TCT 1193

Balloon-Expandable Versus Self-Expandable Transcatheter Aortic Valve Replacement In Patients With Concomitant Mitral Regurgitation

Abstract Presenter: Temirlan Erkenov MD

Date: October 28, 2025

Temirlan Erkenov MD, Tomasz Stankowski MD, Sleiman Sebastian Aboul-Hassan MD, Felix Woitek MD, Stephan Haussig MD, Diana Nikola Matkowska MD, Anja Muehle MD, Khasan Khushvakhtov MD, Ahmed Musa MD, Axel Harnath MD, Dirk Fritzsche MD, Axel Linke MD, Norman Mangner MD

CRF® TCT® TRANSCATHETER CARDIOVASCULAR THERAPEUTICS®

sana Sana-Herzzentrum Cottbus

MITRALKLAPPEN-ZENTRUM DGK-ZERTIFIZIERT

TAVI-ZENTRUM DGK-ZERTIFIZIERT

Disclosure of Relevant Financial Relationships

I, Temirlan Erkenov, MD, have no relevant financial relationships to disclose.

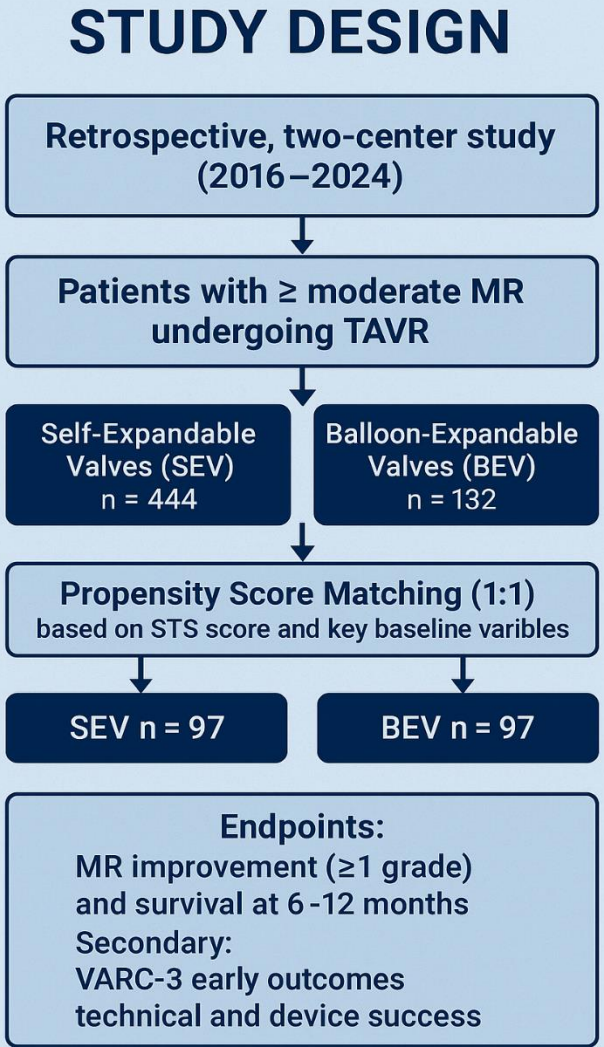
Background/ Study Objective

- Mitral valve regurgitation is a common coexisting valvular abnormality in patients presenting with severe aortic valve stenosis.
- **Moderate or greater mitral regurgitation (MR) is present in approximately 27–48% of patients undergoing Transcatheter Aortic Valve Replacement (TAVR)**
- According to the 2025 ESC/EACTS Guidelines, in patients with severe aortic stenosis (AS) and concomitant MR, TAVR is recommended as the initial treatment, since MR may improve after correction of AS, and mitral intervention should be considered only if significant MR persists after TAVR
- Therefore, we aimed to compare the differences in MR changes following the use of balloon-expandable valves (BEV) and self-expanding valves (SEV) in TAVR procedures.

Patients

- We retrospectively analyzed 576 patients who underwent TAVR (SEV n=444, BEV n=132) with ≥ moderate MR between 01/2016 and 12/2024 in two high – volume German centers.

- Propensity score matching generated from a logistic regression model based on the STS Score selected 97 pairs.



Methods

- ***Primary endpoints:*** Change in MR grade at 6–12 months of follow-up and overall survival after TAVR.
- ***Secondary endpoints:*** Early outcomes according to the Valve Academic Research Consortium-3 (VARC-3) definitions, including device success and early safety.
- ***Ethics & Consent:*** The study was approved by the Ethics Committees of the State Chambers of Physicians in Cottbus (S34 (bB) / 2020) and Dresden (EK 41012019) Germany. Written informed consent was obtained from all participants.
- ***Follow-up:*** Clinical and echocardiographic follow-up was performed at 6–12 months. Follow-up information was obtained from medical records, referring physicians, or direct telephone contact with patients when necessary.

Echocardiography was available in 97% of patients at discharge and in 56% at follow-up.

