

관상동맥 성형술후 Troponin T의 유리

조병렬 · 홍경표 · 최정실 · 박현식 · 조욱현 · 이상철 · 권현철
박승우 · 김준수 · 김덕경 · 이상훈 · 박정의 · 서정돈 · 이원로

Release of Cardiac Troponin T after Percutaneous Transluminal Coronary Angioplasty

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ABSTRACT

Background and Objectives : Small myocardial infarction (MI) has been reported in 8 -20% of patients undergoing percutaneous transluminal coronary angioplasty (PTCA). But neither appropriate threshold of cardiac enzyme nor useful biochemical marker for its detection has not yet been fully defined. We examined the cardiac enzyme to define more valuable biochemical marker for the detection of small MI after PTCA and to evaluate factors associated with small MI after PTCA. **Materials and Methods :** This study population consisted of 209 consecutive patients who underwent PTCA. Cardiac enzyme levels were measured before and 8, 24 hours after PTCA for CK-MB, and before and 16 hours after PTCA for troponin T. We defined small MI when CK-MB levels were over 16U/L and/or troponin T levels were over 0.2 ng/ml. **Results :** Incidence of small MI after PTCA was 28/209 (13.4%) and the most of those were non-Q MI (24/28, 86%). In the detection of small MI after PTCA, the sensitivity of troponin T was higher than CK-MB (92.9% vs 39.3%). Major complications (major dissection, acute coronary occlusion, and side branch occlusion) developed significantly more in patients with small MI than in patients without small MI ($p = 0.002$). Three independent variables, which were significantly associated with small MI after PTCA, were age, total/subtotal occlusion, and acute coronary occlusion as complication ($p = 0.01$, $p = 0.02$, and $p = 0.04$, respectively). **Conclusions :** Troponin T is more sensitive biochemical marker than CK-MB in the detection of small MI after PTCA. Major complications of angioplasty are frequently associated with small MI. Especially, age, total occlusion, and acute coronary occlusion as complication are independent factors significantly associated with small MI after PTCA. (**Korean Circulation J 1998;28(7):1069-1076**)

KEY WORDS : Creatine kinase-MB · Myocardial infarction · Percutaneous transluminal coronary angioplasty · Troponin T.

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서 론

관상동맥 조영술 및 성형술

Judkins 가 A
 () 8 , , A
 20% (1-4) , AHA/ACC A
 가 , AHA/ACC
 , B C
 , TIMI(Thrombolysis in Myocardial Infarction) 0, 1, 2 , (major dissection), (minor dissection),
 가 creatine kinase - isoenzyme MB(CK - MB)가 troponin T가 , 가 , , NHLBI(National Heart, Lung and Blood Institute) A
 가 , B , C, D, E, F
 , TIMI 3
 TIMI 0

재료 및 방법

대 상

통 계

가 가 209 통 계 ± , SPSS Chi - square test, Fisher's exact test, Student's t - test , multivariate analyses p 0.05 mu -

심근효소의 측정 및 분석

결 과

CK - MB troponin T ,
 . CK - MB 8 , 24
 immune inhibition(Johnson & Johnson Clinical Diagnostics, USA) , troponin T 16 enzymeimmunological test(Boehringer Mannheim Diagnostics, Germany) CK - MB 16 U/L , troponin T 0.2 ng/ml

대상환자들의 임상적 특성

209 / 150/59
 59.1 ± 9.5 , 64.4 ± 8.0
 가 59 (28.0%), 가 80 (38.0%), 가 70 (34.0%)

관상동맥 성형술후 심근경색의 발생 빈도

209 28 (13.4%)

Q wave myocardial infarction 24 (86%), Q wave myocardial infarction 2 (7%), Q wave myocardial infarction 2 (7%) (Table 1).

67/209 (32.5%) 11 (16.0%) (Table 3).

진단 및 치료방법에 따른 심근경색 발생의 비교

59/209 (28.0%) 6 (10.0%), 80/209 (38.0%) 14 (17.0%), 70/209 (34.0%) 8 (11.0%) (Table 2).

병변에 따른 심근경색 발생의 비교

A 103/209 (50.0%) 14 (13.0%), 61/209 (29.0%) 7 (11.0%), 32/209 (15.0%) 6 (18.0%), 10/209 (5.0%) 1 (10.0%), 3/209 (1.5%) (Table 3).

