

## 급성 심근경색증에서 일차 관동맥 풍선 확장술시 발생하는 재관류성 부정맥에 대한 전향적 연구

이은미 · 오동주 · 김현철 · 임홍의 · 오영재 · 안정천 · 송우혁  
임도선 · 박창규 · 김영훈 · 서홍석 · 심완주 · 노영무

### A Prospective Study of Reperfusion Arrhythmias in Primary Coronary Angioplasty for Acute Myocardial Infarction

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#### ABSTRACT

**Background and Objectives :** Arrhythmia is known to be a major cause of death in acute myocardial infarction (AMI). Reperfusion arrhythmias (RA) may also occur during angioplasty or thrombolysis. As yet, the clinical significances of RA and angiographic characteristics of the patients who develop RA during primary angioplasty and stenting are not clearly defined. **Methods :** The study group consisted of 60 patients treated with primary angioplasty or stenting for AMI (angioplasty 13, stenting 47 patients). The patients were classified into 2 groups according to RA [RA (-) N = 36/RA (+) N = 24]; demographic and angiographic characteristics including time to reperfusion and incidence of pre-infarct angina were analyzed. **Results :** The RA occurred in 40% of patients undergoing primary angioplasty or stenting (24/60 patients). The minor arrhythmias were more common after reperfusion (transient bradycardia 14, accelerated idioventricular rhythm 11, premature ventricular contraction 4 cases); major arrhythmias were uncommon (ventricular tachycardia/fibrillation 5, asystole 1 case). In the two groups, baseline clinical characteristics were similar except for pain to reperfusion time [RA (-) : RA (+) = 490.8 ± 291.7 : 252.9 ± 109.2 minutes, p = 0.001]. There was a trend toward a greater incidence of RA in the right coronary infarct-related artery [RA (-) : RA (+) = 16.7 : 41.7%, p = NS]. The RA occurred in totally occluded artery (TIMI 0) with a giant thrombus and first ballooning in 19/24 patients (79.2%). The RA disappeared with conservative managements including pacemaker insertion and cardiopulmonary resuscitation and there were no differences in major adverse cardiac events in the two groups during follow-up. **Conclusions :** These findings suggest that the RA are frequent events during primary angioplasty but unrelated to clinical and angiographic characteristics except for reperfusion time and do not influence short-term prognosis in AMI. (Korean Circulation J 2000;30(3):295-302)

**KEY WORDS :** Acute myocardial infarction · Primary angioplasty · Reperfusion arrhythmia.

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## 서 론

6 15%<sup>1)</sup>,  
가<sup>2)</sup>

(reperfusion injuries)

3-5)  
4)6)7)  
8)  
3)  
, 가  
(accelerated idioventricular rhythm)  
,  
9)  
10-12)  
가  
13) (rescue per-  
cutaneous transluminal angioplasty)  
9)  
가 14)15)  
가  
9)11)  
1a  
16)  
가 17-19)  
가  
가 가

21)22)

가

## 재료 및 방법

### 환자 구성

1997 4 1998 9  
(13 )  
(47 ) 60  
30  
0.04  
Q , ST CK - MB  
2

### 관동맥 조영술

1)  
(3 ),  
(45 ° )  
(discrete) (diffuse)

2)  
National Heart Lung  
and Blood Institute(NHLBI) A F  
Thrombolysis In Myocardial Infarction(TIMI)  
grade 0 TIMI grade 1  
3) 2

관동맥 풍선 확장술과 스텐트 삽입술  
10,000 IU  
500 mg  
200 mg  
100 mg  
7 8 French

unpaired t  
Chi -  
square  
p 0.05

## 결 과

환자들의 기본특성 (Table 1)

60

24 (40%),  
( : 55.5%, : 41.7%, p  
=NS),  
252.9 ± 109.2 490.8 ±

재관류성 부정맥

**Table 1.** Baseline clinical characteristics (60 patients)

	RA ( - ) n = 36	RA ( + ) n = 24
Reperfusion strategy (n)		
Angioplasty	10	3
Stent	26	21
Male sex (%)	75	66.7
Mean age (year)	59.5 ± 13.6	60.1 ± 13.9
Chest pain to reperfusion (min)*	490.8 ± 291.7	252.9 ± 109.2
Risk factors		
Current smoker (%)	58.3	70.8
Diabetes mellitus (%)	36.1	20.8
Hypertension (%)	27.8	41.7
Total cholesterol (mg/dl)	188.7 ± 44.5	170.9 ± 30.1
Previous angioplasty (%)	2.4	2.4
Previous MI (%)	2.4	2.4
Ejection fraction (%)	52.7 ± 8.1	50.8 ± 8.9
Pre-infarct angina (%)	55.5	41.7
Killip class (n)		
	24	19
	7	2
	2	1
	3	2
Location of infarction (%) <sup>†</sup>		
Anterior	63.9	37.5
Non-anterior	36.1	62.5

