

Comparative Outcomes of TAVR vs. SAVR in Patients with Cardiac Amyloidosis and Aortic Stenosis: A Retrospective Matched Cohort Study

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Disclosure of Relevant Financial Relationships

None of the authors including me have any financial relationships to disclose.

Background

- Transcatheter aortic valve replacement (TAVR) has emerged as a less invasive alternative to surgical aortic valve replacement (SAVR) for high-risk patients with severe aortic stenosis (AS), including those with significant comorbidities such as amyloidosis.
- However, the optimal approach to valve replacement in this unique cohort remains unclear, as traditional surgical risk models may not adequately account for the pathophysiological impact of amyloid infiltration.
- Limited data exist comparing clinical outcomes between TAVR and SAVR specifically in patients with both AS and cardiac amyloidosis.
- Understanding the comparative safety and efficacy of these interventions is crucial to inform treatment decisions in this frail and often therapeutically challenging population.
- To evaluate major adverse cardiovascular events including all-cause mortality in patients with cardiac amyloidosis and AS undergoing TAVR versus SAVR.

Methods

- This retrospective cohort study used the TriNetX database (Global Collaborative Study) to analyze outcomes in patients aged 18 and older with AS and cardiac amyloidosis between January 2007 and June 2025.
- Patients were stratified into two groups: Group 1 underwent TAVR, and Group 2 underwent SAVR.
- Propensity score matching was applied to balance the two groups based on key variables including demographics, comorbidities, laboratory values, ejection fraction, and medications.
- Outcomes analyzed included atrioventricular block (AVB) or left bundle branch block (LBBB), pacemaker insertion, heart failure (HF), atrial fibrillation/flutter (AF), stroke, and ventricular arrhythmias.
- Kaplan-Meier survival curves were used to compare survival between groups, and statistical analysis was performed with risk ratios using 95% confidence interval (CI) and corresponding *p*-values.

Results

- After matching, there were 228 patients in each group with mean age at index diagnosis 76 (72 % male and 25 % female).
- The mean follow-up time for Group 1 (TAVR) was **611.98 days (SD 588.04)**, while Group 2 (SAVR) had a mean follow-up of **738.94 days (SD 731.14)**.
- **AVB or LBBB:** the absolute risk in Group 1 (TAVR) was 25.88% and in Group 2 (SAVR) was 21.65%, with a risk ratio of 1.196 (95% CI 0.709–2.015, p = 0.5024).
- **Pacemaker insertion:** the absolute risk in Group 1 was 9.30% and in Group 2 was 8.70%, with a risk ratio of 1.070 (95% CI 0.552–2.072, p = 0.8415).
- **All-cause mortality:** the absolute risk in Group 1 was 29.65% and in Group 2 was 26.43%, with a risk ratio of 1.122 (95% CI 0.834–1.508, p = 0.4463).
- **Heart failure:** the absolute risk in Group 1 was 58.82% and in Group 2 was 41.67%, with a risk ratio of 1.412 (95% CI 0.761–2.620, p = 0.2789).
- **Atrial Fibrillation:** the absolute risk in Group 1 was 28.57% and in Group 2 was 27.03%, with a risk ratio of 1.057 (95% CI 0.554–2.017, p = 0.8657).
- **Stroke:** the absolute risk in Group 1 was 9.78% and in Group 2 was 9.39%, with a risk ratio of 1.042 (95% CI 0.555–1.956, p = 0.8992).

