Transcatheter Aortic Valve Replacement (TAVR) with JenaValve Trilogy System for Aortic Regurgitation Following a David Procedure

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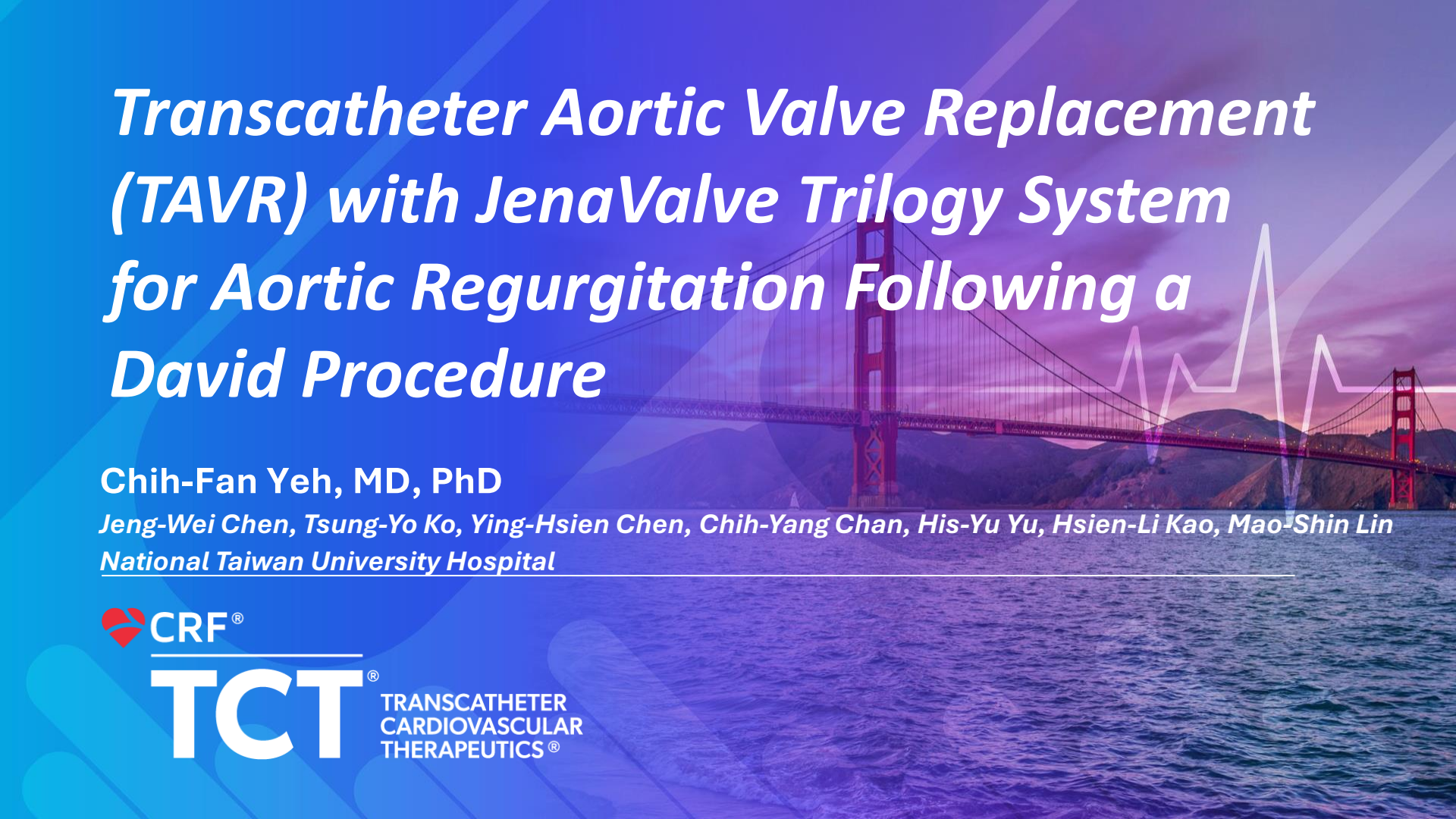

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Disclosure of Relevant Financial Relationships

I, CHIH-FAN YEH, DO NOT have any financial relationships to disclose.

Advantage and challenge for TAVR in AR patients with prior VSARR

- Valve-sparing aortic root replacement (VSARR), also known as the David procedure, is a preferred surgical option for patients with aortic root aneurysms.
- The incidence of severe aortic insufficiency following VSARR is approximately 10% at five years, and 15% at ten years .
- Advantage of TAVR:
  - The subvalvular pledgeted sutures used in VSARR have been proposed as a stable anchoring platform for TAVR valves.
- Challenge for TAVR:
  - Post-David procedure failures often involve leaflet shrinkage, leading to malcoaptation and severe regurgitation.