Results

Clinical characteristics	Overall (n=576)	Preoperative clinical data					
		Before PSM			After PSM		
		SEV n=444	BEV n=132	p-value	SEV n=97	BEV n=97	p-value
Age, years	82.7 ± 5.1	83.1 ± 4.9	81.1 ± 5.2	<0.001	82.2 ± 5.2	81.9 ± 4.7	0.697
BMI, kg/m²	27.6 ± 5.0	27.5 ± 5.0	27.6 ± 4.8	0.86	27.2 ± 4.4	27.4 ± 5.0	0.769
STS-Score, %	8.1 ± 6.0	8.8 ± 6.1	5.7 ± 5.1	<0.001	6.5 ± 3.5	6.4 ± 5.6	0.917
LV EF, %	47.7 ± 13.1	47.4 ± 12.9	48.4 ± 13.6	0.447	48.2 ± 12.3	49.2 ± 13.9	0.605
Preoperative NYHA Class III/IV	458 (79.5%)	373 (84.0%)	85 (64.4%)	<0.001	69 (71.1%)	71 (73.2%)	0.749

Before propensity score matching (PSM), patients treated with SEV were older, had higher STS scores, and were more symptomatic (NYHA class III/IV) compared with patients treated with BEV ($p < 0.001$).

After propensity score matching, both groups were well balanced, with no significant differences in baseline clinical characteristics.

Results

• Post-procedural MR improvement was observed in 53% of patients.

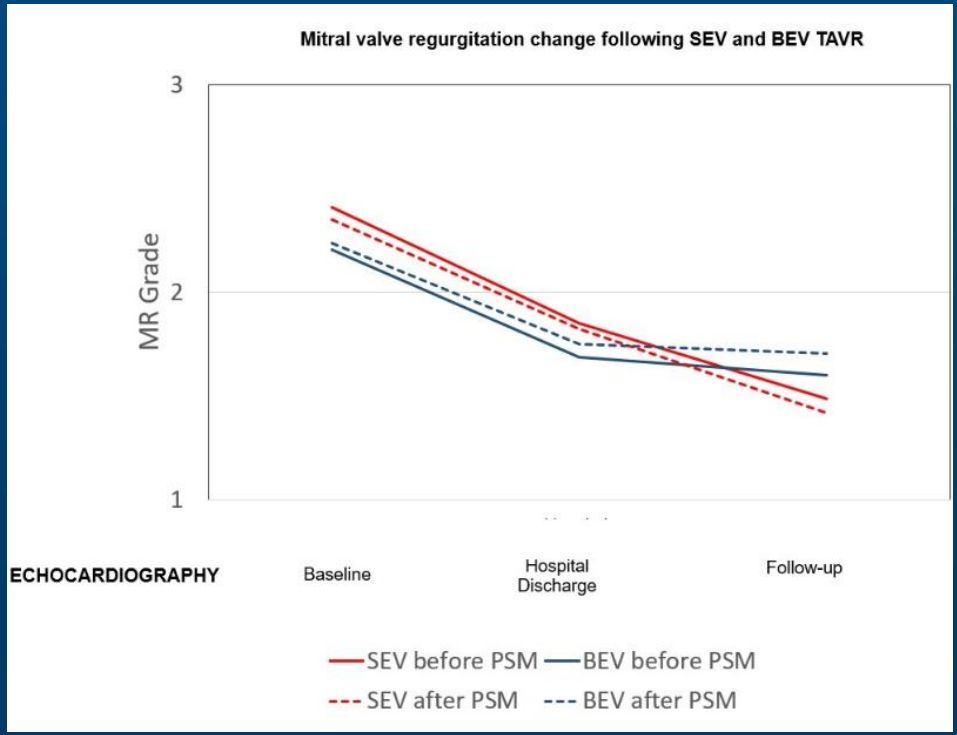
● There were no significant differences between valve types in MR improvement at discharge. 47% of patients showed no improvement, and 4% had worsened MR compared with pre-procedure.

● At discharge:

Before PSM – 53.5% vs 51.5%, p = 0.696
After PSM – 56.3% vs 44.8%, p = 0.112

● At 6–12 months follow-up, echocardiography revealed greater MR improvement in SEV patients:

Before PSM – 75% vs 61%, p = 0.010
After PSM – 75% vs 58%, p = 0.045

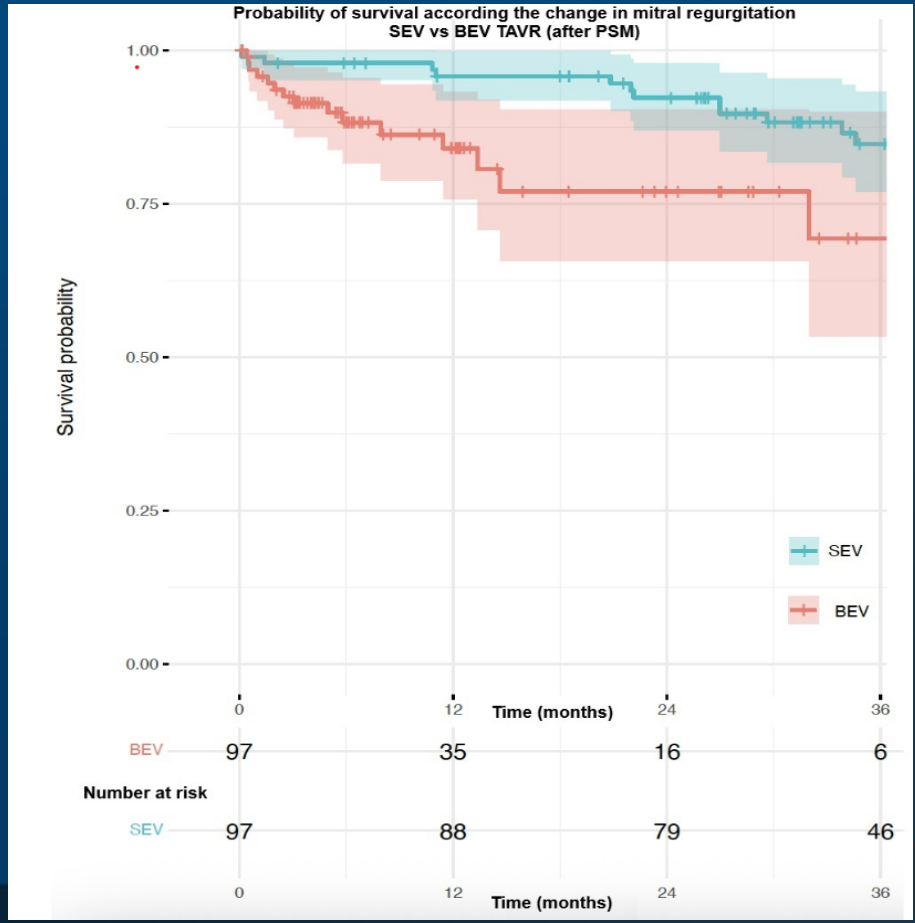


Results

Patients treated with SEV showed better survival compared with those treated with BEV:

1-year: 95.8% vs 84.0%
2-year: 92.3% vs 77.0%
3-year: 84.7% vs 69.3%

In the matched cohort, SEV was associated with a significantly lower risk of mortality:
HR 0.33 (95% CI 0.12–0.91), p = 0.033.



Results

Technical and device success, as well as early safety according to VARC-3 criteria, were similar between both valve types.

There were no significant differences in 30-day mortality, bleeding, stroke, vascular complications, or pacemaker implantation between SEV and BEV groups.

VARC-3 variables	Overall (n=576)	Clinical events observed up to 30-days, according to VARC-3 definitions.					
		Before PSM			After PSM		
		SEV n=444	BEV n=132	p-value	SEV n=97	BEV n=97	p-value
Early mortality	10 (1.7%)	7 (1.6%)	3 (2.3%)	0.593	1 (1.0%)	2 (2.1%)	0.561
Technical success (at exit from procedure room)	548 (95.1%)	419 (94.4%)	129 (97.7%)	0.115	94 (96.9%)	94 (96.9%)	1.000
Device success (at 30 days)	507 (88.0%)	386 (86.9%)	121 (91.7%)	0.142	89 (91.8%)	88 (90.7%)	0.800
Early safety (at 30 days)	459 (79.7%)	356 (80.2%)	103 (78.0%)	0.590	80 (82.5%)	74 (76.3%)	0.287
Bleeding Typ 4	5 (0.9%)	4 (0.9%)	1 (0.8%)	0.876	2 (2.1%)	0 (0%)	0.155
Bleeding Typ 3	18 (3.1%)	11 (2.5%)	7 (5.3%)	0.101	4 (4.1%)	6 (6.2%)	0.516
Bleeding Typ 2	26 (3.5%)	13 (2.9%)	7 (5.3%)	0.191	1 (1.0%)	6 (6.2%)	0.054
Bleeding Typ 1	20 (3.5%)	13 (2.9%)	7 (5.3%)	0.191	2 (2.1%)	7 (7.2%)	0.088
Permanent pacemaker implantation	57 (9.9%)	40 (9.0%)	17 (12.9%)	0203	8 (8.2%)	12 (12.4%)	0.345

Conclusion

- More than 50% of patients show an improvement in mitral regurgitation after TAVR.
- SEV and BEV TAVR have distinct design characteristics that may influence post-procedural mitral valve function.
- Self-expanding TAVR in patients with concomitant mitral regurgitation is associated with greater MR improvement during follow-up and better long-term survival.
- Both valve types demonstrate similar technical and device success, as well as comparable early safety, according to VARC-3 criteria.

Thank you for your attention

Temirlan Erkenov, MD

Sana Herzzentrum Cottbus, Germany