Results

VARIABLE	Absolute Risk Cohort 1 vs. Cohort 2	Relative Risk	95% CI	P value
AV or LBBB	25.9% vs 21.7%	1.2	0.7–2	0.5
Pacemaker insertion	9.30% vs 8.70%	1.070	0.552–2.072	0.8415
All-Cause Mortality	29.65% vs 26.43%	1.122	0.834–1.508	0.4463
Heart Failure	58.82% vs 41.67%	1.412	0.761–2.620	0.2789
Atrial Fibrillation/F lutter	28.57% vs 27.03%,	1.057	0.554–2.017	0.8657
Stroke	9.78% vs 9.39%	1.042	0.555–1.956	0.8992

Kaplan-Meier Survival Curve

AV or LBBB

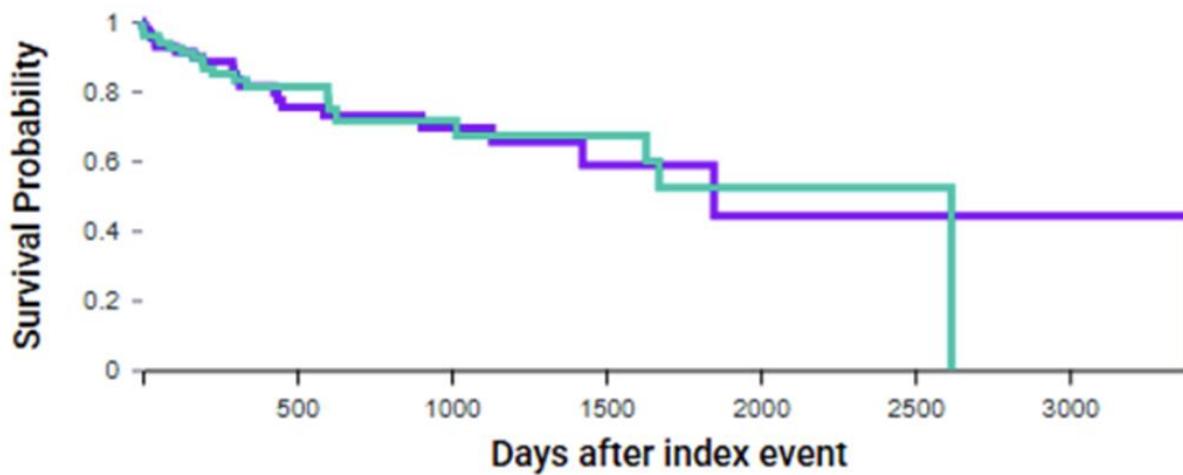


Figure 1: Kaplan-Meier survival analysis comparing survival probabilities between two cohorts: cohort 1 (patients who underwent TAVR, shown in purple) and cohort 2 (patients who underwent SAVR, shown in green). By the end of the observation period, there was no significant difference in survival probabilities between the groups for the outcome of AV block or left bundle branch block ($p = 0.8939$).

