

Long-Term Clinical Outcomes of Balloon-Expandable vs Self-Expandable Valves in Patients with Small Aortic Annulus Undergoing TAVR

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Disclosure of Relevant Financial Relationships

I, [Mangesh Kritya](#) DO NOT have any financial relationships to disclose.

Background

- **Small annulus in TAVR** patients → higher risk of elevated gradients and prosthesis–patient mismatch.
- 1-year outcome comparisons between BEV and SEV have shown ¹:
 - Similar clinical outcomes
 - Hemodynamic differences
- Long-term comparative outcomes remain underexplored.

Objective

To compare **long-term clinical outcomes** between **balloon-expandable (BEV)** and **self-expanding valves (SEV)** in patients with **small aortic annulus** undergoing TAVR.

Methods

- **Design:** Retrospective cohort study
- **Source:** Houston Methodist TAVR Registry (2016-2023)
- **Population:** Patients with **perimeter-derived annulus diameter <23 mm**
- **Outcomes**
 - **Primary:** All-cause mortality
 - **Secondary:** MI, endocarditis, Valve reintervention, Composite (Death + Stroke + HFH)
 - **Hemodynamic:** Post-TAVR mean gradients
- **Median duration of Follow-up:** 743 (254-1420) days
- **Statistical analyses:** Program R v4.4.3

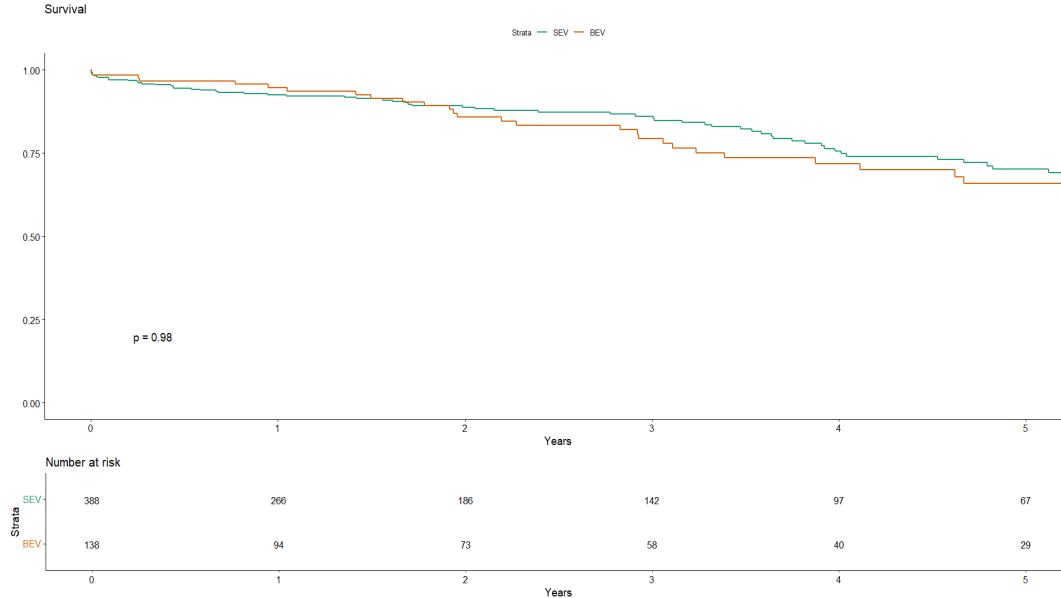
Baseline Features

Variable	BEV (n=240)	SEV (n=707)	p-value
Age	80.5 ± 9.1	79.5 ± 9.2	0.13
Sex (male)	30 (12.5%)	134 (19.0%)	0.15
STS Risk Score	5.46 ± 3.84	5.18 ± 3.74	0.408
Conduction Defect	1 (0.4%)	11 (1.6%)	0.544
AFib/Flutter	2 (0.8%)	12 (1.7%)	0.397
NYHA Class III/IV	196 (81.7%)	517 (73.1%)	0.018
PAD	35 (14.6%)	96 (13.6%)	0.778
Smoker	1 (0.4%)	9 (1.3%)	0.079
Hypertension	216 (90.0%)	613 (86.7%)	0.357
Diabetes	87 (36.2%)	239 (33.8%)	0.254
Dialysis	15 (6.2%)	32 (4.5%)	0.408
Prior PCI	61 (25.4%)	135 (19.1%)	0.134
Prior CABG	33 (13.8%)	124 (17.5%)	0.292

