

Is TAVI the Solution for Patient-Prosthesis Mismatch?

Avinoam Shiran^{1,2}, Nader Khader¹, Ronen Jaffe^{1,2}, David Halon^{1,2}, Salim Adawi¹
¹Cardiology, Lady Davis Carmel Medical Center, Israel
²Technion, Israel Institute of Technology, Israel

Background:

Patient-prosthesis mismatch (PPM) has been reported in up to 70% of patients after aortic valve replacement (AVR) and may be associated with unfavorable hemodynamics and increased morbidity and mortality. Stent valves used for transcatheter aortic valve implantation (TAVI) do not require a sewing ring and therefore have a larger effective aortic valve area (AVA).

The aim of this study was to determine the incidence and hemodynamic significance of PPM after TAVI.

Methods:

We studied 98 consecutive patients (82±6y, 40 males) who had TAVI for native valve aortic stenosis (CoreValve 76, Sapien XT 22) and had transthoracic echocardiography before and after TAVI. AVA was determined using the continuity equation. PPM was defined as AVA index (AVAI) ≤0.85 cm²/m² and severe PPM as AVAI ≤0.65 cm²/m².

Results:

Pre TAVI AVA was 0.76±0.14 cm² and AVAI 0.43±0.08 cm²/m², increasing to 2.1±0.46 cm² and 1.2±0.29 cm²/m² after TAVI. Post TAVI peak aortic gradient was 16±6 mmHg. PPM occurred in 16 patients (16%), 2 (2%) of which had severe PPM. Peak aortic gradient in the patients with PPM was only 20±6 mmHg (range 12-32 mmHg), compared to 15±6 mmHg in those without PPM (p=0.0006). PPM occurred in only 2/21 patients (10%) with a small left ventricular outflow tract (LVOT≤2.0 cm), and was no more frequent than in patients with a large LVOT (14/77 (18%), p=0.5).

PPM was not related to valve type or size, age or gender. Peak aortic gradient after TAVI was similar in patients with small as compared to large LVOT (16±7 vs. 15±6 mmHg, p=0.7). Post TAVI AVAI inversely correlated with weight (r=0.54) and body surface area (r=0.51).

Conclusions:

PPM after TAVI, unlike post AVR, is: 1) Uncommon and usually non-severe, even in patients with a small LVOT 2) Associated with low trans-aortic gradients.