Kaplan-Meier Survival Curve

Pacemaker Insertion

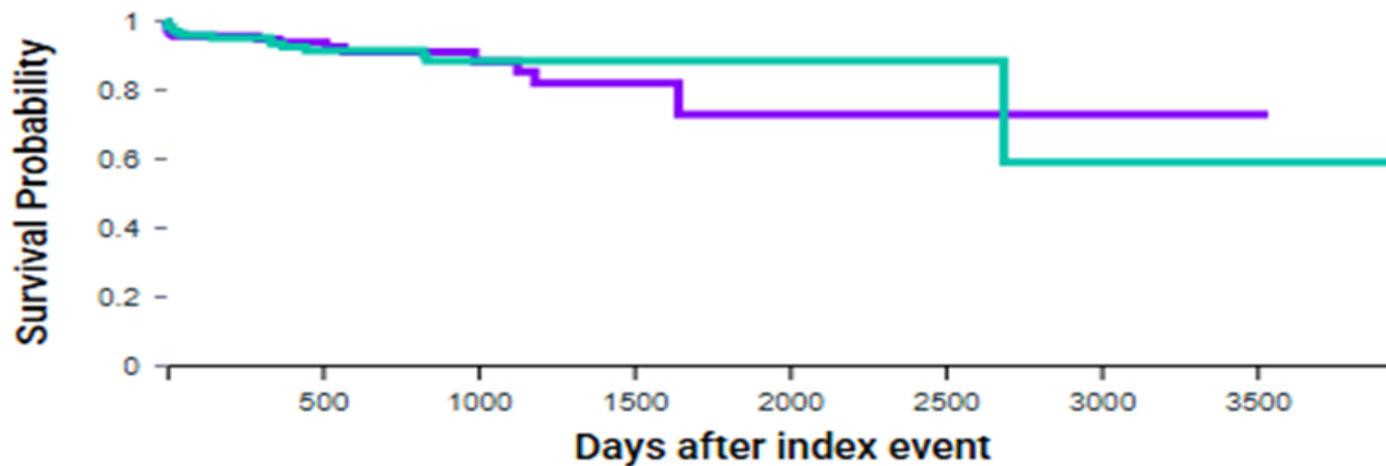


Figure 2 : Kaplan-Meier survival analysis comparing survival probabilities between two cohorts: cohort 1 (patients who underwent TAVR, shown in purple) and cohort 2 (patients who underwent SAVR, shown in green). By the end of the observation period, the survival probability was 72.565% for cohort 1 vs 58.706% for cohort 2 with p 0.5918 for variable pacemaker insertion.

Kaplan-Meier Survival Curve

All-cause Mortality

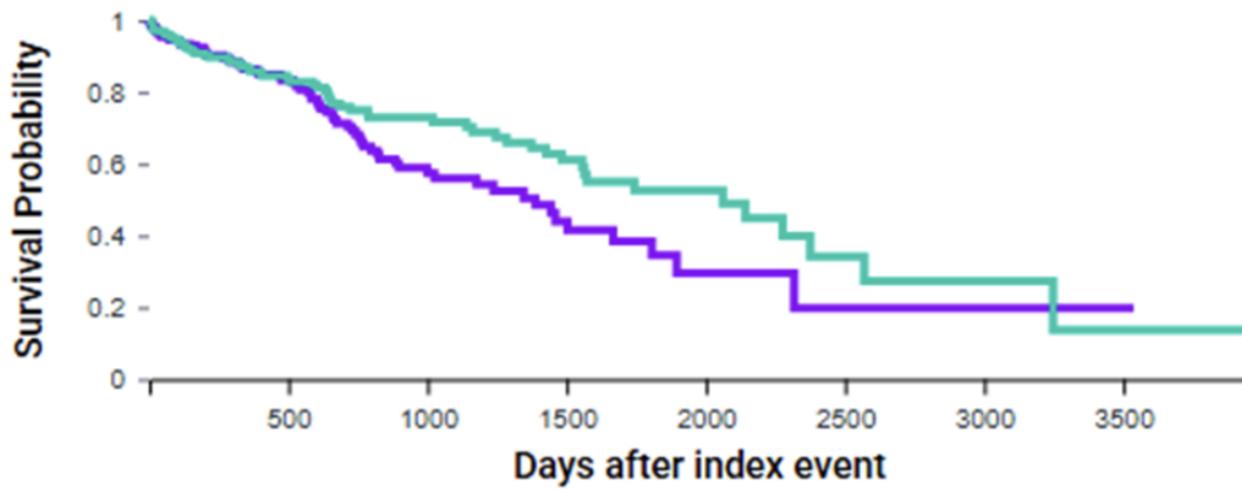


Figure 3: Kaplan-Meier survival analysis comparing survival probabilities between two cohorts: cohort 1 (patients who underwent TAVR, shown in purple) and cohort 2 (patients who underwent SAVR, shown in green). By the end of the observation period, the survival probability was 19.694% in cohort 1 versus 13.645% in cohort 2 at a p value of 0.0773 for variable of all-cause mortality

