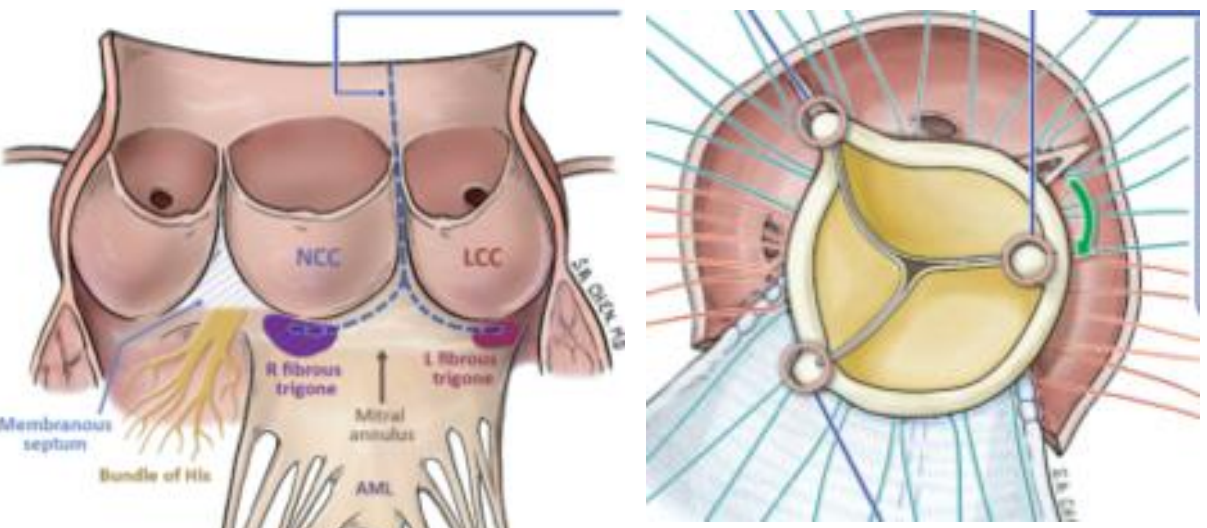


Modification Of Y-incision Technique With Valsalva Graft To Enlarge Sub-valvular Space

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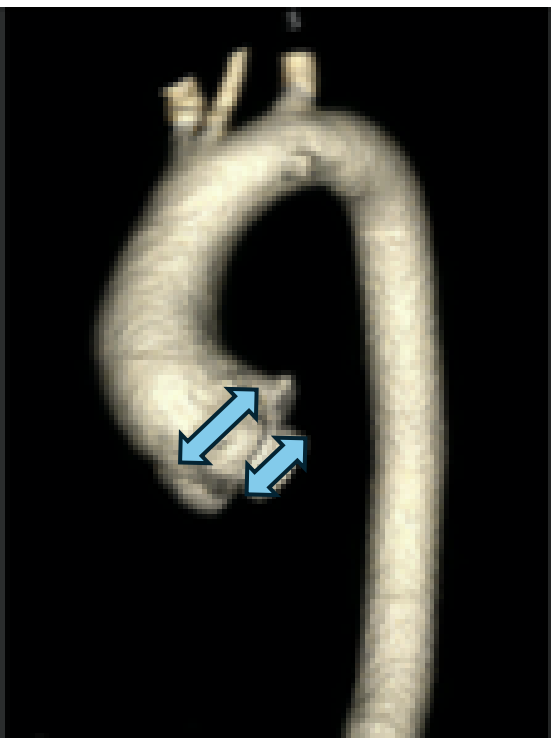
BACKGOUNDS

The Y-incision annular enlargement technique allows for the implantation of larger prosthetic valves without violating mitral valve.



Yang B. Aortic annular enlargement with Y-incision/rectangular patch. Ann Cardiothorac Surg. 2024;13(3):294-302.

- As the mitral annulus is not incised, adequate enlargement of LVOT cannot be achieved, potentially leading to a mismatch between a large prosthetic valve and a relatively small sub-valvular space.



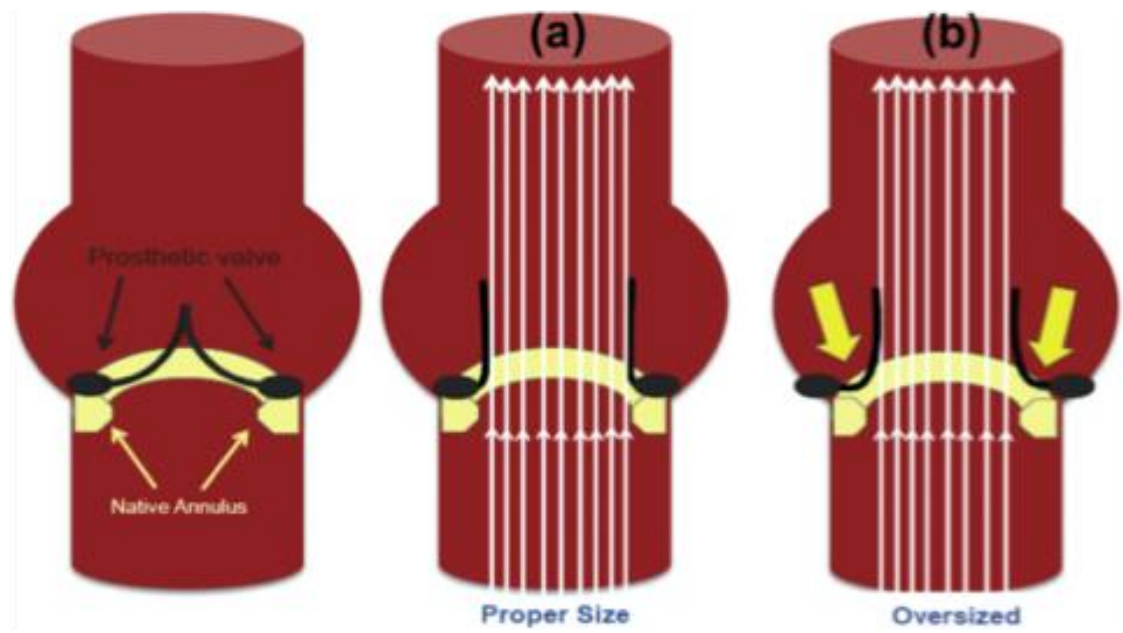
Said SM, Jahanyar J. Yang technique for aortic annular enlargement and the "lemon on a stick". JTCVS Tech. 2022 Sep 16;16:21

