Lifetime Management of Aortic Stenosis

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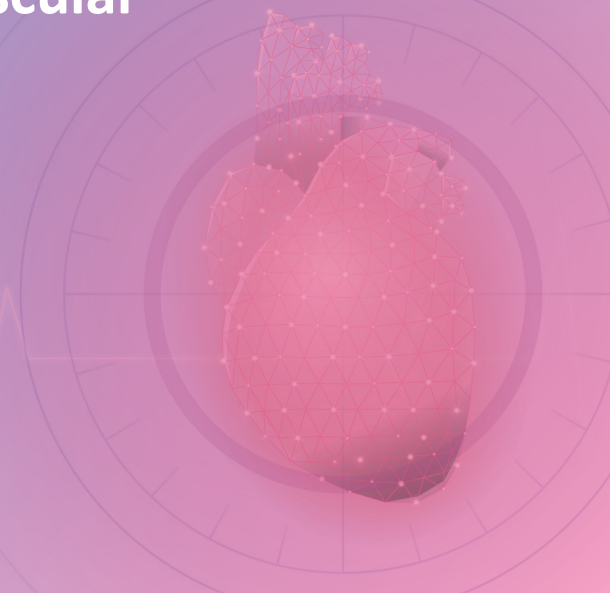


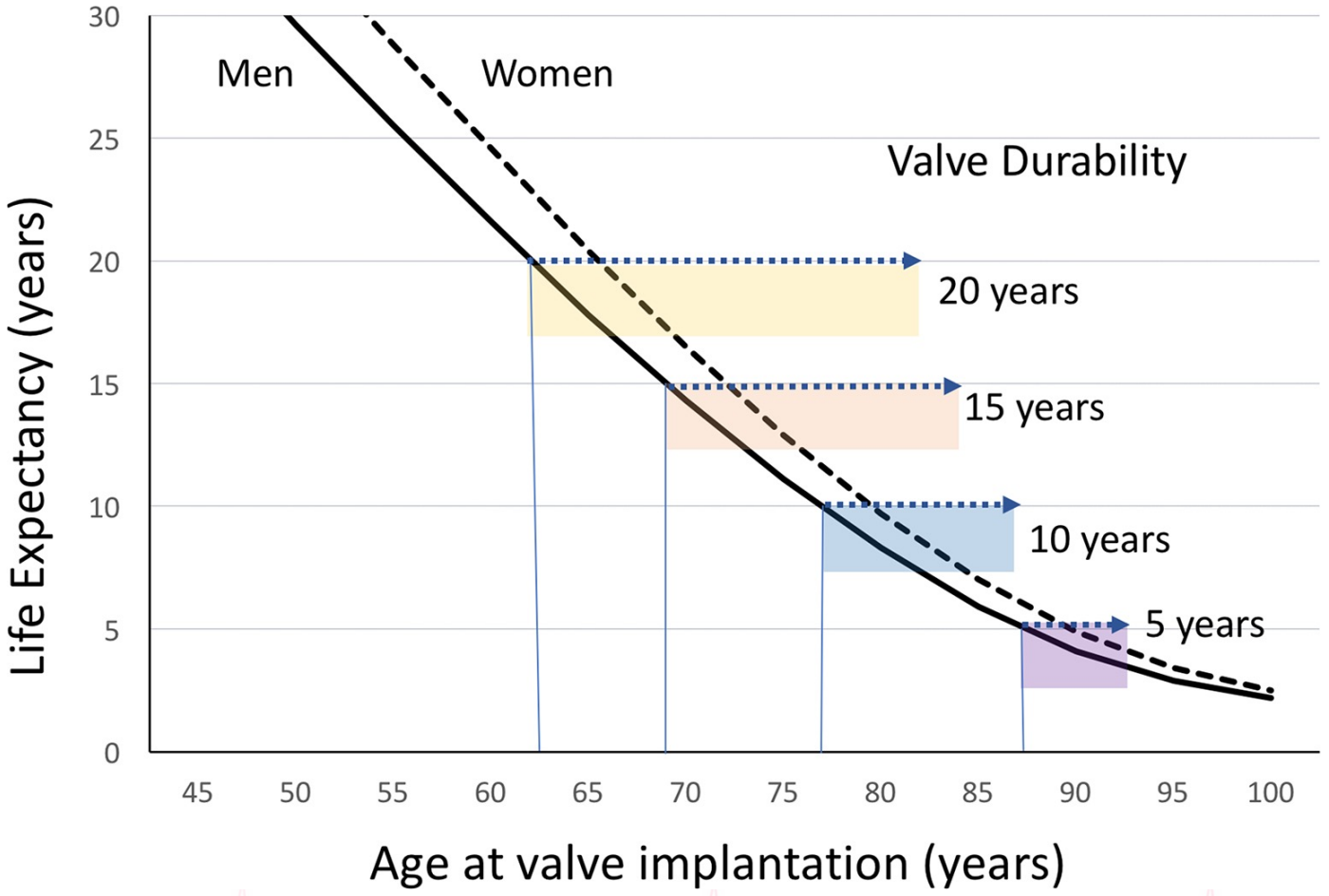
The Goal of Lifetime management

- Maximize patients' survival
- Maximize patients' quality of life
- Minimize harm to patients (procedural trauma, complications, multiple procedures)

Boils down to the first intervention

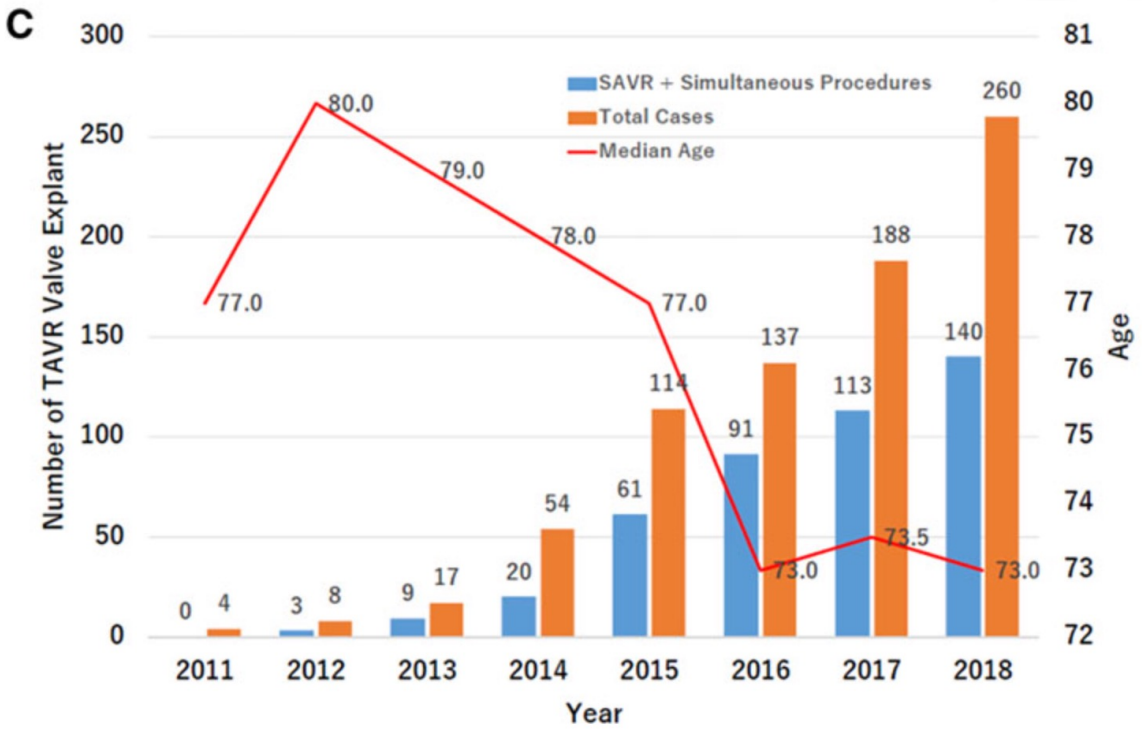
- Maximize patients' survival
- Maximize patients' quality of life
- Minimize harm to patients (procedural trauma, complications, multiple procedures)