Kaplan-Meier Survival Curve

Heart Failure

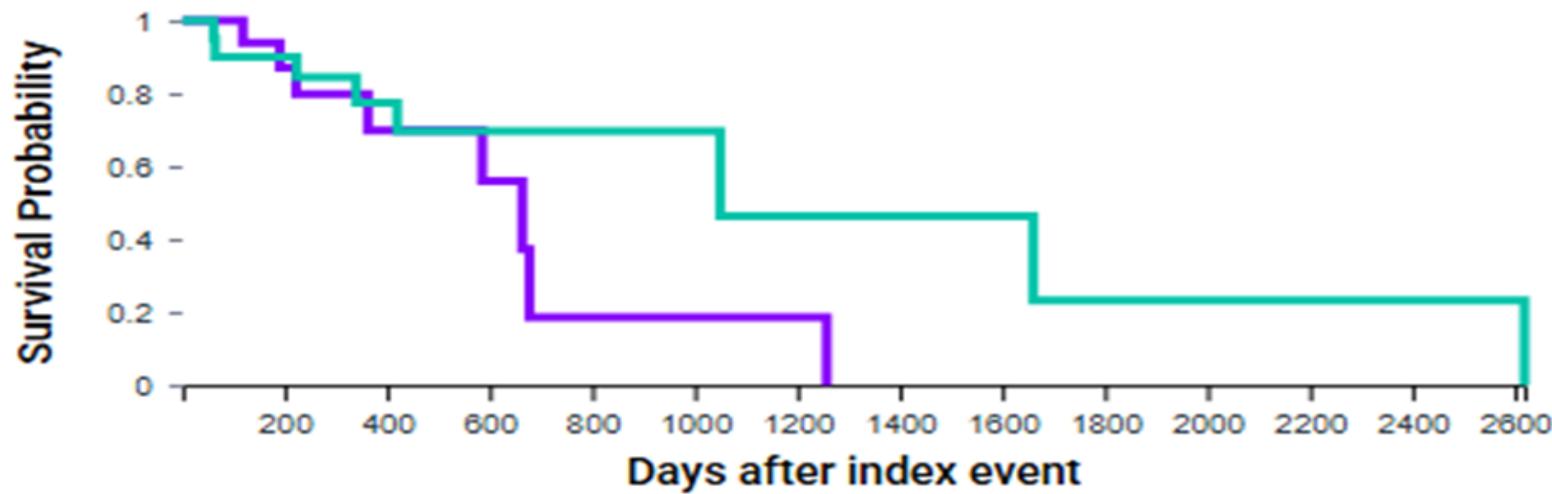


Figure 4: Kaplan-Meier survival analysis comparing survival probabilities between two cohorts: cohort 1 (patients who underwent TAVR, shown in purple) and cohort 2 (patients who underwent SAVR, shown in green). By the end of the observation period, there was no difference in survival probabilities between two groups with a p value of 0.1697 for variable of heart failure