RA = reperfusion arrhythmia, MI = myocardial infarction

\*p = 0.001 RA ( - ) vs RA ( + )

<sup>†</sup>p = 0.045 RH ( - ) vs RA ( + )

통계적 검증

IBM PC SPSSWIN 7.0  
±

**Table 2.** Clinical manifestations of reperfusion arrhythmia (24 patients, 35 cases)

Minor arrhythmia	
Transient bradycardia	14
Accelerated idioventricular rhythm	11
Premature ventricular contraction	4
Major Arrhythmia	
Ventricular tachycardia/fibrillation	5
Asystole	1
Death	0

BP = blood pressure  
12 patients showed several kinds of arrhythmia

**Table 3.** Time of Reperfusion Arrhythmia (24 patients)

After first ballooning	19
After second ballooning	4
Passage of guidewire	1

291.7 (p = 0.001).

(p = 0.045).

재관류성 부정맥의 임상상과 관동맥조영술상의 특징

가  
(asystole)  
(Table 2).

50%  
, 41.6%(10 )

5  
TIMI 0  
TIMI 1  
(Table 3).

가,  
가  
(Table 4).

**Table 4.** Angiographic characteristics (60 lesions)

	RA ( - ) n = 36	RA ( + ) n = 24
Involved vessels (n)		
1	17	15
2	9	8
3	10	1
Dilated artery (%)		
LAD	63.9	33.3
LCX	19.4	20.8
RCA	16.7	41.7
Location of artery (%)		
Proximal	44.4	50.0
Mid	47.2	46.0
Distal	8.4	4.0
Lesion morphology (%)		
Length		
Diffuse	19.4	12.5
Eccentricity	13.9	16.7
Giant thrombus*	44.4	79.2
Calcification	19.4	8.3
Multiple irregularities	13.9	8.3
Angle > 45°	19.4	12.5
TIMI grade (%)*		
0	66.7	91.7
1	14.0	4.1
2	11.0	4.2
3	8.3	0.0
Collateral vessel to infarct related artery (%)	27.7	33.3

RA = reperfusion arrhythmia  
LAD = left anterior descending artery  
LCX = left circumflex artery, RCA = right coronary artery  
TIMI = Thrombolysis In Myocardial Infarction  
\*p<0.05 RA ( - ) vs RA ( + )

재관류성 부정맥의 치료와 예후

, 가  
2 가  
4  
1 . 2

**Table 5.** Management of reperfusion arrhythmia (24 patients)

No treatment	14
Atropine injection	3
Reballooning	2
Lidocaine injection	2
Pacemaker	1
CPR	2

CPR : cardiopulmonary resuscitation

가 1 , 1 (Table 5). 6 , , Q , 2 6 , Q , (Table 6).

**고 찰**

고 찰  
1)  
3-7)  
4)  
Tennant Wiggers  
8)  
3)  
28%  
13)

**Table 6.** Major adverse cardiac events (n = 60)

	RA ( - ) n = 36	RA ( + ) N = 24
Early events (0 - 1M) (n)		
Subacute thrombosis	0	0
Emergency CABG	1	0
Q.MI	0	0
Death	3	0
Late events (1 - 6M) (n)		
TVR	2	2
CABG	0	0
Q.MI	0	0
Death	2	0

RA = reperfusion arrhythmia , M = month  
CABG = coronary artery bypass graft, Q.MI = Q myocardial infarction ; TVR = target vessel revascularization  
p>0.05 RA ( - ) versus RA ( + )

가 21)  
가 , 11)12) 가  
가  
가  
40%  
가  
29 , 6 가  
41%  
Tennant Wiggers  
가  
TIMI 0 TIMI 1  
가 가  
가 가

가

14)

가

. Topol 14)

가

1a

(angiotensin type 1a receptor)

16)25)26)

2

2

14)

(reballooning)

29)

가

가

가

22 - 24)

요약

연구배경 :

```
(preconditioning)가
```

27)28)

가

 $\text{Ca}^{++}$ 

방 품 :

(nonmyelinated vagal afferent fiber)

60

( 13 , 47 ),

결 과 :

24

[24/60 (40%)],

14 , 가 (AIVR) 11 ,

4 , / 5 , 1

( ;  $490.8 \pm 291.7$

, ;  $252.9 \pm 109.2$  ,  $p=0.001$ ).

( ;

= 16.7% ; 41.7%  $p=NS$ ),

(TIMI 0) , 19 (79.1%)

, 10 (41.7%)

결 론 :

중심 단어 :

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