

Supplement Table 1. Cardiac phenotype of each heterotaxy patient.

Phenotypes of the patients	
ID	Cardiac phenotype
CHD 1	Interrupted inferior vena cava, atrioventricular septal defect, malrotation, transverse liver
CHD 4	Double outlet right ventricle, mitral atresia, malrotation
CHD 8	Bilateral superior vena cava, right ventricle dominant atrioventricular septal defect, malposed great vessels, pulmonary atresia, total anomalous pulmonary venous return, malrotation
CHD 11	Interrupted inferior vena cava, bilateral superior vena cava, common atrium, atrioventricular septal defect, pulmonary stenosis
CHD 12	Left superior vena cava, atrioventricular septal defect, transposition of the great arteries, pulmonary atresia, total anomalous pulmonary venous return, malrotation, right-sided stomach, asplenia
CHD 15	No right superior vena cava, unbalanced atrioventricular septal defect, double outlet right ventricle, pulmonary stenosis, transverse liver, asplenia
CHD 17	Left sided inferior vena cava, unbalanced atrioventricular septal defect, double outlet right ventricle, pulmonary atresia, total anomalous pulmonary venous return, transverse liver, asplenia
CHD 19	Interrupted inferior vena cava, normal intracardiac anatomy, duodenal atresia, transverse liver
CHD 32	Hepatic veins drain separately into the right atrium, right ventricle dominant atrioventricular septal defect, double outlet right ventricle, mitral atresia, total anomalous pulmonary venous return, malrotation, transverse liver, asplenia
CHD 34	Interrupted inferior vena cava, right ventricle dominant atrioventricular septal defect, pulmonary stenosis, bilaterally symmetrical pulmonary venous return, malrotation, transverse liver, polysplenia
CHD 37	Interrupted inferior vena cava, right ventricle dominant atrioventricular septal defect, transposition of the great arteries, pulmonary atresia, total anomalous pulmonary venous return, malrotation
CHD 38	Interrupted inferior vena cava, bilateral superior vena cava, malposed great vessels, bilaterally symmetrical pulmonary venous return, right-sided stomach, transverse liver
CHD 41	Interrupted inferior vena cava, separate hepatic venous drainage, common atrium,

	functionally single dominant left ventricle, malposition of the great vessels, pulmonary stenosis
CHD 44	Atrioventricular septal defect, double outlet right ventricle, pulmonary stenosis, total anomalous pulmonary venous return, malrotation, transverse liver, asplenia
CHD 48	Interrupted inferior vena cava, hepatic venous drainage into left-sided atrium, bilateral superior vena cava, double outlet right ventricle, pulmonary stenosis, ipsilateral pulmonary venous return, malrotation
CHD 51	Interrupted inferior vena cava, hypoplastic left side, coarctation of the aorta
CHD 53	Heart positioned in midline, double outlet right ventricle, malrotation, transverse liver, asplenia
CHD 59	Interrupted inferior vena cava, atrioventricular septal defect
CHD 69	Bilateral superior vena cava, common atrium, atrioventricular septal defect, aortic stenosis, ipsilateral pulmonary veins
CHD 71	Left inferior vena cava, double outlet right ventricle, atrioventricular septal defect, pulmonary stenosis, total anomalous pulmonary venous return, transverse liver, right-sided stomach, asplenia
CHD 77	Interrupted inferior vena cava, hepatic venous drainage separate into right-sided atrium, ipsilateral pulmonary venous return, malrotation, right-sided stomach, transverse liver
CHD 82	Interrupted inferior vena cava, right ventricle dominant atrioventricular septal defect, double outlet right ventricle, pulmonary stenosis
CHD 83	Left sided inferior vena cava, left superior vena cava, unbalanced atrioventricular septal defect, transposition of the great vessels, pulmonary atresia, partial anomalous pulmonary venous return, asplenia
CHD 90	Interrupted inferior vena cava, hepatic venous drainage left of midline, bilateral vena cava, right ventricle dominant atrioventricular septal defect, double outlet right ventricle, hypoplastic aortic arch, right-sided stomach
CHD 95	Interrupted inferior vena cava, hepatic venous drainage into right-sided atrium, right ventricle dominant atrioventricular septal defect, double outlet right ventricle, pulmonary atresia
CHD 102	Hepatic venous drainage into the common atrium on left of midline, no right superior vena cava, left superior vena cava with hemiazygos continuation, atrioventricular septal defect, functionally single ventricle, pulmonary stenosis, malrotation, right-sided stomach, polysplenia

CHD 103	Left superior vena cava, no right superior vena cava, hepatic venous drainage separate into right-sided atrium, right ventricle dominant atrioventricular septal defect, coarctation of the aorta
CHD 116	Bilateral vena cava, right ventricle dominant atrioventricular septal defect, total anomalous pulmonary venous return, double outlet right ventricle
CHD 131	Bilateral superior vena cava, right ventricle dominant atrioventricular septal defect, double outlet right ventricle, pulmonary stenosis, polysplenia
CHD 141	Inferior vena cava to base of common atrium, bilateral superior vena cava, right ventricle dominant atrioventricular septal defect, pulmonary atresia, ipsilateral pulmonary venous return
CHD 149	Double outlet right ventricle, right ventricle dominant atrioventricular septal defect, pulmonary atresia, total anomalous pulmonary venous return, asplenia
CHD 154	Interrupted inferior vena cava, atrial septal defect
CHD 186	Hepatic venous drainage to midline of right-sided atrium, bilateral vena cava, atrioventricular septal defect, pulmonary atresia, total anomalous pulmonary venous return, malrotation
CHD 189	Interrupted inferior vena cava, common atrium, atrioventricular septal defect, ipsilateral pulmonary venous return, right-sided stomach
CHD 198	Interrupted inferior vena cava
CHD 204	Left-sided inferior vena cava, bilateral superior vena cava, common atrium, upstairs-downstairs ventricles, right-sided stomach, transverse liver, polysplenia
CHD 437	Interrupted inferior vena cava, double outlet right ventricle, right ventricle dominant atrioventricular septal defect, malrotation
CHD655	Ventricular septal defect, malrotation, polysplenia
CHD678	Bilateral superior vena cava, transposition of the great arteries, pulmonary atresia, ventricular septal defect, asplenia, right sided stomach and transverse liver
CHD 707	Interrupted inferior vena cava, aortic valve hypoplasia, right sided stomach
CHD 765	Hepatic veins drain to the right side of the common atrium, interrupted inferior vena cava, left superior vena cava, absent right superior vena cava, common atrium, atrioventricular septal defect, transposition of the great vessels, pulmonary atresia
CHD 770	Interrupted inferior vena cava
CHD 880	Interrupted inferior vena cava, atrioventricular septal defect

CHD 907	Right ventricle dominant atrioventricular septal defect, mitral atresia, aortic valve atresia, aortic hypoplasia
CHD1067	Interrupted inferior vena cava, atrioventricular septal defect, transposition of the great arteries, right sided stomach
CHD 1142AF	Malposed great arteries with an anterior, hypoplastic pulmonary artery, right ventricle dominant atrioventricular septal defect, left AV valve atresia, total anomalous pulmonary venous return
CHD 1169	Bilateral superior vena cava, right ventricle dominant atrioventricular septal defect, double outlet right ventricle, pulmonary stenosis, total anomalous pulmonary venous return, transverse liver