

혈전내재병변에서 관상동맥 스텐트 시술의 조기 성적*

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= Abstract =

Early Outcomes of Coronary Stenting in Thrombus-Containing Lesions

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Background : Thrombus-containing lesions(TCL) are associated with lower initial success rates and higher restenosis rates after balloon dilation. Furthermore, it has been considered as an absolute contraindication of coronary stenting. With advances in antithrombotic regimens and implantation techniques, coronary stenting has been widened to lesions with adverse morphologic features or to patients with acute coronary syndrome. Here we report the early clinical and angiographic results of coronary stenting in TCL.

Method : We studied 24 consecutive patients(58 ± 8 years, 18 males) undergoing coronary stenting in TCL. Fifteen patients(63%) were treated for acute myocardial infarction(AMI) and 9(37%) for unstable angina. Stenting was performed as the primary therapy in 23 patients(96%) and secondary after angioplasty failure in 1 patient(4%).

Results : 1) Twenty-five stents were deployed successfully in all 24 patients with TCL. Distal flow with TIMI grade 3 was obtained immediately in 21 patients(88%). Ventricular fibrillation occurred in 3 patients(13%) during the procedure. Procedure-related death or emergency bypass surgery did not occur. Marked CK elevation(over 5000U/L) was observed in 5 patients(21%) with AMI who underwent primary stenting. Two of these 5 patients(8%) had distal flow with TIMI grade 2 consistent with distal embolization, and one(4%) had distal flow with TIMI grade 0, suggesting acute stent occlusion. All 24 patients(100%) were event-free and showed clinical improvement at the last follow-up visit(71 ± 15 days). 2) Quantitative angiography demonstrated excellent angiographic results after stenting(minimal luminal diameter 0.3 ± 0.3 vs. 3.4 ± 0.3 mm, diameter stenosis 90.1 ± 10.7 vs. -13.3 ± 8.1 %, $p < 0.005$ respectively). Acute gain was 3.1 ± 0.3 mm($p < 0.005$).

Conclusion : With low incidents of complications, coronary stenting could be used successfully for select patients with TCL as a primary therapeutic option under aggressive antithrombotic therapy. Although early clinical results were excellent, the long-term benefits remain to be established.

KEY WORDS : Thrombus-containing lesion · Coronary stenting.

서 론

(bailout procedure)

37% 1-3) 90% 6.2%, 가 (Nir stent[n=10], AVE GFX stent[n=5], ACS Multilink stent[n=4], Jo stent[n=3], Palmaz - Schatz stent [n=3]).

가 4-9)

가

10-19)

semi - non - compliant balloon

대상 및 방법

1. 대 상

1997 3 1997 9

13 aspirin(250 mg/day) ticlopidine(500mg/day) heparin ACT 300 (54%) 3

75%

가 24 (16%)

148

11 (46%) aspirin (500mg) ticlopidine(250mg) 1 heparin 2 aspirin(100~500mg/day) ticlopidine(500mg/day for 4~8weeks), nitrates

3. 임상적 추적

haziness

50%

23)

2. 스텐트 시술

2

(,)

4. 분석 및 통계

Tagarno cine
projector
absolute calibration
±
paired t-
test
() p 0.05

결 과

1. 대상 환자의 임상적, 혈관조영술상의 특징 및 시술 관련 자료

Table 1
58 ± 8 (: 40~76) 15 (63%)
, 9 (37%)
. 11 (46%)
cr -
eatine kinase(CK) creatine kinase - MB fraction
(CK - MB) 3924.0 ± 2698.9U/L,
179.5 ± 179.1U/L . Table 2

Table 1. Clinical Characteristics of the 24 Patients

Age (yr)	58 ± 8
Male	18 (75%)
Clinical presentation	
Acute MI	15 (63%)
Unstable angina	9 (37%)
Prior MI	0
Previous intravenous thrombolysis	0
Cardiogenic shock	0
Risk factor	
Smoking	12 (50%)
Hypertension	4 (17%)
Hypercholesterolemia	4 (17%)
Diabetes mellitus	2 (8%)

Data are presented as mean value ± SD or number (%) of the patients. MI : myocardial infarction

12 (50%)

Table 3 . 11

(46%)

, 13 (54%)

23 (96%)

1 (4%)

