Overexpanding a large PTFE-Conduit with a Melody® Transcatheter Pulmonary Valve to an advantageous size

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Introduction: Percutaneous pulmonary valve implantation (PPVI) is an excellent alternative method in paediatric patients with right ventricular outflow tract (RVOT) dysfunction to avoid open-heart surgery. We carried out PPVI in a nine-year-old girl presenting gradually worsening tricuspid valve insufficiency due to right-ventricle dilatation caused by free pulmonary regurgitation of a 16-mm polytetrafluorethylene (PTFE) valve-less conduit. Clinically she displayed normal exercise tolerance, no signs of heart failure or cardiac rhythm anomalies.

Methods: The intervention was carried out under general anaesthesia. She underwent a complete haemodynamic examination once transcutaneous femoral vessel access had been obtained. Angiocardiography revealed the aortic bulbus and coronary arteries in a safe distance from the RVOT. In addition, a coronary angiogramme was combined with balloon inflation in the conduit to rule out any coronary arterial compression. We successfully implanted a 22-mm bovine valve integrated in a covered stent (Melody® Transcatheter Pulmonary Valve) without pre-stenting the landing zone.

Conclusion: The optimal timing of intervening in the presence of severe pulmonary regurgitation is unclear. Generally speaking, severe pulmonary regurgitation after an RVOT intervention is well tolerated for years, but it is not a benign cardiac lesion. The clinical evidence strongly supports a timely intervention before the patient becomes symptomatic. The prevailing indication for pulmonary valve replacement in this patient was the gradual increase in tricuspid valve insufficiency. The decision favouring a catheter-based intervention rather than open-heart surgery was challenging. A PTFE conduit may not be the best candidate for PPVI because of its relative rigidity. Additionally, open-heart surgery would make tricuspid valve reconstruction possible. On the other hand, by alleviating the pulmonary regurgitation alone, the right ventricle’s dilatation in turn leading to tricuspid valve insufficiency may resolve. We demonstrate an excellent outcome with PPVI in a PTFE conduit. Fortunately, the internal conduit diameter was enlarged without any complications from 16 mm to 18.5 mm at the narrowest position. The pulmonary valve’s z-score raises from -0.81 to +0.01 providing a new pulmonary valve’s conduit-to-patientsize enabling postpone open-heart surgery for several years. e enabling postpone open-heart surgery for several years.