Kaplan-Meier Survival Curve

Atrial Fibrillation/Flutter

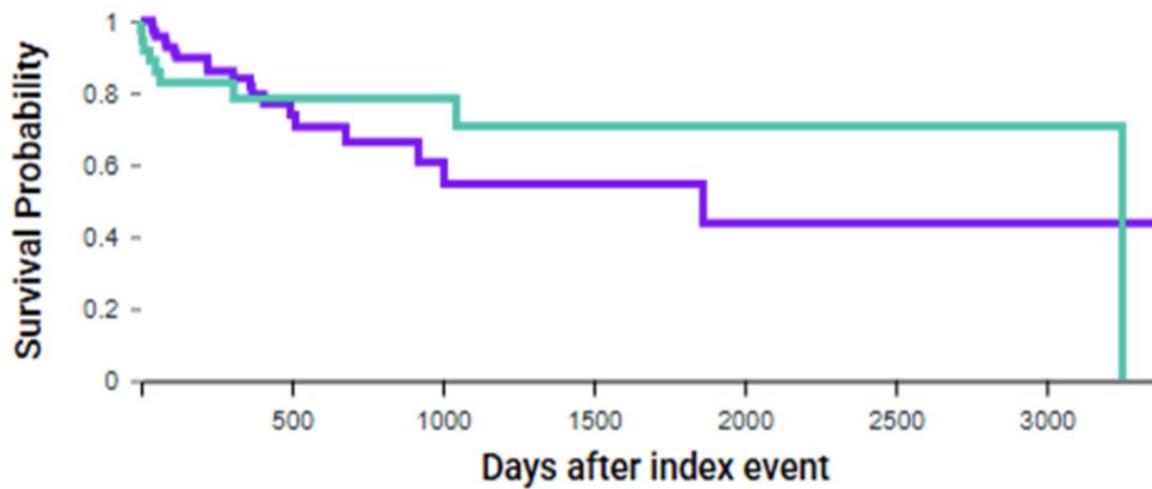


Figure 5: Kaplan-Meier survival analysis comparing survival probabilities between two cohorts: cohort 1 (patients who underwent TAVR, shown in purple) and cohort 2 (patients who underwent SAVR, shown in green). By the end of the observation period, there was no difference in survival probabilities between two groups with a p value of 0.7203 for variable of atrial fibrillation/flutter

Kaplan-Meier Survival Curve

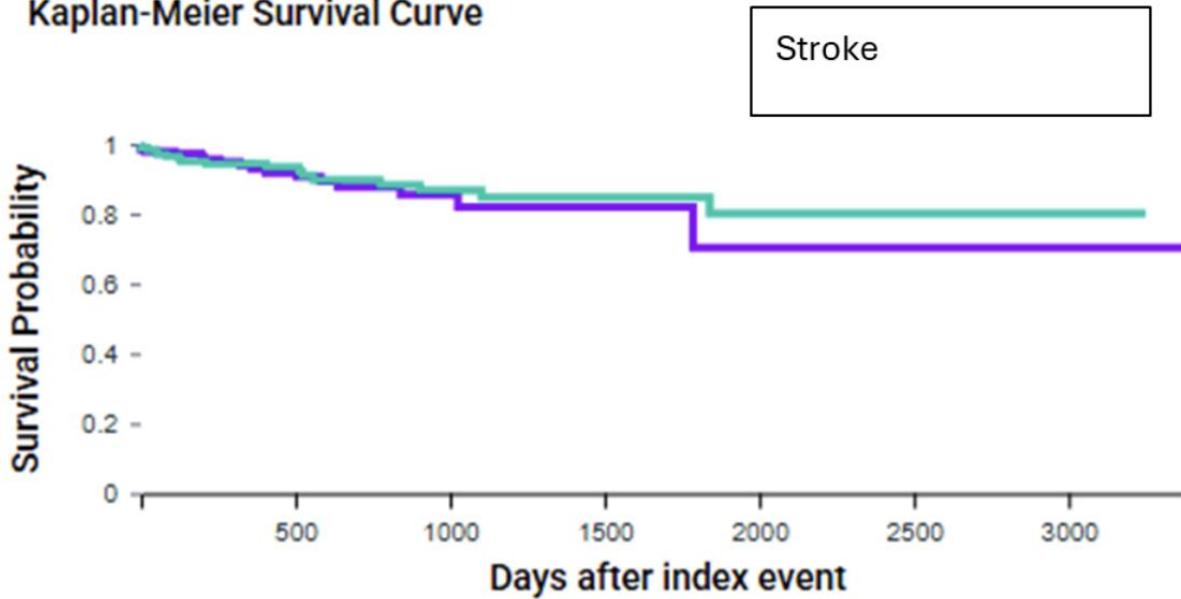


Figure 6 :Kaplan-Meier survival analysis comparing survival probabilities between two cohorts: cohort 1 (patients who underwent TAVR in purple) and cohort 2 (who underwent SAVR, shown in green). By the end of the observation period, the survival probability was 0% vs 80.044% with a p value of 0.6492 for variable of stroke.

Conclusion

- In this matched analysis of patients with both AS and cardiac amyloidosis, there were no significant differences in the rates of heart block, pacemaker implantation, all-cause mortality, heart failure, atrial fibrillation, or stroke between the TAVR and SAVR groups.
- Management decisions in this population should be individualized based on comorbidities, surgical risk, and patient preferences.
- Further research is needed to better guide treatment strategies in this complex cohort.