

Tc-99m MIBI 심근관류스펙트럼을 이용한 좌심실 질량의 측정 : 심초음파를 이용한 측정법과의 비교

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Left Ventricular Mass Measurement Using Tc-99m MIBI Myocardial Perfusion SPECT : Comparison with Echocardiographic Method

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ABSTRACT

Background and Objectives : A left ventricular mass (LVM) can be used as a prognostic factor in patients with cardiovascular disease, and echocardiographic LVM measurements are most commonly used. We have measured LVM using quantitative gated myocardial perfusion SPECT (QGS), and compared these results with LVM measured by echocardiography. **Subjects and Methods** : One hundred and sixteen subjects (M/F = 66/50, mean age : 58 yrs) underwent both rest QGS with Tc-99m MIBI and echocardiography. On visual interpretation, thirty-six subjects (31%) showed perfusion defects. The myocardial volume was obtained using the AutoQUANT program, and the LVM (LVMSPECT) was calculated by multiplying the volume by the specific gravity of the myocardium. We also measured the echocardiographic LVM (LVMEcho) by the Devereux formula, within one month of the LVMSPECT. **Results** : The LVMSPECT and LVMEcho were well correlated ($r = 0.717$, $p < 0.001$), but a significant difference was noted between the two values. The mean difference between the LVMSPECT and LVMEcho was 24 g. The LVMEcho was smaller than the LVMSPECT in those subjects with a small LVMEcho, and greater than the LVMSPECT in the subjects with a large LVMEcho. The difference between the LVMEcho and LVMSPECT (LVMEcho-LVMSPECT) was positively correlated with the LVMEcho ($r = 0.893$, $p < 0.001$). **Conclusion** : The LVMSs measured by gated myocardial perfusion SPECT and echocardiography were well correlated. But they were significantly different, especially in subjects with large LVMSs. (Korean Circulation J 2002;32(12):1072-1077)

KEY WORDS : Hypertrophy, left ventricular ; Radionuclide imaging ; Echocardiography.

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서론

가¹⁾

가²⁻⁴⁾

(EBT : electron beam computed tomography),¹⁾⁵⁾⁶⁾

가⁶⁾

가⁷⁾

가⁸⁾⁹⁾

M - mode

대상 및 방법

대 상

116

가 66 (56.9%)

50 58 ± 10 36

(31.0%)

방 법

740 MBq(20 mCi)

Tc - 99m MIBI 1

(Vertex Plus, ADAC, USA)

20% 140 keV

3 ° 180 °

64 × 64 25 64

8 frame

R - R 50%

Butterworth

6.56 mm

Germano⁸⁾

AutoQUANT (Cedars Sinai Medical Center, Los Angeles, Calif.)

(1.04 mg/cm³)

가 System

Five(GE, USA) ATL HDI 3000(ATL, USA)

M - mode (Fig. 1)

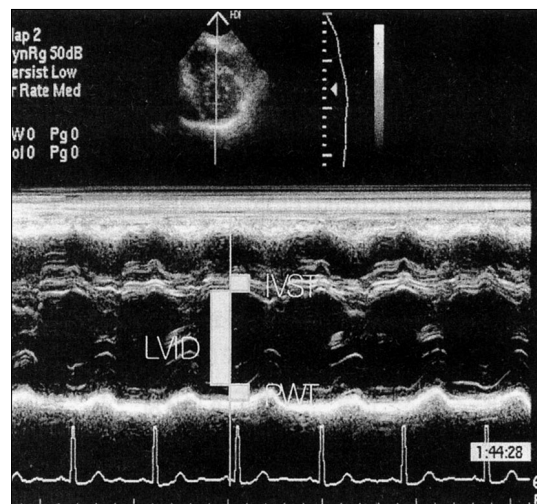


Fig. 1. Echocardiographic measurement of LV mass using M-mode technique. LV mass (g) = $0.80 \{ 1.04 [(IST + PWT + LVID)^3 - (LVID)^3] \} + 0.6$. IST : interventricular septal thickness, PWT : posterior wall thickness, LVID : left ventricular internal diameter.

Table 1. Comparison between LV masses measured by M-mode echocardiography and by gated myocardial perfusion SPECT

	Mean ± SD (g)	Range (g)
LVMEcho	157 ± 49*	54 - 298
LVMSPECT	133 ± 23*	96 - 222

* : p<0.001 by wilcoxon signed ranks test, LVMEcho : LV mass measured by M-mode echocardiography, LVMSPECT : LV mass measured by gated myocardial perfusion SPECT

Devereux

6)

$$\text{LV mass(g)} = 0.80 \{ 1.04 [(\text{IST} + \text{PWT} + \text{LVID})^3 - (\text{LVID})^3] \} + 0.6$$

IST = Interventricular septal thickness

PWT = Posterior wall thickness

LVID = Left ventricular internal diameter

1

($r = 0.893$,

$p < 0.001$, Fig. 4).