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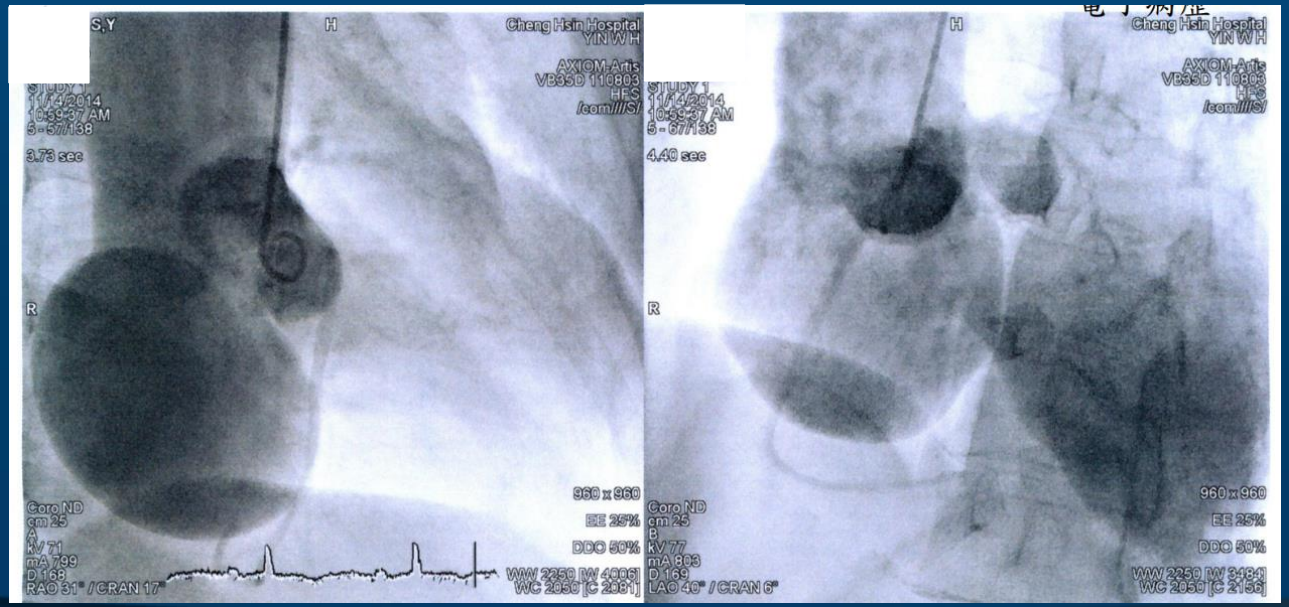
Sinus of Valsalva aneurysm before VSARR

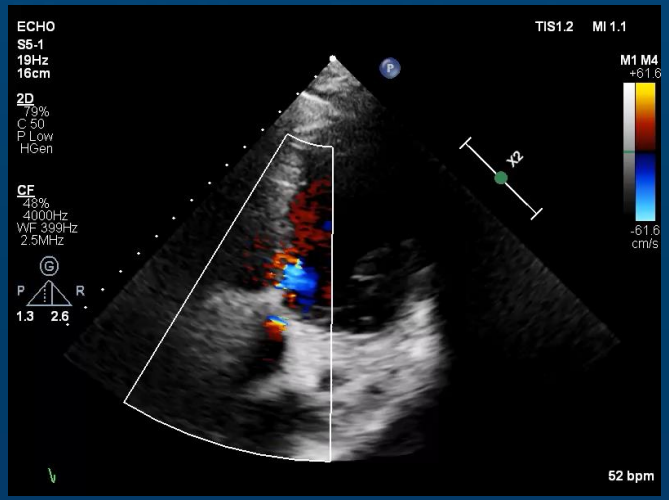
- A 71-year-old woman underwent a David procedure (VSARR) for sinus of Valsalva aneurysm 10 years ago.



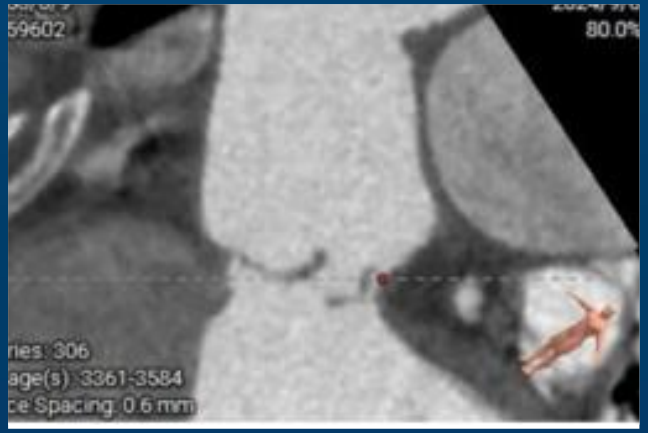
VSARR: Valve-sparing aortic root replacement