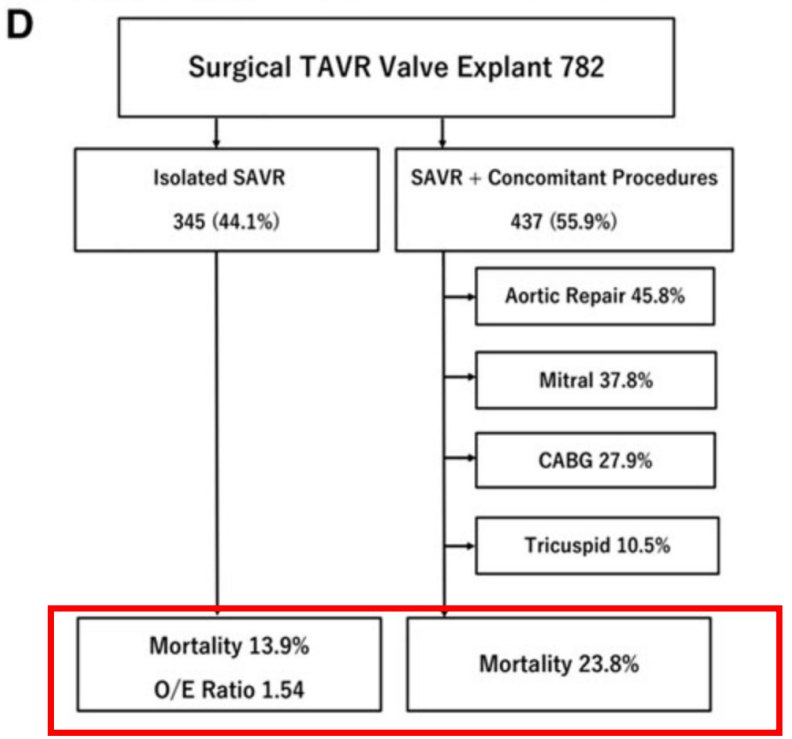
SAVR VS. TAVR



Bagur R, Heart 2017

TAVR First





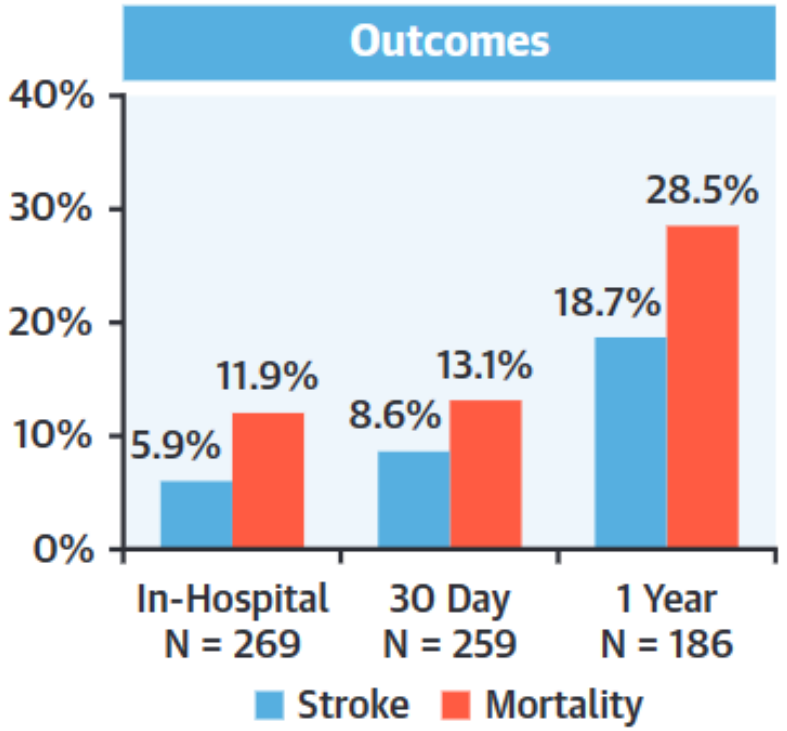
Fukuhara S. Circulation. 2020;142:2285–2287

TAVR First

TABLE 4 Short- and Mid-Term Outcomes After Transcatheter Aortic Valve Replacement Explantation (N = 269)

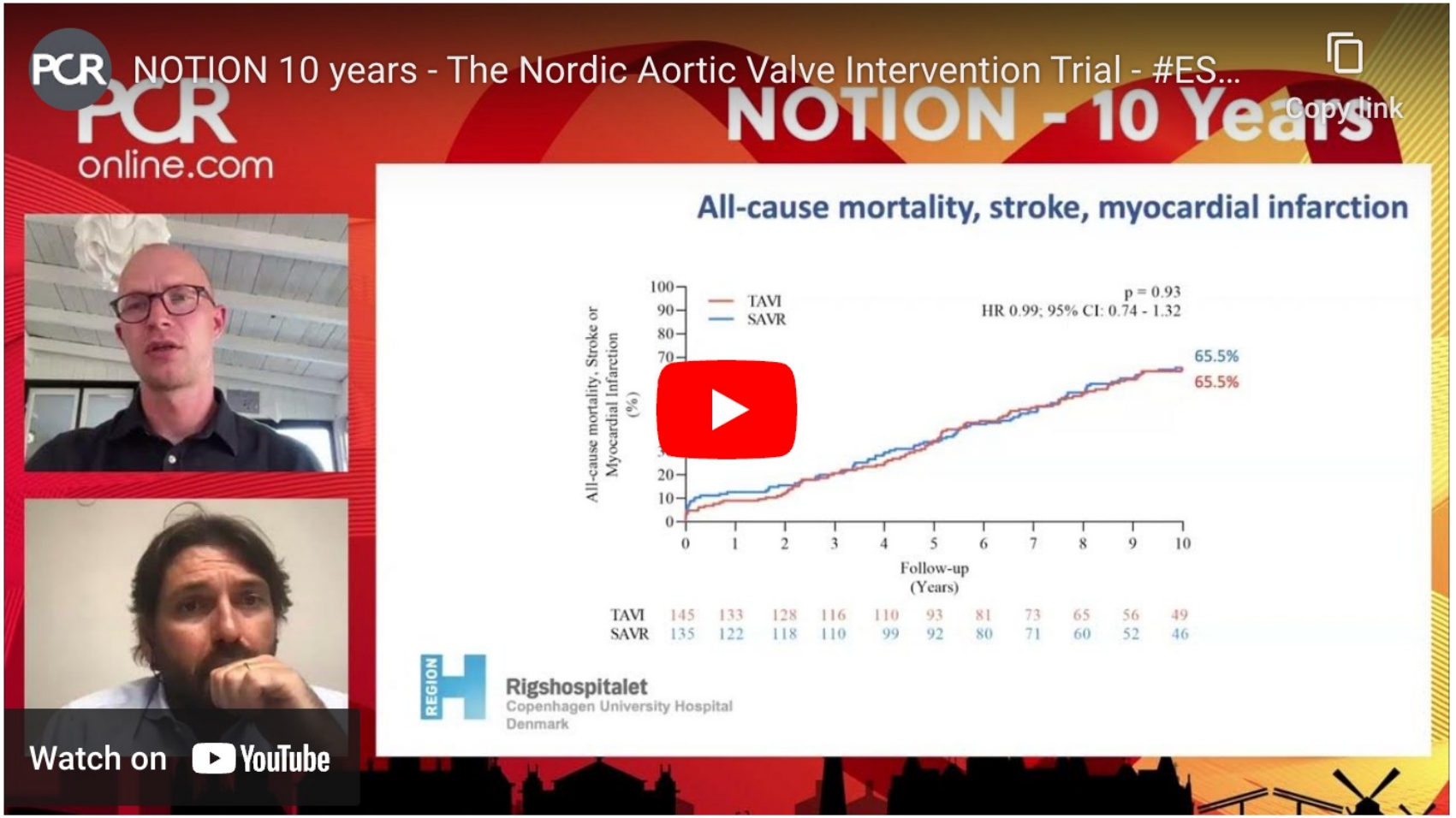
Follow-up (mo) post explantation	14.6 ± 20.7
30 d	
Mortality	34 (13.1)
Stroke	18 (8.6)
Readmission	28 (13.7)
Follow-up complete	259 (97.7)
1 y	
Mortality	53 (28.5)
Stroke	23 (18.7)
Follow-up complete	186 (86.1)

Values are mean ± SD or n (%).

