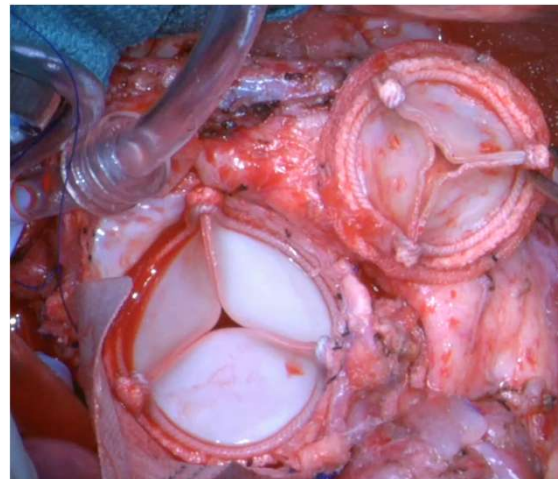
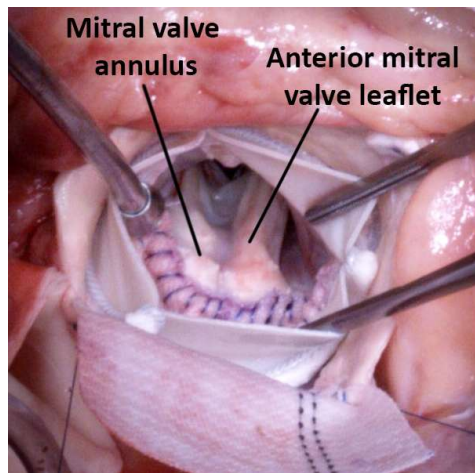
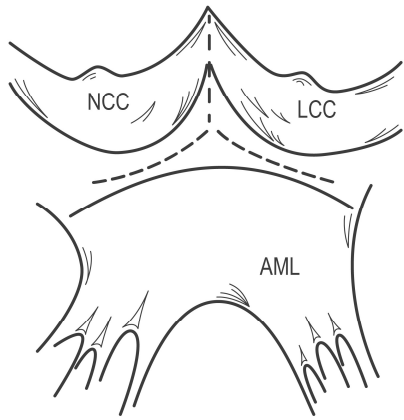


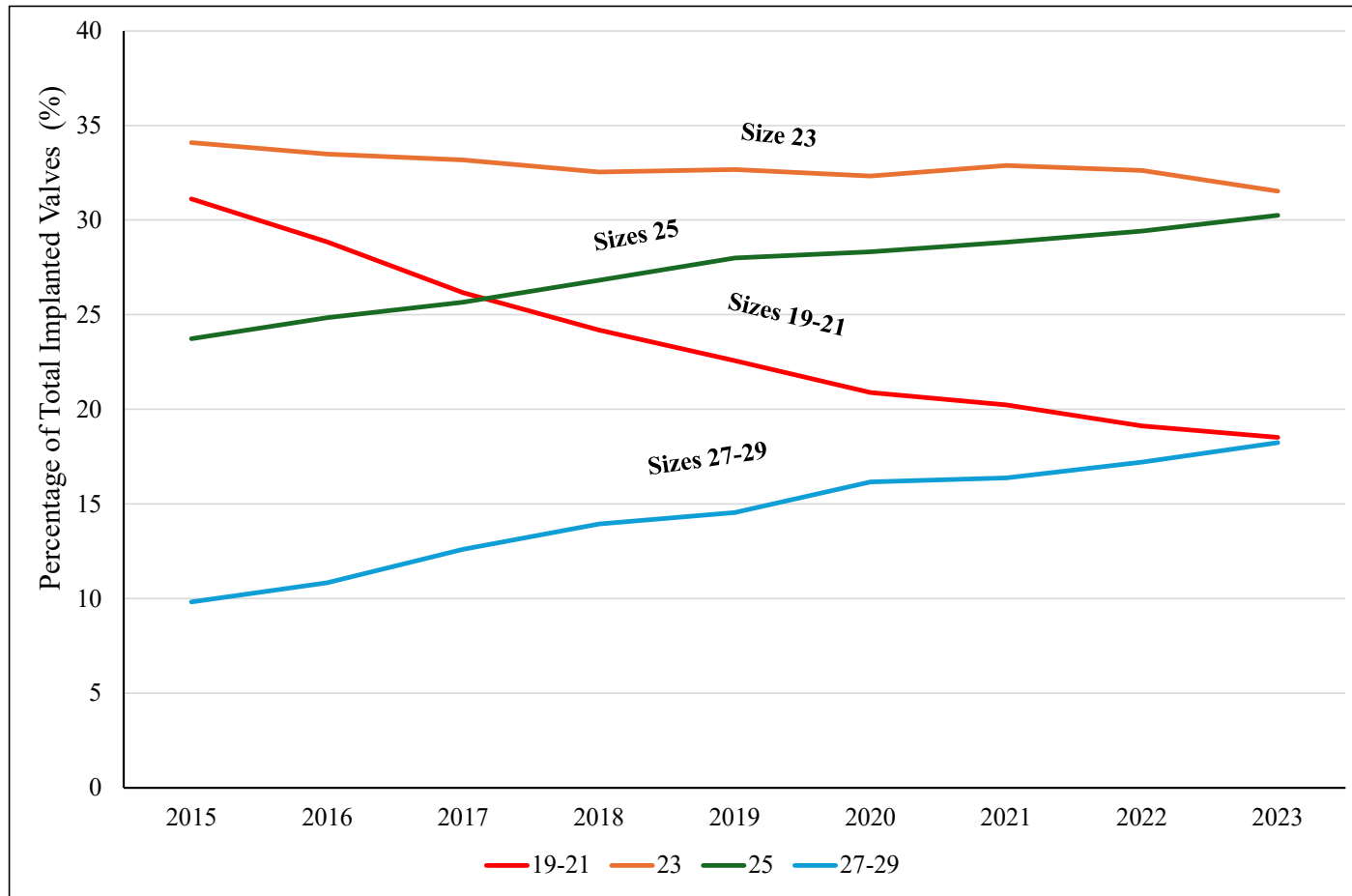
Redo Y-incision Aortic Annular/Root Enlargement – After Prior SAVR or TAVR

