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**The impact of transcatheter aortic valve implantation on aortic elasticity and arterial function**

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Background/Introduction: Aortic stiffness and hemodynamics are established independent predictors of cardiovascular risk. Transcatheter aortic valve implantation (TAVI) is a promising non-surgical technique for the treatment of aortic stenosis.

Purpose: We sought to investigate the effect of TAVI upon aortic vascular function and hemodynamics.

Methods: 67 patients (mean age 80.5±8.1 years, 31 male) with severe symptomatic aortic stenosis scheduled for TAVI were enrolled. Arterial stiffness was assessed by carotid-femoral pulse wave velocity (cfPWV) and brachial-ankle pulse wave velocity (baPWV). Pulse wave analysis of the radial waveform was also performed and the aortic augmentation index corrected for heart rate (AIX@75) was estimated. Measurements were conducted prior to the procedure and at discharge.

Results: Before TAVI, mean transvalvular gradient was 50.1±12.9 mmHg for the population of the study. 24% presented with LVEF<50% and 4 patients with low flow- low gradient severe AS. After the procedure, we observed a statistically significant increase in arterial stiffness indices (7.7±1.5 vs 8.3±1.9 m/s for cfPWV and 1871±535 vs. 2449±646 cm/s for baPWV, with p<0.001 for both variables), and a concomitant decrease in wave reflections as measured by AIX@75 (35±12.1% vs 28.7±8.4%, p<0.001). After TAVI a statistically significant increase in peripheral pulse pressure (72.5±19.4 vs 78±15.8 mmHg, p<0.05) was observed, as well.

Conclusions: Shortly after TAVI the increase in arterial stiffness depicts a "stiffer response" of the vascular system to the acute hemodynamic changes. This could also indicate an "unmasking" of true aortic stiffness as a result of the relief of the LV outflow obstruction. These findings shed light on the short-term hemodynamic effects of the transcatheter aortic valve implantation.