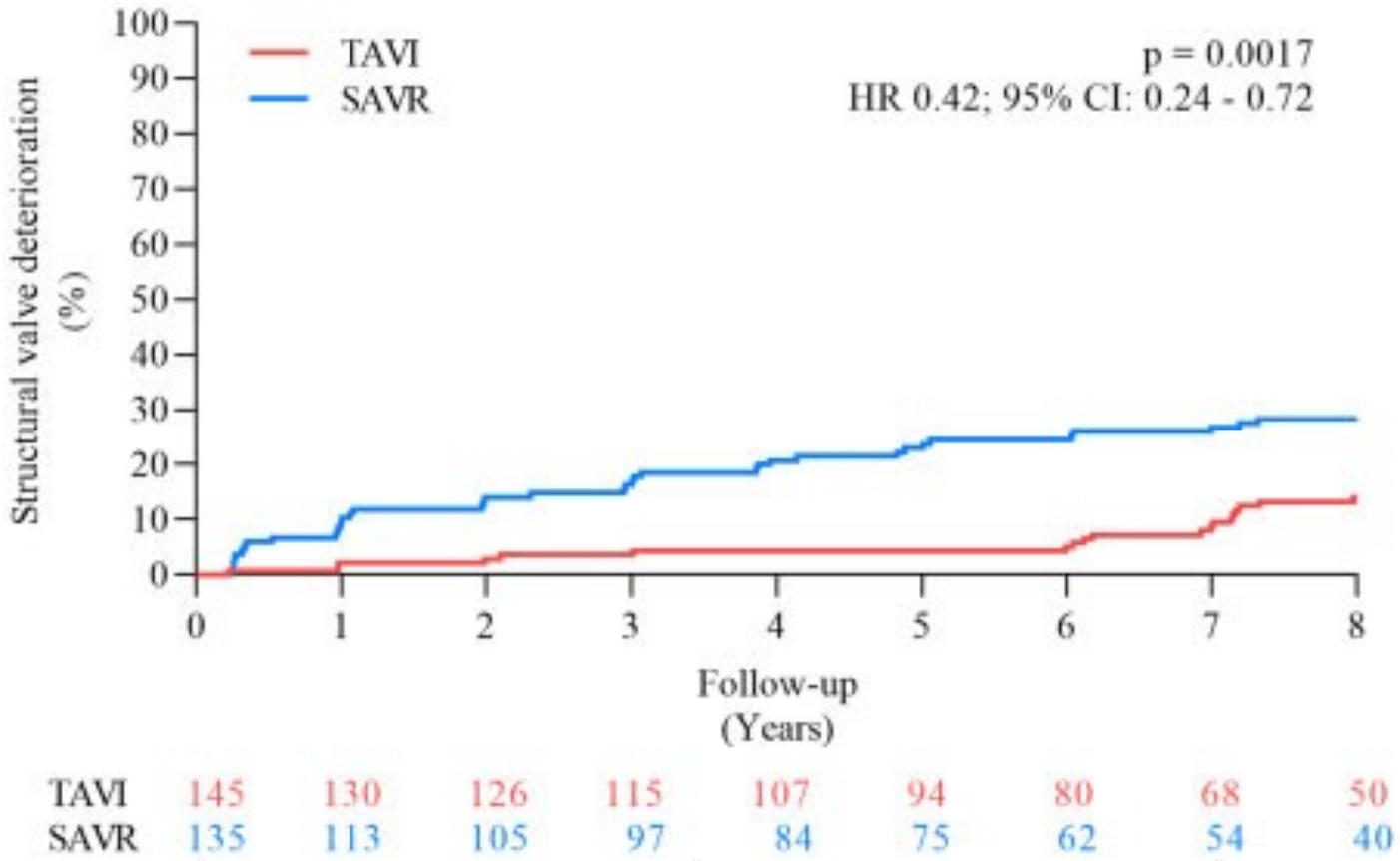


Bapat VN, JACC Cardiovasc Interv. 2021

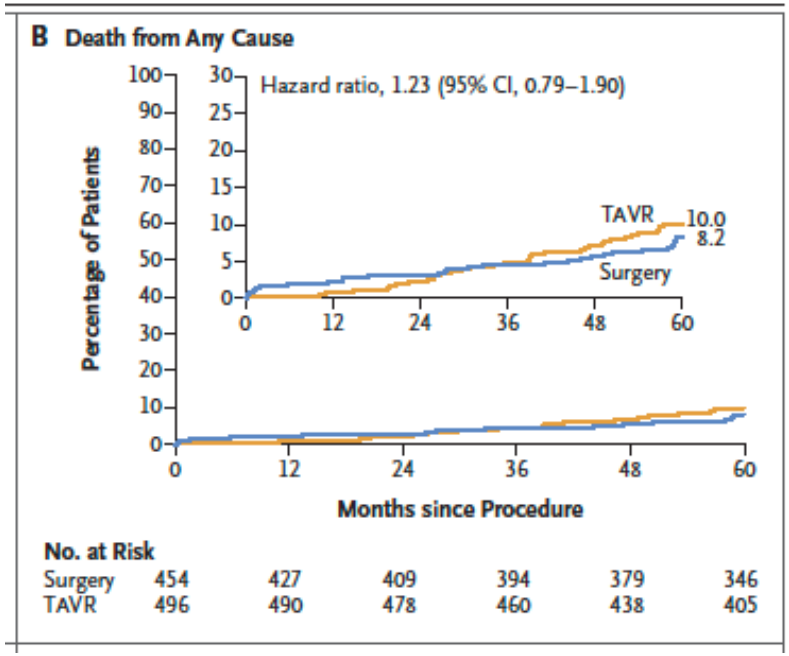
SAVR First


PCR
NOTION 10 years - The Nordic Aortic Valve Intervention Trial - #ES...
Copy link
PCR online.com
NOTION - 10 Years
All-cause mortality, stroke, myocardial infarction
All-cause mortality, Stroke or Myocardial Infarction (%)
TAVI
SAVR
p = 0.93
HR 0.99; 95% CI: 0.74 - 1.32
65.5%
65.5%
Follow-up (Years)
TAVI 145 133 128 116 110 93 81 73 65 56 49
SAVR 135 122 118 110 99 92 80 71 60 52 46
REGION H
Rigshospitalet
Copenhagen University Hospital
Denmark
Watch on YouTube

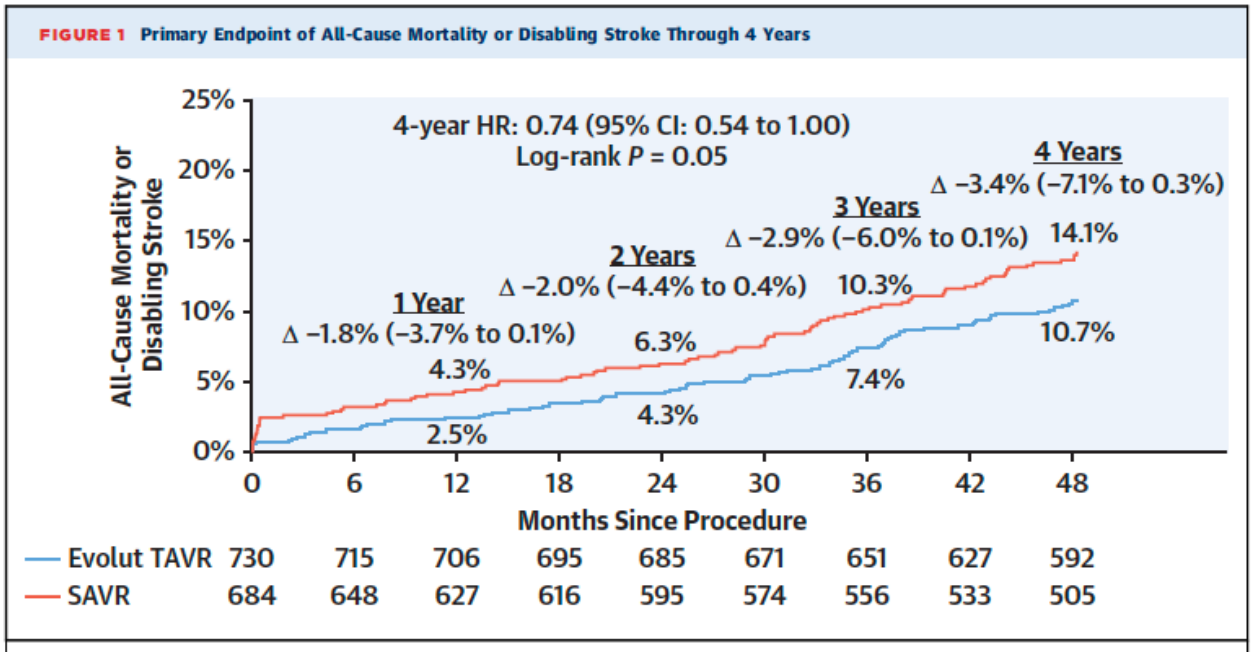
NOTION TRIAL: 8-year structural valve deterioration



