The onset of NET can lead to general and hemodynamic deterioration in these patients and therefore early diagnosis and treatment are essential to reduce the risk of complications. The signs and symptoms of these tumors overlap with those associated with complications of CCHD, such as arrhythmias, hypertension, and heart failure. Thus, the presence of NET should be suspected with the onset of new symptoms in patients with CCHD, even after surgical correction, as these tumors are a potentially treatable cause of clinical deterioration in these patients. A multidisciplinary approach, with tumor resection in a specialized center, is associated with a high success rate, even in this population at risk.[2] This treatment is effective and is associated with good short- and long-term prognosis.

CONFLICTS OF INTEREST

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REFERENCES

1. Oliver JM, González AE. Síndrome hipoxémico crónico. *Rev Esp Cardiol Supl.* 2009;9:13E–22E.
2. Filgueiras-Rama D, Oliver JM, Ruiz-Cantador J, et al. Pheochromocytoma in Eisenmenger's syndrome: a therapeutic challenge. *Rev Port Cardiol.* 2010;29:1873–1877.
3. Opotowsky AR, Moko LE, Ginns J, et al. Pheochromocytoma and paraganglioma in cyanotic congenital heart disease. *J Clin Endocrinol Metab.* 2015;100:1325–1334.
4. Thompson RJ. Current understanding of the O_2-signalling mechanism of adrenal chromaffin cells. In: Borges R, Gandía L, eds. In: *Cell biology of the chromaffin cell.* Madrid: Instituto Teófilo Hernando; 2004:95–106.

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Stented Bovine Jugular Vein Graft (Melody Valve) in Mitral Position. Could Be an Alternative for Mechanical Valve Replacement in the Pediatric Population?

Prótesis de yugular bovina con stent *(Melody) en posición mitral. ¿Posible alternativa a la prótesis mecánica en población pediátrica?*

To the Editor,

Congenital mitral valve disease is an uncommon condition. Medical treatment can be very complicated in some cases, leaving surgery as the only option. Surgical valvuloplasty often fails in children, especially in neonates and young infants, due to the presence of dysplastic valves with a small annulus and special anatomic features. In such cases, valve replacement is generally the only solution. We present 3 cases of Melody valve implantation in the mitral position.

Patient 1 was a 4-month-old infant weighing 4.6 kg with severe mitral regurgitation (MR) (valve with thickened leaflets, reduced mobility, and absence of central coaptation; annulus of 15 mm) that was refractory to medical treatment. Following Kay-Wooler annuloplasty, the boy showed moderate residual MR and was extubated, but he developed severe MR 14 days later and required ventilatory support. We decided to implant a Melody valve in the mitral position using the Boston technique[1] with some modifications.[2] Before initiation of extracorporeal circulation, the valve was expanded to 18 mm and a 3-mm pericardial sewing cuff was added to the center of the stent using loose sutures anchored to the strut chordae; the triangular struts at the proximal and distal ends of the stent were bent outwards, but the 3 struts supporting the valve commissures were left intact. The mitral valve was exposed using a superior transseptal approach. The posterior leaflet and its subvalvular apparatus and part of the anterior leaflet were resected, sparing the anterosuperior zone with its attachments to the anterior papillary muscle. The mitral prosthesis was crimped (6 mm) and attached to the posterior wall of the left ventricle to prevent left ventricular outflow tract (LVOT) obstruction during systole. The pericardial cuff was sutured to the native annulus and the valve was inflated to 4 atm with an 18-mm balloon (annulus diameter + 1). The cuff was tied down and the interatrial septum was reconstructed with a fenestrated pericardial patch (Figure 1). An intraoperative transesophageal echocardiogram (TEE) showed grade III periprosthetic MR. The valve was reinflated with a 22-mm balloon, and the outcome was favorable (grade I-II MR). No postoperative complications were observed and the patient was asymptomatic 9 months later. The echocardiogram revealed a mean mitral valve gradient of 3.6 mmHg and grade II periprosthetic MR. No LVOT obstruction was noted.

