To the Editor:

Recently, we read the fine article by Scantlebury et al1 titled, “Limitations of Doppler Echocardiography in the Evaluation of Serial Stenoses,” which was published in Circulation: Cardiovascular Imaging. Although we compliment the authors for highlighting the limitations of Doppler Echocardiography in the evaluation of serial left ventricular outflow tract stenoses, we do raise the point that we think that their assumption to calculate the pressure gradient across $y$ as $\Delta P = 4(V_1^2 - V_2^2)$ is not appropriate (Figure 2B) and leads to the pressure gradient curve (shown in blue) in Figure 3A.2

From the hemodynamic point of view, it does not make sense that negative gradients occur in mid- to late systole. This phenomenon is attributable to the fact that velocity, $V_2$, is not corrected to account for pressure recovery and not to the Bernoulli equation.

In an article by Garcia et al,2 a new index based on the energy loss concept is presented. The energy loss ($E_L$) can be expressed by using EOA as follows:

$$E_L = 4V_2^2 \left( 1 - \frac{EOA}{A_A} \right)^2$$

where EOA and $A_A$ are expressed in cm$^2$, and $V_{vc}$ corresponds to $V_2$.

EOA can be determined by 3D echo, whereas $A_A$ is the area of the aortic annulus. Viscous losses in these cases are associated with underestimation of the pressure gradient and must not be taken into account.

In summary, if we correct $V_2$ for energy loss, the gradient through the aortic valve will no longer be overestimated.

Disclosures
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References
Letter by Martin and Jenni Regarding Article, "Limitations of Doppler Echocardiography in the Evaluation of Serial Stenoses"
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