

1225

Diagnostic accuracy of left ventricular diastolic strain imaging by speckle tracking echocardiography in detecting ischemic etiology of acute chest pain

Ishii K.¹; Hyodo E.²; Seo Y.³; Ishizu T.³; Tada E.⁴; Kihara H.⁵; Daimon M.⁶; Tanaka A.⁷; Akasaka T.⁷; Watanabe H.⁸; Ito H.⁹; Yoshikawa J.²

¹Kansai Electric Power Hospital, Cardiology, Osaka, Japan

²Nishinomiya Watanabe Cardiovascular Center, Cardiology, Nishinomiya, Japan

³Tsukuba University Hospital, Cardiology, Tsukuba, Japan

⁴Kansai Electric Power Medical Research Institute, Cardiology, Osaka, Japan

⁵Kihara Cardiovascular Clinic, Cardiology, Asahikawa, Japan

⁶University of Tokyo, Cardiology, Tokyo, Japan

⁷Wakayama Medical University, Cardiology, Wakayama, Japan

⁸Tokyo Bay Urayasu/Ichikawa Medical Center, Cardiology, Urayasu, Japan

⁹Okayama University Hospital, Cardiology, Okayama, Japan

Funding Acknowledgements: none

OnBehalf: A TRAC-SI Multicenter Trial

Background: Two-dimensional speckle tracking echocardiography (2D-STE) has been reported to be useful for the diagnosis of myocardial ischemia by detecting delay in regional myocardial expansion (diastolic stunning) up to many hours after an episode of angina. The aim is to evaluate the diagnostic accuracy of Left ventricular (LV) diastolic longitudinal, circumferential, transverse and radial strain imaging by STE to detect the presence of acute coronary syndrome (ACS) in patients with acute chest pain.

Methods: 388 consecutive patients with acute chest pain and without wall motion abnormality, who were admitted to an emergency department (ED) at 1 of 12 clinical sites in Japan, were enrolled and underwent 2D-STE at ED. Left ventricular (LV) longitudinal, circumferential, transverse and radial strain values at aortic valve closure (A) and one-third of diastole duration (B) were measured. The strain imaging diastolic index (SI-DI) was value was determined as: $(A-B)/A \times 100\%$ to assess the LV diastolic strain imaging and was used to identify the regional LV delayed relaxation. All patients underwent coronary CT or coronary angiography to establish the diagnosis of ACS. Clinicians were blinded to the 2D-STE results.

Results: Out of 388 patients, 2D-STE analysis was possible in 358 patients (92%). With assessment of coronary CT or coronary angiography, ACS was diagnosed in 118 patients (33%). 2D-STE was obtained at a mean of 5.3 hours after chest pain episode. SI-DI of longitudinal, circumferential, transverse and radial strain of ischemic segments were significantly lower than those of non-ischemic segments (p value < 0.001), and transverse and radial SI-DI demonstrated high diagnostic accuracy, compared with longitudinal SI-DI (Figure 1). Sensitivity, specificity, and negative predictive value for ACS of transverse SI-DI are 87%, 88%, % and 95%, respectively, using a cut-off value of 63.3.

Conclusion: LV diastolic strain imaging by 2D-STE at ED increase the sensitivity, specificity and accuracy to predict the presence of ACS in patients with chest pain. Compared with longitudinal diastolic strain imaging, transverse diastolic strain imaging is more sensitive marker to detect the myocardial ischemic episode (UMIN000013859).

Abstract 1225 Figure 1

Receiver Operating Characteristic (SI-DI)

