Editorial

Muscle mechanics by velocity vector imaging—questioning the questions themselves!

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For decades, assessment of left ventricular (LV) ejection fraction (EF) has been the predominant parameter for assessing LV systolic function. In recent years, there is broadening of understanding of myocardial myofibre structure, which has paved the way for more comprehensive understanding of myocardial mechanics. The deformation characteristics of myocardium or strain, and its quantitation is complex. The enthusiasm of studying myocardial mechanical function using tissue Doppler-derived strain, faced criticisms with regard to angle dependency, noise interference, and inter as well as intra-observer variability.¹ Speckle tracking echocardiography (ECHO) emerged as an alternative technique, that analyses tissue motion, by tracking natural acoustic reflections, and resolved angle dependency of tissue Doppler-derived strain.² As echocardiographers across the globe were trying to decipher the differences between 'Lagrangian' and 'Eulerian' strain, and conceptualise the LV mechanical function in three-dimensions (3D), there was a 'twist' to the tale. The concept of 'rotation', 'twist', and 'torsion' came to the fore-front.³ While some used the terms interchangeably, others emphasised the subtle differences. Another major highlight was the concept of 'wringing' motion of the heart in systole with storage of potential energy. This potential energy is released back like a spring uncoiling and generating suction force for a rapid early diastolic filling. With stiffness of myocardial fibres, delayed untwisting attenuates LV filling with concomitant rise in LV filling pressures. The sub-endocardial region which is the most vulnerable region to ischaemia, governs LV longitudinal mechanics. Hence, circumferential and radial strain may remain normal or even exaggerated to compensate for preserving LV systolic function.⁴ In other words, LVEF may be a poor indicator of LV systolic function.

Velocity vector imaging (VVI) is a novel imaging technique based on detecting speckles from the myocardium with

two-dimensional (2D) ECHO analysing motion in different directions and is angle independent.⁵ It can be used to study cardiac mechanics and quantify global and regional cardiac function. In this issue, Narayanan et al.,⁶ in the article 'Assessment of LV systolic function by VVI' have compared global LVEF assessed by VVI, 2D ECHO and single photon emission computed tomography (SPECT). The results question the accuracy of VVI tracking algorithm as it underestimated LVEF as compared to SPECT. It would have been interesting to see the results of regional function in this study. Unfortunately, the authors failed to address this issue which is a limitation of this study. However, the authors deserve appreciation for boldly declaring the results which is not aligned to the existing belief.

While eulogies pertaining to new imaging technologies are easier to sight in the literature, negative studies are often ignored. This brings to fore-front a study which used 2D and 3D speckle tracking technique.⁷ There was underestimation of LV volumes with 2D speckle tracking ECHO as compared to 3D speckle tracking. The advantage of 3D speckle tracking is the evaluation of the motion of all myocardial segments in a single analysis step. In a single beat, the rotational mechanics of LV can be performed more accurately. However, the data on muscle mechanics with 3D ECHO is small and needs further elucidation.

At present, there are more questions than answers and questions questioning the questions themselves with regard to assessment of muscle mechanics by ECHO. Definitely, we will have more answers tomorrow, but understanding tomorrow, a day ahead, is not a contradiction of terms.

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CardioSiteIndia

There has been a long standing need for an online portal for the Cardiologists and Internists in India that would help in keeping them updated about the recent happenings in the field of cardiology. Keeping this in mind, the website CardioSiteIndia (www.cardiositeindia.com) has been launched.

CardioSiteIndia is unique in terms of its offerings. It is a highly activity-driven forum that provides its members with an opportunity to network upload PPTs and videos, share journal reviews and receive the latest updates in the field of cardiology from all over the world.

Following are the salient features of CardioSiteIndia:

- Journal reviews and views of the cardiology community of India.
- Case of the month.
- Hot topic of the week and burning issues.
- Quick fire diagnostic quiz: ECG, Echo, Angio, etc.
- Latest news in cardiology from India and the world.

Apart from the above features, CardioSiteIndia provides its members with a social networking feature so as to enable the cardiologists of India to conveniently connect with each other and express their opinions. It also has a separate section for the lay population that would help the enormous number of people seeking heart-related information.

The Editor-in-Chief of the portal is Dr. Dev Pahlajani, an eminent cardiologist who pioneered invasive and interventional cardiology in India. He would be providing all the academic inputs for the portal along with a team of cardiologists of preeminence from all over the country.

The portal is being developed by Hansa MedCell which is a leading independent provider of Continuing Medical Education (CME), medical information, and pharma marketing strategy services.