Pre-op evaluation identified severe AR with malcoaptation of NCC

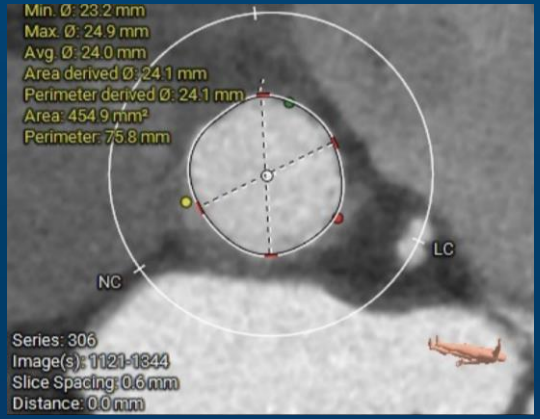
Severe eccentric aortic regurgitation in TTE



Prolapse of the non-coronary cusp with incomplete coaptation in CT scan



Annular perimeter:76mm Minimal calcium In CT scan



AI ERO_: 0.28 cm²

CT: computed tomography
NCC: non-coronary cusp
TTE: transthoracic echocardiography

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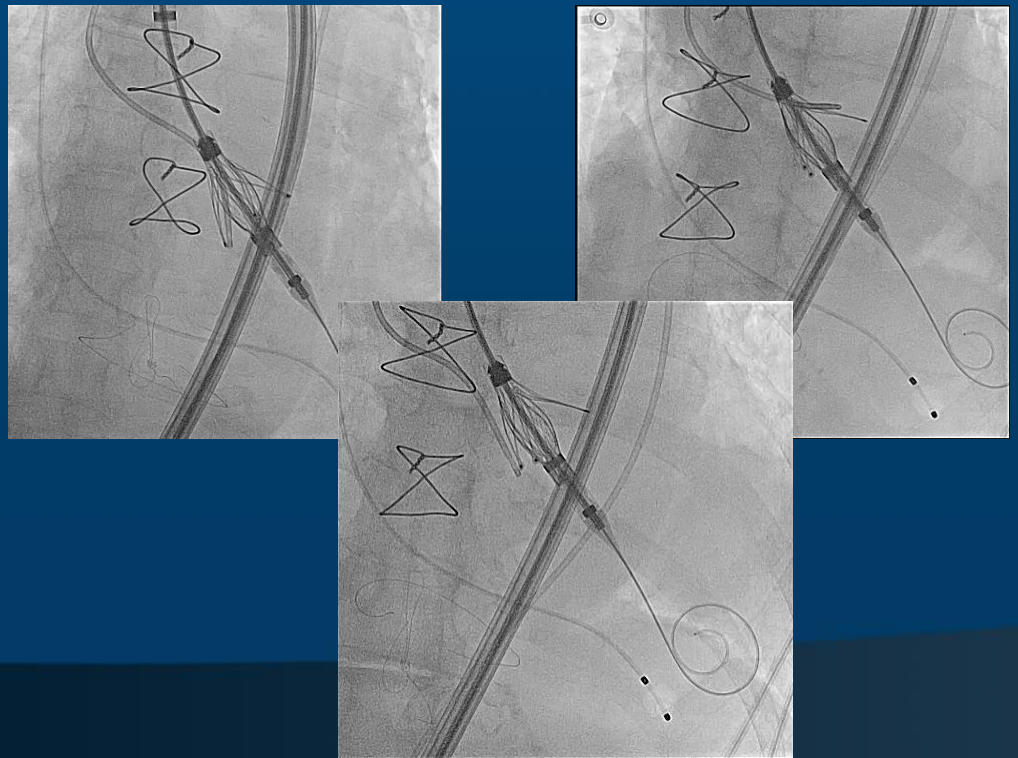
Alignment of JenaValve locators started with the NCC, followed by LCC and RCC