Bo Yang, MD, PhD

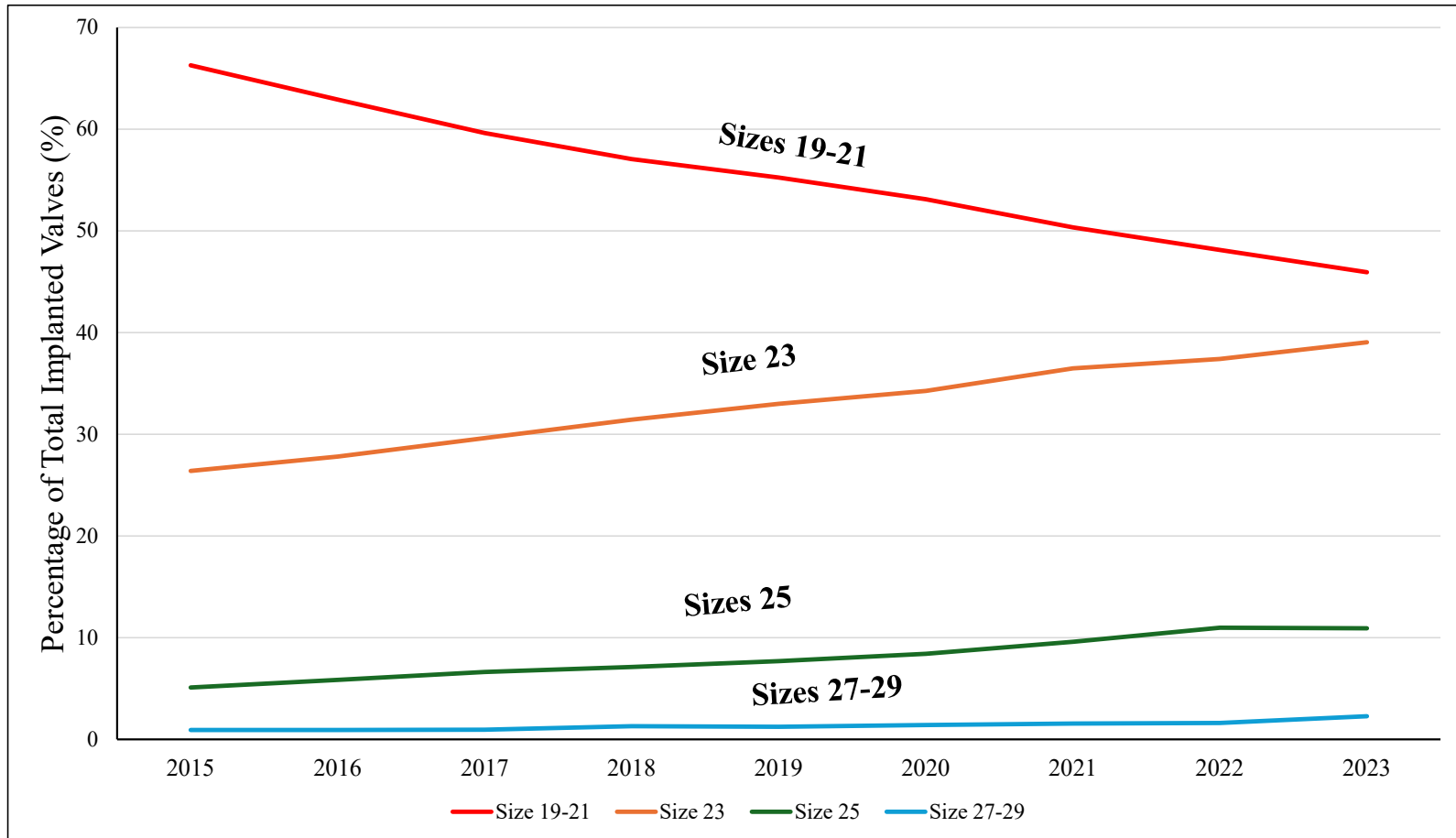
Director of MI-AORTA, Frankel Cardiovascular Center
Director of Aortic Surgery
Director of Research
Frankel Professor in Aortic Surgery,
Dept. of Cardiac Surgery, University of Michigan



SAVR Prosthesis Sizes in the US 2015-2023



SAVR Prosthesis Sizes in US Females 2015-2023



Normal aortic annulus:

Male: **23.1 ± 2.0 mm** (n=2,214);

Female: **21.0 ± 1.8 mm** (n=1,156) (Capps SB, JTCVS 2000)

Normal aortic annular area: 3-4 cm² (Rahimtoola, Circ 1978)



Size 21



21 Valve – 14mm



Size 23



23 Valve – 16mm

NOTION Trial

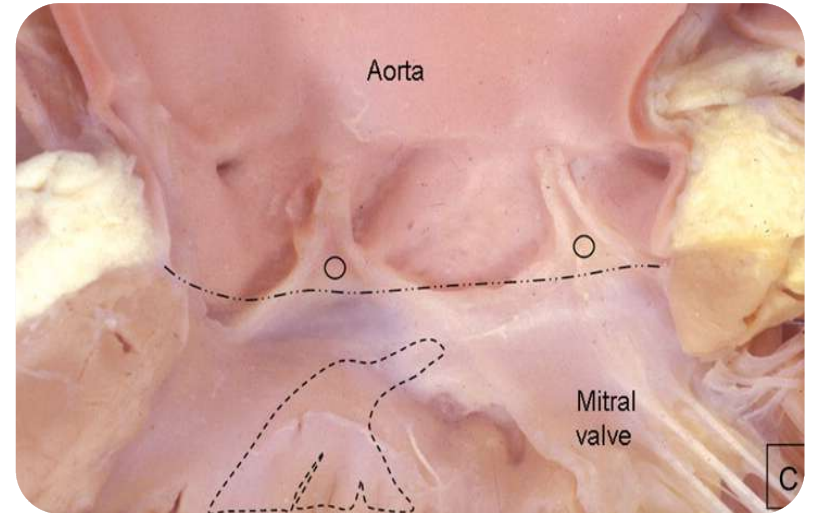
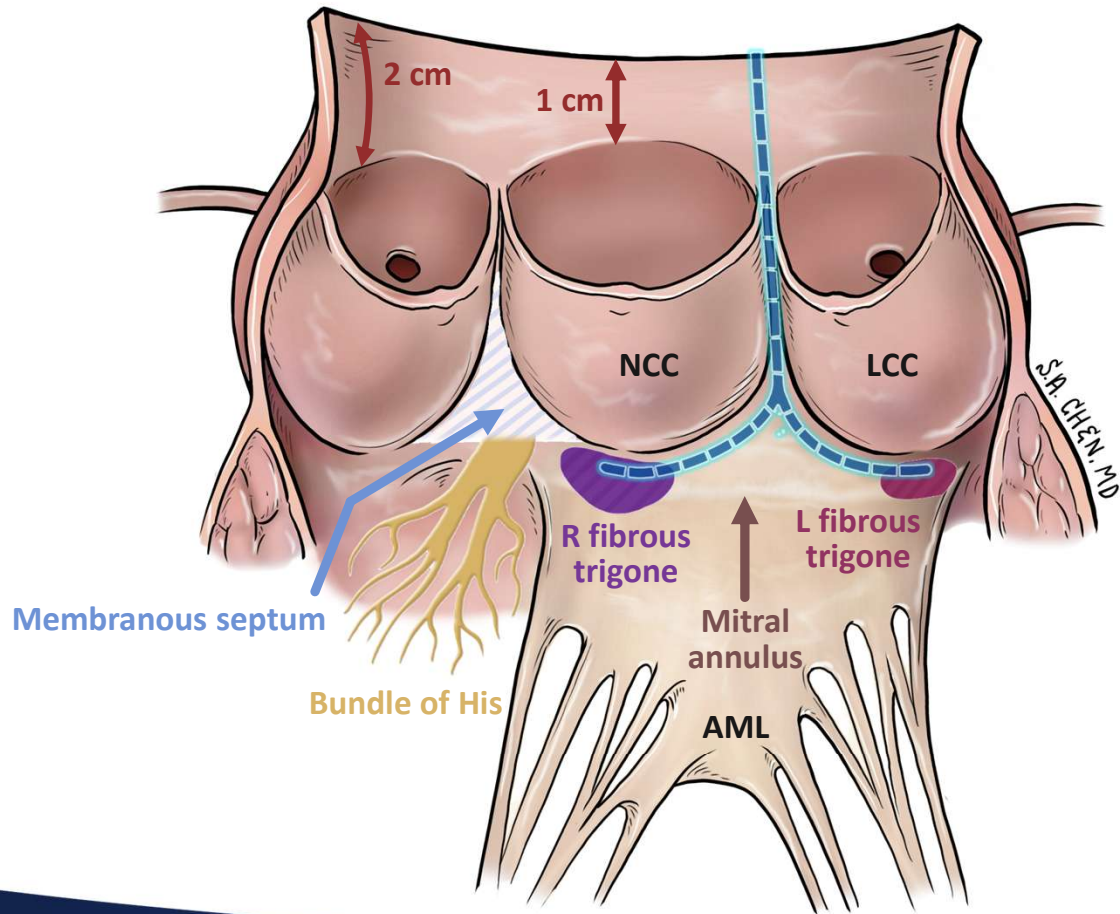
PARTNER 1, 2, 3, Pivotal,
Evolut low risk, SURTAVI
(mod-severe PPM 52-60%)