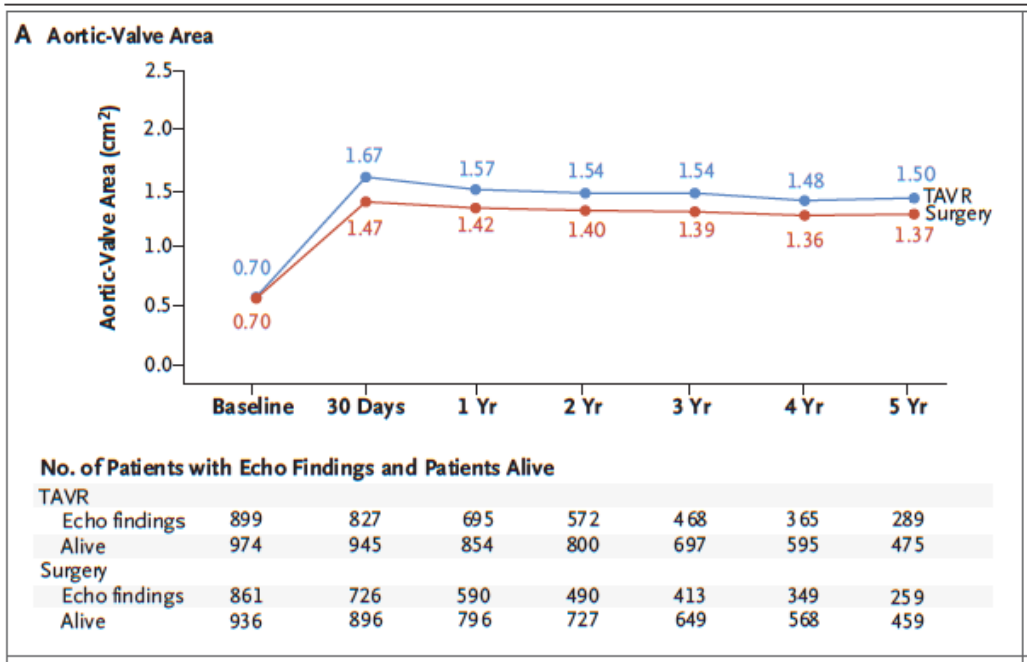
SAVR First



PARTNER 3: 5-year outcomes



Evolute low-risk trial: 4-year outcomes

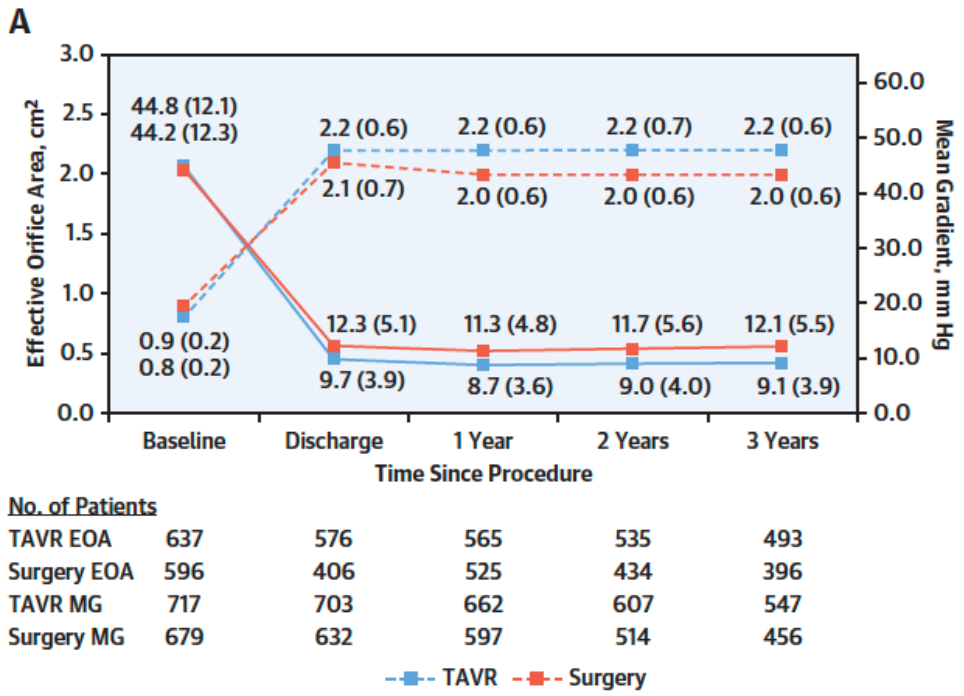


No. of Patients with Echo Findings and Patients Alive

TAVR							
Echo findings	899	827	695	572	468	365	289
Alive	974	945	854	800	697	595	475
Surgery							
Echo findings	861	726	590	490	413	349	259
Alive	936	896	796	727	649	568	459

PARTNER 3: Mack MJ, NEJM 2023

FIGURE 4 Hemodynamic Valve Performance



No. of Patients					
TAVR EOA	637	576	565	535	493
Surgery EOA	596	406	525	434	396
TAVR MG	717	703	662	607	547
Surgery MG	679	632	597	514	456

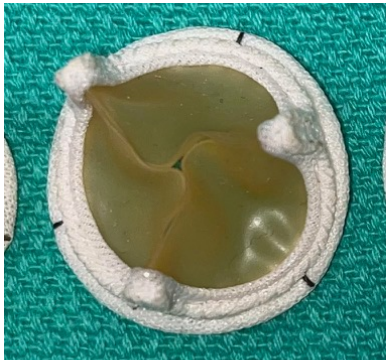
Evolute low risk: Forrest KJ, JACC, 2023

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 cm^2 (Rahimtoola, Circ 1978)



Size 21

21 Valve – 14mm

Size 23

23 Valve – 16mm

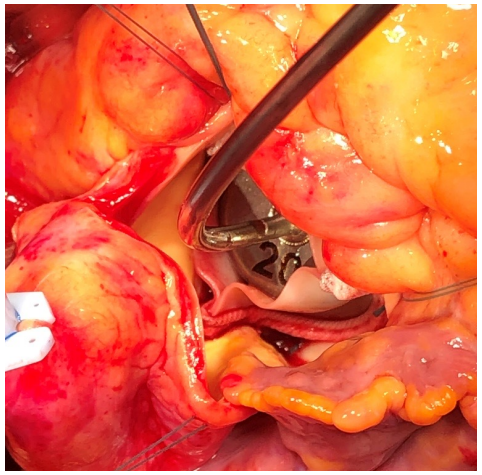
NOTION Trial

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

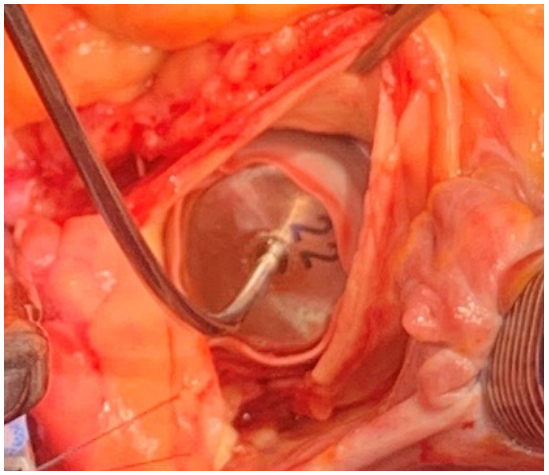
Annular Area Reduction without Enlargement:

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%**

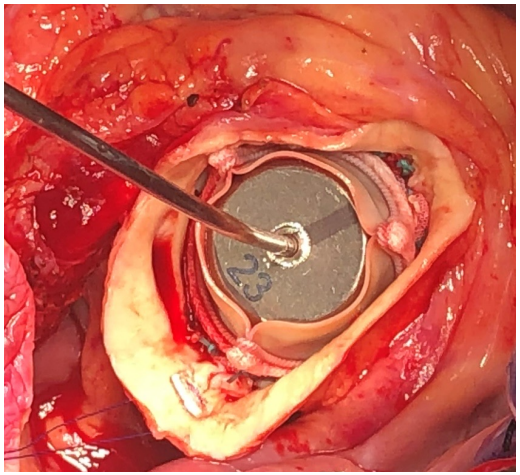
The inner diameter of the prosthetic valve is 5-7 mm smaller than the label



