Summary

Assessment of Left Ventricular Function by Thallium-201 Quantitative Gated Cardiac SPECT

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[Purpose] Present study was designed to evaluate the accuracy of the measurement of left ventricular volume by quantitative gated SPECT (QGS) software using ^{201}T1 and the effect of cutoff frequency of Butterworth prereconstruction filter on the calculation of volume. **[Methods]** The RH-2 type cardiac phantom and 20 patients with ischemic heart disease were studied. Left ventricular end-diastolic volume (EDV), end-systolic volume (ESV) and ejection fraction (EF) were calculated by the QGS software using the various frequency of Butterworth filter. These parameters were evaluated by Simpson's method using left ventriculography (LVG). **[Results]** The volume of the phantom calculated by QGS was under-estimated by 14%. In the clinical study, EDV and ESV measured by QGS were smaller than those obtained from LVG by 10%. When the cutoff frequency of Butterworth filter was 0.43 cycles/cm, the values measured by QGS were best correlated with those by LVG (EDV: $r=0.80$, $p<0.001$; ESV: $r=0.86$, $p<0.001$; EF: $r=0.80$, $p<0.001$). **[Conclusion]** These data suggest that ^{201}Tl quantitative gated cardiac SPECT can estimate myocardial ischemia and left ventricular function simultaneously.

Key words: Gated SPECT, Quantitative gated SPECT (QGS), Thallium-201, Butterworth filter, Left ventricular function.