

관상동맥질환에서 Dipyridamole 부하 Tc-99m Tetrofosmin SPECT의 진단적 유용성

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Diagnostic Value of Dipyridamole Tc-99m Tetrofosmin SPECT for Detection of Coronary Artery Disease

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ABSTRACT

Background and Objects : Tc-99m tetrofosmin is a recently developed myocardial perfusion agent. We examined the diagnostic accuracy of dipyridamole Tc-99m tetrofosmin SPECT. **Materials and Method :** 61 patients underwent one-day rest/dipyridamole Tc-99m tetrofosmin SPECT. 26 patients had history of myocardial infarction. Coronary angiography, performed within 1 week after SPECT study, revealed normal coronary arteries or insignificant coronary artery stenosis in 19 and 22 patients (when considering 50% or 70% reduction of luminal diameter as significant stenosis). **Results :** Number of male was 39 (63.9%) and mean age was 59(range 32-84). The diagnostic accuracy of dipyridamole Tc-99m tetrofosmin SPECT for detection of coronary artery disease (50% and 70% coronary artery stenosis, respectively) was as follows : sensitivity 90.5%, 90.0%, specificity 73.7%, 66.7%, positive predictive value 88.4%, 83.7%, negative predictive value 77.8%, 77.8% and predictive accuracy was 85.2%, 81.9% respectively. The overall sensitivity and specificity of dipyridamole Tc-99m tetrofosmin SPECT for detection of individual coronary stenosis(50% and 70% coronary stenosis by coronary angiography) were 64.6%, 64.1% and 86.4%, 85.7% respectively. In patients without myocardial infarction, sensitivity 76.5%, specificity 76.5%, positive predictive value 83.3%, negative predictive value 76.5% and predictive accuracy was 80.0%. **Conclusion :** One-day rest/stress dipyridamole Tc-99m tetrofosmin myocardial SPECT is a useful noninvasive method for detection of coronary artery disease. (**Korean Circulation J 1998;28(6):923-930**)

KEY WORDS : Dipyridamole Tc-99m tetrofosmin SPECT · Coronary artery disease.

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<p>서론</p>	<p>검사방법</p>
<p>1) 가</p>	<p>24 methylxanthine , , , , 2, 3 nitrate, 1</p>
<p>2-4)</p>	<p>protocol Tc - 99m tetrofosmin 10 mCi</p>
<p>thallium - 201 1976 가</p>	<p>1 4~5 dipyrindamole 0.56 mg/kg 4</p>
<p>5) Thallium 가 가 6)7)</p>	<p>7 Tc - 99m tetrofosmin 25 mCi 1 Tetrofosmin tetrofosmin kit (Myoview, Amersham International plc.)</p>
<p>10 technetium - 99m 가 Tc - 99m tetrofosmin 8)</p>	<p>sodium pertechnetate(Tc - 99m) 15</p>
<p>9) 10)</p>	<p></p>
<p>(redistribution)가 10)11) 가</p>	<p>Tc-99m tetrofosmin SPECT영상 및 판정 Siemens Multispect 2</p>
<p>ridamole²⁾ adenosine¹²⁾ . Adenosine 12-14) 가</p>	<p>dipy - photopeak 140 keV 15% window 45 45 180 4 20 45</p>
<p>adenosine . Dipyridamole 16)17) 가</p>	<p>64 × 64 matrix Ma - cintosh Quadra 950 computer Butt - erworth filter</p>
<p>Tc - 99m tetr - ofosmin TI - 201 17)</p>	<p>(reorientation) 7.79 mm (vertical long axis view), (short axis view) (horizontal long axis)</p>
<p>Tc - 99m tetrofosmin 가 13)18) dipyridamole</p>	<p>Cedars - Sinai quantitative tomographic anal - ysis program</p>
<p>SPECT</p>	<p>(se - miquantitative analysis) , 가 , 가</p>
<p>재료 및 방법</p>	<p>관상동맥조영술 및 판정</p>
<p>대 상 가 1996 6 1997 7 가 dipyridamole Tc - 99m tetrofosmin SPECT 61</p>	<p>Judkin dipyridamole Tc - 99m tetrofosmin SPECT 1 quantitative method 3 50% , 70%</p>

99m tetrofosmin SPECT

50% 70% 가

1 50% 76.5%, 76.5%,

83.3%, 76.5%,

90.5%, 73.7%, 80.0% (Table 3).

