Commentary on Viewpoint: Is left ventricular volume during diastasis the real equilibrium volume, and what is the relationship to diastolic suction?

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TO THE EDITOR: Zhang et al. (6) elegantly discuss the concept of diastasis (static equilibrium volume) and diastolic suction and address the idea that diastasis provides a measure of ventricular equilibrium. While this definition provides a very useful working model, one must also consider differences between early diastolic filling and diastolic suction when examining ventricular function. Inasmuch as it is the filling pressure and diastolic suction that create the atrial-ventricular pressure gradient at the mitral valve that results in early diastolic filling, and ultimately an equilibrium volume (4), the concept of using a measure of diastasis to determine diastolic suction may only apply if filling pressure is zero.

Any change in blood volume, such as seen with moderate exercise training or following bed rest/spaceflight, will alter atrial pressure and the atrial-ventricular pressure gradient, and, as such, will alter the equilibrium volume (2, 3, 5). Thus changes in filling pressure may manifest as an increase in diastolic suction if observations are made using static equilibrium volumes. Furthermore, transition from upright to supine posture will change right atrial pressure (5). This is particularly relevant as many activities are performed in an upright position, while M-mode echo measuring the static equilibrium volume is made in the supine position.

While it is clear the method of Zhang et al. can be effective in examining early diastolic filling, methods such as MRI tagging that directly examine the ability of the left ventricle to relax under a variety of conditions may provide a more precise measurement when filling pressure and/or blood volume is changing (1).

REFERENCES

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