Table 2 Effective orifice diameters measured under steady flow conditions

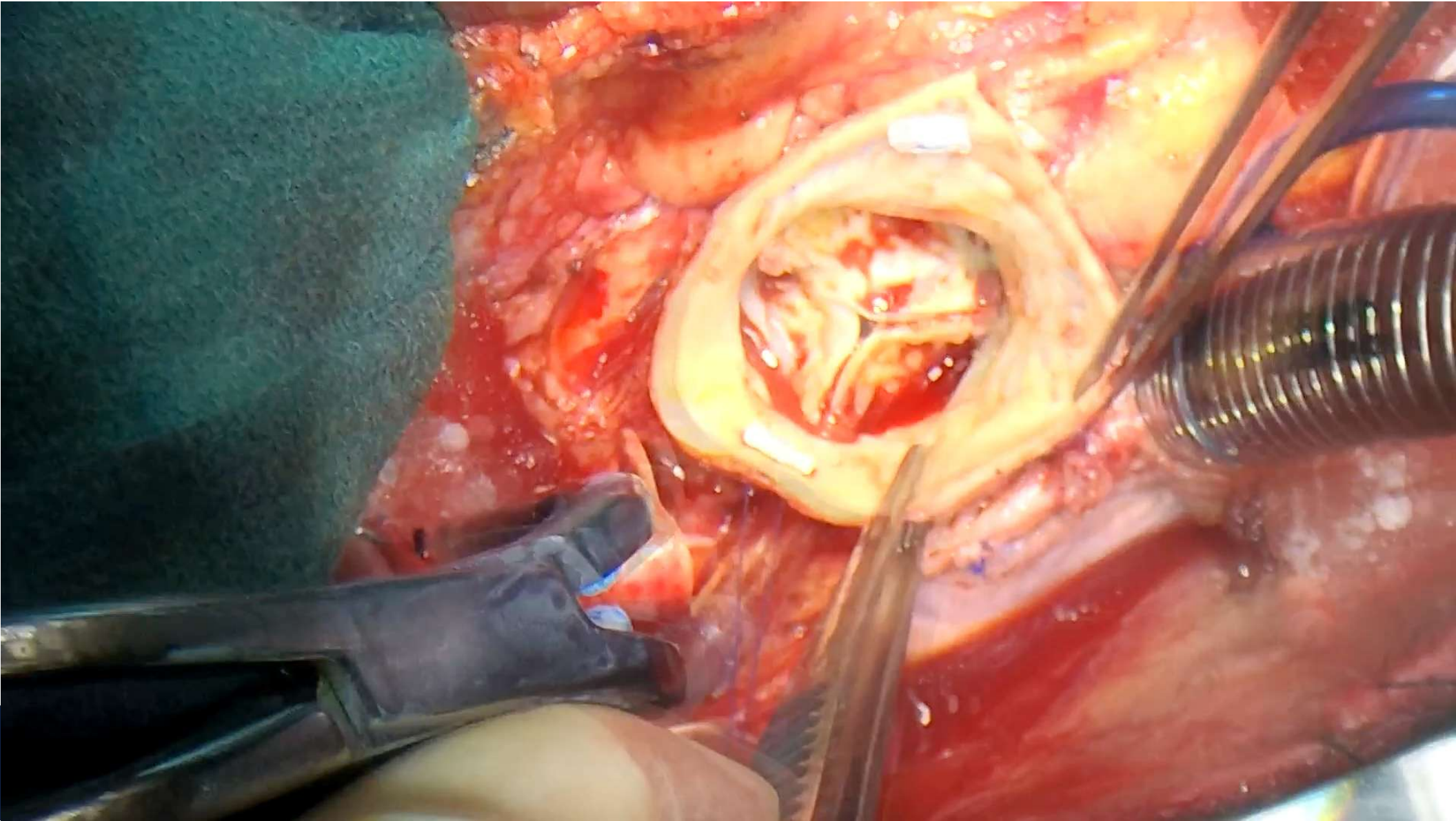
Valve model	Effective orifice diameter at 25 L/min (mm) [†]				Mean ± SD (mm)
	Laboratory 1	Laboratory 2	Laboratory 3	Laboratory 4	
Magna Ease/Theon					
19 mm	14.8	14.8	15.0	15.1	14.9±0.1
23 mm	16.7	17.1	17.2	16.8	17.0±0.2
29 mm	22.9	22.9	23.4	23.0	23.1±0.3
31 mm	23.5	24.4	24.3	23.8	24.0±0.4
Avalus					
21 mm	15.3	15.4	15.5	15.3	15.4±0.1
25 mm	17.5	17.7	17.6	17.6	17.6±0.1
27 mm	20.5	21.1	21.2	20.7	20.9±0.3

