

급성 심근경색환자에서의 관동맥내 스텐트 시술

홍명기 · 박성욱 · 김재중 · 정상식 · 이철환 · 김진우 · 이일수 · 박승정

= Abstract =

Intracoronary Stenting in Patients with Acute Myocardial Infarction

Myeong-Ki Hong, M.D., Seong-Wook Park, M.D., PhD, Jae-Joong Kim, M.D.,
Sang-Sig Cheong, M.D., Cheol Whan Lee, M.D., Jin-Woo Kim, M.D.,
Il-Soo Lee, M.D., Seung-Jung Park, M.D., Ph.D., F.A.C.C.

*Departments of Internal Medicine, College of Medicine, University of Ulsan,
Cardiovascular Center, Asan Medical Center, Seoul, Korea*

Background : In elective intervention, the implantation of an intracoronary stent is an established treatment modality to reduce restenosis in comparison with balloon angioplasty. However, stenting was empirically thought to be contraindicated for acute myocardial infarction because of the propensity for thrombosis, although the percutaneous transluminal coronary balloon angioplasty (PTCA) on infarct-related artery is associated with a high incidence of restenosis. To our knowledge, there is no report comparing the longterm efficacy of coronary stenting with PTCA in patients with acute myocardial infarction. Accordingly, we investigated the effect of stent implantation on restenosis of infarct-related artery in acute myocardial infarction, comparing with conventional balloon angioplasty.

Method : From January 1994 to December 1995, 97 patients (stenting in 45 patients : PTCA in 52 patients) underwent intracoronary stenting or PTCA on infarct-related artery successfully at 7-10 days after onset of infarction. The coronary stents were Palmaz-Schatz stent in 35 patients and Cordis stent in 10 patients. Follow-up coronary angiography was performed in all patients 6 months later after intervention.

Results : No death, emergency coronary artery bypass surgery or reinfarction occurred during hospitalization in 97 patients. In 45 patients with stent implantation, no stent thrombosis occurred. The 6-months angiographic restenosis rate was 13 percent in patients assigned to stent implantation and 52 percent in patients assigned to PTCA ($p < 0.05$).

Conclusion : We conclude that the intracoronary stent implantation on infarct-related artery at 7-10 days after acute myocardial infarction is safe, feasible and significantly reduces the restenosis rate.

KEY WORDS : Stent · Restenosis · Acute myocardial infarction.

서 론

(early reperfusion)

(myocardium at risk)

(infarct - related artery, IRA)

1,2).

, : 45 , PTCA : 52) .

1), (myocardial salvage)

3). Direct percutaneous transluminal coronary angioplasty(PTCA)가 tissue plasminogen activator(t-urokinase(UK) 3,000,000U

4). Direct PTCA Palmaz - Schatz 가 35
 가 , Cordis 10 .
 Direct PTCA 1) thallium SPECT

5). (postinfarct an -
 gina) , 2) 70%

(percutaneous transluminal coronary angio -
 plasty, PTCA) 6). ticlopidine , (cardio -
 genic shock) 가 3.0mm

가 ,

2. 스텐트 시술방법
 Palmaz - Schatz
 , delivery system bare
 stent
 20%

Cordis premounted balloon
 , 12 14

10 가 ,

heparin 10,000U , activated clo -
 tting time 250
 heparin 5,000U . Palmaz - Sch -
 atz Cordis warfarin
 , heparin prothro -
 mbin time

연구대상 및 방법

1. 연구대상
 1994 1 1995 12
 7 10

97 (

(100 200mg qd), ticlopidine(250
 mg bid)

3. Thallium-201 심근스캔(myocardial scan)
Thallium - 201

가 (partially reversible defects)

4. 관동맥조영술 분석
Percent diameter stenosis, (minimal luminal diameter) reference vessel
가 on - line quantitative system(ANCOR V2.0, Simens)
(gui - ding catheter)

5. 임상 및 혈관조영 추적조사(Clinical and angiographic follow-up)

1, 3, 6
6
50%

6. 통계 분석
+/-
two - tailed t test
chi - square
test
결 과
45
52
Table 1
가 . 97
45 (46% : : 42%, PTCA : 50%)
. 97
Table 2

(final luminal diameter) 3.5mm

(p<0.

Table 1. Baseline clinical characteristics and in-hospital events of the 97 patients(%)

	STENT (n=45)	PTCA (n=52)
Mean age (years)	54.1 ± 6.2	53.9 ± 7.3
Male/Female	38/7	49/3
Risk Factors		
Hypertension	10(22)	13(25)
Diabetes Mellitus	6(13)	7(13)
Hypercholesterolemia	6(13)	4(8)
Current Smoker	32(71)	40(77)
Thrombolysis	19(42)	26(50)
Previous myocardial infarction	42(4)	0
Ejection fraction(%)	56.7 ± 6.2	54.8 ± 10.2
Site of infarction		
Anterior/Inferior	19/26	22/30
Number of disease vessels	1	
1	32(71)	34(65)
2	12(27)	14(27)
3	1(2)	4(8)
In-hospital events		
Acute/subacute closure	0/0	0/0
Death	0	0
Emergency CABG	0	0
Reinfarction	0	0

CABG : coronary artery bypass graft surgery

Table 2. Angiographic and procedural characteristics of the 97 lesions(%)

	STENT (n=45)	PTCA (n=52)
Modified AHA/ACC lesion type		
A	4(9)	5(10)
B1	10(22)	23(44)
B2	27(60)	22(42)
C	4(9)	2(4)
Vessel dilated		
Left anterior descending	19(42)	18(35)
Left circumflex	5(11)	12(23)
Right	21(47)	22(42)
Size of final luminal diameter*		
< 3.5mm	11(24)	49(94)
3.5mm	34(76)	3(6)

*p < 0.05

05). 97 (coronary artery bypass graft, CABG) (reinfarction) 45 (stent thrombosis) (Table 1).

