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Images in Congenital Cardiac Disease

Repair of an aorto-right ventricular tunnel in a newborn

Victoria C. Ziesenitz,[1] Matthias Gorenflo,[1] Tsvetomir Loukanov[2]

[1]*Department of Paediatric and Congenital Cardiology;* [2]*Department of Cardiac Surgery, Division of Congenital Cardiac Surgery, University Hospital Heidelberg, Heidelberg, Germany*

Abstract A newborn presented with an aorto-right ventricular tunnel, a defect connecting the left aortic sinus to the right ventricle. The patient underwent repair on 4th day of life.

Keywords: Aorto-right ventricular tunnel; aorto-ventricular tunnel; left–right shunt; aortic regurgitation; transaortic approach

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Aorto-right ventricular tunnel is a very rare congenital defect connecting the ascending aorta to the right ventricle, leading to pulmonary over-circulation, with <20 cases reported thus far.[1]

We describe the case of a newborn, delivered at 39 weeks of gestation, who was prenatally diagnosed with aorto-right ventricular tunnel. After birth (weight 3.4 kg), the patient presented with progressive heart failure and impaired biventricular function (Fig 1, Supplementary video 1). Doppler ultrasound showed high amplitude of the aortic pulse curve and reversed diastolic flow in the abdominal aorta. Cardiac catheterisation on the 2nd day of life including coronary angiography confirmed an aorto-right ventricular tunnel (diameter 3–5 mm, length 8 mm) with haemodynamically significant left-to-right shunt from the aorta to the right ventricle, systemic pressure in the dilated and hypertrophied right ventricle, and persistent arterial duct. The aorto-right ventricular tunnel and a small left coronary artery originated from the left posterior aortic sinus.

Corrective cardiac surgery was performed on the 4th day of life (see Supplementary videos 2–4). The aortic entry of the tunnel was closed by an autologous pericardial patch while sparing the left coronary artery. A transaortic approach was used to prevent damage to the aortic valve and a ventriculotomy. Follow-up echocardiography 14 months later showed good biventricular function, mild aortic regurgitation, and no residual aorto-ventricular tunnel.

In summary, aorto-right ventricular tunnel may cause progressive postnatal heart failure. Patch closure is the surgical procedure of choice for repair. It minimises shear stress on the aortic root and the risk for aortic regurgitation. Surgical precision is required to avoid coronary artery obstruction.

Correspondence to: Dr T. Loukanov, Department of Cardiac Surgery, Division of Congenital Cardiac Surgery, University Hospital Heidelberg, Im Neuenheimer Feld 430, D-69120 Heidelberg, Germany. Tel: +49 6221 56 6190; Fax: +49 6221 56 5585; E-mail: Tsvetomir.Loukanov@med.uni-heidelberg.de

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Conflicts of Interest

None.

Ethical Standards

This work is a retrospective case report. It was facilitated through the research database at the Department of Paediatric and Congenital Cardiology, which had been approved by the institutional Ethics committee of the Medical Faculty at Heidelberg University.

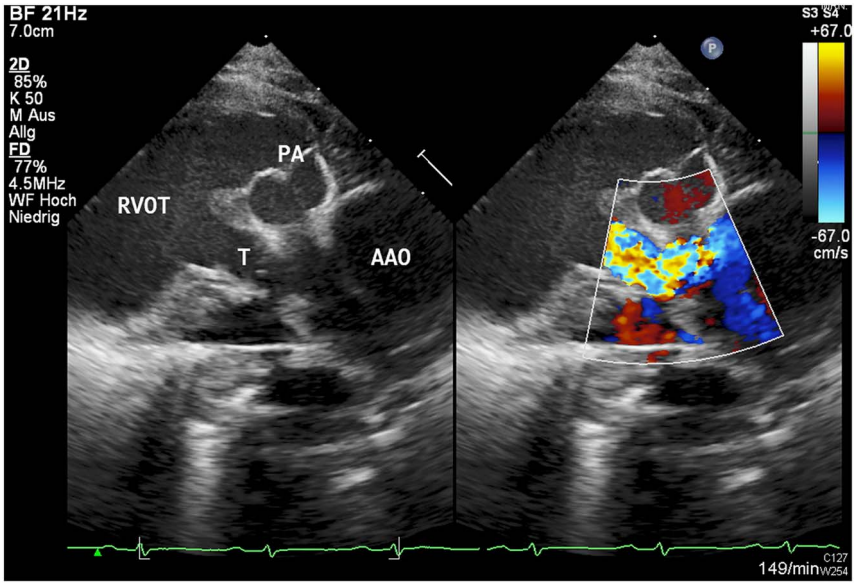

Figure 1.
Postnatal echocardiogram, parasternal long axis: a tunnel (T) connecting the ascending aorta (AAO) with the dilated right ventricle leading to a significant left–right shunt. The tunnel passes behind the free-standing subpulmonary infundibulum. PA = pulmonary trunk; RVOT = right ventricular outflow tract.

Supplementary materials

To view supplementary material for this article, please visit http://dx.doi.org/10.1017/S1047951115001572

Reference

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