A 39-year-old woman, with combined thoracic deformities of the pectus excavatum and scoliosis, was referred for further evaluation of postural desaturation. She presented with oxygen saturation (SpO₂) of 94% in the supine and 79% in the upright positions. Chest radiography showed a depressed sternum and straight dorsal spine, and the distance between the sternum and vertebra decreased to 7.3 cm in the upright position (Figure A–C). On transesophageal echocardiography a crescent-shaped atrial septal defect (ASD) was noted on the top of the floppy atrial septum and a prominent Eustachian valve (EV), both of which formed a tubular path from the inferior vena cava (IVC) toward the ASD (Figure D,E). Computed tomography showed right heart compression by the sternum and spine, which forced the floppy septum primum to shift down with the ASD widely open to the IVC (Figure C,F,G). This right-to-left shunting from the IVC toward the ASD was clearly visualized on phase-contrast cine magnetic resonance imaging (Movie S1). Venography from the IVC indicated more conspicuous right-to-left shunting along the EV and mobile septum (Figure H; Movie S2), compared with that from the superior vena cava. A 21-mm Occlutech Figulla Flex II Occluder® (Occlutech, Jena, Germany) was successfully implanted, with subsequent improvement in SpO₂ to 97% in the upright position. Multimodality imaging successfully visualized the multifactorial causes of platypnea-orthodeoxia syndrome in a young woman without pulmonary hypertension or aging-related problems, which included combined thoracic deformities, a prominent EV, and the eccentric shape and position of the ASD.

Disclosures
The authors declare no conflicts of interest.

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Supplementary Files

Movie S1. Phase-contrast cine magnetic resonance imaging showing right-to-left shunting flow (white on the right image) from the inferior vena cava toward the atrial septal defect.

Movie S2. Venography with a cranial-left anterior oblique projection from the inferior vena cava (IVC). Contrast medium from the IVC drains mainly into the left atrium (LA) through a tubular path formed by the atrial septum and a prominent Eustachian valve. Note: the floppy, mobile septum plays an important role in drawing contrast medium from the IVC into the LA.

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