Table 2. Angiographic characteristics of the 24 lesions

EF(%)	47 ± 6
1VD/2VD/3VD	11/12/1 (46/50/4%)
Collateral circulation	7 (29%)
LAD/RCA/LCx	10/10/4 (42/42/16%)
Lesion type B 2/C	19/5 (79/21%)
TIMI flow 0 - 1/2 - 3	13/11 (54/46%)
Diameter stenosis(%)	90.1 ± 10.7
Minimal luminal diameter(mm)	0.3 ± 0.3
Lesion length(mm)	12.1 ± 3.5
Calcification	2(8%)
Thrombus	
Filling defect	12(50%)
Total occlusion	12(50%)

Data are presented as mean value ± SD or number (%) of the patients. EF : ejection fraction, VD : vessel diseased, LAD : left anterior descending coronary artery, RCA : right coronary artery, LCx : left circumflex coronary artery, TIMI : Thrombolysis in Myocardial Infarction trial coronary flow grade

Table 3. Procedural data for the 24 patients

Indication for stenting	
Primary therapy for de novo lesion	23(96%)
Bailout procedure	1(4%)
Initial balloon diameter(mm)	2.5 ± 0.2
Largest balloon diameter(mm)	3.2 ± 0.3
Inflation frequency	2.6 ± 0.8
Inflation time(sec)	70.1 ± 22.3
Maximal pressure(atm)	14.2 ± 1.5
Stent/RD ratio	1.2 ± 0.8
TIMI flow after stenting	
0	1(4%)
2	2(8%)
3	21(88%)

Data are presented as mean value ± SD or number (%) of the patients. RD : reference diameter, TIMI : Thrombolysis in Myocardial Infarction trial coronary flow grade

2. 시술의 임상적 결과

가	(23, 96%)	24 (100%)	
	1 (4%)	2	
		1	2
	23 (96%)	CK	CK - MB
14		(54%,	9
		196.0U/L,	415.5 ± 362.5U/L
		5.8 ± 4.4U/L	240.0 ± 3.4 ± 2.5U/L

Table 4. Quantitative angiographic results

	Baseline	After predilation	Final poststent
Reference diameter(mm)	3.0 ± 0.3		
Minimal luminal diameter(mm)	0.3 ± 0.3	1.6 ± 0.4	3.4 ± 0.3*
Diameter stenosis(%)	90.1 ± 10.7	47.4 ± 9.7	- 13.3 ± 8.1*
Acute gain(mm)			3.1 ± 0.3 [†]

* : p<0.005 vs. baseline value

[†] : p<0.005 vs. baseline minimal luminal diameter

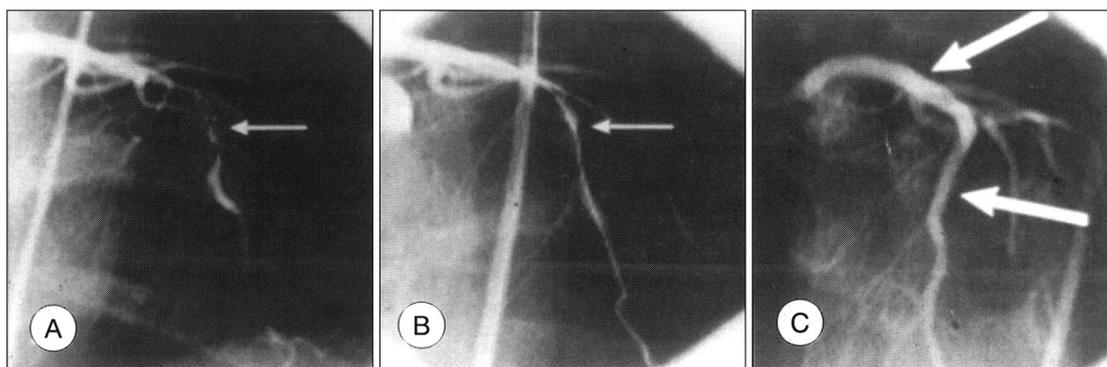


Fig. 1. A : Coronary angiogram revealing a diffuse, critical stenosis with multiple intraluminal filling defects (arrow) at the middle left anterior descending coronary artery in a patient with unstable angina. B : Despite several predilations with an undersized balloon catheter, distal flow was maintained with intraluminal haziness (arrow). C : Two stents implantation provided an excellent angiographic result and no visible residual thrombus (large arrows).