Wu et al, Ann Cardiothorac Surg 2024 – FDA official publication

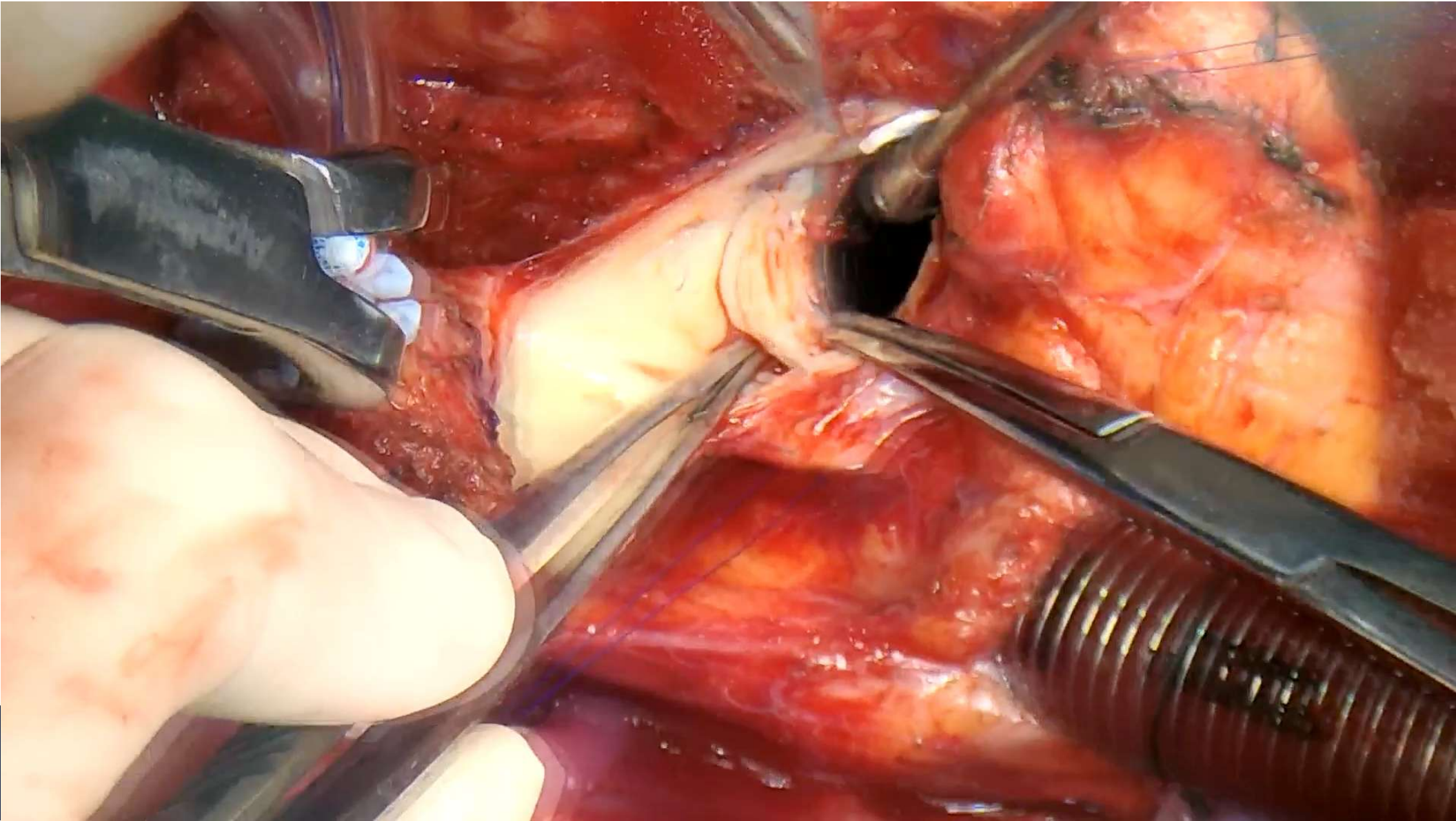
Y INCISION



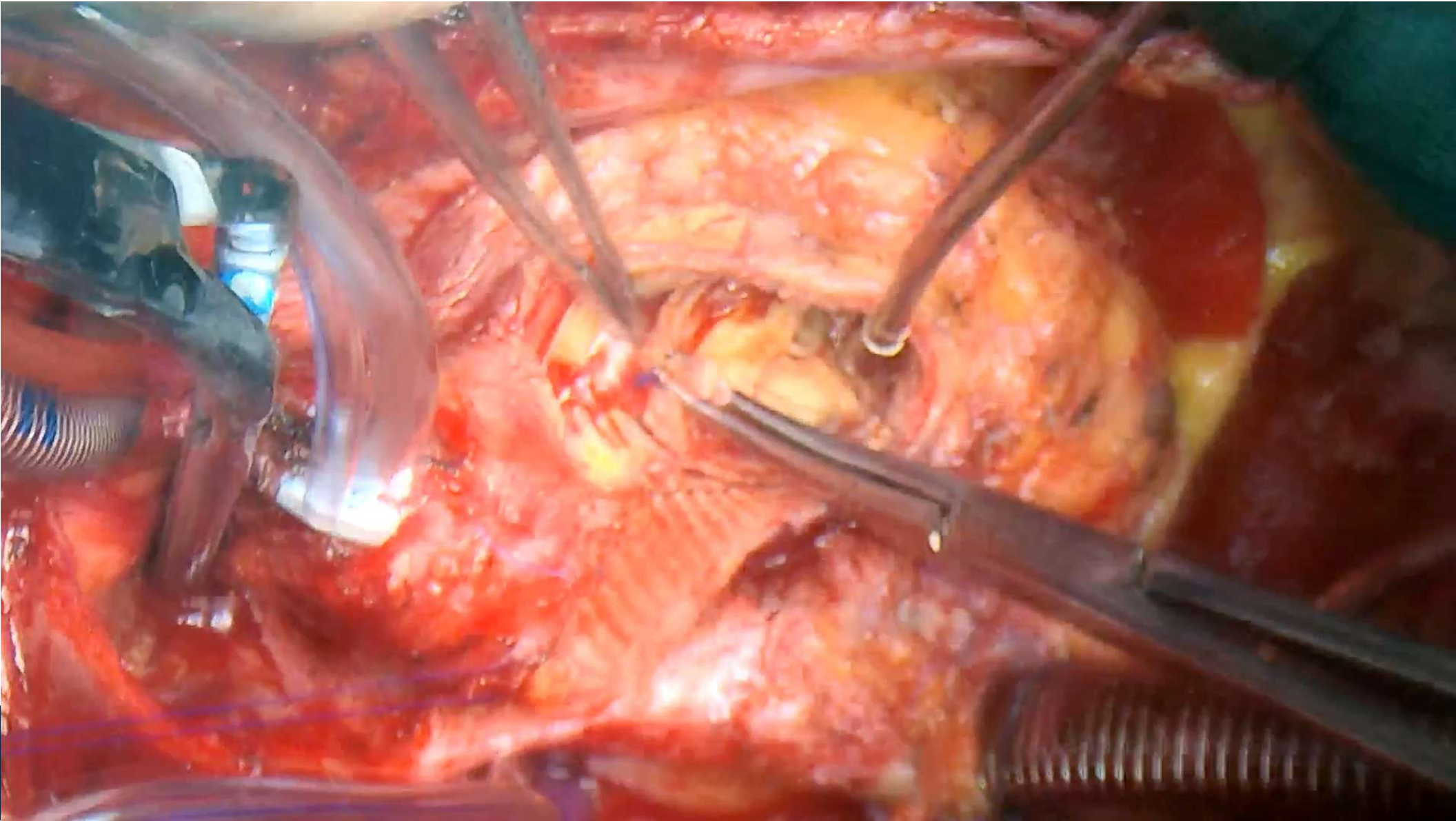
Redo SAVR + Y-incision AAE after
prior SAVR (trifecta 21), Upsize
from 21 to 29 and ascending
replacement