Patient 2 was a 7-month-old girl weighing 4.7 kg, who had been treated for complete atrioventricular canal defect at another hospital using the double-patch technique with cleft closure and the Alfieri technique, following pulmonary artery banding. Postoperative clinical course was indolent and the patient required prolonged hospital stay. The infant had a severe double mitral valve lesion and an annulus of 15 mm. She failed to thrive and developed heart failure despite maximum medical treatment. It was decided to implant the Melody valve in the mitral position using the technique described above, with expansion of the prosthesis to 17 mm. Intraoperative TEE showed no evidence of residual MR or LVOT obstruction (Figure 2). The patient was asymptomatic at the 7-month follow-up visit and had no residual lesions (mean gradient, 3 mm Hg; no MR).

Patient 3 was a 3-kg neonate with congenital aortic valve stenosis (peak gradient, 100 mm Hg). Valvuloplasty had been performed when the child was 2 days old, but the next day, extracorporeal membrane oxygenation was required due to ventricular dysfunction. The neonate was weaned off the oxygenation system after 5 days. The echocardiogram showed a residual aortic stenosis of 50 mmHg, a patent foramen ovale of 4 to 6 mm with a significant left-to-right shunt and moderate MR with

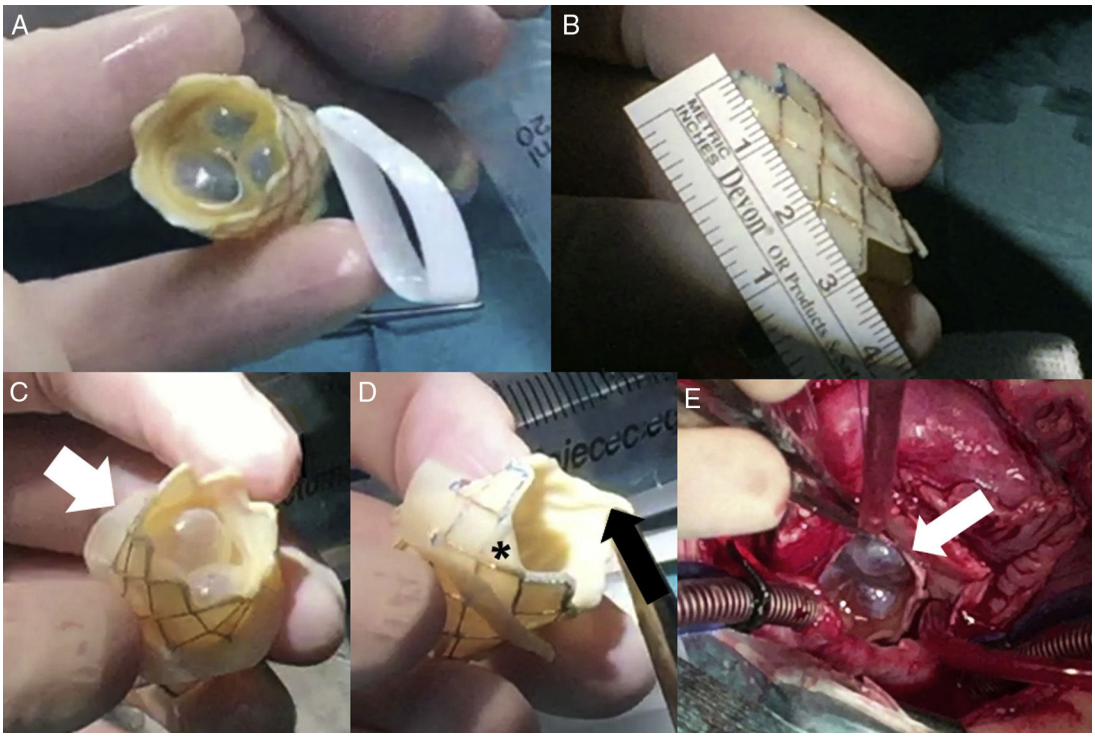

Figure 1. A and B: stented bovine jugular vein graft (Melody valve). C: sutured pericardial bovine cuff (arrow). D: triangular struts bent outwards (asterisk); the 3 struts supporting the valve commissures at the distal end are left intact (arrow). E: prosthesis implanted in the mitral position.