88.4%, 77.8%, 85.2%

1 70%

가 90.0%, 66.7%, 50%

83.7%, 77.8%, 81.9%

(Table 2).

Dipyridamole 부하 Tc-99m tetrofosmin SPECT검사의
각관상동맥분지별 협착발견의 진단능 (Table 4 and 5)

Table 2. Diagnostic values in the detection of CAD

Index (%)	Percent stenosis	
	50%	70%
Sensitivity	90.5 (38/42)	90.0 (36/40)
Specificity	73.7 (14/19)	66.7 (14/21)
(+)PV	88.4 (38/43)	83.7 (36/43)
(-)PV	77.8 (14/18)	77.8 (14/18)
Predictive accuracy	85.2 (52/61)	81.9 (50/61)

CAD : coronary artery disease
(+)PV : positive predictive value
(-)PV : negative predictive value

Table 3. Diagnostic values in the detection of CAD in patients without MI

Index (%)	Percent stenosis	
	50% or	70%
Sensitivity	76.5 (15/19)	
Specificity	76.5 (13/17)	
(+)PV	83.3 (15/18)	
(-)PV	76.5 (13/17)	
Predictive accuracy	80.0 (28/35)	

CAD : coronary artery disease
(+)PV : positive predictive value
(-)PV : negative predictive value
MI : myocardial infarction

Table 4. Diagnostic values in localizing stenotic artery in total patients

	Stenosis 50%				Stenosis 70%			
	LAD	LCX	RCA		LAD	LCX	RCA	
Sensitivity	64.6 (42/65)	73.1 (19/26)	66.7 (16/24)	46.7 (7/15)	64.1 (41/64)	73.1 (19/26)	65.2 (15/23)	46.7 (7/15)
Specificity	86.4 (102/118)	85.7 (30/35)	89.2 (33/37)	84.8 (39/46)	85.7 (102/119)	85.7 (30/35)	86.8 (33/38)	84.8 (39/46)
(+)PV (%)	72.4 (42/58)	79.2 (19/24)	80.0 (16/20)	50.0 (7/14)	70.7 (41/58)	79.2 (19/24)	75.0 (15/20)	50.0 (7/14)
(-)PV (%)	81.6 (102/125)	81.1 (30/37)	80.5 (33/41)	82.9 (39/47)	81.6 (102/125)	81.1 (30/37)	80.5 (33/41)	82.9 (39/47)
PA (%)	78.7 (144/183)	80.3 (49/61)	80.3 (49/61)	75.4 (46/61)	78.1 (143/183)	80.3 (49/61)	78.7 (48/61)	75.4 (46/61)

LAD : left anterior descending artery ; LCX : left circumflex artery ; RCA : right coronary artery ;
(+)PV : positive predictive value ; (-)PV : negative predictive value ; PA : predictive accuracy

Table 5. Diagnostic values in localizing stenotic artery in patients without myocardial infarction

	Stenosis 50% or 70%			
	LAD	LCX	RCA	
Sensitivity(%)	62.9 (17/27)	66.7 (8/12)	75.0 (6/8)	42.9 (3/7)
Sensitivity(%)	89.7 (70/78)	95.7 (22/23)	85.2 (23/27)	89.3 (25/28)
(+)PV	68.0 (17/25)	88.9 (8/9)	60.0 (6/10)	50.0 (3/6)
(-)PV	87.5 (70/80)	84.6 (22/26)	92.0 ((23/25)	86.2 (25/29)
PA	82.9 (87/105)	85.7 (30/35)	82.9 (29/35)	80.0 (28/35)

LAD : left anterior descending artery ; LCX : left circumflex artery ;

RCA : right coronary artery ; (+)PV : positive predictive value ;