Yang B, Ghita C, Makkinejad A, Green C, Wu X.

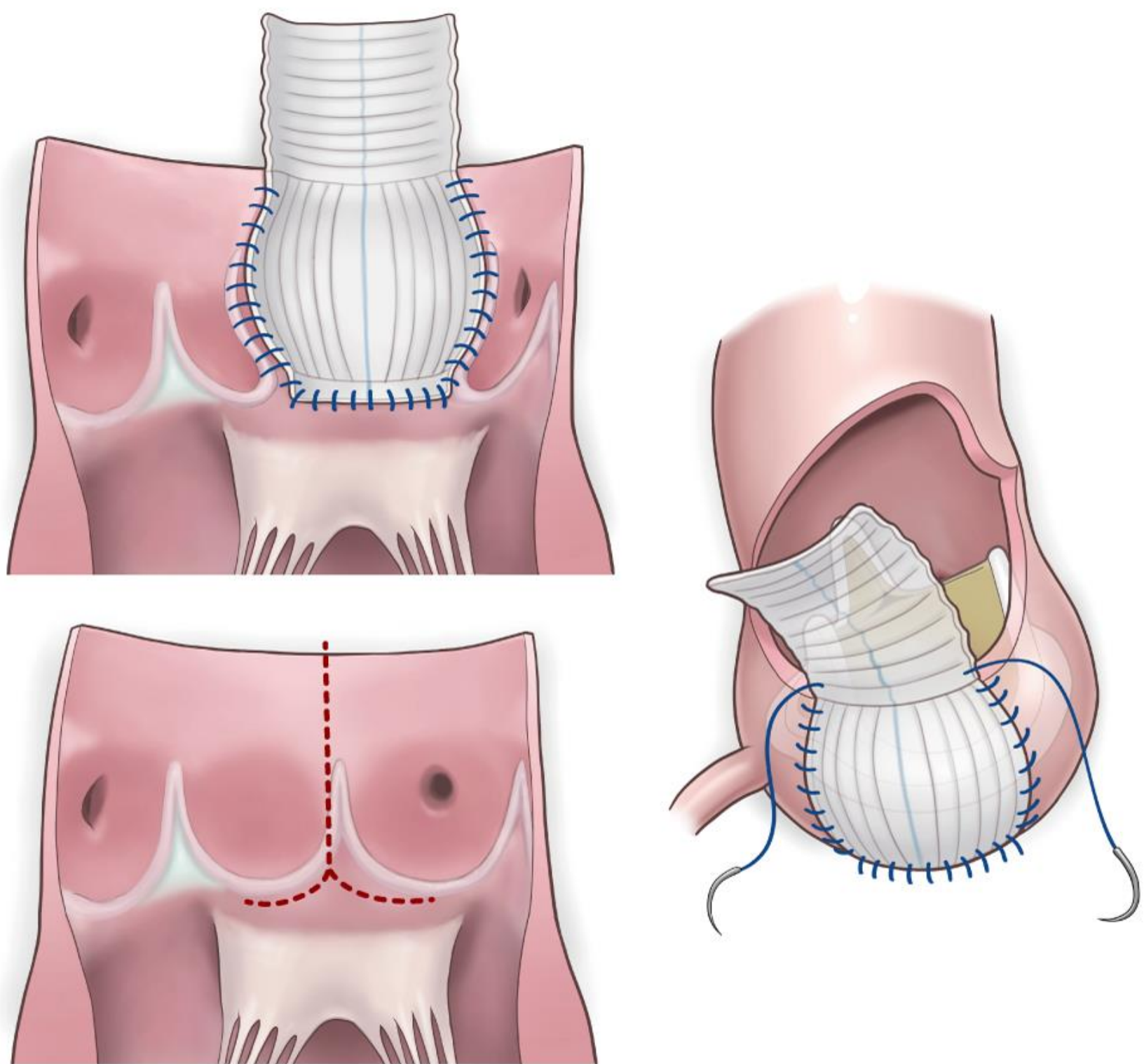
Early outcomes of the Y-incision technique to enlarge the aortic annulus 3 to 4 valve sizes. J Thorac Cardiovasc Surg. 2024;167(4):1196-1205.e2.

- A restricted sub-valvular space may impair prosthetic valve function.
- This has the potential to impair hemodynamic performance and reduce prosthetic valve durability.