Table 1. Incidence of myocardial infarction after percutaneous transluminal coronary angioplasty

Myocardial infarction :	28/209 (13.4%)
Non Q wave myocardial infarction	24 (86%)
Q wave myocardial infarction	2 (7%)
Reinfarction in previous myocardial infarction	2 (7%)

Table 2. Incidence of newly developed myocardial infarction after percutaneous transluminal coronary angioplasty in each disease group*

Diagnosis	Total	MI (-)	MI (+)
Old MI	59 (28%)	53 (90.0%)	6 (10.0%)
Unstable angina	80 (38%)	66 (83.0%)	14 (17.0%)
Stable angina	70 (34%)	62 (89.0%)	8 (11.0%)

*No significant difference between each disease group

Table 3. Incidence of newly developed myocardial infarction after percutaneous transluminal coronary angioplasty in each treatment modality*

Treatment	Total	MI (-)	MI (+)
Balloon	142 (67.5%)	125 (89.0%)	17 (11.0%)
Stent	67 (32.5%)	56 (84.0%)	11 (16.0%)

*No significant difference between each treatment modality

Table 4. Incidence of newly developed myocardial infarction after percutaneous transluminal coronary angioplasty in each lesion characteristics*

Lesion	Total	MI (-)	MI (+)
Type A	103 (50%)	89 (87.0%)	14 (13.0%)
Irregular	61 (29%)	54 (89.0%)	7 (11.0%)
Total/subtotal	32 (15%)	26 (82.0%)	6 (18.0%)
Thrombus	10 (18%)	9 (90.0%)	1 (10.0%)
SVG	3 (1.5%)	3 (100%)	0 (0%)

SVG = saphenous vein graft

*No significant difference in each lesion characteristics

Table 5. Incidence of newly developed myocardial infarction after percutaneous transluminal coronary angioplasty in each complication group*

Complications	MI (-)	MI (+)	OR	95% CI	p value
No complication	89	8			
Acute occlusion	3	3	11.13	1.92 - 64.45	p = 0.03
Side br. occlusion	4	3	8.34	1.58 - 44.01	p = 0.05
Thrombus	2	0	2.11	0.09 - 47.57	p = 1.00
Minor dissection	68	10	1.64	0.61 - 2.26	p = 0.33
Major dissection	12	4	3.71	0.97 - 47.57	p = 0.066
Major complication [†]	21	10	5.30	1.86 - 15.06	p = 0.02

OR = odds ratio, CI = confidence interval

*Significant difference in each complication group (p = 0.005)

[†]Sum of major dissection, acute occlusion, side branch occlusion, and thrombus

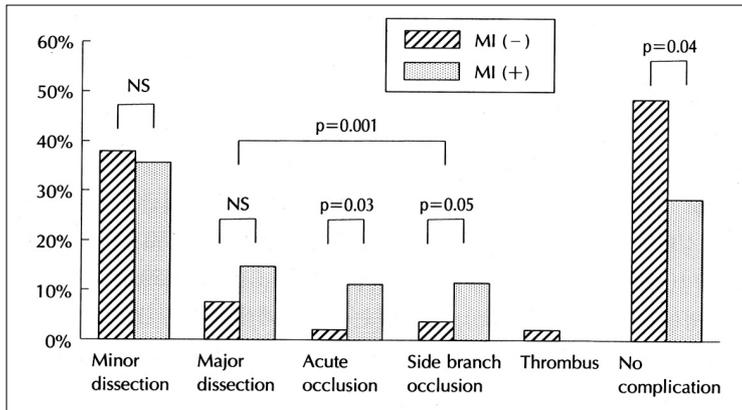


Fig. 1. Incidence of newly developed myocardial infarction after percutaneous transluminal coronary angioplasty in each complication group.

Table 6. Independent factors associated with myocardial infarction after percutaneous transluminal coronary angioplasty by multivariate analyses

Factors	p-value
Age	0.01
Total/subtotal occlusion	0.02
Acute coronary occlusion	0.04

(Table 4).

합병증에 따른 심근경색 발생의 비교

가 97/209 (46.0%) , 가 (94/209 ; 44.0%) .

