

**Comparison of the Hemodynamic Performance and Midterm Outcome
of Per-Cutaneous versus Surgical Stentless Bioprotheses
for Aortic Stenosis with Anticipated Patient Prosthesis Mismatch**

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Objectives:

To compare the hemodynamic performance and midterm survival of transcatheter aortic valve implantation (TAVI) to that of surgically implanted stentless aortic valve replacement (SAVR) for the treatment of severe AS in patients with small LVOT for body surface area (BSA), anticipated to have significant patient prosthesis mismatch (PPM).

Methods:

A single center retrospective analysis of 86 and 49 consecutive TAVI and SAVR patients have been implanted from January 2009 to December 2011. Inclusion criteria were severe aortic stenosis and calculated minimal effective orifice area (BSA \times 0.85) larger than the best projected EOA based on the reference values in any type of stented bio/mechanical prosthesis available. Doppler echocardiographic data were obtained before the intervention, at discharge and at 3month follow-up.

Results:

Peak and mean transprosthetic gradient at discharge were lower ($p < 0.001$ and $p = 0.0002$ respectively) in the TAVI group (16.3 ± 6.7 and 9.1 ± 3.61 mmHg) compared with the SAVR (23.9 ± 9.1 and 12.5 ± 4.8 mmHg). At least mild aortic regurgitation was more frequent in the TAVI compared with the SAVR group (61% vs. 7%; $p < 0.0001$). At 3 months followup, the mean gradient in the TAVI was similar to that of the SAVR group but the prevalence of severe PPM was significantly lower (5% vs. 19%; $p = 0.05$) in the TAVI group. However, the unadjusted 3-year survival rate was superior in the SAVR vs. TAVI group ($91.6 \pm 4.0\%$ vs. $67.0 \pm 7.7\%$; $p = 0.01$). Adjustments for age and co-morbidity resulted in loss of the difference in mortality between the groups.

Conclusions:

In patients with anticipated PPM TAVI offers better hemodynamic performance, and lower incidence of PPM than aortic valve replacement with stentless valve. The superior hemodynamic performance does not translate to improved survival, although it is comparable when adjusted for differences in age and comorbidity. TAVI may be considered as a substitute to surgical SAVR in older and sicker patients anticipated to have significant PPM based on small outflow tract for BSA.