Cleveland JD, Bowdish ME, Eberhardt CE, et al. Evaluation of Hemodynamic Performance of Aortic Valve Bioprostheses in a Model of Oversizing. Ann Thorac Surg. 2017;103(6):1866-1876.



- We describe a modification using a Valsalva graft instead of a Dacron patch to optimize sub-valvular space and potentially improve hemodynamics.



METHODS

✓Surgical Technique

- Standard Y-incision and transverse aortotomy
- Graft Sizing: $(\text{Enlargement width} + 5 \text{ mm}) \times 3 \div 3.14$
- Graft Prepartaion:

One-third of J-graft Valsalva graft trimmed

Graft sutured to aortomitral curtain

Sutures placed at skirt–Valsalva junction to avoid mitral leaflet interference)

- Valve Implantation:

Native annulus: pledgeted mattress sutures (non-everting)

Graft portion: non-pledgeted inverted-U sutures to preserve subvalvular space

We performed 134 AVR via median sternotomy between Apr. 2023 and Dec. 2024 at Chiba-nishi General Hospital. Among them, there were 8 cases requiring annular enlargement: 8 patients (Study group)

Apr. 2023 - Dec. 2024

Total AVR via median sternotomy
(including combined procedures)
n = 134

Patients without annular
enlargement
n = 126

Patients with annular enlargement
n = 8

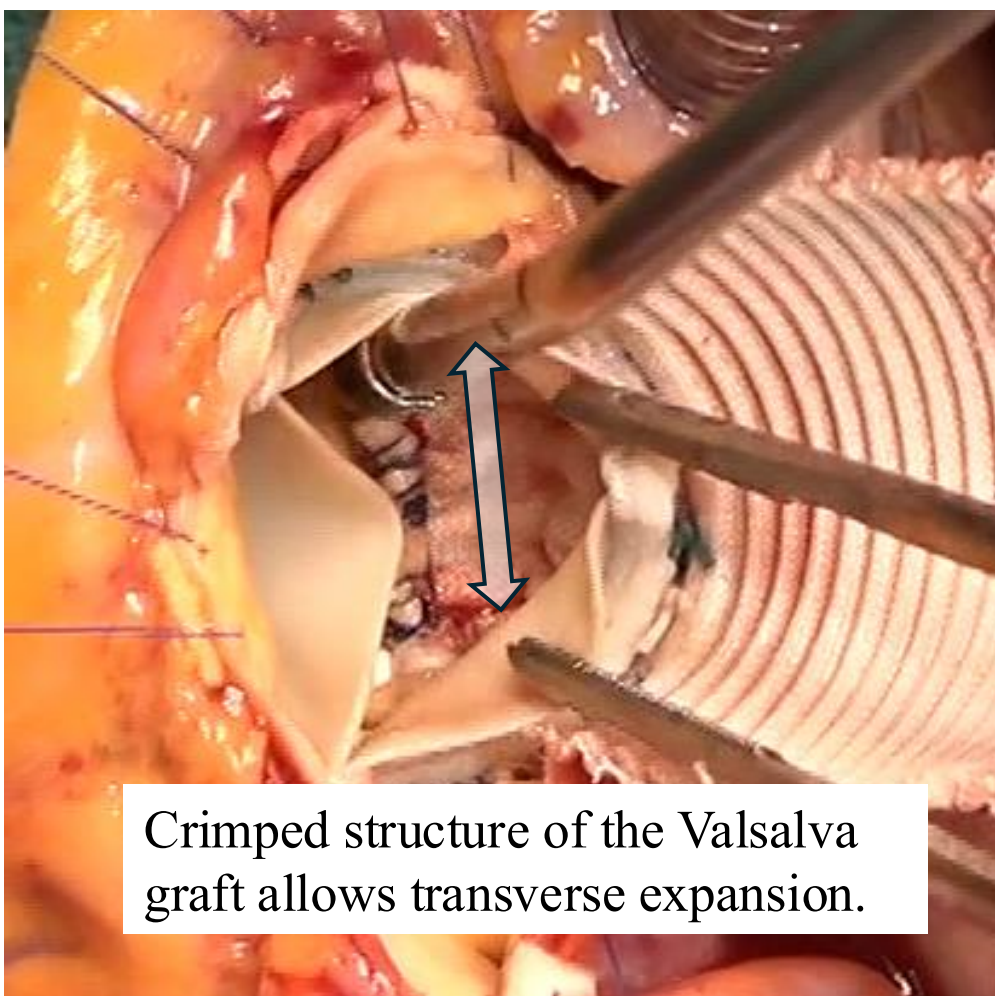
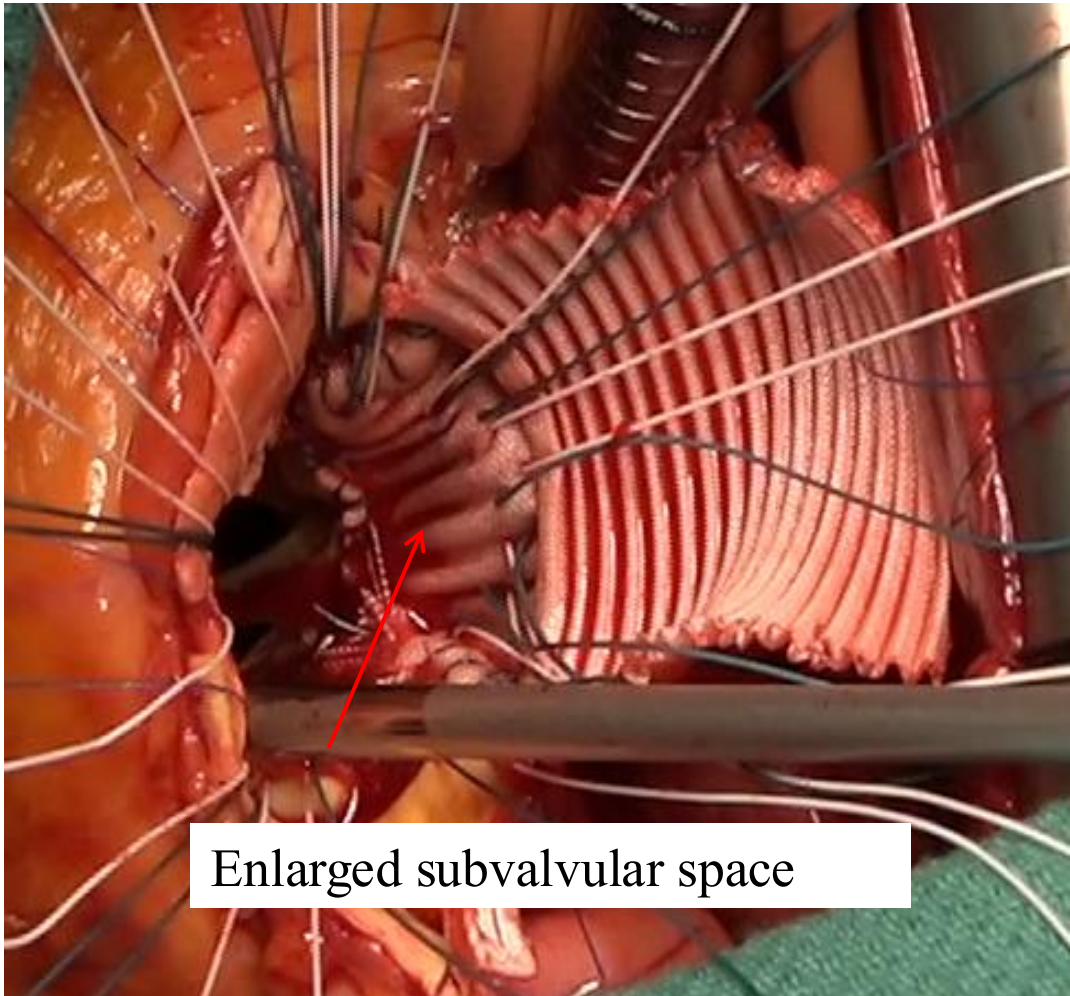
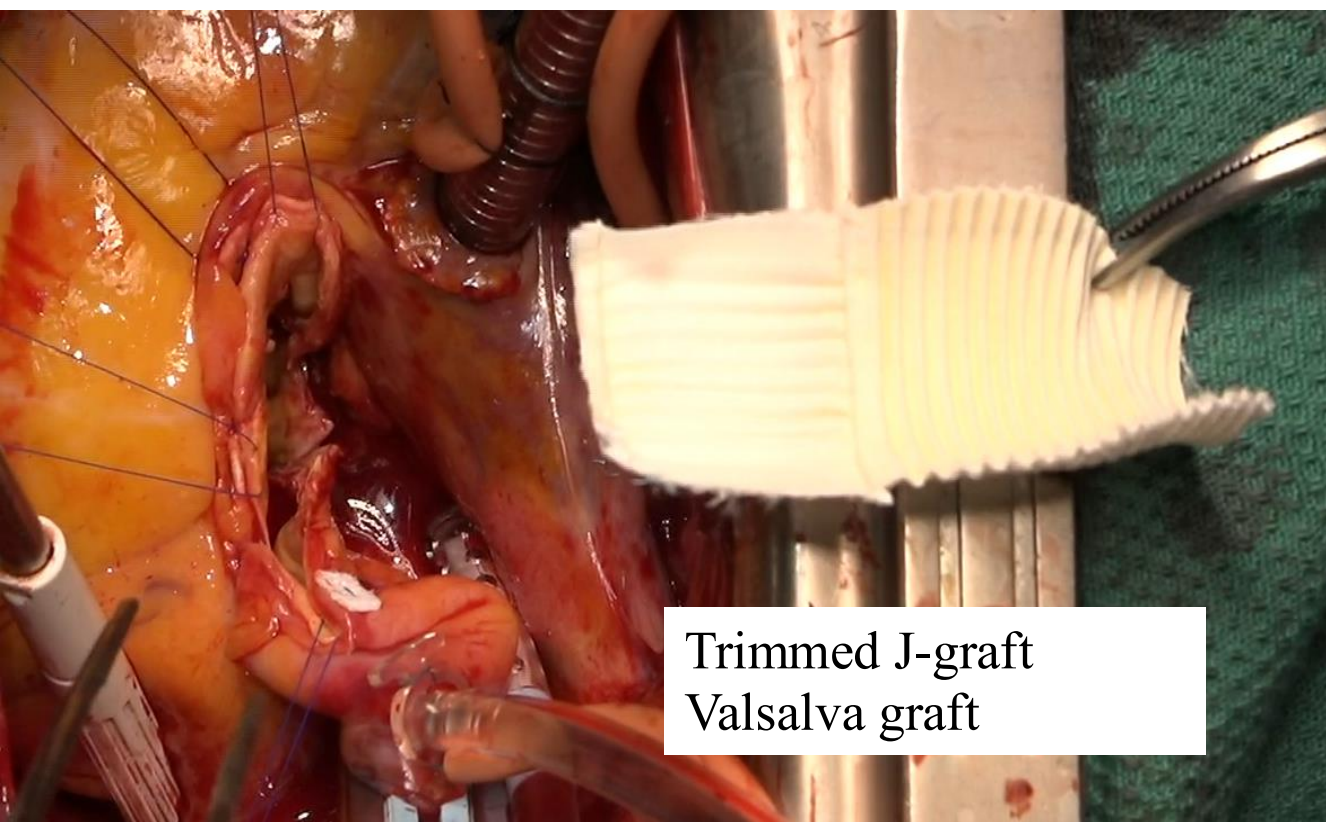
✓Outcome

