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Melody® valve implantation in tetralogy of Fallot with acquired double right ventricular outflow tract.

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The authors, Paulo Valderrama, Fernando Ballesteros and Alejandro Rodríguez have not conflicts of interest related to the paper.
The author José Luis Zunzunegui is a physician proctor for Melody® valve.
Tetralogy of Fallot (ToF) is the most common cyanotic congenital heart defect (≈ 4.5%)\(^1\). Approximately, 5% have an anomalous coronary artery crossing the right ventricular outflow tract (RVOT)\(^2\).

A 14 year old girl with ToF and anomalous coronary artery crossing the RVOT and left atrial isomerism (also called polysplenia, is associated with paired left-sidedness viscera: left atrial appendages, bilobed lungs, long hyparterial bronchi, multiple small spleens and interruption of the inferior vena cava (IVC) with azygos continuation). After corrective surgery, immediate postoperative period was complicated by severe stenosis in RVOT and a 14mm Contegra\(^®\) valved conduit (Medtronic, Minneapolis, MN, USA) was implanted between the anterior wall of the RV and the pulmonary artery trunk in a non – anatomical position, avoiding the anomalous coronary artery and native RVOT. Ten years after surgery, patient was referred to our hospital, presenting severe stenosis and regurgitation in both the native RVOT and Contegra\(^®\) conduit, resulting in severe RV dilation (RVEDVi by CMR: 209ml/m\(^2\)) (Figure 1a).

Initial procedure to treat conduit dysfunction was performed through right internal jugular vein access (due to interruption of the IVC). Maxi LD 20 mm diameter balloon was used for conduit sizing and coronary compression test. The landing zone for Melody\(^®\) valve was created by implanting 2 overlapping CP stents (NuMED Inc., Hopkinton, NY, USA), mounted on a Maxi LD balloon, with resolution of both conduit stenosis at proximal and distal surgical anastomosis. The first 20 mm Melody\(^®\) valve was implanted with good angiographic results, and no regurgitation or residual stenosis. In a second elective procedure, the native RVOT was treated; selective coronary compression test with Maxi LD 20 mm diameter balloon demonstrated no dynamic coronary flow compromise, with right coronary
artery passing between both outflow tracts. In this case an AndraStent 43XL (Andramed, Reutlingen, Germany), mounted on a Maxi LD balloon first, and a second 20 mm Melody® valve was implanted with good angiographic and hemodynamic result. (Figure 1b)

At seven year follow-up, the patient showed marked clinical improvement as well as improved functional capacity, asymptomatic from a cardiovascular point of view with aspirin therapy.

Patients with anomalous coronary anatomy significantly increase operative morbidity and mortality and have an increased risk of coronary compression during PPVI.

According to our knowledge, this is the first report on two percutaneous Melody® valves implanted in a double RVOT with good angiographic and clinical results during a seven-year follow-up.
Figure legend:

Figure 1: Initial MRI (a) and final angiography in native RVOT (b). CP stent implanted in Contegra conduit (C) and Andrastent 43XL stent implanted in the native outflow tract (NOT). Selective coronary angiography (arrow) shows normal coronary flow in anomalous coronary artery (*) between both Melody® valves.

References:


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