

Percutaneous pulmonary valve replacement in patients with left anterior descending coronary artery crossing the RVOT due to anomalous origin from the right coronary sinus

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Introduction: Percutaneous pulmonary valve implantation (PPVI) has found widespread acceptance in the postoperative reevaluation of the right ventricular outflow tract. Major obstacles for PPVI are coronary arteries in close proximity to the expected landing zone of the implanted valve. In patients with origin of the left anterior descending coronary artery (LAD) from the right coronary sinus the LAD crosses the RVOT and frequently precludes PPVI. We report our experience with PPVI in 4 patients with this coronary anomaly.

Patients: In our institution 66 patients underwent PPVI from 1/2010 – 11/2018. Origin of the LAD from the right coronary sinus was present in 4 patients (m=26,8 years). Underlying diagnoses were tetralogy of Fallot (2 pts.), PA-VSD and DORV. The morphology of the RVOT included s/p implantation of 18mm Contegra conduit, s/p 22mm homograft, s/p 18mm Goretex tube in addition to the native RVOT and RVOT following pulmonary valvotomy.

Results: The coronary arteries were displayed by selective injections and revealed the LAD crossing the RVOT at or just below the former pulmonary valve level. Balloon sizing was not performed in 2 patients with distal landing zones and calcified grafts. In the remaining patients balloon sizing was essential to define a landing zone distal to the LAD. In two patients the landing zone was short limiting the implantation to 26mm and 22mm Stents (LDmax and CP). In these patients the melody valve was shortened by folding of the proximal and distal struts. The third patient underwent implantation of melody valves both in the 18mm Goretex tube and in the native RVOT while the fourth patient underwent implantation of a 26mm Edwards Sapien valve. Selective angiographies following pretesting and valve implantation revealed unimpeded flow to the coronary arteries. The postinterventional course was uneventful and patients are doing well with a mean follow-up of 2,8 years.

Conclusions: According to our results anomalous origin of the LAD does not always preclude PPVI. The decision can be made on an individual basis depending on absence of proximal obstruction of the RVOT and on the possibility to create a landing zone distal to the LAD crossing the RVOT.