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The impact of improved percutaneous pulmonary valve design on patient characteristics: Smaller, younger and more complex

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Objectives: The SAPIEN 3 (S3; Edwards Lifescience, Irvine, CA, USA) is a new design of a transcatheter heart valve (THV) with sizes from 23 to 29 mm. Our objective was to compare the patient characteristics receiving earlier Edwards THV types (Sapien valves and Sapien XT valves) to the current patient population eligible for percutaneous pulmonary valve implantation (PPVI).

Methods: During 2011 and 2017, 74 patients were treated with PPVI in two centers. Patient data and valve types were evaluated retrospectively.

Results: From 2011 to 2013 the Sapien valve was implanted in 24 cases, Sapien XT from 2013 to 2016 in n = 24. Since 2015 PPVI was increasingly performed with the S3 valve (n = 26). In the S3 group, patients showed a tendency to be younger ($p > 0,05$) and were significantly smaller ($p < 0,05$) when compared to earlier THV types:

Sapien 3 (n = 26): Median age 13,5; range 5,8-52 years; Median weight 51,5 kg; range 15,0-93,0 kg; (n = 4 < 20 kg)

Sapien XT (n = 24): Median age 17,7; range 7,8-44,2 years; Median weight 64 kg; range 21,5-106 kg.

Sapien (n = 24): Median age 17,9; range 6,6 - 42 years; Median weight 60 kg; range 20,0-135 kg;

Valve sizes used were mostly 23 and 26 mm (Sapien n = 23; XT n = 16; S3 n = 20). The largest 29 mm model is increasingly used during the last years (XT n = 3, S3 n = 6).

Compared to the initial Sapien group, the S3 group showed a broader variety of underlying congenital heart diseases (CHD) and increased procedural complexity (Sapien-in-Melody implantation, PPVI in a single PA, PPVI in the native RVOT).

Conclusion: Compared to the Edwards Sapien and XT valves, patients who received the latest Edwards Sapien 3 valve tended to be smaller (even below 20 kg) and younger. Right now PPVI is applicable in a broader variety and more complex cohort of CHD. A THV size of 29 mm is increasingly utilized.