Mechanisms of Platypnea-Orthodeoxia: What Causes Water to Flow Uphill?

To the Editor:

Platypnea-orthodeoxia is a relatively uncommon but striking clinical syndrome characterized by dyspnea and deoxygenation accompanying a change to a sitting or standing from a recumbent position. Since Burchell et al.1 described this rare syndrome over half a century ago, no more than 50 cases have been reported in the literature.2

Two conditions must coexist to cause platypnea-orthodeoxia: an anatomical component in the form of an interatrial communication and a functional component that produces a deformity in the atrial septum and results in a redirection of shunt flow with the assumption of an upright posture. The former may be an atrial septal defect, a patent foramen ovale, or a fenestrated atrial septal aneurysm. The latter may be cardiac, such as pericardial effusion or constrictive pericarditis; pulmonary, such as emphysema, arteriovenous malformation, pneumonectomy, or amiodarone toxicity; abdominal, such as cirrhosis of the liver or ileus; or vascular, such as aortic aneurysm or elongation.2

Under normal conditions an interatrial communication allows blood to shunt from left to right due to a higher pressure in left atrium than right atrium and a greater compliance of the right ventricle than the left ventricle. Right-to-left interatrial shunting is usually associated with spontaneous or induced pulmonary hypertension and, therefore, in the absence of a right-to-left pressure gradient, what is the mechanism for a right-to-left shunt? Or put in another way, what causes water to flow uphill?2

A persistent Eustachian valve can cause interatrial right-to-left shunting with a normal right atrial pressure.3 Platypnea-orthodeoxia could be explained on the basis of positional modification of abnormal shunting. Standing upright could stretch the interatrial communication, be it a patent foramen ovale, an atrial septal defect, or a fenestrated atrial septal aneurysm, thus allowing more streaming of venous blood from inferior vena cava through the defect, whether or not a persistent Eustachian valve coexists.3 This redirection of flow caused by an anatomic distortion of the right atrium or the atrial septum also might occur from a loculated pericardial effusion, an aortic aneurysm, or aortic elongation.2

The elegant echocardiographic demonstration by Medina et al.4 is an example of the last mentioned situation. The readers are referred to my recent editorial for a more detailed discussion of the etiology, differential diagnosis, and management of platypnea-orthodeoxia.2 Suffice it to say that the definitive treatment for platypnea-orthodeoxia is closure of the interatrial communication, which can be carried out nowadays by transcatheter techniques,5 as was done in the case of Medina et al.4

Response

We appreciate very much Dr Cheng’s comments regarding the definition, pathophysiology, differential diagnosis, and management of platypnea-orthodeoxia syndrome, and we completely agree with them.1

From our point of view, Dr Cheng’s articles2–4 help explain the underlying mechanisms of this condition and offer current recommendations for its treatment.

Alfonso Medina, MD
Chief of Cardiology Department
Hospital Dr. Negrín
University of Las Palmas
Las Palmas, Spain
E-mail amedina@idecnet.com

Jose Suarez de Lezo, MD
Hospital Reina Sofia
University of Córdoba
Córdoba, Spain

Eduardo Caballero, MD
Jose Ramon Ortega, MD
Hospital Dr. Negrín
Las Palmas, Spain

References

Mechanisms of Platypnea-Orthodeoxia: What Causes Water to Flow Uphill?
Tsung O. Cheng

Circulation. 2002;105:e47
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2002 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/105/6/e47

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org/subscriptions/