1. Primary Outcomes

- Early surgical results
- Postoperative echocardiographic/ CT data

2.Secondary Outcome

- Feasibility of transcatheter valve-in-SAV (TAV-in-SAV) after annular enlargement



RESULTS

Variables	Value (N=8)
Preoperative characteristics	
Age, years	70.4 ± 7.1
Sex, male/female	0 / 8
Body surface area, m ²	1.42 ± 0.16
Annulus diameter, mm	17.9 ± 1.6
Operative data	
Operation time, min	280.3 ± 52.3
Cardiopulmonary bypass time, min	165.5 ± 27.1
Aortic cross-clamp time, min	118.8 ± 17.3
Prosthetic valve size, mm	23.3 ± 0.7
Valsalva graft size, mm	25.8 ± 2.0
Concomitant procedure, n (%)	4 (50%)
Operative mortality	0

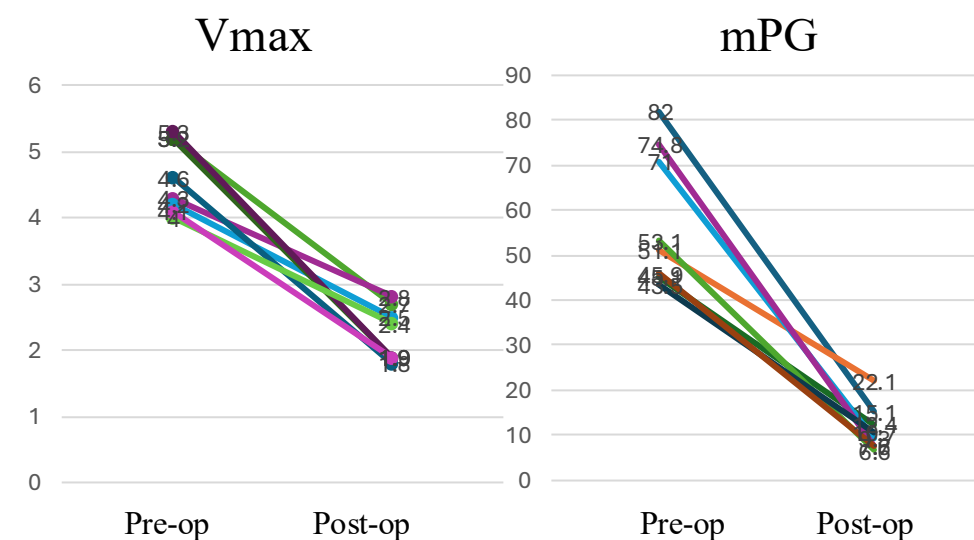
Not feasible for a 19-mm prosthetic valve