25 Valve – 20 mm

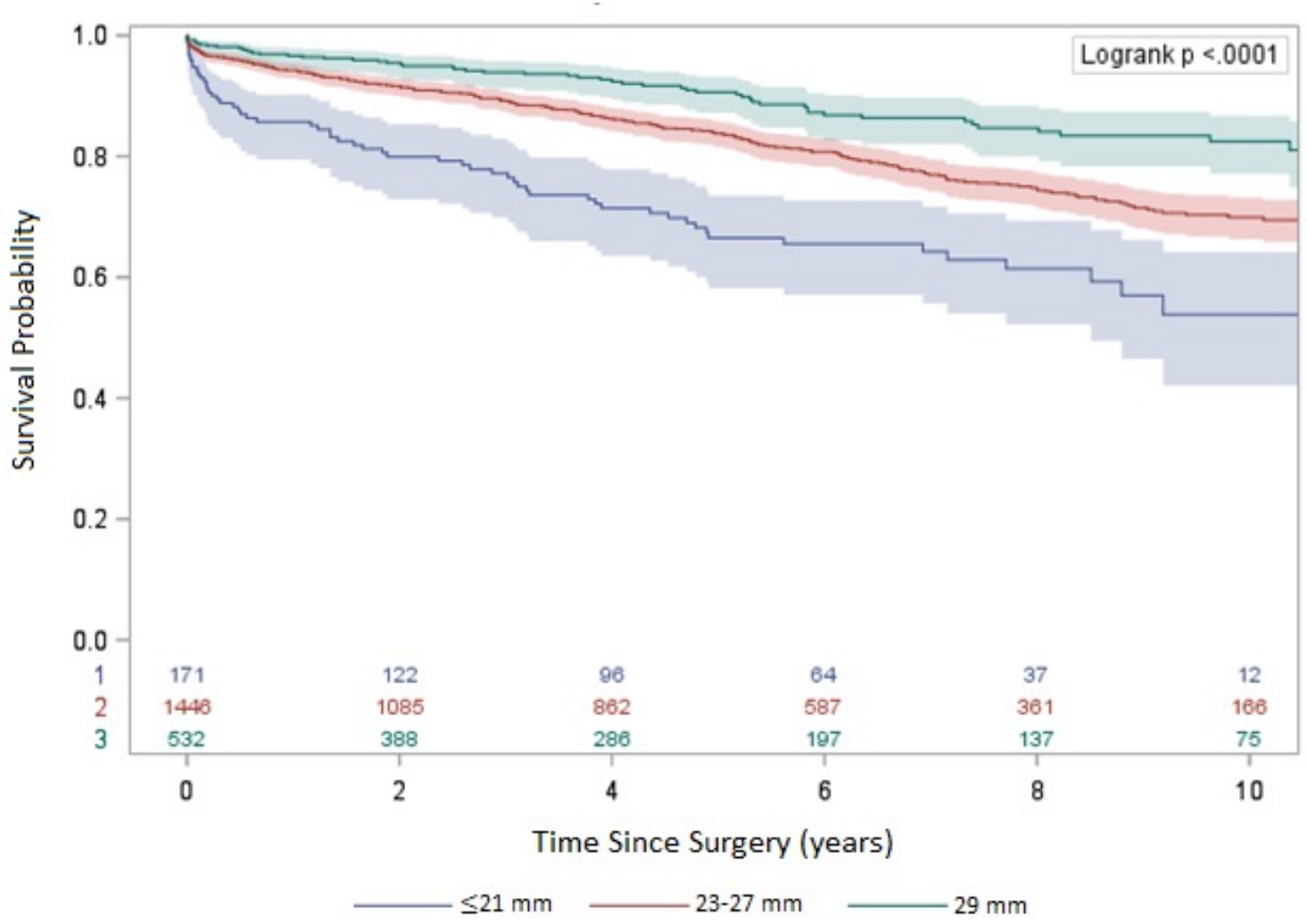


27 Valve – 22 mm



29 Valve – 23 mm

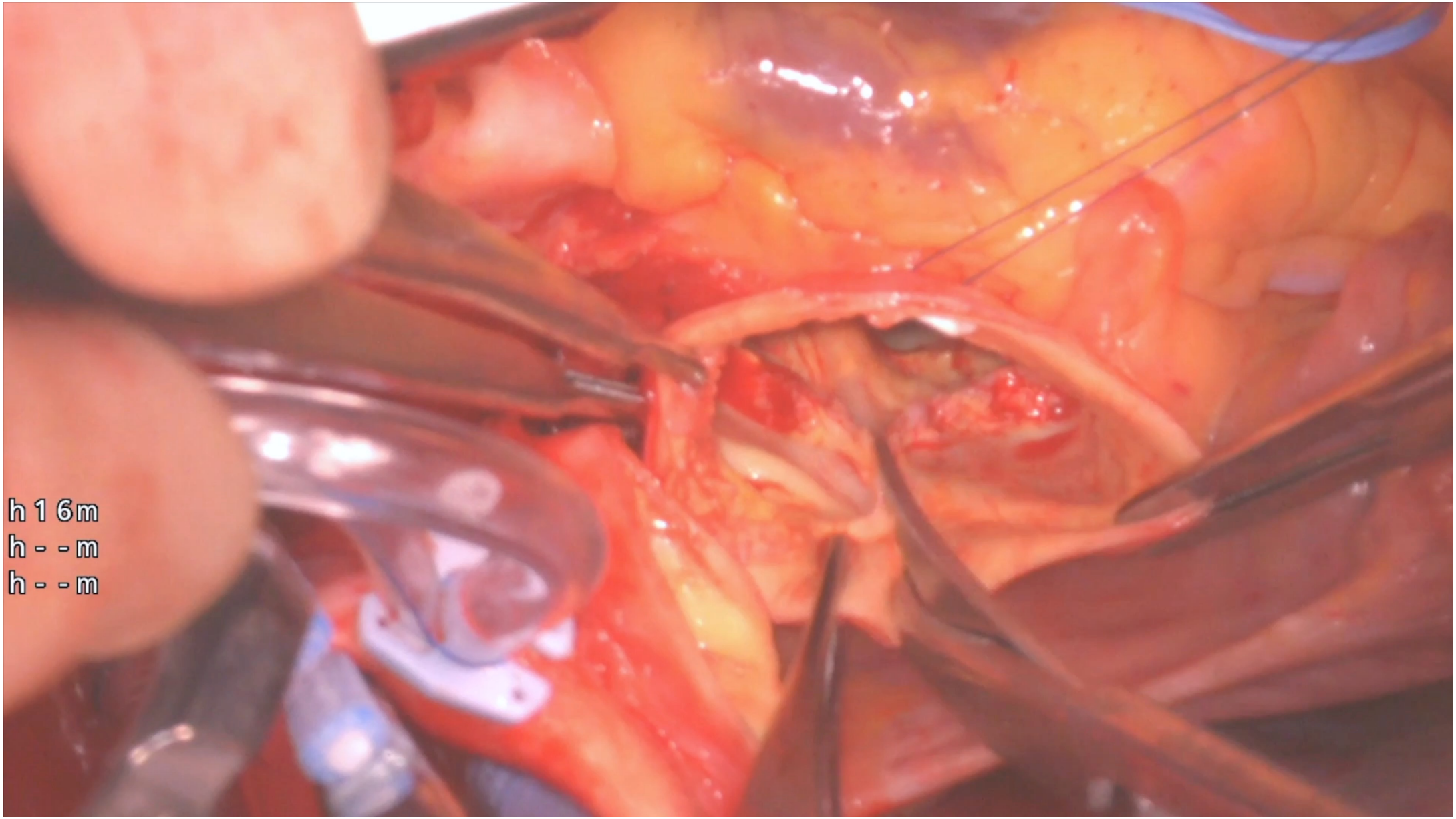
Long-term Survival Based on the Valve Sizes:



Yang B, Ann Thora Surg, 2023

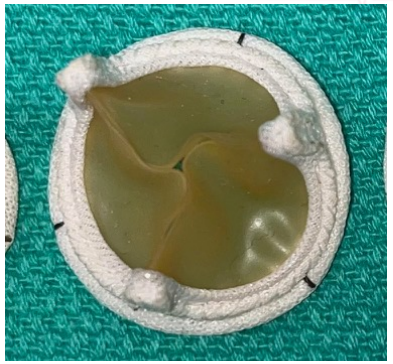
Unpublished Data

MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

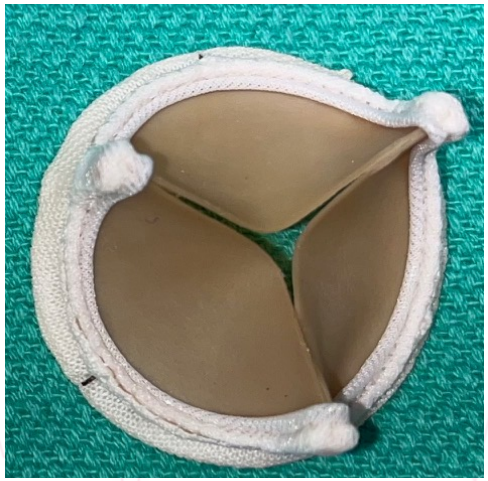

h 1 6m
h - - m
h - - m

102 consecutive AS pts: Preoperative and Intraoperative data

Variable	Patients (n=102)
Age (years)	65 (59, 71)
Female Sex	67 (67)
BSA (m^2)	2.0 (1.8, 2.2)
BMI (kg/m^2)	31 (27, 37)
Previous Cardiac Surgery	25 (25)
Previous Aortic Valve Surgery	21 (21)
Native annulus size (mm)	**21 (19, 23)**
Annular enlarged (valve size)	**3 (3, 4)**
Implanted prosthesis size	**29 (27, 29)**