(-)PV : negative predictive value ; PA : predictive accuracy

가 , 50% 62.9%, 70% 89.7%, (lipophilic), cationic dip-
68.0%, 87.5%, 가 82.9% hosphine .⁸⁾ ,
 (redistribution)
66.7%, 95.7%, 88.9%, .⁷⁾¹⁰⁾¹¹⁾
84.6%, 85.7% . 가 ses -
75.0%, tamibi 가
85.2%, 60.0%, 92.0%, .²⁰⁾²¹⁾ Phase III multicenter trial
82.9% Tc - 99m tetrofosmin (planar im -
age) TI - 201
42.9%, 89.3%, 80.0% .¹⁷⁾
50.0%, 86.2%,
(Table 5).
고 찰
50
Dipyridamole
adenosine adenosine deaminase
adenosine
adenosine
가 가 가 adenosine adenosine - A₂
slow inward current
adenylate cyclase cAMP
calcium
가
Technetium - 99m(, Tc - 99m)
Thallium - 201(, TI - 201) 3~5 가
가 , 가 가
가 10 가
(disparity in regional myocar -
se - dial perfusion)²⁾
stamibi .²⁰⁾ rate pressure product 가
Tc - 99m tetrofosmin .²⁶⁾

Tc-99m tetrofosmin 1 (1day protocol) 33-35)
2 (2day protocol) 가 93~97%
/ (stress/rest) 가 , 가 84~94%,
1 78~93% 가 .
2 27)
Au Yong 1 / 1 / 30%,
가 가 1 25%
2 가 34)
가 28) 가 78% .
가 dipyrindamole Tc-
99m tetrofosmin SPECT 31)
50%
53%, 72%, 가 46%, 76%,
24%, 94%, 89%, 46%
/ .
Dipyridamole Tc-99m tetrofosmin SPE-
CT Powers³⁰⁾ 25 .
dipyridamole / Tc-99m tetrofos-
min SPECT 90%, 100% 가 .
dipyridamole Tc-99m tetrofosmin SPE-
CT 31) 64 1 dipyrid- ECT¹³⁾³²⁾ adenosine SP-
amole / Tc-99m tetrofosmin SPECT 가
50% 85%,
55% . Tc-99m tet-
rofosmin Tc-99m
tetrofosmin SPECT planar image phase III multic-
enter trial¹⁷⁾ 181 (11%), (5%), (4%)
77%, 58% 25 (26%), ST
Tc-99m tetrofosmin SPECT³²⁾ (19%),
75%, 80% . adenos-
ine Tc-99m tetrofosmin SPECT¹³⁾ , aminophylline
92~97%, 3911 dipyrindamole thallium Ranhosky¹⁵⁾
91~86% 4 2
. dipyrindamole Tc-99m tetrofosmin SPECT
, 가 dipyrindamole
31)
aminophylline 가
가
. Thallium SPECT
dipyridamole Tc-99m - tetrofo-
smin SPECT

요 약

서 론 :

Tc - 99m tetrofosmin

dipyridamole Tc -

99m - tetrofosmin SPECT

재료 및 방법 :

가 61 Tc - 99m
tetrofosmin 10 mCi 1
4~5 dipyridamole 0.56
mg/Kg 4 7 Tc - 99m
tetrofosmin 25 mCi 1
SPECT 1

결 과 :

가 39 (63.9%) 59 (32
~84) 50%
70% 1
21 (34.4%), 20 (32.8%), 2
14 (22.9%), 12 (19.7%), 3 5
(8.2%) 5 (8.2%), 2 (3.3%) 2
(3.3%)
19 (31.1%), 22 (36.1%)
90.5%, 90.0%,
73.7%, 66.7%, 88.4%, 83.7%,
77.8%, 77.8%, 85.2%, 81.9%
64.6%, 64.1%,
86.4%, 85.7%, 72.4%, 70.7%,
81.6%, 81.6%, 78.7%,
78.1%
76.5%, 83.3%, 76.5%,
80.0%
62.9%, 89.7%, 68.0%,
87.5%, 82.9%

결 론 :

Dipyridamole Tc - 99m tetrofosmin SPECT

중심 단어 : Dipyridamole Tc - 99m tetrofos-
min SPECT

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