Aortic Valve Features

	BEV (n=240)	SEV (n=707)	p-value
Bicuspid AV	13 (5.4%)	55 (7.7%)	0.064
Annular Calcification	72 (30.0%)	270 (38.2%)	0.069
Peak Velocity	3.85 ± 0.81	3.90 ± 0.78	0.488
Perimeter Derived Diameter (<23 mm)	9.98 ± 10.93	10.41 ± 10.84	0.598
Degenerative Aortic Valve	233 (97.1%)	680 (96.2%)	0.833

Primary Outcome

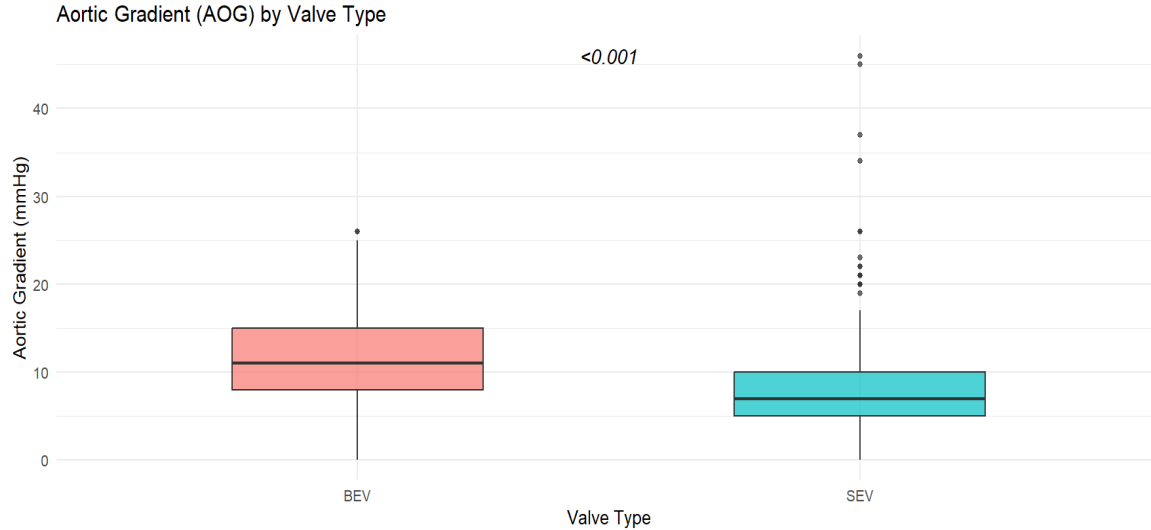


- BEV vs SEV: HR = 1.00 (95% CI: 0.66–1.52), $p=0.984$
- No difference in **all-cause mortality** over 5 years.
- Mortality Rate: 17.6%

Secondary Outcomes

Outcome	Rate	HR	p-value
Composite	39.3%	0.94	0.728
Myocardial Infarction	16.9%	0.87	0.984
New PPM implantation	6.9%	1.24	0.616
Endocarditis	1.3%	0.71	0.602
Valve reintervention	2.6%	1.00	0.991

Hemodynamic Outcomes



- Mean gradient at 1 year:
 - SEV: **8.4 ± 5.8 mmHg**
 - BEV: **11.7 ± 5.8 mmHg**
 - *p* < 0.001

Summary

- **Clinical outcomes** were similar between BEV and SEV
 - **SEV** → Better hemodynamic performance (lower gradients) at 1 year
- Interesting to check the long-term gradients of both SEV and BEV

Thank You