통계처리

Pearson

, Wilcoxon signed ranks test Paired T -

test , $p = 0.05$

결 과

($r = 0.717$, $p < 0.001$, Fig. 2),

가 ($p < 0.001$, Fig. 3).

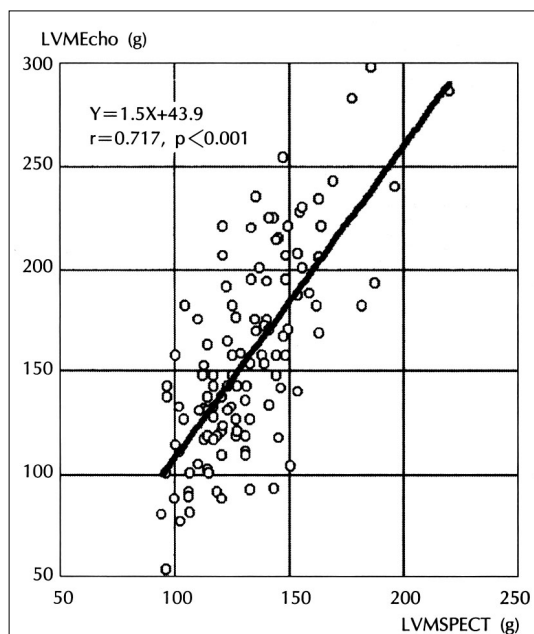


Fig. 2. Correlation between LV masses measured by gated myocardial perfusion SPECT and by M-mode echocardiography. LV : left ventricular.

고 찰

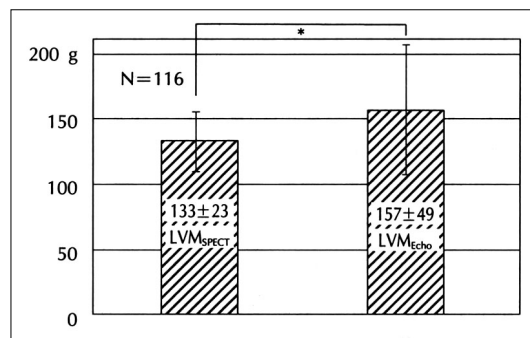


Fig. 3. Comparison between LV masses measured by gated myocardial perfusion SPECT and by M-mode echocardiography. * : $p < 0.001$, LV : left ventricular.

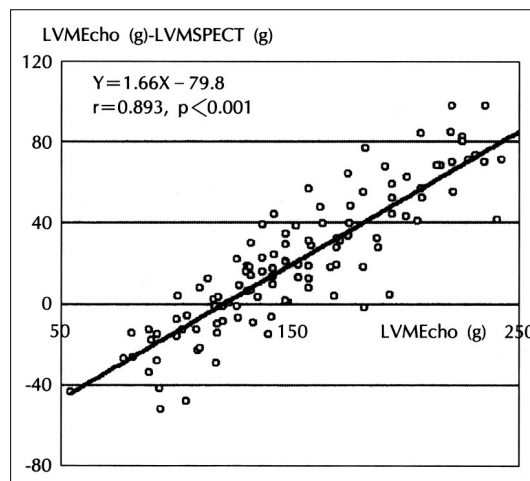


Fig. 4. Correlation between LV mass measured by M-mode echocardiography and difference of LV masses, measured by M-mode echocardiography and gated myocardial perfusion SPECT. LV : left ventricular.

Thallium - 201 chloride 가 , 가 , 가

. Tc - 99m MIBI Tc - 99m Tetrofosmin 가

Tc - 99m 가 , 가 , 가

가 , 가 , 가

가 10 - 12 가 , 가

가 , 가

10)13)14) 가 M - mode 가 26)

, Germano 가 AutoQUANT program 가 ,

가 , 가

15 - 19 가 가

20 - 23 가

6) 가 (spillover) 가

1)24) M - mode 27) 가

1)25) 가 가

(partial volume effect), Compton Stewart 26) 가

25) 가

M - mode area length ,

M - mode area length ,

area length

결론 :

가

가

가

중심 단어 :

가

2002

요약

배경 및 목적 :

가 ,

가

방 법 :

116 (/ = 66/50, 58)
36 (31%)

AutoQUANT program

M - mode Deveroux

결 과 :

SPECT (LVMS-

PECT) (LV-

MEcho) (r=0.717,

p<0.001), 가 (Ranks

test, p<0.001). LVMEcho가 , LV-

MSPECT LVMEcho , LV-

MEcho가 LVMSPECT가 LVMEcho

LVMEcho LVMSPECT

(LVMEcho - LVMSPECT) LVMEcho

(r = 0.893, p<0.001).

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