Conscious sedation

Aortogram before TAVR

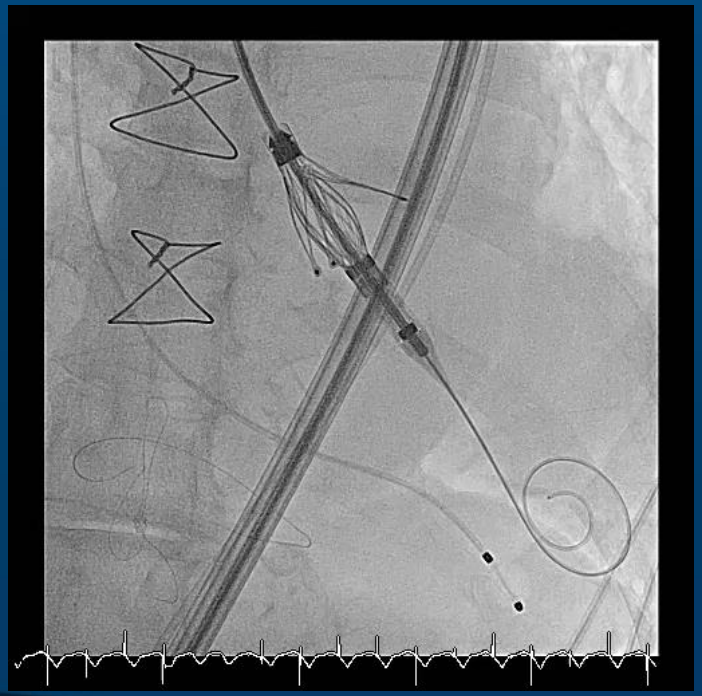
Alignment confirmation of the locators to the native cusps by angiogram



AR index: 0

Deployment of JenaValve resulted in no residual AR

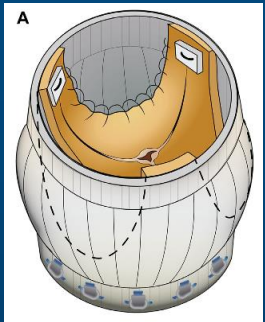
Deployment of 23 mm Trilogy JenaValve



Aortogram after TAVR

AR index: 0.36

Difference between JevaValve and Sapien 3 valve in AR patients treated with prior VSARR



Challenges from VSARR	Sapien 3	JenaValve
Lack of calcium and altered root geometry for positioning and securing	Secured using Corknots and sinus suture line	Clipping mechanism that anchors positioning feelers into the native aortic annulus
Suture line disruption/balloon overinflation vs paravalvular leak	**Careful oversizing** by measuring perimeter at neo-annulus and CorKnots level	Only need perimeter at annulus level

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JACC Case Rep. 2021 Dec 1;3(17):1803-1805.

Conclusion

- Image evaluation to determine the mechanism of failed VSARR could facilitate proper treatment strategies, ex. TAVR vs SAVR, TAVR size, TAVR devices.
- We secured the locators of JenaValve Trilogy onto shrunk leaflet first due to the longest anchoring distance, ensuring the sealing ring aligned with the anchor plane.
- Beside patients with native AR, we demonstrated Trilogy JenaValve could be used to treat a failed VSARR with excellent result.

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ESC European Society of Cardiology

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CASE REPORT
Structural intervention

Transcatheter aortic valve replacement with JenaValve Trilogy system for aortic regurgitation following a David procedure: a case report

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Background Valve-sparing aortic root replacement (VSARR), also known as the David procedure, is a preferred surgical option for patients with aortic root aneurysms, offering preservation of the native valve and avoidance of mechanical valve replacement with lifelong anticoagulation. However, long-term durability remains a concern, with progressive aortic regurgitation (AR) occurring in up to 20% of cases. Redo surgical valve replacement is standard for failed VSARR, but transcatheter aortic valve replacement (TAVR) has emerged as a less invasive alternative for high-risk patients, despite technical challenges in non-calcified anatomy. This case highlights the first reported use of the JenaValve Trilogy system to treat post-David procedure AR.

Case summary A 71-year-old female developed severe AR ten years after undergoing a David procedure for a sinus of Valsalva aneurysm. Echocardiography showed eccentric AR due to left and non-coronary cusp malcoaptation, with an effective regurgitant orifice of 0.28 cm^2. Due to comorbidities and patient preference, TAVR was selected over surgical redo. A 23-mm Trilogy JenaValve was implanted via transfemoral access under conscious sedation. Post-procedural aortogram confirmed successful deployment and absence of residual regurgitation. The patient recovered uneventfully and was discharged on postoperative day five.

Discussion This case demonstrates the feasibility of the JenaValve Trilogy for managing post-VSARR AR, even in the absence of annular calcification. Its unique anchoring mechanism, which uses locators positioned within the sinuses, provides secure fixation in complex anatomies. This leaflet-locating design may offer a transcatheter option for patients with non-calcified anatomy. While promising, further clinical experience and long-term data are needed to better define the role of this system in failed valve-sparing repairs.

Keywords Aortic regurgitation • Case report • Transcatheter aortic valve replacement • Valve-sparing aortic root replacement

ESC curriculum 4.1 Aortic regurgitation • 4.10 Prosthetic valves

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