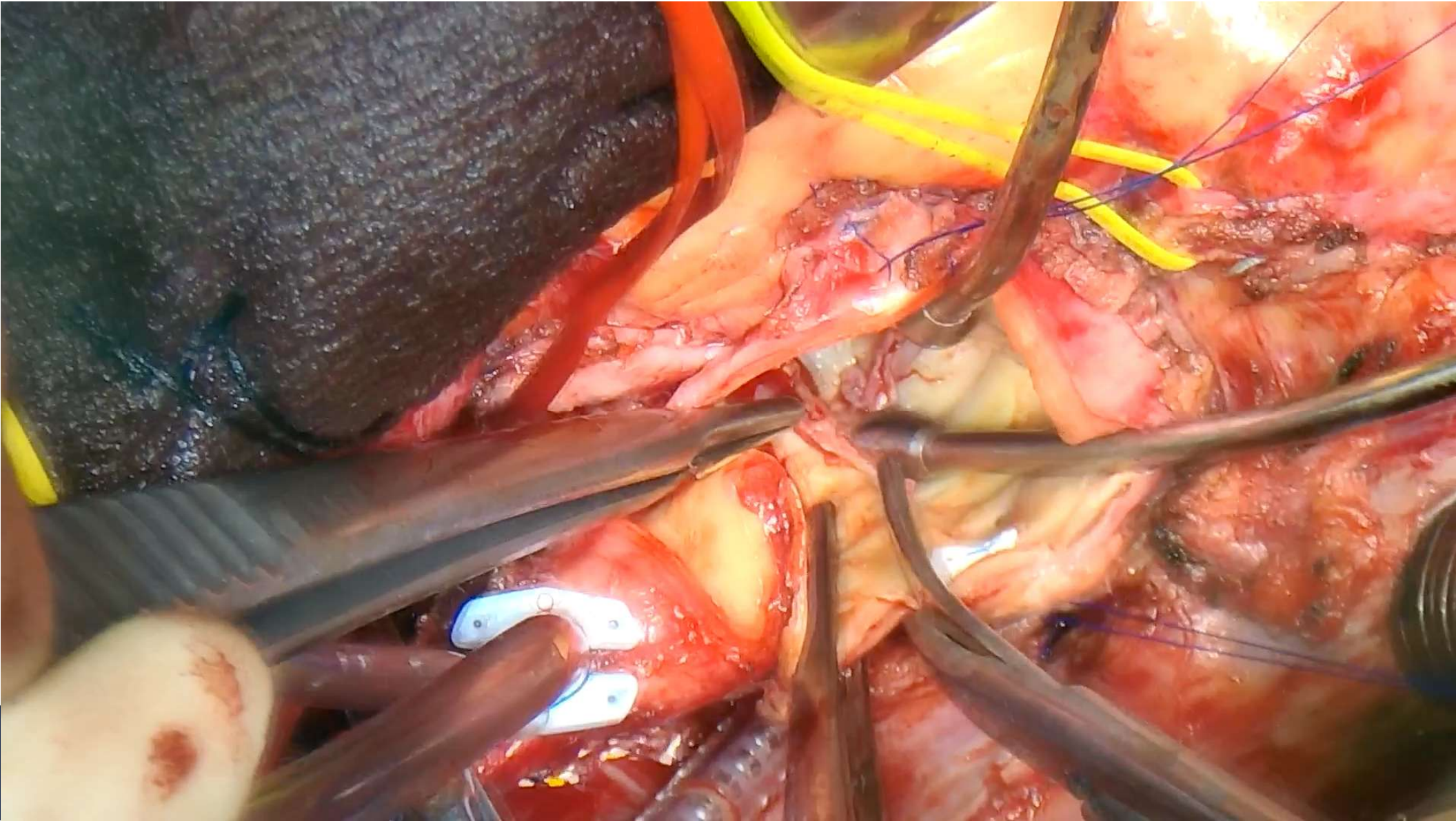
Redo SAVR + Y-incision AAE after
prior StJ mechanical valve, Upsize
from 21 to 27 (Tophat)



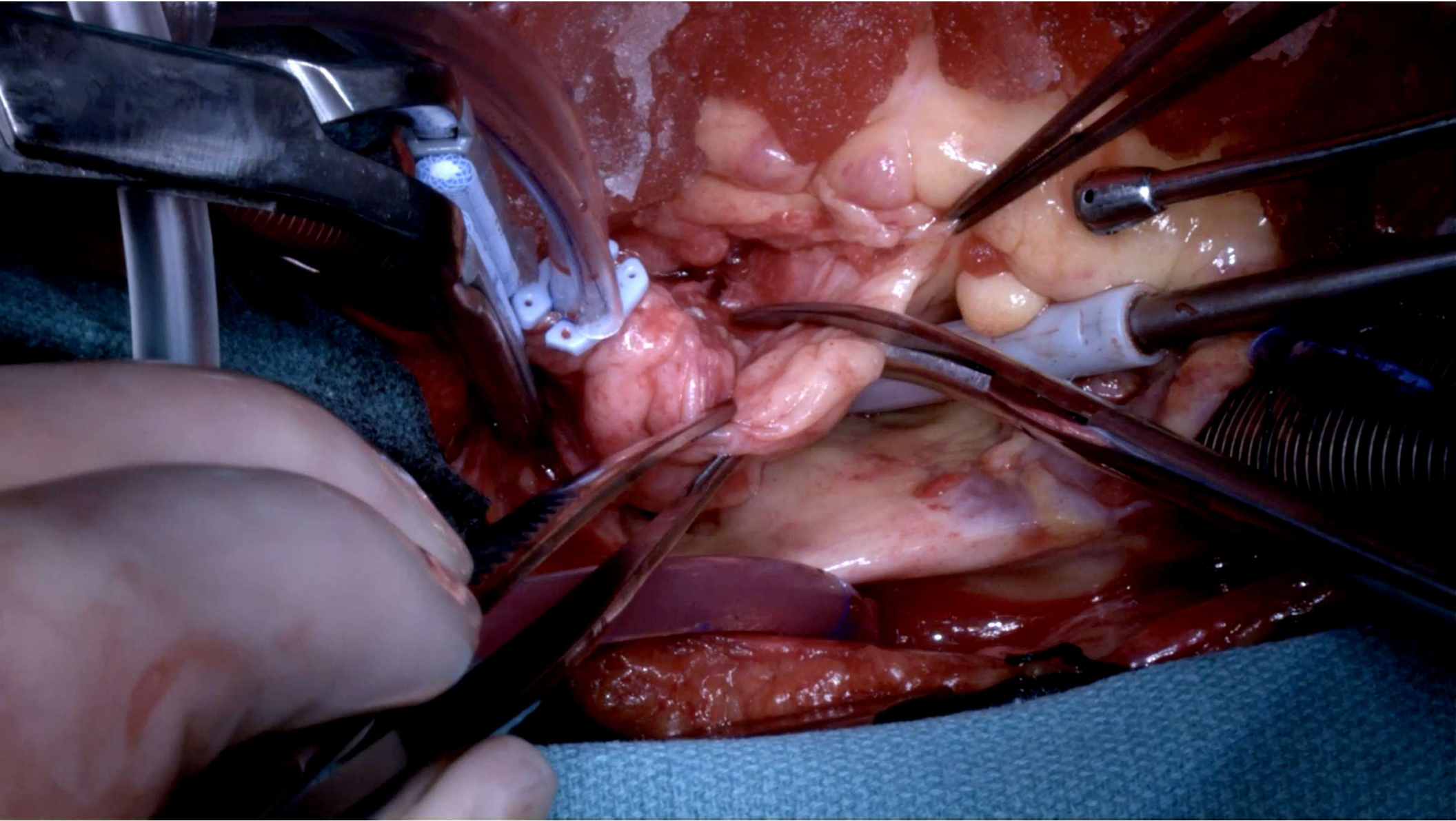
Redo SAVR + Y-incision AAE after
prior ascending (24 mm graft) and
21 Magna, Upsize from 21 to 29
(Magna)