Size 21

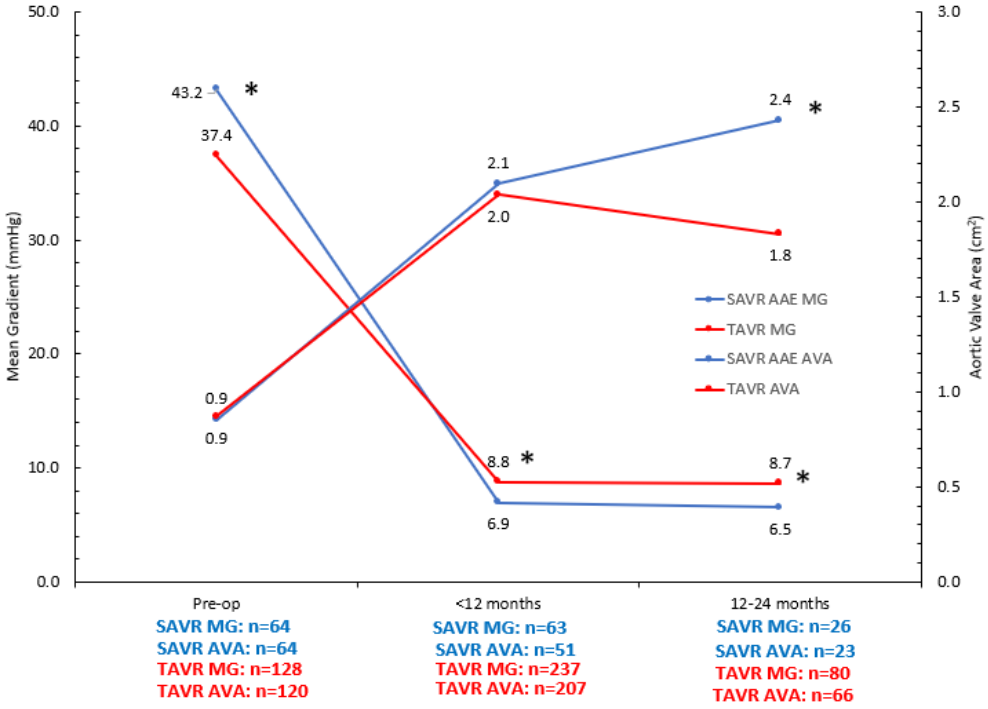


Size 29

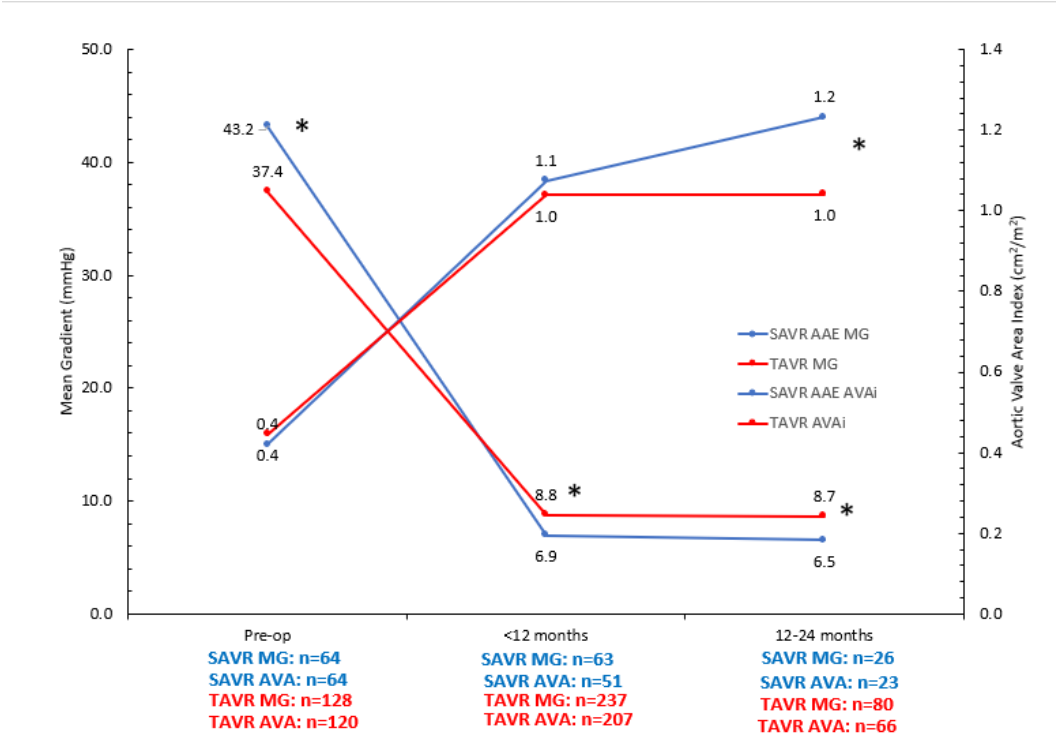
Postoperative Outcomes (n=102, consecutive cases of AS)

Reoperation for Bleeding	0 (0)
Stroke exacerbation	1 (1)
Acute MI	0 (0)
Permanent Dialysis	0 (0)
CHB/ Pacemaker Implant*	**1 (1)**
Deep Sternal Infection	0 (0)
Hours intubated	4 (3, 9)
Operative mortality	0 (0)

Hemodynamics: TAVR vs. SAVR +Y-AAE (PSM, Native AS)

