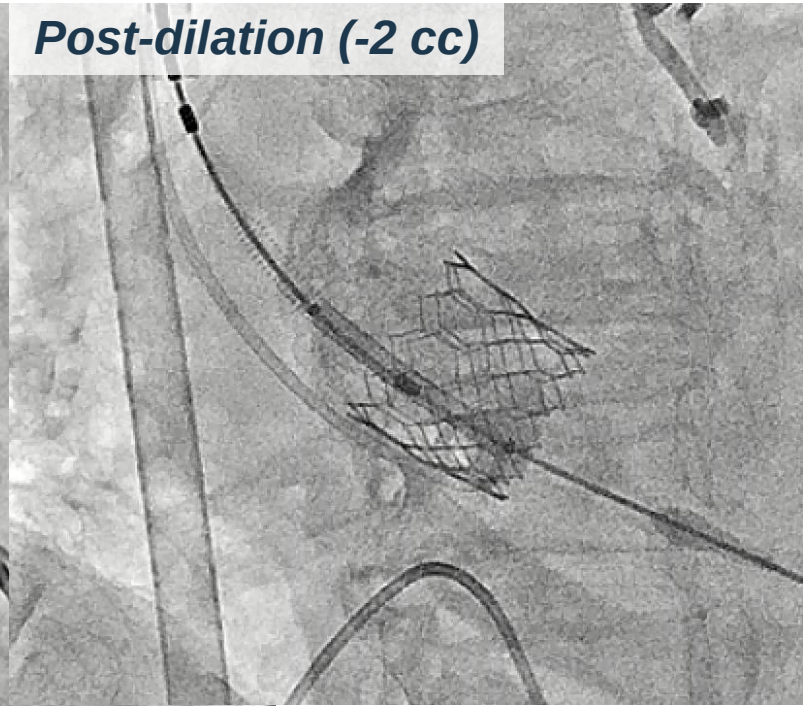
TC-TAVI

- via Lt.CCA
- BAV 16 mm, S3UR 23 mm
- under VA-ECMO

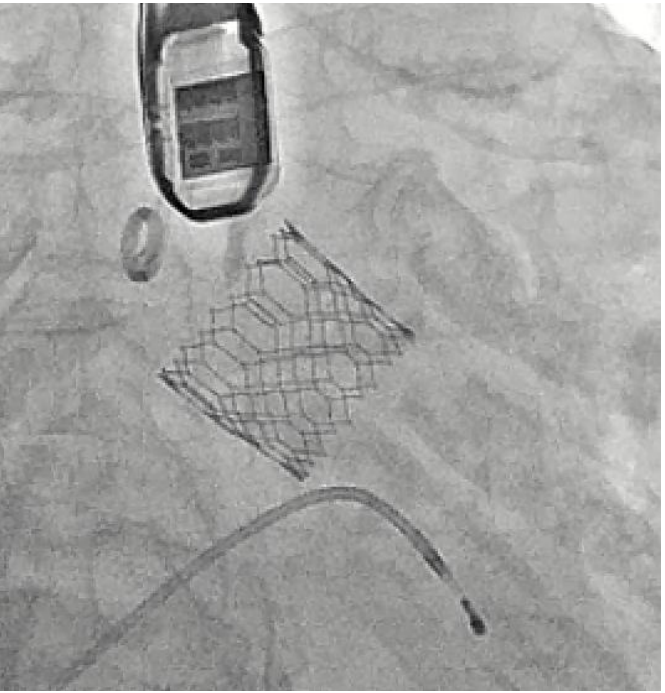


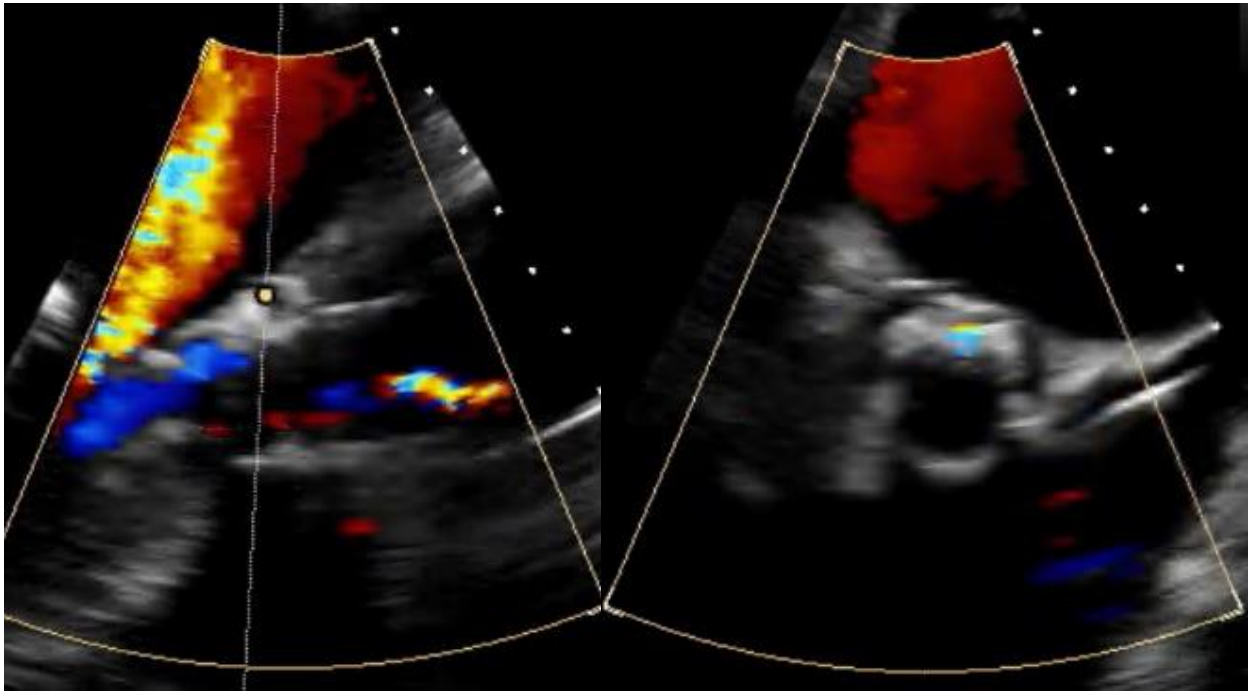
Cusp-overlap view





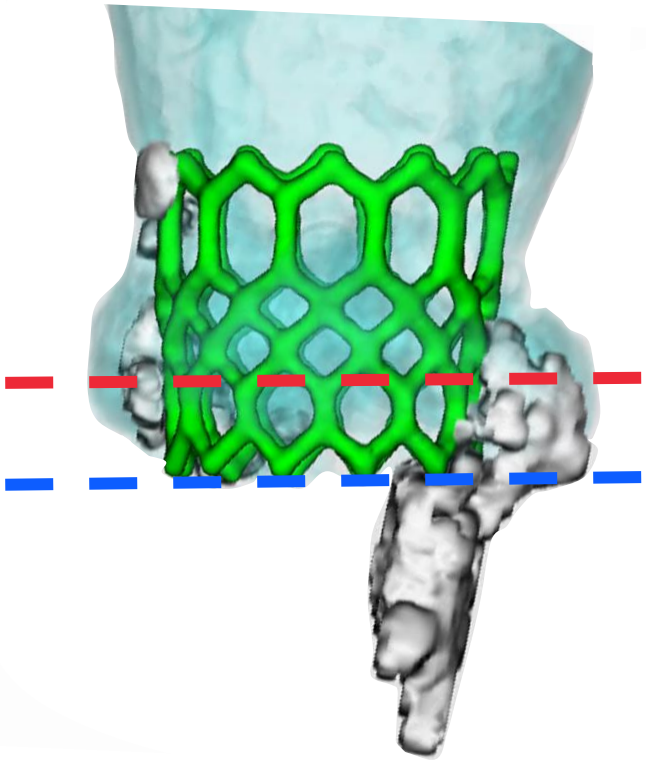
Final result

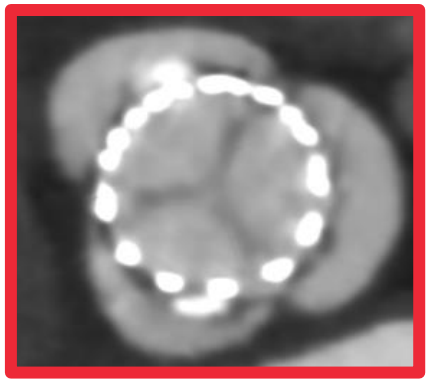


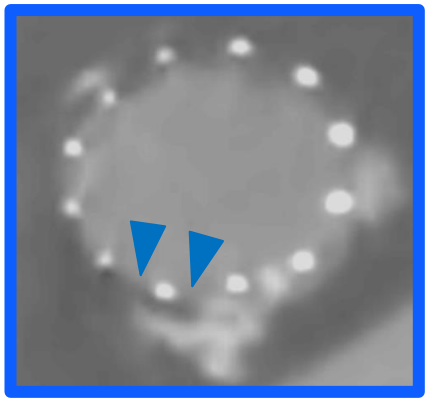


PVL trace

Postoperative CT







sealed

(annulus +8.5 mm)

not sealed

(annulus)

Accurate Positioning of BEV

✓ LVOT calcification is well-known as a risk factor of annulus rupture.

Pasic M et al. JACC Cardiovasc Interv 2015;8:1-9.

Self-expandable valves are normally selected, but **accurate implantation of balloon-expandable valves** can be a feasible option.

✓ **Prophylactic VA-ECMO** can be an effective strategy to stabilize hemodynamics during long rapid pacing for accurate positioning.

being submitted

Conclusion

✓ LVOT calcification is a risk factor for annular rupture in TAVI.
However, even self-expandable valves may be inappropriate.

✓ A larger valve, a transcarotid approach, and slow inflation
can facilitate an accurate placement of balloon-expandable valves.