

CORRESPONDENCE

LETTER TO THE EDITOR

Anatomical Constellations for Upright Hypoxemia



To the Editor:

Mima *et al.*¹ reported a rare case of platypnea-orthodeoxia. While the cause of this syndrome remains debated, predisposing anatomical and physiological factors must always be present. These include incompletely sealed interatrial septum with presence of atrial septal defect or patent foramen ovale and reversal of dominant pressure between atrial cavities when the patient's posture is changed from supine to upright, to facilitate right-to-left shunt of deoxygenated blood.

The anatomical features of the patient presented by Mima *et al.* have striking resemblance to those reported earlier by our group,² namely, elevated right hemidiaphragm, enlarged horizontally positioned aortic root, and resulting compression of the relatively small right atrium (RA; [Figure 1](#)).

It could be postulated that such a constellation of anatomical distortions leads to a further RA compression between the diaphragm and aortic root in the upright position, elevating RA pressure sufficiently to transiently exceed left atrial pressure. In addition, the angle of entry of the intrahepatic portion of the inferior vena cava (IVC) is possibly changing, so that the inflow of blood is directed more toward the atrial septal defect, as seen in fetal circulation.

Future dynamic three-dimensional studies of patients with platypnea-orthodeoxia may provide better insights into volumetric and geometrical postural changes of the RA. Careful planimetry could help to shine some light on postural changes in the angle of IVC entry into the RA, particularly in patients with elevated right hemidiaphragm. Incorporation of dynamic vorticity studies in echocardiographic assessment may better inform about blood inflow entering the RA from the IVC and the spatial relationship between inflow vortex and interatrial septum in this group of patients. Lastly, patients who present with symptoms of hypoxemia in the presence of anatomical

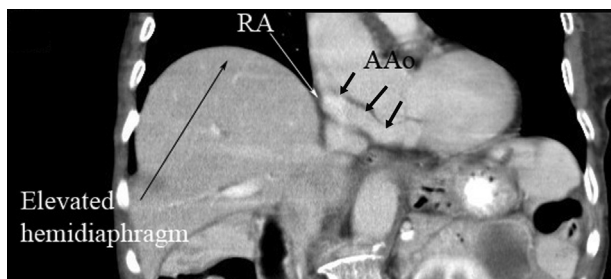


Figure 1 Computed tomography of the chest demonstrated elevated right hemidiaphragm (*single long black arrow*), horizontally positioned dilated aortic root (*thick black arrows*), and a small compressed and geometrically distorted RA (*white arrow*).

features highlighted by these 2 cases should be routinely assessed by dynamic echocardiography with bubble contrast to help exclude platypnea-orthodeoxia.

ETHICS STATEMENT

The authors declare that the work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans.

CONSENT STATEMENT

Complete written informed consent was obtained from the patient (or appropriate parent, guardian, or power of attorney) for the publication of this study and accompanying images.

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DISCLOSURE STATEMENT

The authors report no conflict of interest.

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