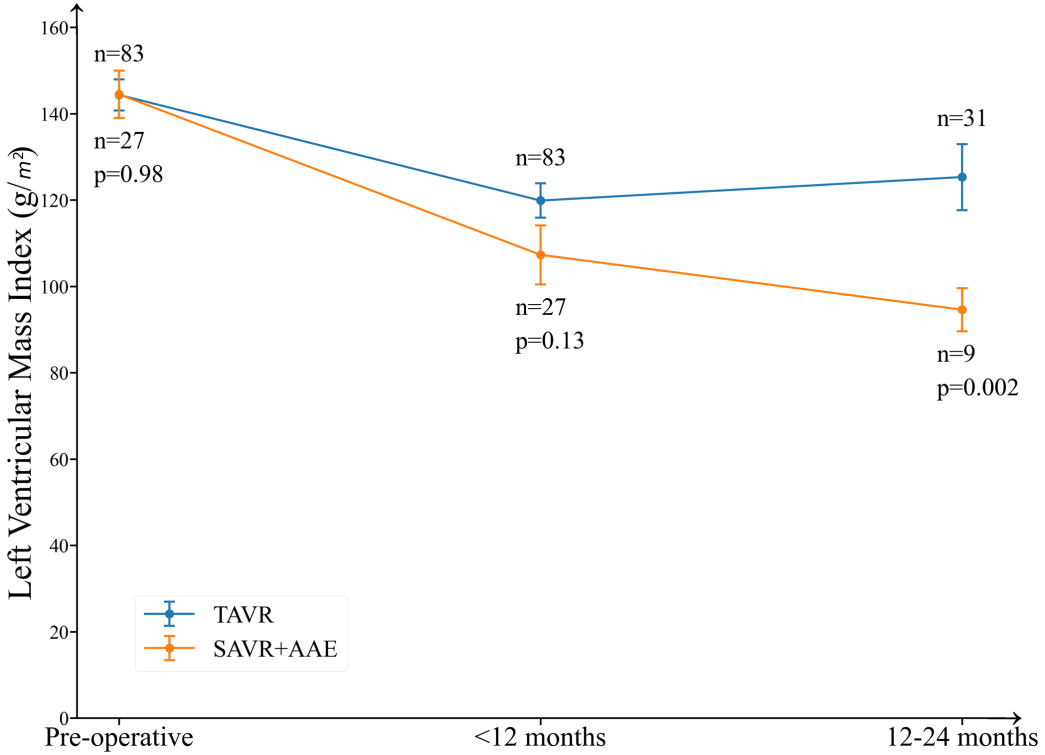


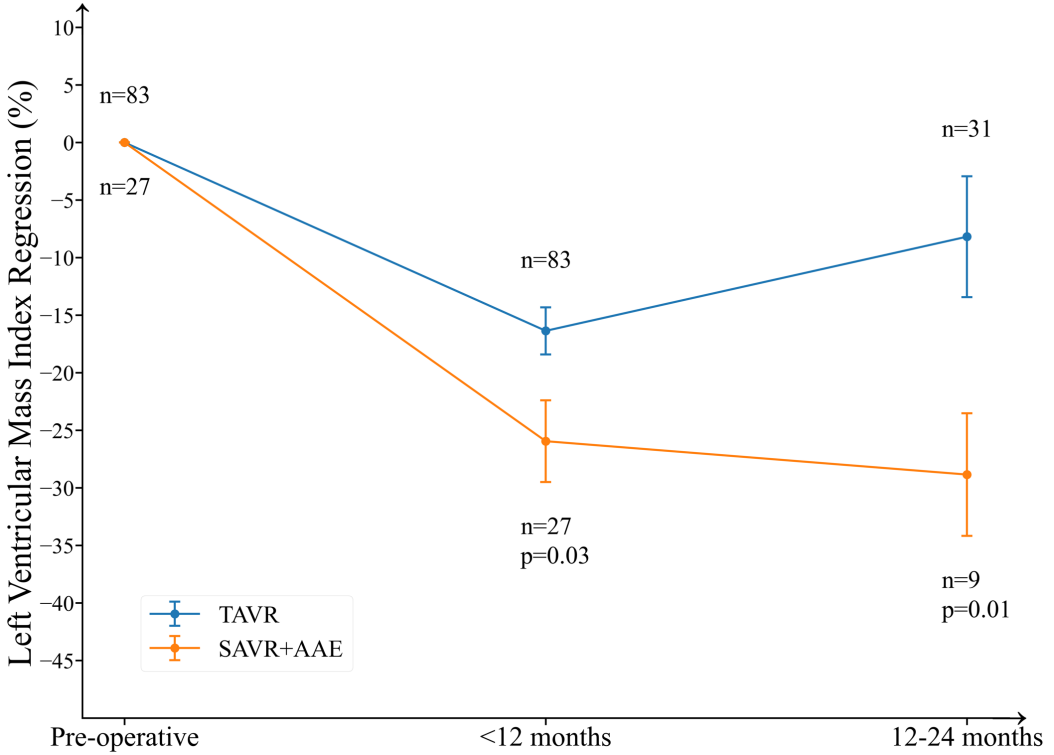
AVA and mean Gradient



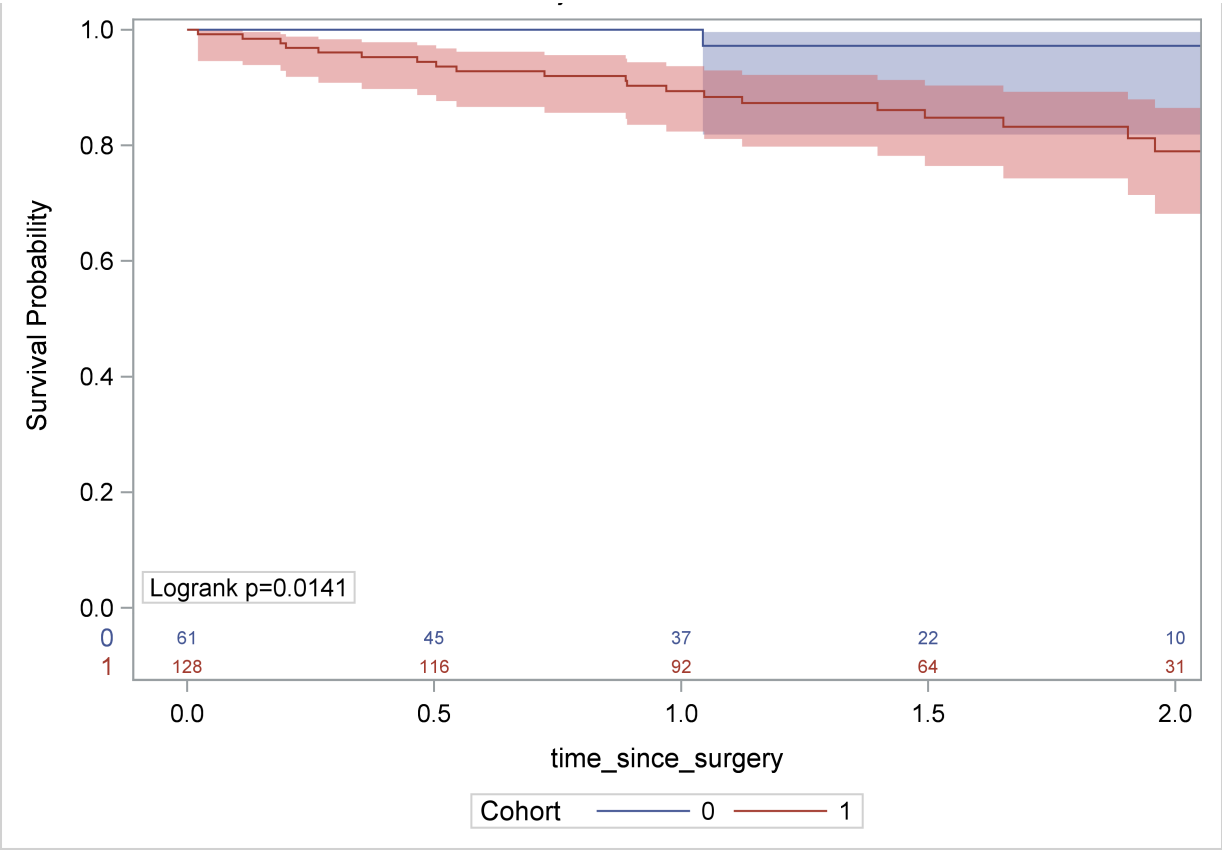
AVA index and mean Gradient

LV mass index regression in patients with moderate to severe LV hypertrophy





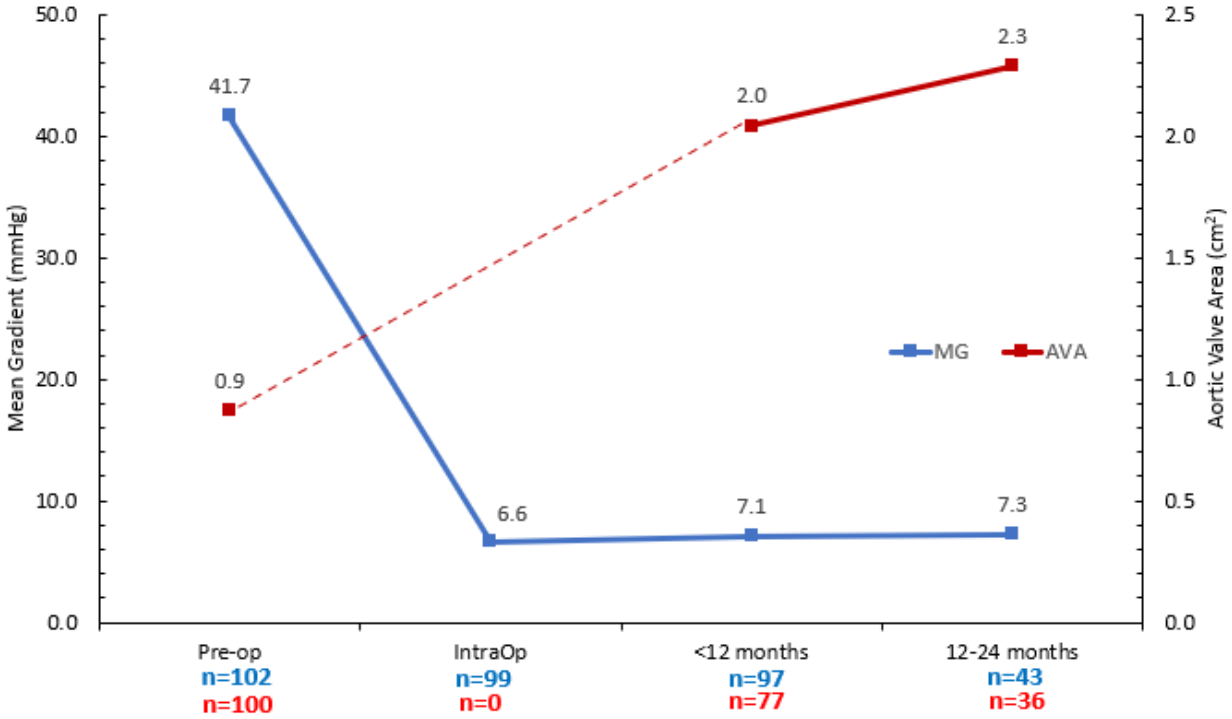
PSM: TAVR (n=128) vs SAVR + Y-AEE (n=61)

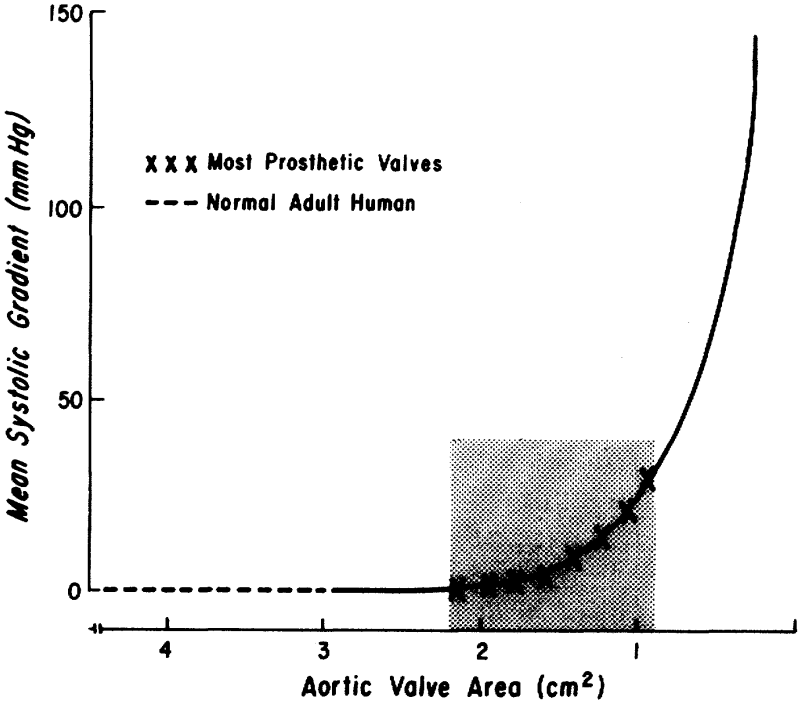


Cox Model

Variable	Hazard Ratio (95% CI)	p-value
Age	0.99 (0.94, 1.1)	0.77
Chronic Lung Disease	4.33 (1.8, 10.28)	**0.0009**
TAVR	7.77 (1.01, 60.18)	**0.04**