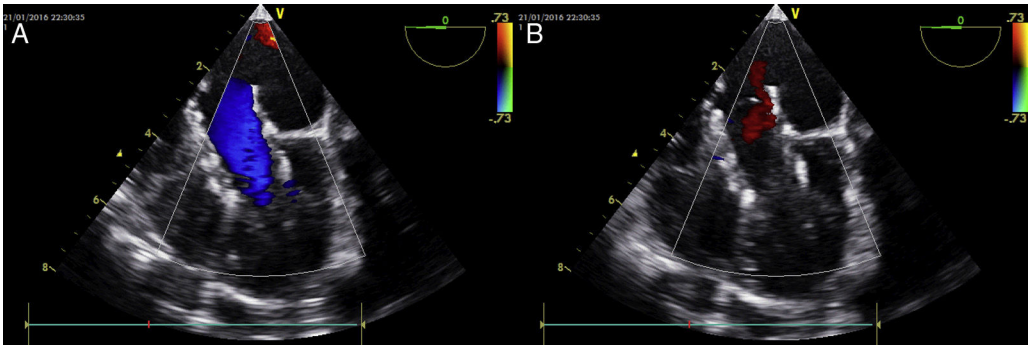

Figure 2. Transesophageal echocardiogram showing absence of stenosis (A) and regurgitation (B) with the implanted valve.

structural damage to the leaflets, and an annulus of 15 mm. Progress was not favorable and it was decided to perform a percutaneous aortic valvuloplasty and attempt to close the atrial septal defect. This was not possible, however, because the borders were too loose. After repeated failed attempts at extubation and episodes of low cardiac output, we decided to surgically close the atrial septal defect to force antegrade flow. Extubation, however, was still not possible. As MR appeared to have an important role in the patient's progress, it was decided to replace the mitral valve with a Melody valve expanded to 18 mm. Severe LVOT obstruction due to the prosthesis was observed at the pump outlet and the Ross-Konno procedure was performed immediately. The outcome was favorable, with disappearance of the LVOT obstruction and a normally functioning prosthesis. Postoperative recovery was slow due to lung damage. Two months after surgery the patient had grade II MR.

The search for alternatives to mechanical valve prostheses continues in pediatric settings. Major obstacles to the use of mechanical valves in young patients are a lack of suitably sized valves (the smallest valve available is 16 mm), the need for anticoagulation therapy, and failure to accommodate somatic growth. Different techniques such as supra-annular implantation[3] and the chimney mitral valve replacement technique[4] have been designed to reduce the risk of thrombosis by preventing the hemidiscs from becoming blocked by surrounding tissue. They do not, however, resolve the other problems mentioned. The Boston group recently described the use of the stented bovine jugular vein graft (Melody valve) in the mitral position.[5,6] This device offers several advantages: it can be implanted in very small annuli as it adapts to different diameters; it is theoretically possible to expand the valve percutaneously over time, and it avoids the need for anticoagulants because antiplatelet therapy is sufficient. Our initial experience with the Melody valve has been very positive, although we recognize the need to analyze the short- and mid-term durability of this prosthetic valve.

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REFERENCES

1. Emani SM. Melody valve for mitral valve replacement. *Oper Tech Thorac Cardiovasc Surg.* 2014;19:454–463.
2. Hofmann M, Dave H, Hübler M, et al. Simplified surgical-hybrid Melody® valve implantation for paediatric mitral valve disease. *Eur J Cardiothorac Surg.* 2015;47:926–928.
3. Kanter KR, Kogon BE, Kirshbom PM. Supra-annular mitral valve replacement in children. *Ann Thorac Surg.* 2011;92:2221–2227.
4. Gonzalez Rocafort A, Aroca A, Polo L, et al. Chimney technique for mitral valve replacement in children. *Ann Thorac Surg.* 2013;96:1885–1887.
5. Abdullah I, Ramirez FB, McElhinney DB, et al. Modification of a stented bovine jugular vein conduit (Melody valve) for surgical mitral valve replacement. *Ann Thorac Surg.* 2012;94:e97–e98.
6. Quiñonez LG, Breitbart R, Tworetsky W, et al. Stented bovine jugular vein graft (Melody valve) for surgical mitral valve replacement in infants and children. *J Thorac Cardiovasc Surg.* 2014;148:1443–1449.

