



Total or Partial? Rare Cases of Partial Anomalous Pulmonary Venous Return: Three Pulmonary Veins Connected to the Coronary Sinus

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Case 1 was a 7.5-month-old male patient weighing 7.3 kg, who had been hospitalized three times due to bronchiolitis/pneumonia. On physical examination, a 3/6 systolic ejection murmur was heard at the left upper sternal border, and his oxygen saturation (SpO₂) was 98%. Transthoracic echocardiography (TTE) revealed a patent foramen ovale with *left-to-right shunt*, moderate enlargement of the right ventricle, giant coronary sinus (CS) (Figure 1a, Video 1), and a partial anomalous pulmonary venous return (APVR) in which three pulmonary veins drained into the CS (Video 2). Computed tomography (CT) showed three pulmonary veins draining into the coronary sinus (Figure 1b, Video 3). This patient was referred to us with the diagnosis of total APVR.

Case 2 was a 9-month-old male patient weighing 8.5 kg. Similar to the first case, a 3/6 systolic ejection murmur was heard on physical examination. The patient's SpO₂ was 97%. TTE showed a small secundum atrial septal defect with a left-to-right shunt, enlargement of the right heart chamber, and drainage of three pulmonary veins into the CS. The diagnosis was confirmed by CT. The 3D PDF file of Case 2 demonstrates the modeling of three pulmonary veins that are drained into the CS (Appendix 1). This document is included in the 3D PDF HEART ATLAS project of the Turkish Society of Pediatric Cardiology and Cardiac Surgery. Both patients underwent surgery

by unroofing the CS, and tolerated the process well. Postoperative echocardiography showed unobstructed pulmonary venous drainage into the left atrium.

The pulmonary venous connection to the coronary sinus occurs in approximately 3% of partial APVR.¹ A careful echocardiographic evaluation is essential, and all pulmonary veins should be seen draining into the left atrium on TTE. Otherwise, partial APVR should be suspected. Additional examinations, such as Cardiac CT and magnetic resonance, and modeling of cardiac structures in 3D PDF can be performed to confirm the diagnosis.¹⁻³ The most important feature distinguishing partial APVR from total APVR is that the interatrial shunt is left-to-right in the partial APVR and right-to-left in the total APVR as observed in TTE.

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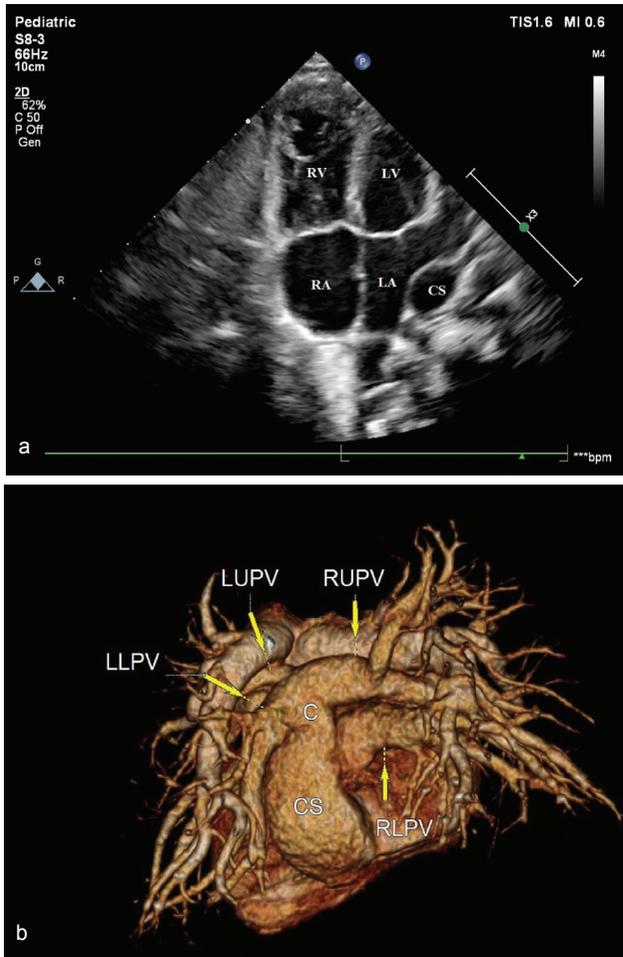


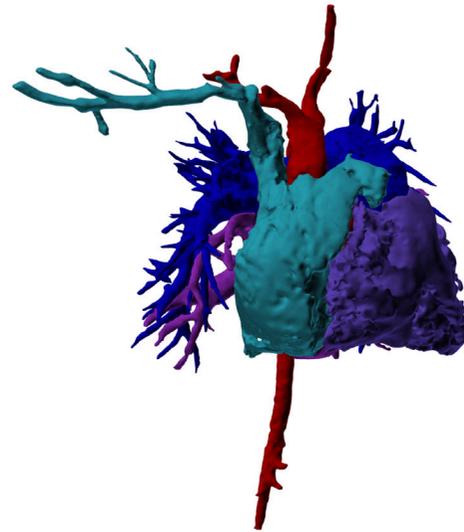
FIG. 1. a) Case 1: Transthoracic echocardiography reveals dilatation of the right heart chambers and the coronary sinus, b) Case 1; 3D-computed tomography (CT) angiography imaging shows that the coronary sinus is dilated, the right lower pulmonary vein is drained into the left atrium, and the other three pulmonary veins re drained separately into the coronary sinus.

CS, coronary sinus; LA, left atrium; LV, left ventricle; LLPV, left lower pulmonary vein; LUPV, left upper pulmonary vein; RA, right atrium; RLPV, right lower pulmonary vein; RUPV, right upper pulmonary vein; RV, right ventricle.

Informed Consent: Informed consent was obtained from the patient's parents.

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APPENDIX 1. The 3D PDF file of Case 2 demonstrates the modeling of three pulmonary veins that are drained into the coronary sinus.



Video 1.

Transthoracic echocardiographic four-chamber view shows the dilated right heart chambers and coronary sinus of Case 1.

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Video 2.

Echocardiographic subcostal sagittal view shows the PFO with left-to-right shunt and pulmonary veins draining into the coronary sinus of Case 1.

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Video 3.

3D-computed tomography imaging shows the dilated coronary sinus, and three pulmonary veins drained into the coronary sinus of Case 1.

10.4274/balkanmedj.galenos.2023.2023-2-65.video3

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