

Criss-cross heart with atrial inversion and juxtaposed atrial appendages: an echocardiographic study

Atriyumların ters yerleşimi ve atriyum apendikslerinin bitişik konumu ile birlikte “criss-cross” kalp: Bir ekokardiyografik çalışma

Supertiksh Yadav

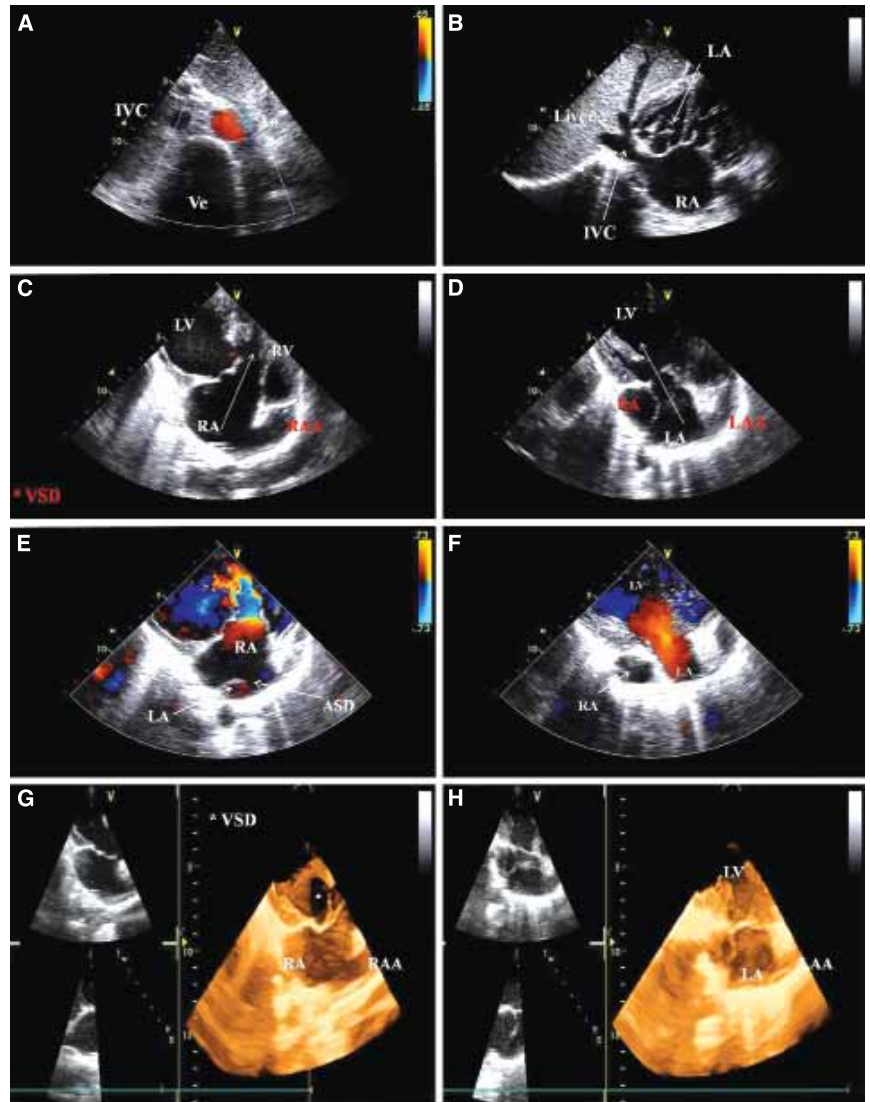
Pradeep Eswarappa Haranahalli

Malay Shukla

Chandra Mohan Varma

Department of Cardiology,
L.P.S. Institute of Cardiology,
Ganesh Shankar Vidhyarthi Memorial
Medical College, Kanpur, India

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 transthoracic 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).



Figures– (A) Abdominal situs solitus; (B) Atrial inversion; (C, D) Arrow showing direction of blood flow across atrioventricular valves; (E, F) Color Doppler showing direction of blood flow across atrioventricular valves; (G, H) Showing Fig. C and Fig. D in 3D echocardiography. *Supplementary video files associated with this presentation can be found in the online version of the journal.