Equivalent to a three-size increase in prosthetic valve size

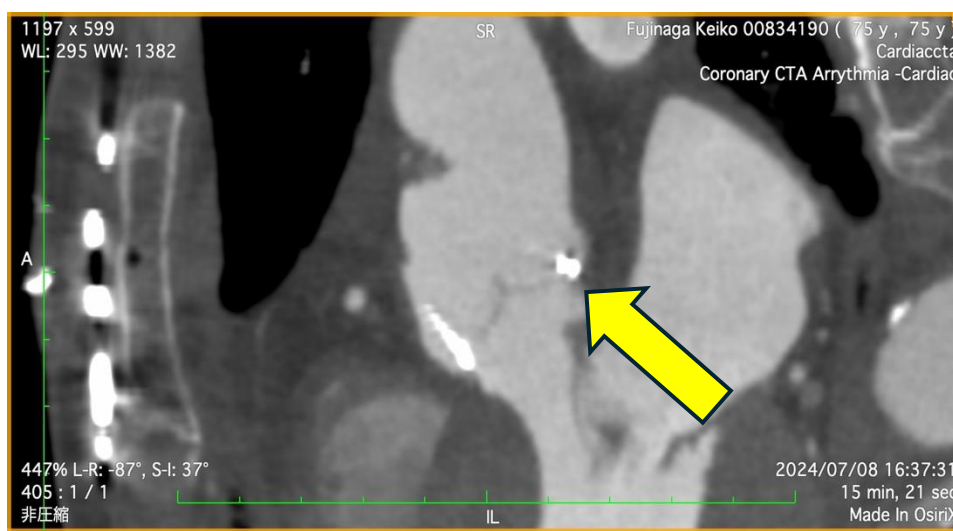
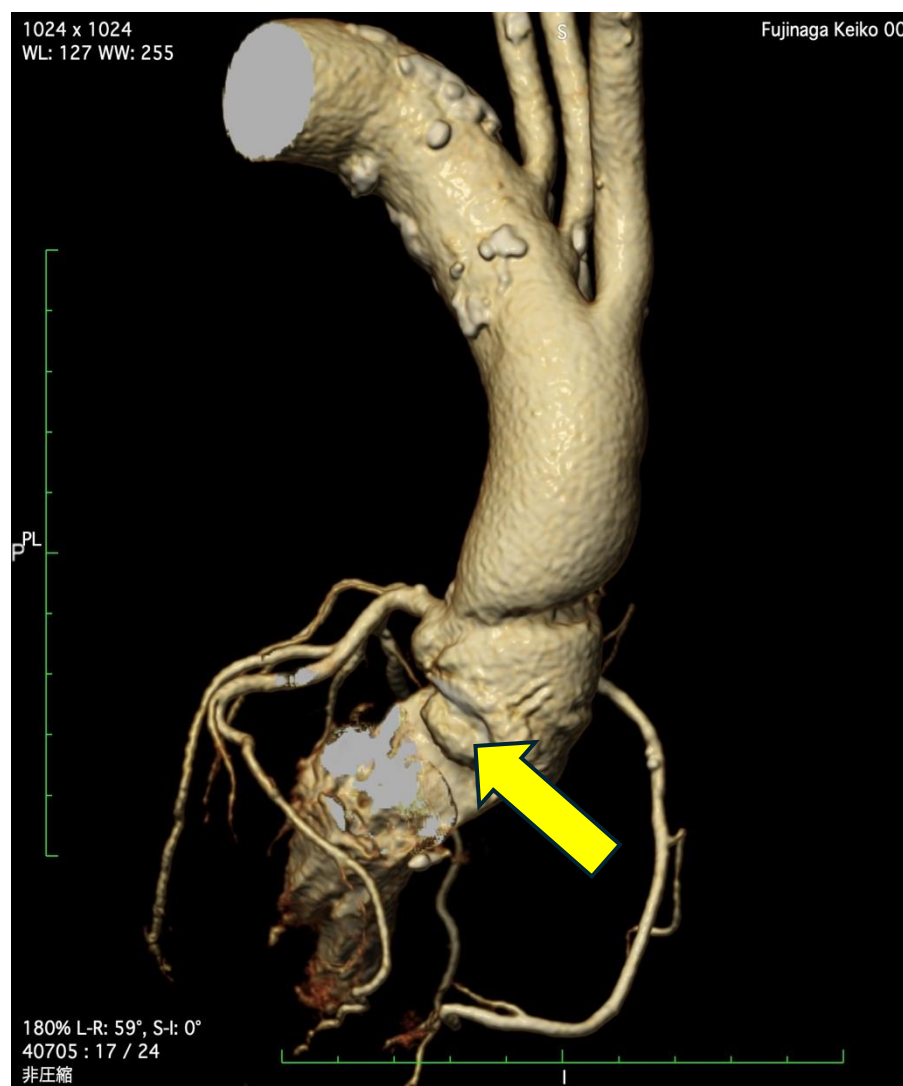
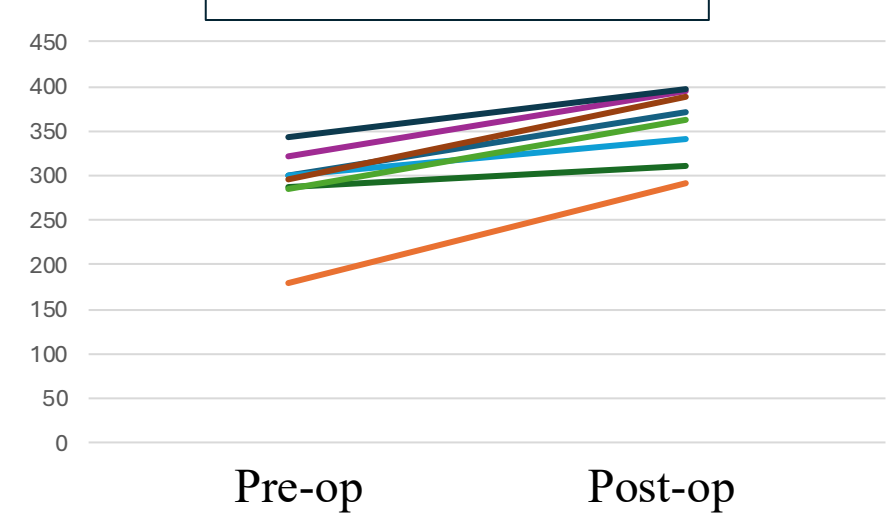
Values are presented as mean ± SD or number (%).

