



## TRANSCATHETER PULMONARY VALVE IMPLANTATION IN A DOUBLE BARREL RIGHT VENTRICULAR OUTFLOW TRACT

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A 36-year-old gentleman with 22q11 deletion syndrome and tetralogy of Fallot was seen in the adult congenital heart disease clinic. He was initially palliated with a right modified BTT shunt as a neonate. At 2 years of age, the patient underwent complete repair consisting of VSD closure with a Dacron patch and placement of a 14 mm cryopreserved homograft RV-PA conduit anterior to his native hypoplastic stenotic right ventricular outflow tract due to a reported coronary abnormality. Since that time, he has done well with no additional cardiac interventions or operations. Over the last few years, the patient developed dyspnea on exertion and easy fatigability. Transthoracic echocardiography showed moderate conduit regurgitation with a PIPG 53 mmHg (mean 27 mmHg), and severe conduit regurgitation. A cardiac MRI showed mild conduit stenosis (peak velocity 2.3 m/s), with severe insufficiency (regurgitant fraction 42%), normal RV size, and right pulmonary artery stenosis secondary to compression from the ascending aorta with balanced flows (RPA 48%, LPA 52%) (Video 1). The coronary arteries were remote from the RV-PA conduit. Given his symptoms and mixed disease, he was referred to the cardiac catheterization laboratory for conduit rehabilitation with transcatheter pulmonary valve implantation within the conduit due to his mixed RVOT disease. There was a possibility the patient may be left with some residual pulmonary regurgitation via his small native RVOT which could be occluded if needed. RPA intervention was not planned given the interaction and compression with the ascending aorta.

Under general anesthesia, there was a baseline peak gradient of 25 mmHg across the RV-PA conduit, and a 5 mmHg gradient across the stenotic right pulmonary artery. The RV-PA conduit underwent serial conduit angioplasty using a 16-, 18-, 20-, and 22-mm balloon with coronary artery testing using the 22 mm balloon. The coronary arteries were demonstrated to be remote from the RV-PA conduit, and a 3110 Palmaz XL stent was implanted within the conduit on a 22 mm BiB balloon. The stent was post dilated with a 22 mm Atlas Gold balloon, and a 23 mm S3 valve was implanted within the stented conduit. Following the intervention, there was a residual gradient of 8 mmHg across the RVOT, no Sapien valvar regurgitation, and no native RVOT regurgitation secondary to his native pulmonary valve (Video 2).

Transthoracic echocardiogram the following day showed mild conduit stenosis with a PIPG 27 mmHg (mean 12 mmHg), and no regurgitation. The patient is doing well clinically.

### Learning points of the procedure

- Pre-procedural advanced imaging can be vital for procedural planning
- Angiography gives a great understanding of anatomy