Redo SAVR + Y-incision AAE after
prior SAVR (21 Magna), Upsize
from 21 to 27 (Magna), partial
aortotomy



Redo SAVR + Y-incision AAE after prior
TAVR (23 Sapien), Upsize from 19 to
25



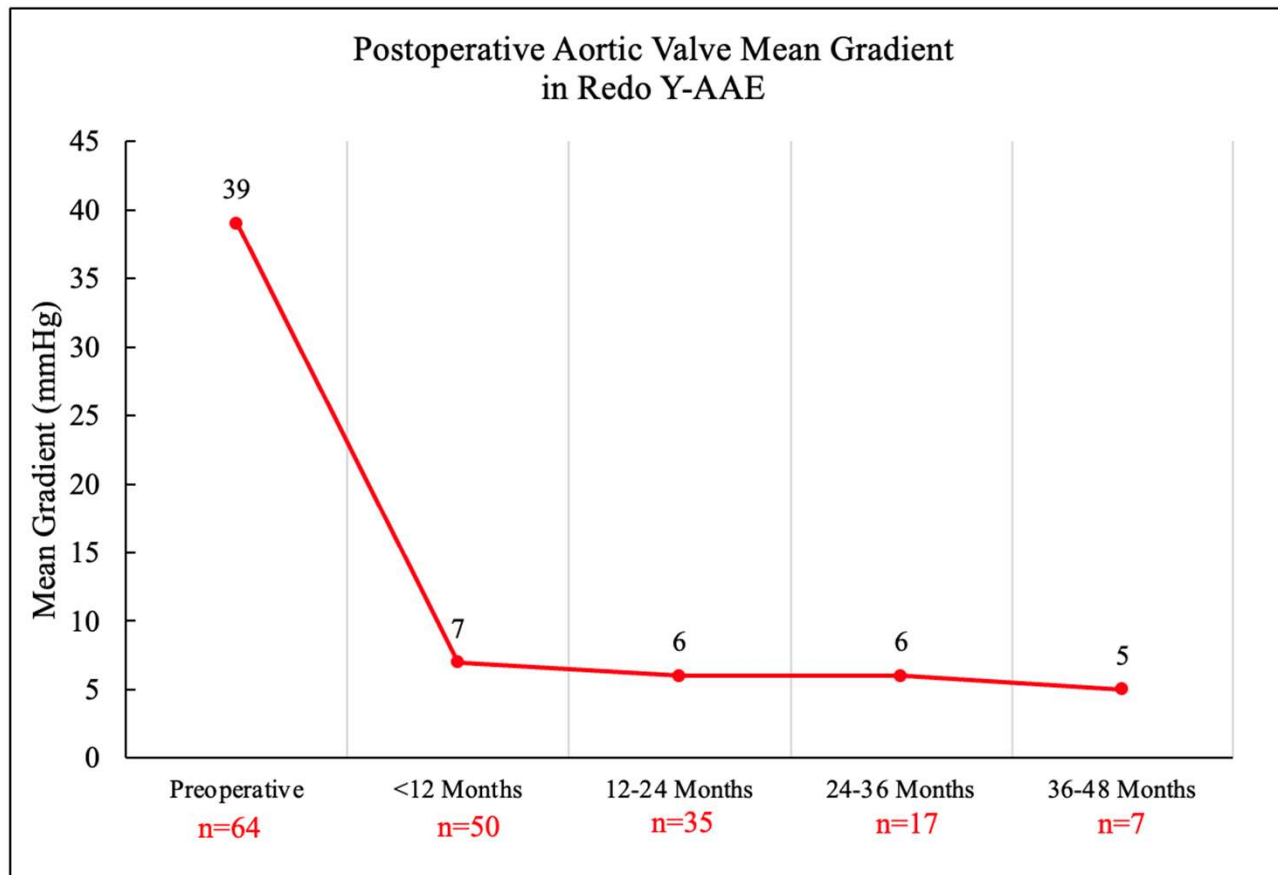
❖ Preoperative and Intraoperative Data

Variable	Y-Incision Patients (n=66)
Age (years)	65 (60, 71)
Female Sex	45 (67%)
BSA (m ²)	2.0 (1.8, 2.3)
BMI (kg/m ²)	29.8 (25.2, 38.6)
Isolated AVR	37 (56%)
Aortic Valve Model	
Bioprosthetic	59 (89%)
Mechanical	7 (11%)
Native Aortic Annulus Size (mm)	21 (19, 21)
Annular Size Enlarged (valve size)	3 (3, 4)
Implanted Prosthesis Size (mm)	27 (25, 29)