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A Reversible Cause of Acute Right Ventricular Failure After Heart Transplant

Una causa reversible de fracaso ventricular derecho agudo tras el trasplante cardiaco

To the Editor,

We report the case of a 41-year-old man, who was an active smoker, with no prior history of cardiac conditions or other history of interest, and who was admitted to hospital for anterior ST-elevation myocardial infarction in Killip class IV. During admission, he experienced cardiac arrest unresponsive to advanced cardiopulmonary resuscitation. Peripheral venoarterial extracorporeal membrane oxygenation was used initially during the arrest and was subsequently switched to central extracorporeal membrane oxygenation. Intra-aortic balloon counterpulsation was also required. Coronary artery disease was detected in 3 vessels with chronic occlusion of the circumflex artery and right coronary artery and acute occlusion of the proximal left anterior descending

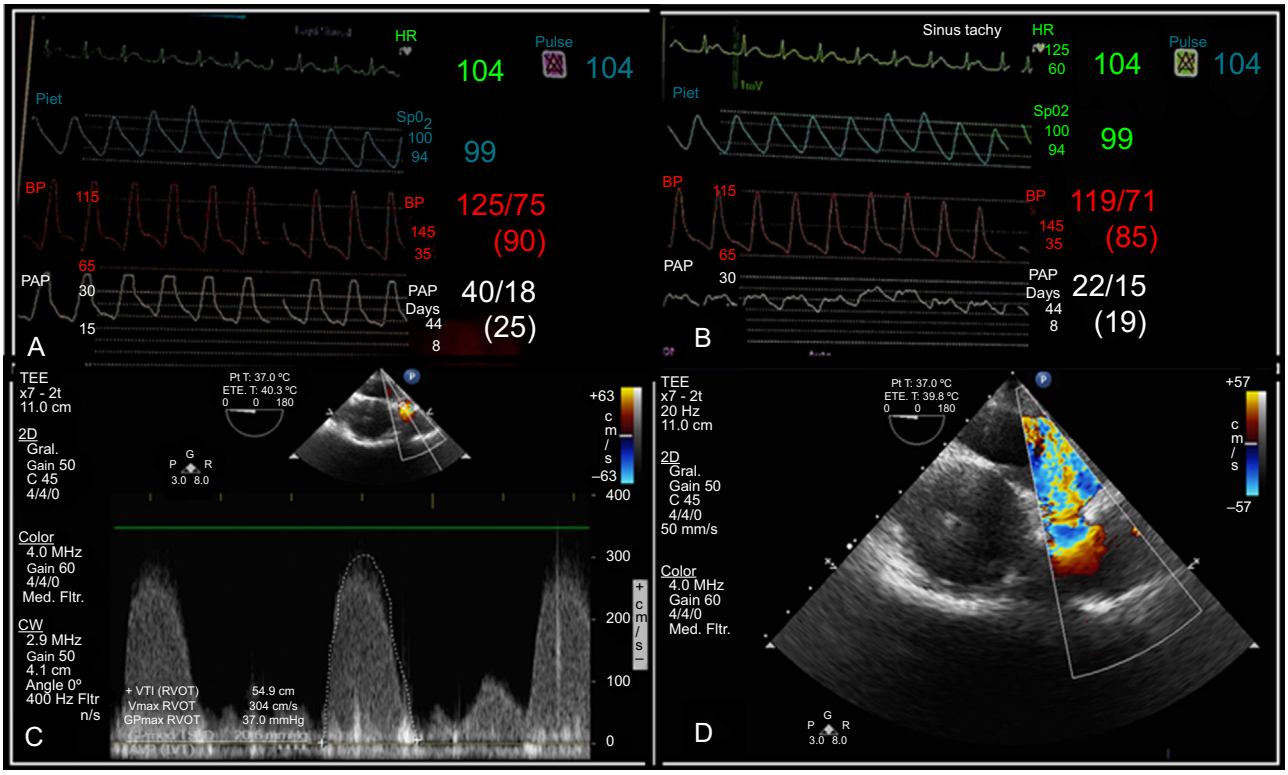

Figure 1. A and B, Swan-Ganz catheter measurements. A: pulmonary hypertension according to pulmonary artery pressure prior to stenosis of the pulmonary artery anastomosis. B: normal pulmonary artery pressures after the stenosis of the pulmonary artery anastomosis. C: stenosis of the pulmonary artery anastomosis: flow > 3 m/s, maximum gradient 38 mmHg. D: stenosis of the pulmonary artery along the short axis of the aortic arch at the level of the esophagus.