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Transcatheter pulmonary valve implantation in small right ventricle to pulmonary arteries conduits.

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Objectives. Evaluate the feasibility and the outcome of Melody valve (Medtronic Inc, Minneapolis, USA) implantation in small right ventricle outflow conduits.

The current guidelines recommend a minimal conduit diameter of 16 mm and no dilatation to a diameter greater than 110% of the original implant size for deployment of a percutaneous pulmonary valve.

Methods. Seven consecutive patients (May 2008-October 2015) from 5 institutions underwent transcatheter pulmonary valve implantation in less than 16 mm conduit diameter (n=7). Three additional patients with a conduit diameter of 16 mm (n=2) or 17 mm (n=1) underwent a 22mm Melody valve implantation. The median age and weight of the 10 patients was 10.85(7.7 to 15) years and 41.5(19 to 60) kg, respectively.

Results. The median diameter of the conduit at the time of the procedure was 12(10 to 14) mm and the median right systolic right ventricular pressure was 62(40 to 94) mmHg. The procedure was successful in all cases with a median diameter of the implanted pulmonary valve of 22(18 to 22) mm. A confined conduit rupture occurred in 4 patients and was treated with covered stent implantation prior to melody valve implantation. The post-implantation median systolic right ventricular pressure was 30 (29 to 50) mmHg. One patient who had implantation of an 18 mm diameter Melody valve experienced moderate post implantation systolic right ventricular hypertension (50 mmHg). After a median follow-up of 13.7(2.9 to 85.2) months, all the patients are asymptomatic and no further intervention was required.

Conclusions. Transcatheter pulmonary valve implantation is feasible in small conduits, with a high rate of ruptures that remain confined because of the surrounded fibrosis. In this setting, one should always try to implant the largest available pulmonary valve.