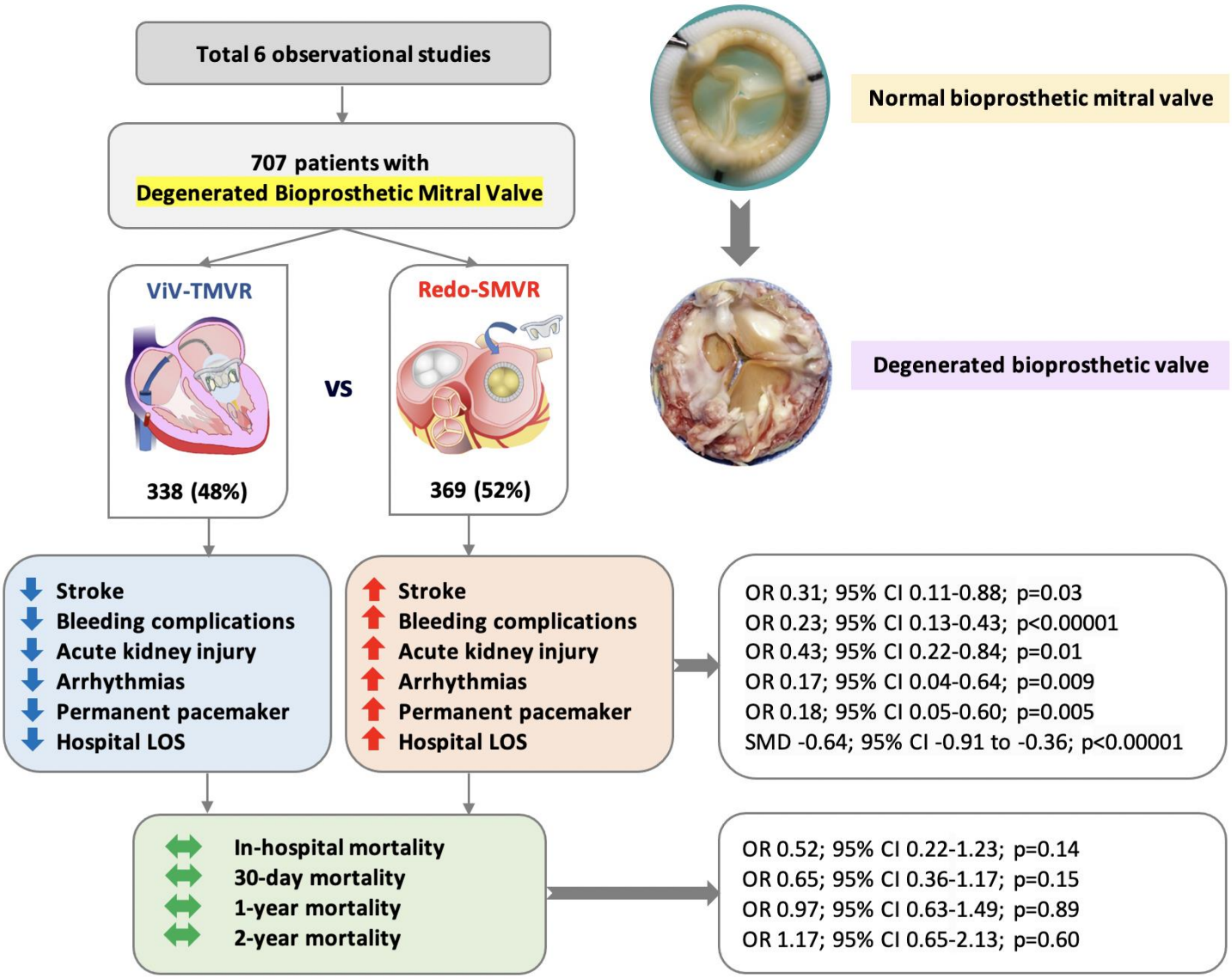
Meta-Analysis Comparing Valve-in-Valve Transcatheter Mitral Valve Replacement Versus Redo Surgical Mitral Valve Replacement in Degenerated Bioprosthetic Mitral Valve

Background: Valve-in-valve transcatheter mitral valve replacement (ViV-TMVR) and redo surgical mitral valve replacement (redo-SMVR) are two treatment strategies for patients with bioprosthetic mitral valve dysfunction. We conducted a systematic review and meta-analysis to compare the outcomes of ViV-TMVR versus redo-SMVR.

Methods: We searched multiple databases for studies comparing outcomes of ViV-TMVR versus redo-SMVR in degenerated bioprosthetic mitral valves. We used a random effects model to calculate odd ratios (ORs) with 95% confidence intervals (CIs). Outcomes included in-hospital, 30-day, 1-year, and 2-year mortality, stroke, bleeding, acute kidney injury (AKI), arrhythmias, permanent pacemaker insertion (PPMI), and hospital length of stay (LOS).

Results: Six observational studies with 707 subjects were included. Median follow-up was 2.7 years. Despite their older age and greater comorbidity burden, patients undergoing ViV-TMVR had a similar in-hospital mortality (OR 0.52; 95% CI 0.22-1.23; p=0.14), 30-day mortality (OR 0.65; 95% CI 0.36-1.17; p=0.15), 1-year mortality (OR 0.97; 95% CI 0.63-1.49; p=0.89), and 2-year mortality (OR 1.17; 95% CI 0.65-2.13; p=0.60) compared to redo-SMVR. ViV-TMVR was associated with significantly lower periprocedural complications including stroke, bleeding, AKI, arrhythmias, and PPMI, and shorter hospital LOS compared to redo-SMVR.

Conclusions: ViV-TMVR was associated with better outcomes compared to redo-SMVR in patients with degenerated bioprosthetic mitral valves, including lower complication rates and shorter hospital LOS with no significant difference in mortality rates. Large-scale randomized trials are needed to mitigate biases and confirm our findings.


Total 6 observational studies
707 patients with
Degenerated Bioprosthetic Mitral Valve
ViV-TMVR
338 (48%)
VS
Redo-SMVR
369 (52%)
Normal bioprosthetic mitral valve
Degenerated bioprosthetic valve
Stroke
Bleeding complications
Acute kidney injury
Arrhythmias
Permanent pacemaker
Hospital LOS
Stroke
Bleeding complications
Acute kidney injury
Arrhythmias
Permanent pacemaker
Hospital LOS
OR 0.31; 95% CI 0.11-0.88; p=0.03
OR 0.23; 95% CI 0.13-0.43; p<0.00001
OR 0.43; 95% CI 0.22-0.84; p=0.01
OR 0.17; 95% CI 0.04-0.64; p=0.009
OR 0.18; 95% CI 0.05-0.60; p=0.005
SMD -0.64; 95% CI -0.91 to -0.36; p<0.00001
In-hospital mortality
30-day mortality
1-year mortality
2-year mortality
OR 0.52; 95% CI 0.22-1.23; p=0.14
OR 0.65; 95% CI 0.36-1.17; p=0.15
OR 0.97; 95% CI 0.63-1.49; p=0.89
OR 1.17; 95% CI 0.65-2.13; p=0.60