Variables	Preoperative	Postoperative
Left ventricular dimensions		
LVDD, mm	41.1 ± 4.0	38.2 ± 1.8
LVDs, mm	23.5 ± 2.0	26.5 ± 2.2
LVEF, %	66.0 ± 4.3	59.0 ± 6.1
Mitral regurgitation (≥ moderate)	0	0
Aortic valve		
Vmax, m/s	4.6 ± 0.5	2.2 ± 0.4
Mean pressure gradient, mmHg	58.3 ± 15.2	11.4 ± 5.1
Area of sub-valvular space, mm ²	265 ± 55	357 ± 40
Valve-to-coronary distance		
LCA, mm	-	8.1 ± 1.4
RCA, mm	-	3.6 ± 1.3

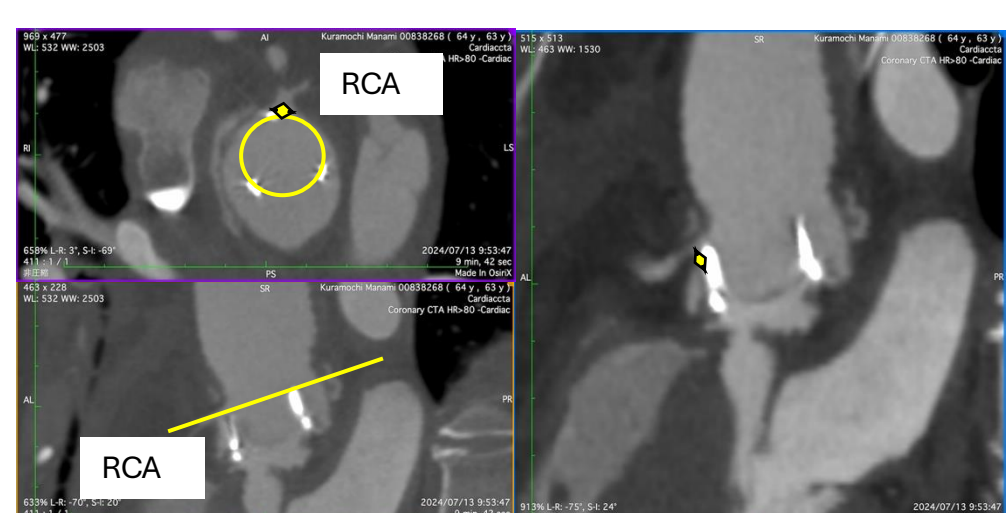
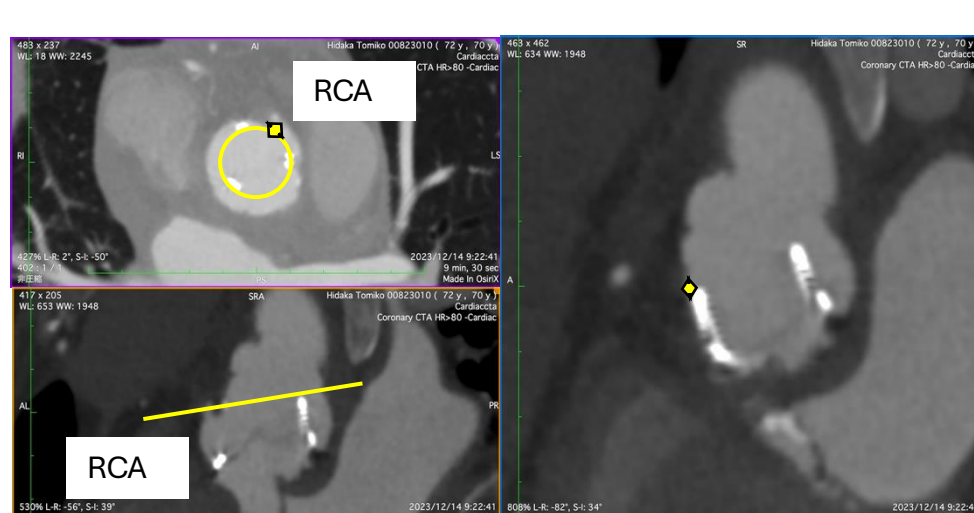
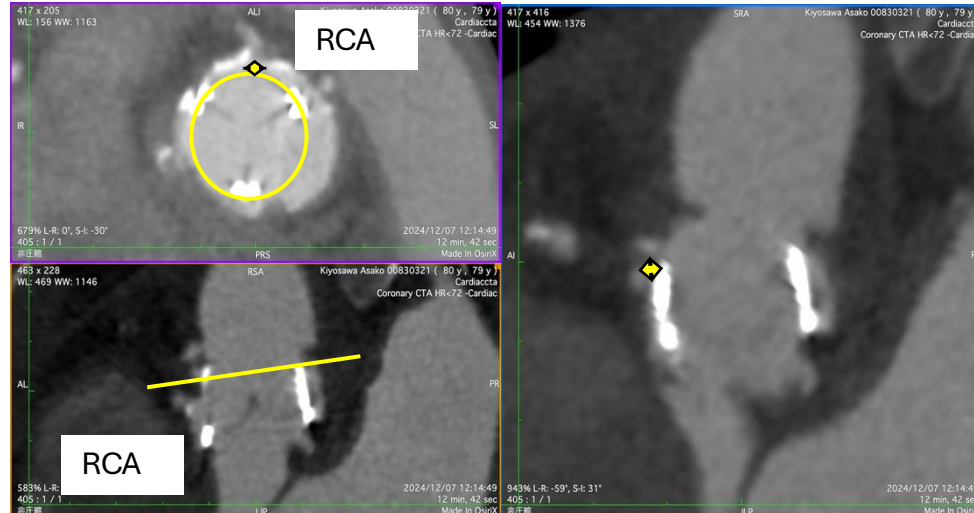
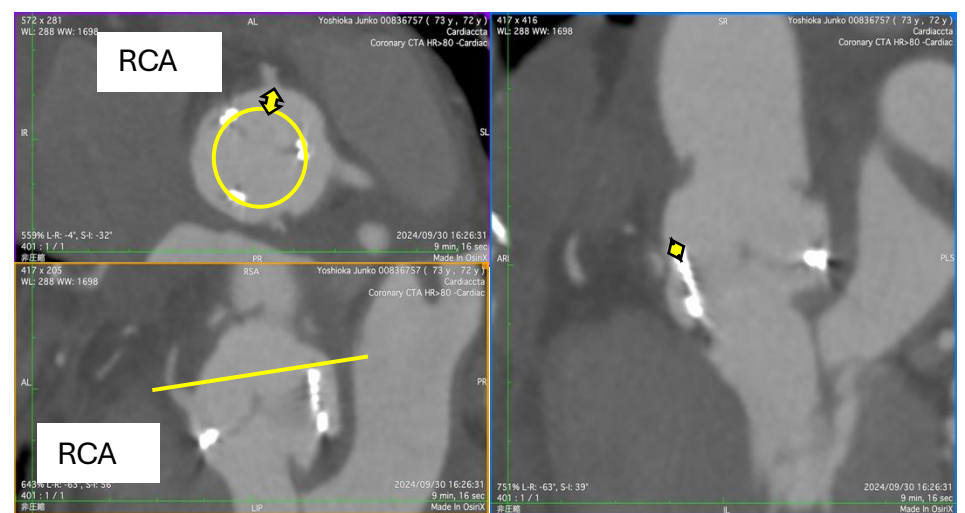
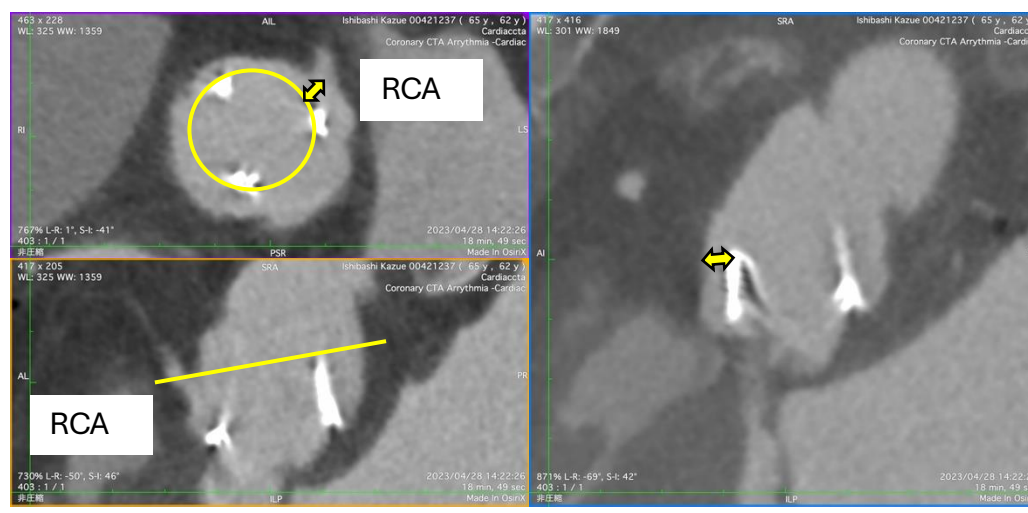
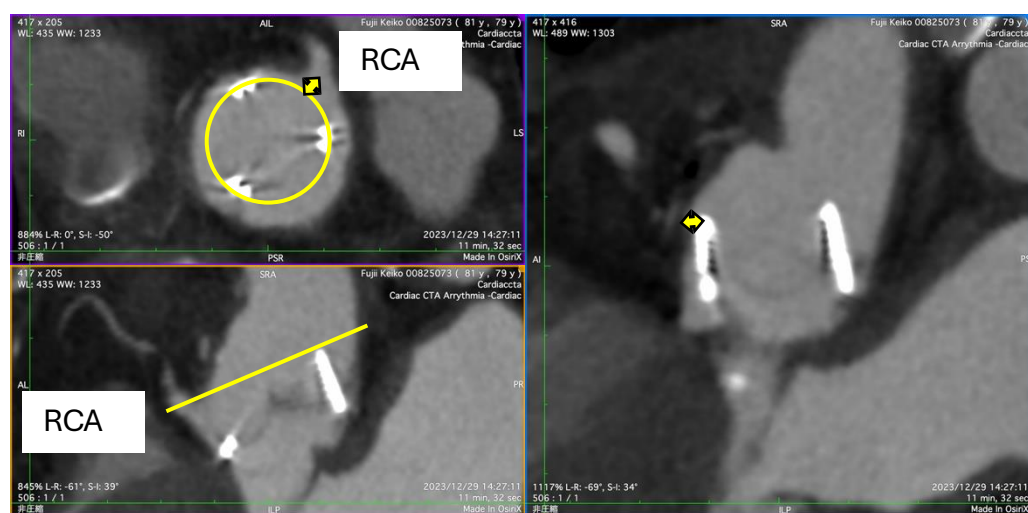
Echocardiographic data



Sub-Valvular area



- Bulging beneath the prosthetic valve due to the Valsalva graft was confirmed.



CONCLUSION

The modified Y-incision using a Valsalva graft facilitates implantation of three-size larger prostheses and sub-valvular enlargement, which may lead to improved hemodynamic performance.

However, limited RCA-VTC and VTSTJ raise concerns for valve-in-valve procedures.

Feasibility can be improved by appropriate valve downsizing or selection of a low-profile prosthesis, together with adjunctive aortic root or STJ enlargement, which also contributes to improved anatomical alignment