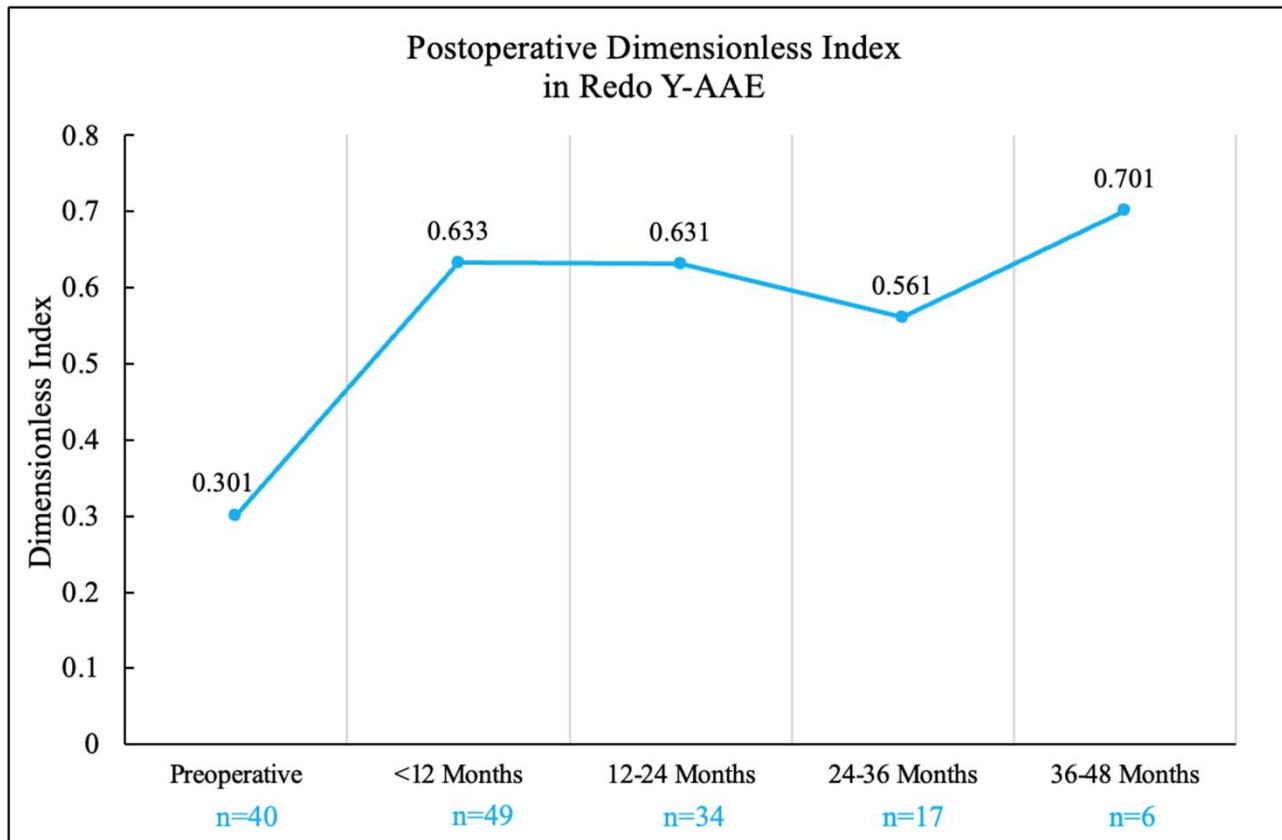
❖ Postoperative Outcomes

Variable	Y-Incision Patients (n= 65)
Reoperation for Bleeding	1 (1.5%)
Stroke Exacerbation	1 (1.5%)
Prolonged Ventilation	11 (16.9%)
Permanent Dialysis	0 (0%)
CHB/Pacemaker Implant	2 (3.1%)
Deep Sternal Infection	0 (0%)
Hours Intubated	8.4 (4.3, 20.5)
Operative Mortality	1 (1.5%)

❖ Hemodynamic Outcomes (AV MG)



❖ Hemodynamic Outcomes (DI)



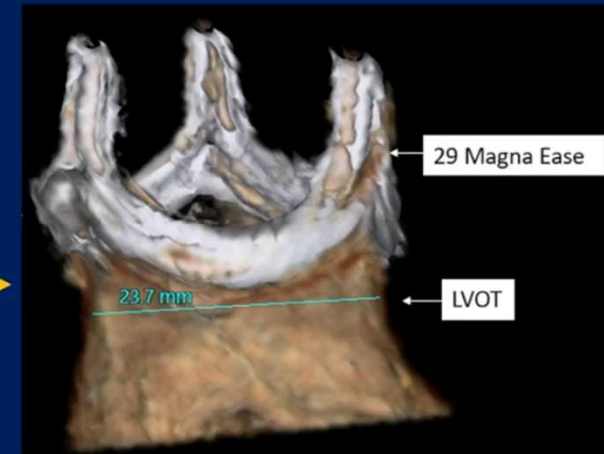
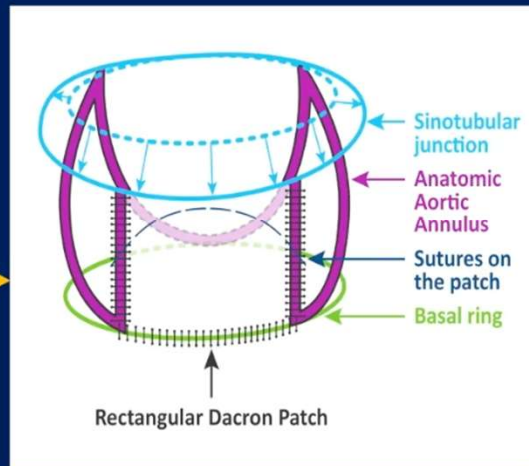
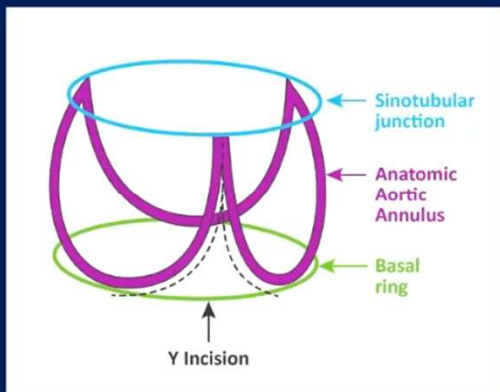
❖ Conclusion - Why AAE is Important in Redo AVR

- **Second chance for surgeons and patients**
- **Y-incision/rectangular patch aortic annular enlargement could safely and effectively enlarge the aortic annulus by 3-4 valve sizes**
 - Better hemodynamics**
 - Better long-term survival**
 - Better longevity of the prosthetic valve**
 - Better set-up for future V-in-V TAVR if needed to avoid third sternotomy**

