

Midline crossing right pulmonary veins with dual drainage to the left atrium

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Abstract

We report the exceptional case of transcatheter treatment of a partial anomalous pulmonary venous drainage of the right lung to the innominate vein and dual drainage to the left atrium.

A 5-year-old Caucasian boy was referred for heart murmur. Echocardiography showed a dilated right ventricle, no atrial septal defect but a partial anomalous pulmonary venous return of the right lung into the innominate vein, which was confirmed by 3D CT (Movie 1). Cardiac catheterisation showed normal pulmonary artery pressures and a significant left-to-right shunt (Qp:Qs = 2). Pulmonary artery angiography with 3D rotational angiography confirmed partial anomalous pulmonary venous return of the entire right lung to a vertical vein (Fig 1A and B, plain arrow) connected to the innominate vein, whilst it unmasked a dual drainage of the three right pulmonary veins to the left atrium (Fig 1B, dotted arrows; Movie 2); the two left pulmonary veins were normally connected to the left atrium (Fig 1B, dotted arrows). Balloon occlusion test of the vertical vein using a 18 × 20 mm Tyshak-II balloon dilatation catheter with simultaneous pulmonary artery angiography demonstrated normal drainage of the three right pulmonary veins into the left atrium (Fig 1C). After multidisciplinary team discussion, transcatheter occlusion of the vertical vein was successfully performed using a 14 mm Amplatzer Vascular Plug-II (Fig 1D). The 1-year follow-up has been uneventful.

Partial anomalous pulmonary venous return is a rare CHD affecting 0.039% livebirths. Midline crossing of pulmonary veins is exceptional. Partial anomalous pulmonary venous

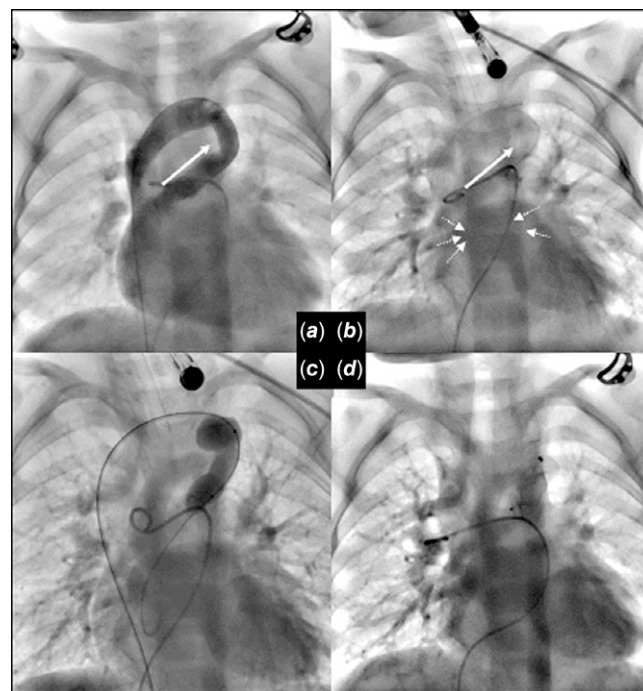


Figure 1. Panel A: Angiography into the vertical vein (anteroposterior view) showing a large drainage of the right lung into the innominate vein; Panel B: Levophase of pulmonary angiography showing (a) a normal drainage of both left and right pulmonary veins into the left atrium, associated with (b) an abnormal drainage of the right pulmonary veins into the innominate vein. This demonstrates partial anomalous pulmonary venous return of the right lung to the innominate vein (midline crossing) with dual drainage; Panel C: Balloon occlusion test of the vertical vein, confirming normal drainage of the three right pulmonary veins to the left atrium; Panel D: Transcatheter correction of the malformation using a vascular plug into the vertical vein.

return with additional drainage to the left atrium has been occasionally reported, allowing for transcatheter therapy, although world experience remains limited.¹ We believe clinicians should be aware of this rare entity and strive to look for it, as it may change the decision-making process, avoiding open-heart surgery.

Supplementary material. For supplementary materials referred to in this article, please visit <https://doi.org/10.1017/S1047951123000161>

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Conflicts of interest. A.-E.B. is consultant and proctor for Abbott and Occlutech. The other authors have nothing to disclose.

Ethical standards. The authors assert that all procedures contributing to this work comply with the Helsinki Declaration of 1975, as revised in 2008.

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