A 62-year-old man was admitted to our hospital because of cerebral infarction. Interestingly, oxygen saturation declined from 92% in supine to 78% in the upright position. Transesophageal echocardiography revealed the atrial septal defect (ASD) 10 mm in diameter. Although color Doppler demonstrated only left-to-right shunt, contrast imaging revealed mild bidirectional shunt in the supine position (A and B, Online Videos 1 and 2). Surprisingly, massive right-to-left shunt occurred in the upright position (C and D, Online Videos 3 and 4).

Multislice computed tomography in the upright position demonstrated the right-to-left shunt through the ASD (E, arrowhead) and the compressed right atrium by elongated aorta that might enhance right-to-left shunt (E, arrows). There was no evidence of pulmonary hypertension; thus, the patient was diagnosed as platypnea-orthodeoxia syndrome associated with ASD, which was confirmed on surgery to be closed (F, arrow). Ao = aorta; LA = left atrium; LV = left ventricle; RA = right atrium.