

## Summary

### Left Ventricular Systolic Wall Motion after Exercise Stress and Myocardial Perfusion in Patients with Ischemic Heart Disease

#### —Investigation by ECG gated Myocardial Tomography—

Michihiro NARITA\*, Tadashi KURIHARA\*, Takashi SINDOH\*,  
Yoshihiro SAWADA\* and Minoru Honda\*\*

*\*Department of Cardiology, Sumitomo Hospital*

*\*\*Department of Radiology, Sumitomo Hospital*

To investigate regional left ventricular (LV) wall motion (WM) after recovery from myocardial ischemia, we performed ECG-gated myocardial perfusion tomography with  $^{99m}\text{Tc}$ -MIBI (G-SPECT) in patients with ischemic heart disease (IHD). In addition, we compared the left ventricular (LV) systolic function obtained by G-SPECT at rest with that obtained by contrast left ventriculography (LVG).

We performed G-SPECT at 30 minutes after exercise stress (Ex-30) and 3 hours after exercise (rest). LVWM and LV ejection fractions (EF) were analyzed by the QGS (quantitative gated SPECT) program. The LV was divided into 9 segments and regional WM (RWM) was analyzed quantitatively. In addition, myocardial perfusion was assessed quantitatively. In 64 patients with several different types of heart disease, EF obtained by G-SPECT correlated well with LVG-EF ( $r = 0.907$ ,  $p < 0.001$ ), and RWM of G-SPECT coincided well with that of LVG ( $\kappa$  value 0.67,  $p < 0.01$ ). Eighty patients with suspected IHD were divided according to Ex-Rest myocardial perfusion. In 83% of patients with Ex-induced perfusion

abnormalities disappeared completely at rest, and in 58% of patients with Ex-induced abnormalities disappeared incompletely, RWM abnormalities which were observed at Ex-30 improved at rest and as did EF. In 79% of patients with a fixed defect (FD), RWM abnormalities and EF at Ex-30 did not differ with those at rest, but in 12% of the patients, the RWM abnormality of Ex-30 improved at rest.

In most myocardial segments that had recovered from transient ischemia, RWM abnormalities persisted at least 30 minutes after Ex (stunning). In a small portion of the myocardial segments regarded as having myocardial necrosis because of a fixed perfusion abnormality, RWM abnormalities at Ex-30 improved at rest. These segments were supposed to contain viable myocardium.

In conclusion, G-SPECT is a powerful method for clarifying the relation between the regional systolic function and myocardial perfusion.

**Key words:** ECG-gated myocardial tomography, Regional wall motion, Stunning.