Re: Evaluation of Left Atrial Volumes and Ejection Force by Real-Time Three-Dimensional Echocardiography

We are pleased that Dr Nemes and his colleagues are interested in our study on real-time three-dimensional echocardiography (RT3DE) for calculation of left atrial ejection force (LAEF).1 We also appreciate their studies on the utility of LAEF on hypertrophic cardiomyopathy (HCM) and noncompaction cardiomyopathies (NCCM).2

However, we believe that a proper method for calculating LAEF is necessary and useful. The study by Anwar et al2 differs from ours in several important aspects. Firstly, the formulation used in the study by Anwar et al2 is adopted from Manning et al3 (0.5 x 1.06 x MVA x A2), which is different from ours (1/3 x 1.06 x MAA x A2).1 Secondly, peak A velocity is measured at mitral valve leaflet.2 Ideally, peak A velocity must also be measured by putting the sample volume at the mitral orifice annulus. We found that peak A velocity measured at mitral valve leaflet are systemically higher than that measured at the mitral annulus. The use of peak A velocity measured at the mitral valve leaflet would hence overestimate LAEF substantially. Lastly, the timing of mitral annulus area (MAA) measurement from RT3DE should be measured at the instant of p-wave of ECG (this corresponds to atrial systolic contraction phase in Figure 1).4

LAEF, defined as the force expended by the atrium to eject the blood through the mitral valve during atrial systole, has played a more important role in diverse heart diseases.2,5,6 We would look forward to see the study use three-dimensional speckle-tracking echocardiography for LAEF assessment,4 with consideration of our modified formulation.

REFERENCES

Liang Zhong,1 PhD, Reginald Liew,1 MBBS (Hons), MRCP, PhD, Zee Pin Ding,1 MBBS, MMed (Int Med)
1Department of Cardiology, National Heart Centre, Singapore

Address for Correspondence: Dr Liang Zhong, National Heart Centre Singapore, Mistri Wing 17 Third Hospital Avenue, Singapore 168752.
Email: zhong.liang@nhcs.com.sg

Fig. 1. Proper calculation of LAEF (1/3 x 1.06 x MAA x A2)1, wherein MAA is the mitral annulus area from RT3DE, A is the peak A velocity measured by putting sample volume at the mitral orifice annulus from the Doppler echocardiography.