Criss-cross heart (CCH), also called superoinferior ventricles or upstairs-downstairs heart, is a complex congenital cardiac anomaly characterized by crossing of inflow streams of two ventricles, due to apparent twisting of the heart on its long axis. We report the images of a rare case of CCH in which there was visceral situs solitus and atrial inversion with juxtaposed atrial appendages.

A 16-year-old boy presented with central cyanosis and pan-digital clubbing. Two-dimensional trans-thoracic echocardiogram (2D TTE) and real-time 3D TTE (GE Vivid 7 System) revealed the aorta (Ao) and inferior vena cava (IVC) situated to the left and right of vertebra (Ve), respectively (Fig A, Video 1*). The IVC was draining into the left-sided morphologic right atrium (RA) as per the veno-atrial concordance rule, and was confirmed by injection of agitated saline into the left antecubital vein (Fig. B, Video 2*). On standard apical four-chamber (A4C) view, all four chambers could not be visualized, only the morphologic left atrium (LA) draining into the morphologic left ventricle (LV) (Fig. D, arrow indicating direction of blood flow, Videos 4, 6*). Tilting the probe downwards revealed an anteriorly placed morphologic right ventricle (RV) receiving blood from the morphologic RA (Fig. C, arrow indicating direction of blood flow, Videos 3, 7*). The inflow axes of RA-RV and LA-LV were intersecting rather than parallel. Associated lesions were large ventricular septal defect (VSD) and ostium-secundum atrial septal defect (ASD) with juxtaposition of atrial appendages, as both appendages were positioned on the left side (Fig. C, D).