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## **Hybrid Melody valve implantation in the tricuspid position in a 2.5-year-old boy with hypoplastic left heart syndrome**

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Tricuspid valve function has a significant impact on the systemic circulation and thus the survival and functional status of a patient after univentricular palliation of hypoplastic left heart syndrome [1]. Infants and young children with tricuspid regurgitation have limited options for prosthetic valve replacement due to the size of the tricuspid annulus (<15 mm).

A new perspective in this area of pediatric surgery is the use of a stented bovine jugular vein graft (Melody valve) with the intention of further valve expansion in the cathlab as the child grows [2]. In young children The Melody valve is predominantly implanted in the mitral position [2, 3]. Still, there are little data describing tricuspid valve replacement. We present a case of successful hybrid implantation of a Melody valve in the tricuspid position in a patient with single ventricle circulation.

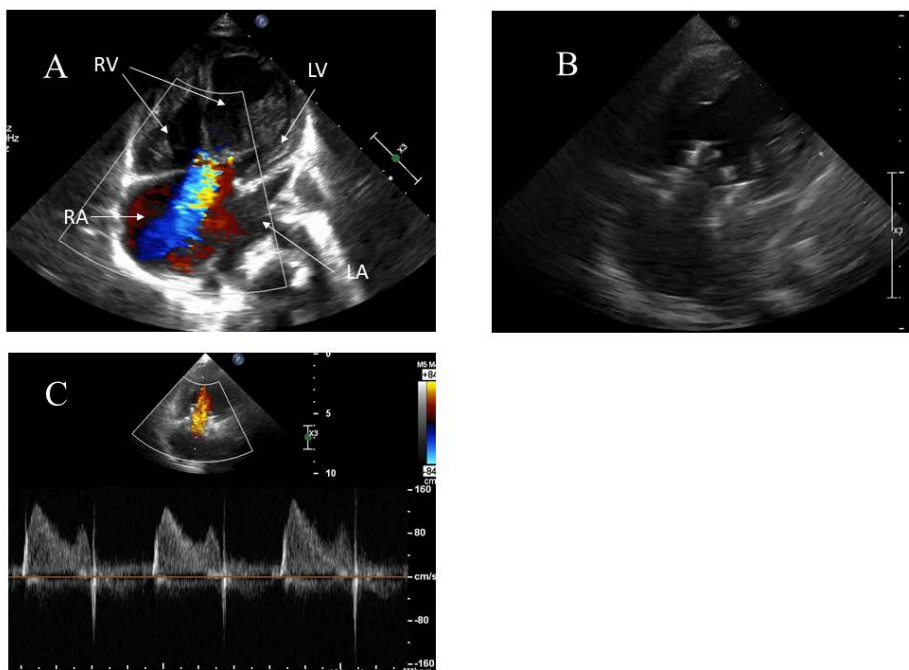
A 2.5-year-old boy with hypoplastic left heart syndrome, sick sinus syndrome, after cardiac surgery treatments, including a bidirectional Glenn shunt, was admitted to the cardiac department due to heart failure. Transthoracic echocardiography followed by transesophageal echocardiography revealed massive tricuspid regurgitation, with a reduced cardiac output (Figure 1A). Tricuspid insufficiency was present since birth. However, due to structural dysfunction of the valve, tricuspid regurgitation had markedly deteriorated over time. Despite intensification of heart failure treatment, the child's general condition failed to improve, and he was scheduled for surgery. The size of the atrioventricular annulus (14 mm) limited the prosthetic options. A hybrid procedure involving Melody valve implantation in the tricuspid position by right atriotomy was performed. Single prolene 5-0 sutures were placed on the atrioventricular valve annulus. The structure of the valve leaflets and subvalvular apparatus were left untouched. In the first stage of the Melody valve implantation, the stent was shortened by folding the distal edges on both sides. The valve was then mounted on a high-pressure balloon (Atlas gold) with a diameter of 20 mm. However, during inflation of the balloon, it moved outside the valve annulus. Therefore, the valve was mounted on a low-pressure balloon (Tyshak II) with a diameter of 20 mm. During inflation of the balloon, an optimal valve position was obtained. The valve was placed in the atrioventricular position using continuous sutures while reducing the diameter of the atrioventricular annulus. The patient underwent epicardial pacemaker implantation at the time of the Melody valve implantation.

The postoperative period was complicated by endocarditis, which was treated efficiently with antibiotics. At discharge, the mean echocardiographic Doppler gradient of the Melody valve in the tricuspid position was 3 mm Hg, and regurgitation was mild (Figure 1B, 1C). During 18 months of follow up, valvular function remained stable, thus Fontan procedure was performed. Severe tricuspid regurgitation which is a risk factor for mortality in children undergoing palliative procedures for hypoplastic left heart syndrome, can be reduced by successful tricuspid valve procedures [4]. Melody valve placement in the atrioventricular valve position is a new alternative in valve surgery for the youngest and most challenging patients with single ventricle who require surgical valve interventions.

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**Figure 1.** A. Massive regurgitation of the tricuspid valve in hypoplastic left heart syndrome. B. The Melody Valve implanted in the tricuspid position. C. The pulse wave Doppler flow of the Melody Valve in the tricuspid position before discharge.

Abbreviations: LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle