

## 이 동 수

**Dong Soo Lee, MD, FACC**

*Department of Nuclear Medicine, Seoul National University College of Medicine, Seoul, Korea*

서론

SPECT

SPECT가

1970, 80

1990

45

4,000

1998

SPECT

SPECT

가

SPECT

가

SPECT

진단 초기의 검사로서 심근 관류 SPECT

68%

77%

가

가

18%

SPECT

9%

85%

87%

SPECT

가

90%

: , 110 - 744

28

: (02) 760 - 2501 · : (02) 766 - 9083

E - mail : dsl@plaza.snu.ac.kr

SPECT

가

3) 가

가 0.2

SPECT SP - 가

ECT가 , , , , ,

SPECT가 SPECT 7)

가 60%

가 가 0.2 0.6

SPECT

가 가

2

2) 가

QALY(Quality

adjusted life year) 0.5

4 SPECT 가

(0.15 0.85)

SPECT

가 1/4

1/4 1/4 8)

가

SPECT가 가

SPECT SP -

ECT

가 /

SPECT 가가 30 가

가 13%

SPECT가

가

5)6) SPECT가

0.5%

4) 2%

SPECT

9)10) SPECT

가

SPECT

SPECT

12

SPECT

/

가

가

, SPECT가 <sup>12)</sup> 가 SPECT TI - 201 Tc - 99m -  
 급성 심근 경색증 때에 심근 SPECT MIBI 3 6  
 가 SPECT 3 4 SPECT  
 SPECT (myocardium at risk) 2 3  
 가 SPECT 가 가  
 SPECT <sup>13)</sup> 가 (adjuvant angioplasty)  
 SPECT SPECT  
 가 SPECT  
 SPECT 가  
 가 <sup>14)</sup> 14 21  
 SPECT / SPECT  
 SPECT  
 (adjuvant angio - 게이트 심근 SPECT  
 plasty) SPECT 가 가  
 SPECT ST 5 SPECT  
 가 가 <sup>15)16)</sup> 가  
 SPECT SPECT  
 가  
 가 <sup>16)</sup>  
 ST 가 가  
 SPECT <sup>13)</sup> / 가 1  
 60

SPECT<sup>21)</sup> 가

1,000 SPECT 가

MR

SPECT 가

SPECT

SPECT ( 10 MR,

16 mm : - )

가

SPECT One -

가 가 stop

가 가

가 3

가 SPECT가

SPECT

가

가 /

가, 가

SPECT Tc - 99m MIBI Tc -

99m tetrofosmin

SPECT

가 1/3

가

1995 Cedars - Sinai 가 가가

Tc - 99m<sup>22)</sup>

18)

가 thermodilution 관동맥 재개통술 전의 심근 SPECT

19)

가 100% SPECT

SPECT

가 SPECT

가 SPECT

11 ml,

5 ml, 5.4%가 2

17)

20

SPECT

2 mm, 20%

20)

± 16%

가

가 .

SPECT .

37 MBq

80

90

SPECT, PET .

가

Tc - 99m

SPECT 가

가

1999 / /

Tc - 99m 가 70%

Tc - 99m 가

23)

SPECT가

가

ECT / 가 .

SP - peer review

Tc - 99m

SPECT

27)28)

FDG PET/SPECT

24)

SPECT

FDG

25)

가

/

SPECT가

가

가

ECT 가

가

300 ,

PET SP -

2

PET

5

PET

1/3 1/4

가

가

24)25)

100%

가

PET 31)

50%

SPECT가 PET

26)

60%

가

85%

50%

가

10%

25 30%

SPECT가 , ,

가

가

FDG PET

가

심근 SPECT를 이용한 위험의 계층화와 예후 예측

가  
SPECT  
가  
가  
SPECT

/  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

가  
SPECT  
가

SPECT 가

Tc-99m

가  
가  
가  
가  
SPECT

## REFERENCES

- 32) 1) Iskandrian AS, Giubbini R. *Comparison of nuclear cardiology in the United States and Europe. Q J Nucl Med* 1996;40:27-34.
- 2) 이동수. SPECT보험에 관한 안내. 대한핵의학회지 1998; 32:2N-7N.
- 가 3) Patterson RE, Eisner RL, Horowitz SF. *Comparison of cost-effectiveness and utility of exercise ECG, single photon emission computed tomography, positron emission tomography, and coronary angiography for diagnosis of coronary artery disease. Circulation* 1995;91:54-65.
- 가 4) Iskandrian AS, Chae SC, Heo J, Stanberry CD, Wasserleben V, Cave V. *Independent and incremental prognostic value of exercise single-photon emission computed tomographic (SPECT) thallium imaging in coronary artery disease. J Am Coll Cardiol* 1993;22:665-70.
- 5) Berman DS, Hachamovitch R, Kiat H, Cohen I, Cabico JA, Wang FP, et al. *Incremental value of prognostic testing in patients with known or suspected ischemic heart disease: A basis for optimal utilization of exercise technetium-99m sestamibi myocardial perfusion single-photon emission computed tomography. J Am Coll Cardiol* 1995; 26:639-47.
- 6) Kang WJ, Lee DS, Chung J-K, Lee MM, Lee MC. *Prognostic value of rest Tl-201/dipyridamole stress Tc-99m MIBI myocardial single photon emission computed tomography (SPECT). Korean Circulation J* 1998;28:1260-71.
- 7) Pryor DB, Harrell FE Jr, Lee KL, Califf RM, Rosati RA. *Estimating the likelihood of significant coronary artery disease. Am J Med* 1983;75:771-80.
- 34) Cox 8) Lee DS, Kang KW, Cheon GJ, Jang MJ, Lee MM, Chung J-K, et al. *Cost-effectiveness of myocardial perfusion SPECT for diagnosis of coronary artery disease in Korea: Comparison with exercise ECG and coronary angiography. Korean J Nucl Med* 2000;34:207-21.
- 9) Fleischmann KE, Hunink MG, Kuntz KM, Douglas PS. *Exercise echocardiography or exercise SPECT imaging? A meta-analysis of diagnostic test performance. JAMA* 1998;280:913-20.
- 10) Kymes SM, Bruns DE, Shaw LJ, Gillespie KN, Fletcher JW. *Anatomy of a meta-analysis: A critical review of "exercise echocardiography or exercise SPECT imaging? A meta-analysis of diagnostic test performance". J Nucl Cardiol* 2000;7:599-615.
- 11) Lee DS, Jang MJ, Kang KW, Chung J-K, Lee MC. *Increased cost-effectiveness of myocardial SPECT after consideration of benign prognosis of negative SPECT in suspected coronary artery disease. J Nucl Med* 2000;41:

- 170P (abstract).
- 12) Lee DS, Jang MJ, Cheon GJ, Chung J-K, Lee MC. Comparison of cost-effectiveness of stress myocardial SPECT and echocardiography in suspected coronary artery disease considering prognostic value of false negatives. *Eur J Nucl Med* 2000;27:932 (abstract).
  - 13) Ryan TJ, Anderson JL, Antman EM, Braniff BA, Brooks NH, Califf RM, et al. ACC/AHA guidelines for the management of patients with acute myocardial infarction: Executive summary. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction). *Circulation* 1996;94:2341-50.
  - 14) Mahmarian JJ, Pratt CM, Nishimura S, Abreu A, Verani MS. Quantitative adenosine 201Tl single-photon emission computed tomography for the early assessment of patients surviving acute myocardial infarction. *Circulation* 1993; 87:1197-210.
  - 15) Lee DS. New imaging techniques in myocardial perfusion SPECT. *Korean J Nucl Med* 1998;32:1-8.
  - 16) Kang WJ, Lee DS, Lee MM, Chung J-K, Lee MC, Koh C-S. Performance of gated myocardial perfusion SPECT to diagnose coronary artery disease. *Korean J Nucl Med* 1997;31:50-6.
  - 17) Lee DS, Ahn JY, Cheon GJ, Chung J-K, Lee MC. Reproducibility of assessment of myocardial function using gated Tc-99m MIBI SPECT and quantitative software. *Nucl Med Comm* 2000;21:1127-34.
  - 18) Germano G, Kiat H, Kavanagh PB, Moriel M, Mazzanti M, Su HT, et al. Automatic quantification of ejection fraction from gated myocardial perfusion SPECT. *J Nucl Med* 1995;36:2138-47.
  - 19) Iskandrian AE, Germano G, VanDecker W, Ogilby JD, Wo-If N, Mintz R, et al. Validation of left ventricular volume measurements by gated SPECT <sup>99m</sup>Tc-labeled sestamibi imaging. *J Nucl Cardiol* 1998;5:574-8.
  - 20) Paeng JC, Lee DS, Cheon GJ, Lee MM, Chung J-K, Lee MC. Reproducibility of an automatic aquantitation of regional myocardial wall motion and systolic thickening on gated Tc-99m MIBI myocardial SPECT. *J Nucl Med*; 2001. p. 42 (in press).
  - 21) Mizushige K, Furumoto W, Hirao K, Iwado Y, Ohmori K, Matsuo H. Quantitative evaluation of left ventricular regional wall motion using a real-time wall thickness curve system with two-dimensional echocardiography. *Am J Cardiol* 1999;84:1204-8.
  - 22) Lee DS, Ahn JY, Kim SK, Oh BH, Seo JD, Chung J-K, et al. Limited performance of quantitative assessment of myocardial function by thallium-201 gated myocardial single-photon emission tomography. *Eur J Nucl Med* 2000; 27:185-91.
  - 23) Lee DS, Lee WW, Yeo JS, Kim SK, Kim KB, Chung J-K, et al. Prediction of improvement of myocardial wall motion after coronary artery bypass surgery using rest Tl-201/Tc-99mMIBI/24 hour delay Tl-201 SPECT. *Korean J Nucl Med* 1998;32:497-508.
  - 24) Baumgartner H, Porenta G, Lau YK, Wutte M, Klaar U, Me-hrabi M, et al. Assessment of myocardial viability by dobutamine echocardiography, positron emission tomography and thallium-201 SPECT: Correlation with histopathology in explanted hearts. *J Am Coll Cardiol* 1998; 32:1701-8.
  - 25) Srinivasan G, Kitsiou AN, Bacharach SL, Bartlett ML, Miller-Davis C, Dilsizian V. [<sup>18</sup>F]fluorodeoxyglucose single photon emission computed tomography: Can it replace PET and thallium SPECT for the assessment of myocardial viability? *Circulation* 1998;97:843-50.
  - 26) Udelson JE, Coleman PS, Metherall J, Pandian NG, Gomez AR, Griffith JL, et al. Predicting recovery of severe regional ventricular dysfunction. Comparison of resting scintigraphy with 201Tl and <sup>99m</sup>Tc-sestamibi. *Circulation* 1994;89:2552-61.
  - 27) Lee WW, Lee DS, Yoon SN, Kim KB, Chung J-K, Lee MC, et al. The prediction of wall motion improvement with pre-CABG Tl-201 rest/gated dipyridamole stress Tc-99m-MIBI/Tl-201 24 hour redistribution myocardial SPECT compared to post-CABG SPECT. *J Nucl Med* 1997;38:3P (abstract).
  - 28) Kang WJ, Lee DS, Cheon GJ, Kim KB, Chung J-K, Lee MC. Necessary and sufficient SPECT predictors for myocardial viability before coronary artery bypass surgery by patient-based approach. *J Nucl Med* 1998;39:60P (abstract).
  - 29) Lee DS, Kang WJ, Cheon GJ, Kim KB, Chung J-K, Lee MC. Detection of viable myocardium by the change of wall motion or wall thickening using gated Tc-99m MIBI SPECT after nitroglycerin. *J Nucl Med* 1998;39: 59P (abstract).
  - 30) Kim YK, Cheon GJ, Lee DS, Kim KB, Lee MM, Chung J-K, et al. Myocardial viability assessment by nitroglycerine gated Tc-99m-MIBI SPECT: Comparison with rest-24 hour redistribution Tl-201 SPECT. *J Nucl Med* 1999; 40:1P (abstract).
  - 31) Bax JJ, Wijns W, Cornel JH, Visser FC, Boersma E, Fioretti PM. Accuracy of currently available techniques for prediction of functional recovery after revascularization in patients with left ventricular dysfunction due to chronic coronary artery disease: Comparison of pooled data. *J Am Coll Cardiol* 1997;30:1451-60.
  - 32) Sharir T, Germano G, Kavanagh PB, Lai S, Cohen I, Lewin HC, et al. Incremental prognostic value of post-stress left ventricular ejection fraction and volume by gated myocardial perfusion single photon emission computed tomography. *Circulation* 1999;100:1035-42.
  - 33) Hachamovitch R, Berman DS, Shaw LJ, Kiat H, Cohen I, Cabico JA, et al. Incremental prognostic value of myocardial perfusion single photon emission computed tomography for the prediction of cardiac death: Differential stratification for risk of cardiac death and myocardial infarction. *Circulation* 1998;97:535-43.
  - 34) Lee DS, Cheon GJ, Jang MJ, Kang WJ, Chung J-K, Lee MC, et al. Longterm prognostic value of dipyridamole stress myocardial SPECT. *Korean J Nucl Med* 2000;34: 39-54.