

Hemodynamic Profile of the Percutaneous Corevalve™ Compared to Surgical Aortic Valve Replacement

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Background: Surgical aortic valve replacement (SAVR) has been for many years the only effective treatment for patients with severe aortic stenosis. Transcatheter aortic valve implantation (TAVI) has recently emerged as an alternative treatment for in-operable and high risk surgical patients. Our objective was to examine the immediate post-procedural and midterm hemodynamic profile of the trans-femorally implanted CoreValve™ as compared to surgical bioprosthetic valve as shown by serial echocardiograms.

Methods: Forty four patients who had undergone trans-femoral TAVI (CoreValve™ bioprosthetic valve) were matched to 66 patients who had undergone SAVR using a bioprosthesis. Matching was done according to body surface area, left ventricular ejection fraction, left ventricular outflow tract dimensions, aortic valve gradients and measured effective orifice area (EOA). Doppler echocardiographic data was compared before the procedure, at discharge, and at 6-12 months follow up.

Results: TAVI patients were older, with more patients having renal failure and ischemic heart disease. At discharge, TAVI patients had lower peak and mean transprosthetic gradients compared to SAVR patients (17.1 vs. 26.3 mmHg, $p<0.0001$ and 9.3 vs. 15.1 mmHg, $p<0.0001$, respectively). EOA was bigger in the TAVI group (1.95 vs. 1.48 cm², $p<0.0001$). Severe patient prosthetic mismatch (PPM) was found in 17 of the surgical patients (26%) and in none of the TAVI patients ($p<0.0001$). Mild to moderate aortic regurgitation was evident in 36% of the TAVI group compared to 8% in the SAVR group ($p<0.001$). These findings did not change at 6-12 months follow-up (EOA was 1.90 vs. 1.54 cm², $p=0.004$).

Conclusions: The post-procedure and mid-term hemodynamic profile of TAVI seems to be better than that of SAVR as expressed by lower transprosthetic gradients, bigger effective orifice areas, and a lower prevalence of severe PPM, despite a higher prevalence of aortic regurgitation.