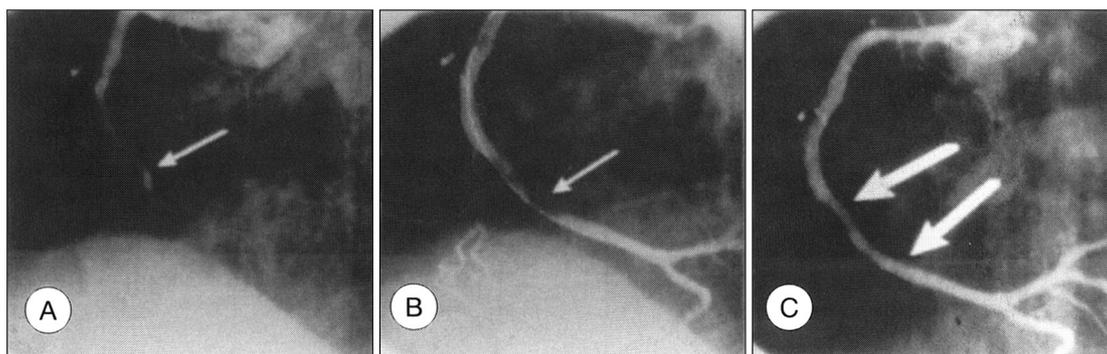


Fig. 2. A : Complete occlusion of the middle right coronary artery in a patient presenting with acute inferior myocardial infarction. Staining of contrast agent and haziness (arrow) were visualized at the site of occlusion. B : After several balloon inflations the artery was perfused with TIMI grade 2, but a filling defect (arrow) persisted at the site distal to previous occlusion. C : Subsequent stent implantation was required to obtain a satisfactory angiographic result (large arrows) with brisk anterograde coronary flow.

가 , 11 (46%)
 $379.5 \pm 384.4 \text{U/L}$ $3924.0 \pm 2698.9 \text{U/L}$,
 $25.5 \pm 31.9 \text{U/L}$ $179.5 \pm 179.1 \text{U/L}$ 가 .
 5 (21%) CK ($>5000 \text{U/L}$)

2 (8%) TIMI 2
 가 , 1
 6

1 (4%) TIMI 0
 가 .

2
 . 3
 (13%) 1
 가 .
 가 .

3. 혈관조영상의 정량적 분석 결과

$3.0 \pm 0.3 \text{mm}$
 $0.3 \pm 0.3 \text{mm}$, $90.1 \pm 10.7\%$
 $1.6 \pm 0.4 \text{mm}$, $47.4 \pm 9.7\%$

$3.4 \pm 0.3 \text{mm}$ 가 ,
 $-13.3 \pm 8.1\%$ ($p < 0.005$,
 respectively). $3.1 \pm 0.3 \text{mm}$
 $0.3 \pm 0.3 \text{mm}$ 가
 ($p < 0.005$) (Table 4).

4. 임상적 추적

24
 71 ± 15

(,)
)

고 안

(1%)
 가 ^{17,19)}

7~9%
 1~3%
 74~90%
 95% ^{5,6)}

가
^{8,9)}

가 ⁹⁾ Aspirin
 12%
 ticlopidine

14
 . 3
 1
 0~1% ^{10,11,19)}

가 가
 1~3% ^{13-15,20)}

1. 혈전 환경하에서 스텐트 시술에 관한 연구

1993 Grinstead
 139
 , 6
 가

¹⁶⁾ Romero
 87

29% ¹⁸⁾
 가 Kaul
 Alfonso

(1%)
 가 ^{17,19)}

대상 및 방법 :
 24 (58 ± 8
 , 18)
 15
 (63%), 9 (37%)
 23 (96%) , 1 (4%)

결 과 :
 1) 24 (100%)
 . 21 (88%) TIMI 3 가
 . 3 (13%)
 5 (21%) CK (5000U/L)
 . 2 (8%)
 TIMI 2 , 1 (4%)
 TIMI 0
 24 (100%) (71 ± 15)

2)
 (0.3 ± 0.3 vs. 3.4 ± 0.3mm,
 90.1 ± 10.7 vs. - 13.3 ± 8.1%, p<0.005
 respectively) , 3.1 ± 0.3mm
 (p<0.005).

결 론 :
 가

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