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Transfemoral Implantation of an Edwards Sapien 3 Valve in the Damus-Kaye-Stansel Anastomosis in a Patient with Fontan Circulation

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Transcatheter pulmonary valve replacement with the Melody valve has fast become an important adjunct in the treatment of children and adults with failing right ventricular outflow tract conduits. Recently, the Melody valve has also been successfully implanted in the tricuspid, mitral, and aortic positions, typically within a failing bioprosthetic valve. The Edwards Sapien valve has been developed for treatment of calcified stenotic aortic valves in elderly patients at high surgical risk. There is limited data on the use of this valve in other positions.

We present a 22-year old patient with univentricular physiology who had already undergone 5 open heart surgeries including palliation with a Damus-Kaye-Stansel (DKS) procedure, Fontan completion and tricuspid valve replacement. In addition, epimyocardial pacemaker implantation and revisions had been necessary. He developed symptomatic free regurgitation of the pulmonary portion of his DKS-anastomosis. To avoid additional high-risk open heart surgery, we successfully implanted an Edwards-Sapien 3 valve transfemorally in the pulmonary portion of the DKS anastomosis relieving the insufficiency. To our knowledge, this is the first successful use of a transcatheter valve in a DKS anastomosis in a patient with single-ventricle physiology.

This intervention may increase functional longevity of single-ventricle palliation, postpone the need further surgery, and potentially for orthotopic heart transplantation.