Fengxia Duan, Mingxing Xie. Department of Ultrasonography, Union Hospital of Tongji Medical College, Huazhong University of Science and Technology, Hubei Provincial Key Laboratory of Molecular Imaging, Wuhan 430022, China

**Objectives** To assess the left ventricular global systolic function in patients with coronary artery heart disease by automated motion tracking of mitral annular displacement (TMAD).

**Methods** 30 patients (20 males and 10 females, aged from 39 to 67 years old, average age 58.33±4.65 years old) with coronary artery heart disease (coronary artery stenosis ≥70%, which were confirmed by coronary angiography) and 31 age-matched normal controls (21 males and 10 females, aged from 33 to 59 years old, average age 52 ±9.6 years old) were enrolled in this study. After routine echocardiography by Philips IE33 with S5-1 probe (the frequency is 1.7–3.4 MHz, frame rate >60 frame/s), left ventricular end-diastolic volume (LVEDV), left ventricular end-systolic volume (LVESV) and left ventricular ejection fraction (LVEF) were measured by biplane Simpson’s method. Apical four-chamber, three-chamber and two-chamber two-dimensional dynamic images were stored, which lasted three to five consecutive cardiac cycles. The parameters were obtained using offline Qlab 7.0 software: maximal systolic displacement (Ds) of every annulus, systolic displacement of the middle point (D-mid), long-axis fractional shortening (FSL), then the mean of Ds, D-mid and FSL were calculated respectively. The correlation between mitral annular motion parameters and LVEF were analysed.

**Results**
1. The mean of Ds, D-mid and FSL were significantly decreased in CHD group compared with normal controls (p<0.001 for all).
2. TMAD was less time-consuming than biplane Simpson’s method (p<0.001), and the time for each method were (174.70±29.98) s, (235.15±38.35) s respectively.
3. There was correlation between the mean of Ds, the mean of D-mid, the mean of FSL and LVEF (r=0.662, 0.706, 0.759, p<0.001) in normal group, and there was also correlation between the mean of Ds, the mean of D-mid, the mean of FSL and LVEF in CHD group (r=0.783, 0.755, 0.715, p<0.001).
4. Intraobserver and interobserver reliability for the mean of Ds, D-mid, and FSL were acceptable. Intraobserver ICC values of the mean of Ds, D-mid, and FSL were 0.87, 0.85, 0.95, and interobserver ICC values were 0.84, 0.84, 0.88, respectively.

**Conclusions** TMAD technology was a simple, accurate, and objective method, which can be used to evaluate the left ventricular global systolic function in patients with coronary artery heart disease.