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stress 3D myocardial contrast echocardiography using Sonazoid® is more reliable at detecting myocardial ischemic areas than other echocardiographycal methods

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Background: As 3D myocardial contrast echocardiography (MCE) is expected to be more reliable at detecting myocardial ischemic areas than 2D MCE , we tried 3D MCE using Sonazoid® solution (Perfluorobutane microbubbles) as a contrast agent. This study was approved by the Clinic's ethical committee and all procedures were performed in accordance with the Declaration of Helsinki of the World Medical Association.

Method: Twenty-four patients suspected of having coronary artery disease(CAD) participated in this study. 3D MCE was performed, using the GE Vivid E95 v 201 with a 4V-D probe (1.5~4.0 MHZ) and the EchoPAC PC version 201. To make ischemic areas more clearly identified, mild stress was loaded on the heart. On reaching it, 10.0ml of Sonazoid® solution was injected slowly. 3D MCE was performed with mechanical index: 0.4~0.6 for the apex short axis views(APSAX), frames/second: 21.2. APSAX was recorded, and by turning it freely, the whole LVW was investigated for ischemia.

Results: Among the 24 patients, 13 patients showed non-contrasted segments in their LVW images. They all went through coronary angiography (CAG), which showed they all had significant CAD. In all 13 patients, each area affected with stenosis corresponded with each non-contrasted segment. As the images below show, LVW segments were a bright yellowish colour except the anterior segment (Fig.1). By turning this to the left, the lateral LVW was observed. By rotating this over the cross axle, no other non-contrasted segment except the anterior segment was observed(Fig.2). These findings suggested significant stenosis of LAD. This was testified by CAG(Fig.3).

Conclusion: Stress 3D MCE that involved just one-shot of a contrast agent enabled us to observe the whole LVW and to achieve higher diagnostic accuracy. Hence, it is concluded that this method is more useful than stress 2D or 3D echocardiography or 2D MCE.
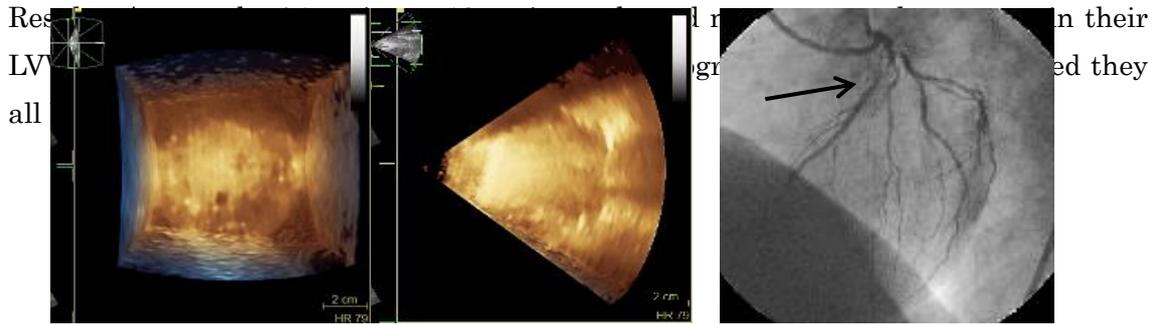
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Fig.1	Fig.2	Fig.3
Front APSAX	Lateral LVW	CAG ＃7