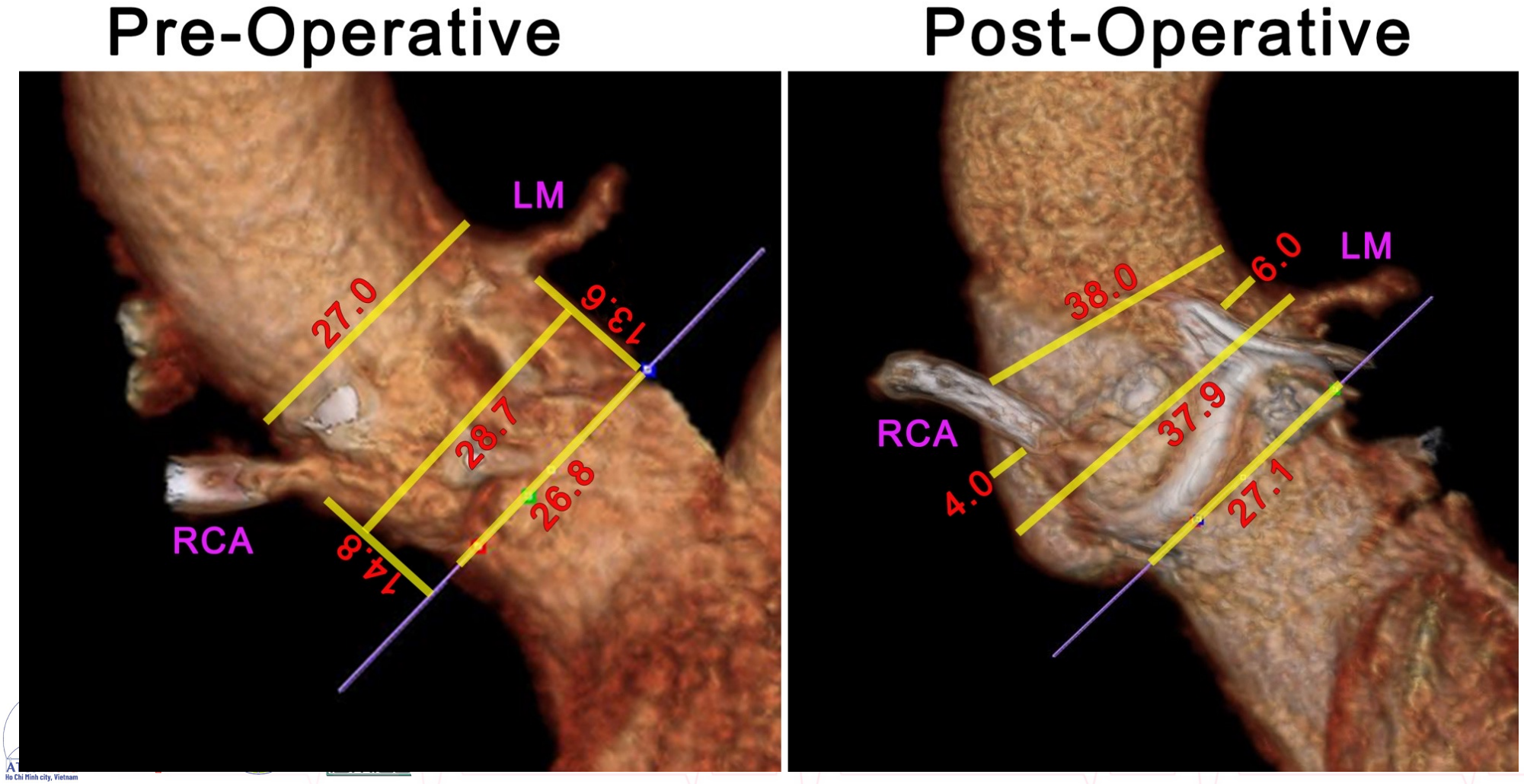
Patients with severe aortic stenosis only (n=102)





(Rahimtoola, Circ 1978)

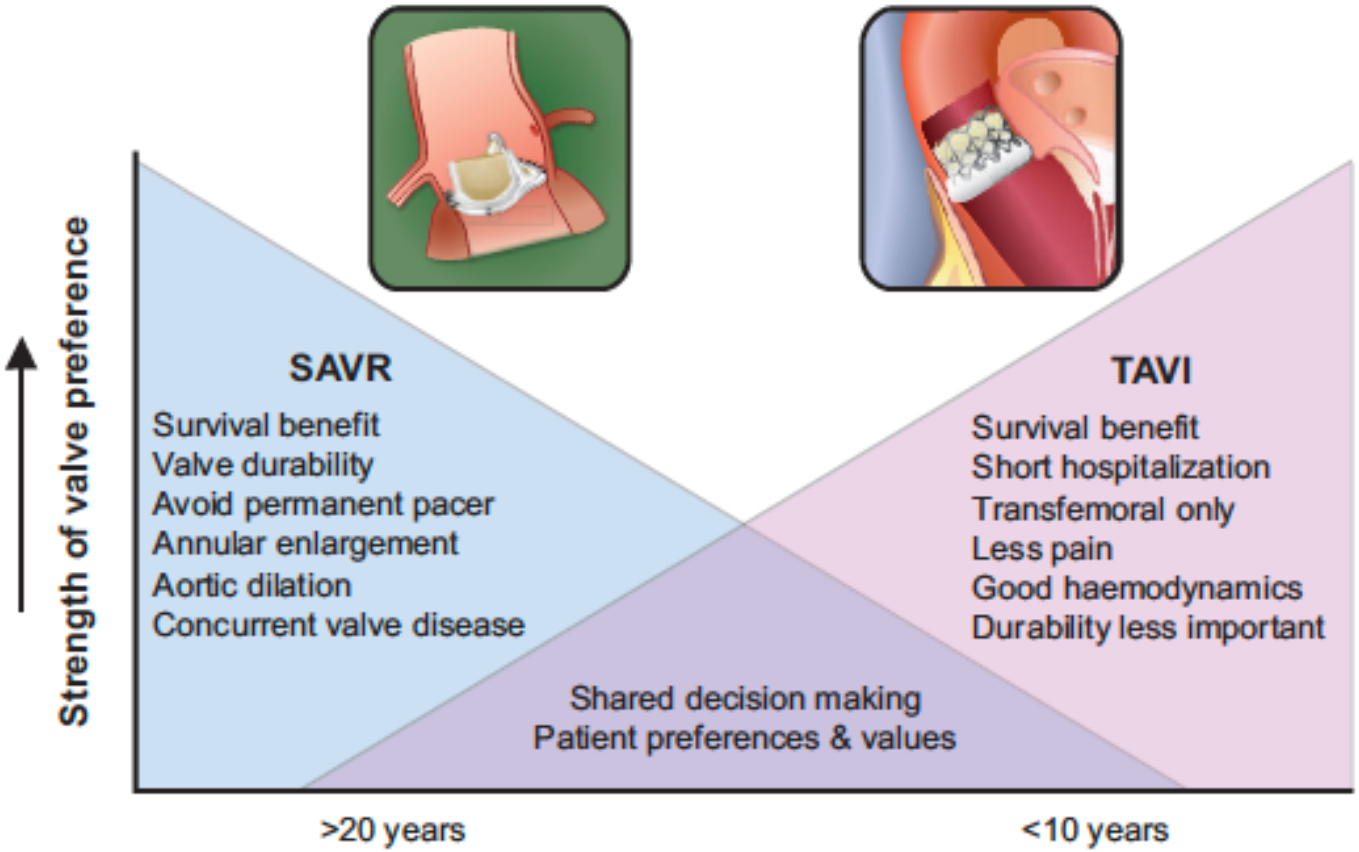
AVE + Y-incision AAE: 23 annulus enlarged to 29 Magna Ease valve



Summary

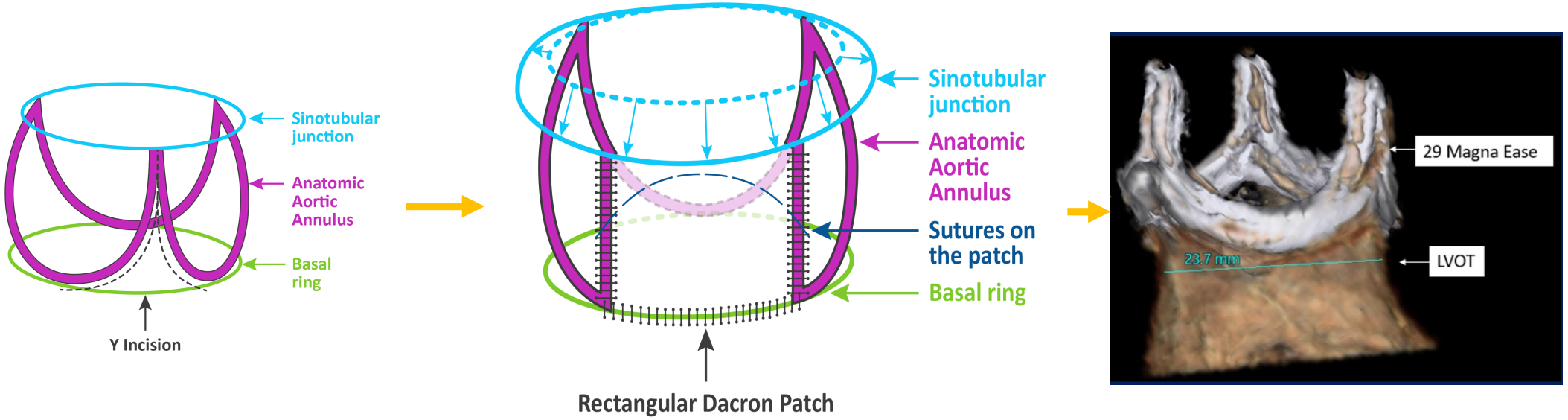
SAVR + Y-AAE (up 3-4 valve sizes)

- **Better long-term survival**
- **Better hemodynamics (QOL)**
- **Better longevity of the prosthetic valve**
- **Better set-up for future V-in-V TAVR if needed**



Oyetunji SO, Heart J, Volume 42, Issue 30, 7 August 2021

A “Y” Incision/Rectangular Patch to Enlarge the Aortic Annulus 3-4 Valve Sizes



Yang B, JTCVS Tech, 2022