(100%).

13%, 52% (p<0.05).

Table 3

(simple lesions : type A or B1) (complex lesions : type B2 or C)

(simple lesions : 57% vs 0%, p<0.001 ; complex lesions : 46% vs 19%, p<0.05).

11%, 72% (p<0.001).

15%, 41%(p<0.05) 3.5mm

(33% vs 6%).

7 (26%)

3.5mm 6%

3.5mm 36% (p<0.05).

(19% vs 0%) (p<0.05).

3 (: 1 (2%), PTCA : 2 (4%)) 21 (: 5 (11%), PTCA 16 (31%))

9 (17%)

(Table 3).

97

Table 4

(minimal luminal

Table 3. Restenosis rate of the 97 lesions and follow-up events(%)

	STENT (n=45)	PTCA (n=52)
Overall restenosis rate*	6(13)	27(52)
Modified AHA/ACC lesion type		
A	0/ 4(0)	3/ 5(60)
B1	0/10(0)	13/23(57)
B2	5/27(19)	10/22(45)
C	1/4(25)	1/ 2(50)
Vessel dilated		
Left anterior descending*	2/19(11)	13/18(72)
Left circumflex	1/ 5(20)	5/12(42)
Right	3/21(14)	9/22(41)
Size of final luminal diameter		
< 3.5mm	4/11(36)	26/49(53)
3.5mm	2/34(6)	1/ 3(33)
Total occlusion	0/ 6(0)	7/27(26)
Follow-up events		
Elective CABG	1(2)	2(4)
Balloon PTCA	5(11)	16(31)
Elective stenting	-	9(17)

CABG : coronary artery bypass graft surgery, PTCA : percutaneous transluminal coronary angioplasty,*p<0.05

Table 4. Quantitative angiographic measurements

	STENT(n=45)	PTCA(n=52)
Reference vessel diameter, mm	3.5 ± 0.4	3.4 ± 0.4
Balloon-to-vessel ratio*	1.07 ± 0.07	0.96 ± 0.07
Diameter stenosis, %		
Baseline	76.8 ± 9.8	78.4 ± 15.4
Final*	-2.7 ± 7.4	13.2 ± 7.5
Follow-up*	27.7 ± 23.1	60.9 ± 28.6
Minimum lumen diameter, mm		
Baseline	0.9 ± 0.4	0.8 ± 0.5
Final*	3.7 ± 0.5	2.9 ± 0.3
Follow-up*	2.7 ± 0.9	1.4 ± 1.0
Acute gain*	2.8 ± 0.6	2.2 ± 0.5
Late loss*	1.1 ± 0.6	1.5 ± 1.0
Maximal inflation pressure, atm*	13.8 ± 0.4	8.5 ± 0.9

*p<0.05

diameter), percent diameter stenosis re -
reference vessel 7 10 ,
. (inflation pressure)
(balloon - to - vessel ratio) .
(p<0.05). 가 가
diameter stenosis ,
(p<0.05).
. , diameter stenosis late lo - , (stent thrombosis)
ss (p<0.05). , 13,14)
고 안 7 10 ,
7 , (stent thrombosis)
7 - 10) .
(viable myocardium) (acute stage) direct stenting
(functional test) ,
. , 가
(post - infarction 15 - 19) . 가
angina) 2
8 13) .
. 11) .
thallium 가 (52%
. vs 13%, p<0.05).
7 10 direct PTCA , direct stenting
direct PTCA ,
di -
(atherosclerotic plaque) ect PTCA direct stenting
. ,
(intravascular ultrasound) (44% vs 18%, p<0.05)¹⁸⁾.
(low echogenic) ,
88% 3.5mm 6)
12) . 20)
50%
. ,
(reinfarction)

21,22) (thrombotic milieu) , 7 10 가 ,

(luminal diameter) , (luminal diameter) , late 연구대상 및 방법 : 1994 1 1995 12 late loss가 7 10 21,22) . 97 (: 45 , PTCA : 52) . (progressive luminal renarrowing) Palmaz - Schatz 가 35 , Cordis (total occlusion) 10 . Thallium - 201 20) . , 가 (partially reversible defects) (0% vs 26%). late 1 , 3 , 6 loss가 , 6 . 가 결 과 : 97 , (coronary artery bypass graft, CABG) (reinfarction) . 가 , re - 45 (st - eence vessel 가 . ent thrombosis) . 7 (100%). 10 , 13%, 52% (p<0.05). 3.5mm 6% , 3.5mm 36% (p< 0.05). (19% vs 0%)(p<0.05). 연구배경 : 결 론 : 7 10 가 , , 가 ,

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