가

(1.5% vs 10.7% [p=0.015], 2.2% vs 10.7% [p=0.024], respectively).

가

(p=0.002).

0.04)(Table 5, Fig. 1).

(p=

2가

0.01),

(p=0.02)

(p= .5)

(p=0.04)

가

(p=0.07)(Table 6).

CK-MB와 troponin T의 예민도

28 troponin T가
26 troponin T가 2

troponin T 92.9%

28 CK-MB가

11 CK-MB가 39.3%

T가 CK-MB

troponin

고 찰

가

CK-MB

Q Q

1) 가 , 2) , 3) , 4) , 5) .
 6) serum glutamate oxaloacetate trans-aminase(SGOT ; aspartate transaminase, AST)
 Lactate dehydrogenase(LDH) LDH isoenzyme creatine kinase(CK) CK isoenzyme(CK - MB), troponin T, troponin I

CK-MB 및 troponin T의 특성

CK 가 2 M subunits (CK - MM), 2 B subunits(CK - BB), 1 M subunit 1 B subunit(CK - MB) 3 isoenzyme 가 8) CK 225 IU - 12000 IU 9) CK - MB 1 3% 10) CK 1600 IU 6) CK - MB가 15 30% 6) CK - MB 3 8 가 12 24 2 3 6) CK - MB 92% 100% 11) CK - MB가 가 12)13) CK CK - MB가

troponin T가 Troponin T tropomyosin troponin T (94%) triprotein 14)

6%가 15)16) troponin T가 가 , 가 troponin T가 2 3 2 troponin T 16) 3 8 가 12 2 5 14 6) Troponin T troponin T enzyme immunoassay 0.5% 17) troponin T CK - MB 가 7 , 5 18) troponin T CK - MB 19-22) troponin T 93% 100% 23) 관상동맥 성형술 후 작은 심근경색의 진단 CK - MB troponin T 가 2 5 CK - MB 가 0.04 ng/ml 가 0.2 ng/ml 19) CK 가 CK - MB 24)25) CK - MB (16 IU/L) , trop - onin T 0.2 ng/ml

CK - MB troponin T 93% 100% 23) 관상동맥 성형술 후 작은 심근경색의 진단 CK - MB troponin T 가 2 5 CK - MB 가 0.04 ng/ml 가 0.2 ng/ml 19) CK 가 CK - MB 24)25) CK - MB (16 IU/L) , trop - onin T 0.2 ng/ml

가 tional atherectomy), (Rotational atherectomy),
 () (Excimer laser angioplasty)
 CK - MB 가
 8 20% .²⁸⁻³¹⁾
 .¹⁻⁴⁾ 113.4 가
 .³²⁾
 CK - MB troponin T . Abbas
 39% 93% .
 troponin T가 .²¹⁾ 110 (100 10
 .¹⁻⁴⁾ CK - MB)
 가 troponin T (p<0.01) (p<0.0001)
 T CK - MB troponin (p<0.01), (p<0.05),
 가 (p<0.01)가 troponin T
 , , 가
 심근경색 발생의 관련인자 . 3)25)33)
 CK - MB
 , , 가 troponin T가 가
 .³⁴⁾ , 가
 ,²¹⁾²⁶⁾ 가 (p=0.002),
 가 (p=0.015), 가 (p=0.024)
 가 CK - MB troponin T가 가
 (p=0.04).
 요 약
 가 연구배경 : 가
 (11.0% vs 16.0%). La Vecchia .²⁷⁾ 19 가
 25 8 20%
 가
 가
 (37% vs 14%), CK - MB (p
 =0.004). , 가 가
 목 적 :
 가 가
 가 (Direc - 가

방 법 :

가 가
209
CK - MB troponin T , CK - MB
8 , 24 immune
inhibition(Johnson & Johnson Clinical Diagnostics,
USA) , troponin T
16 enzyme immunological test
(Boehringer Mannheim Diagnostics, Germany)
. CK - MB 16 U/L , troponin
T 0.2 ng/ml

결 과 :

209 28 (13.4%)
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(p=0.015, p=0.024, re -
spectively). , 가
0.002). (p =
(p=0.01),
(p=0.02)
(p=0.04)

결 론 :

Troponin T
CK - MB
, 가

중심 단어 :

- MB - T.

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