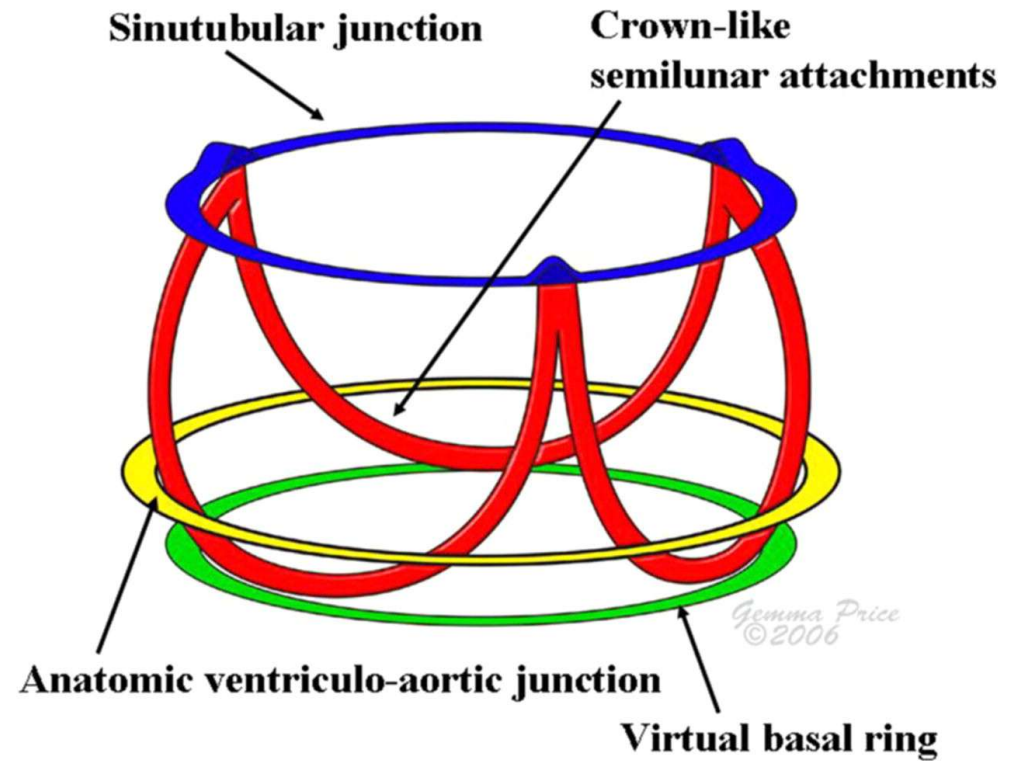
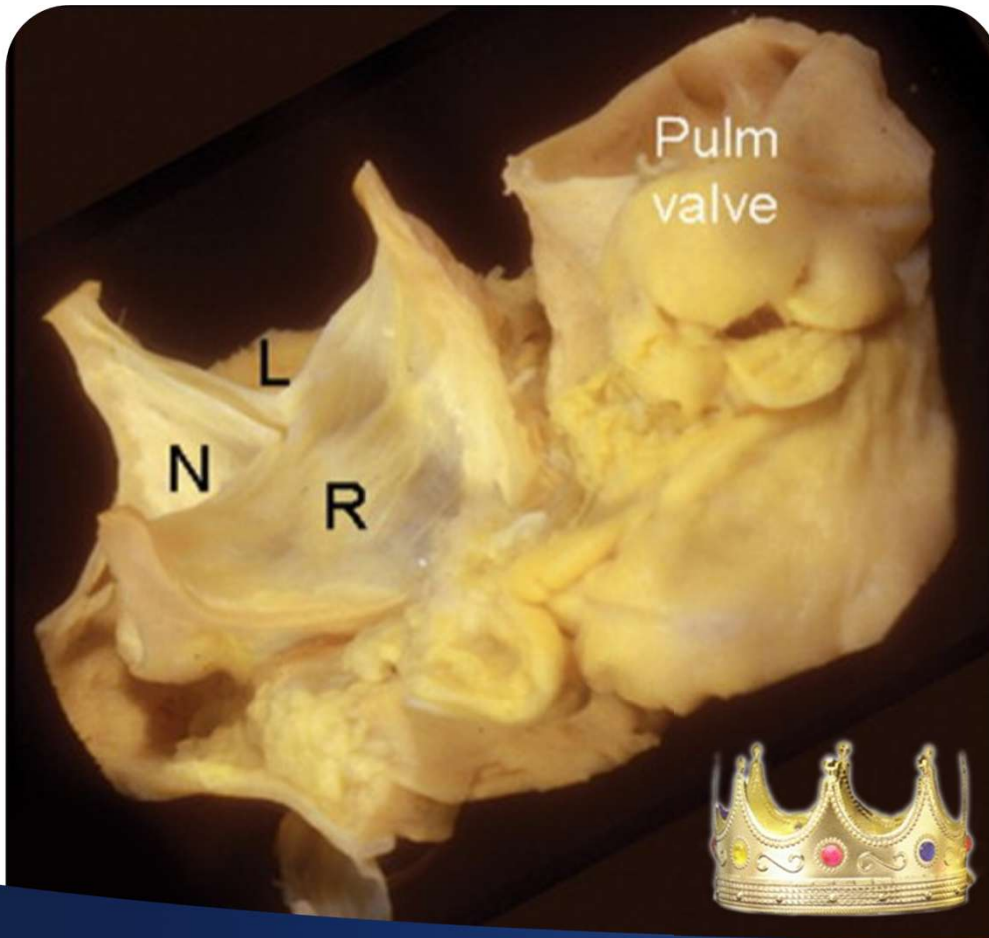
Redo SAVR + Y-incision AAE after
SAVR + Nicks AAE, Upsize from 19 to
27

Reoperation after prior Nicks Procedure

Bo Yang, MD, Ph.D.
Dept of Cardiac Surgery
University of Michigan

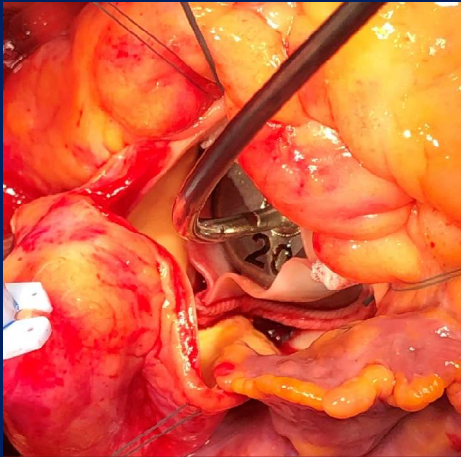


❖ Aortic annular enlargement (AAE) – What aortic annulus are we talking about

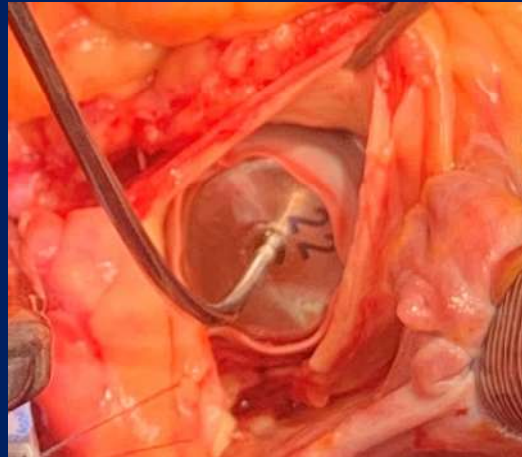


The inner diameter of the prosthetic valve is 5-7 mm smaller than the label

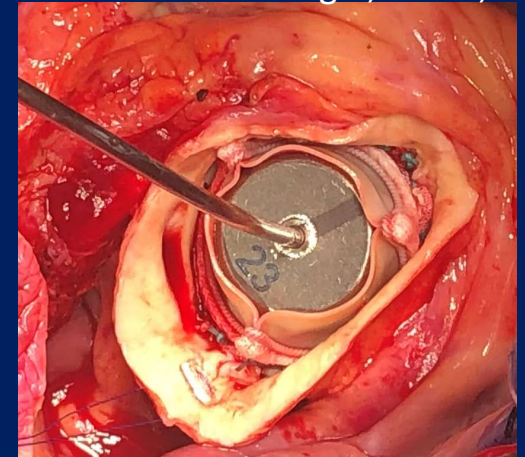
Yang B, JTCVS, 2023



25 Valve – 20 mm



27 Valve – 22 mm



29 Valve – 23 mm



23 Valve – 16mm



21 Valve – 14mm



19 Valve – 14mm

❖ Annular Area Reduction without Enlargement:

Native Annulus	AVR without enlargement		AVR with ARE upsize by 3-4 valve sizes	
	New annulus diameter	Annular area reduction	New annulus diameter	Annular area reduction
25 mm	20 mm	-36%	23-24 mm (29 valve)	-15%
23 mm	16 mm	-52%	23-24 mm (29 valve)	0%
21 mm	14 mm	-56%	21-23 mm (27 -29 valve)	0-20%
19 mm	14 mm	-46%	20-22 mm (25-27 valve)	0-34%

Yang B, *JTCVS*, 2023