

긴 복잡 관동맥 협착병변의 Single Long Stent와 Multiple Conventional Stent의 조기 및 후기 시술성적에 관한 연구

가

진동규 · 이윤정 · 이화은 · 정원호 · 김영준 · 오세진
손민수 · 손지원 · 안태훈 · 최인석 · 신익균

Immediate and Long Term Outcome of Single Long Stent for Long Complex Coronary Artery Stenosis Compared to Multiple Conventional Stent

Dongkyu Jin, MD, Yunjeong Lee, MD, Hwaeeun Lee, MD, Wonho Jung, MD,
Yeongjun Kim, MD, Sejin Oh, MD, Minsoo Son, MD, Jiwon Son, MD,
Taehoon Ahn, MD, Insuk Choi, MD and Eakkyun Shin, MD

Division of Cardiology, Heart Center, Gil Medical Center, Gachon Medical College, Incheon, Korea

ABSTRACT

Coronary stenting for long complex lesion is effective but associated with complication. We compared the results of stenting between with multiple conventional stenting group (group A) and with single long stenting group (group B). Fifty patients were prospectively and randomly enrolled : 25 patients for each group. Each group showed no significant differences of clinical characteristics. One patient died of heart failure in each group, not associated with the procedure itself. One patient had cerebrovascular accident in each group. Five patients had major bleeding (2, group A ; 3, group B). Angiographic success rate was 100% in each group and procedural success rate was 96% and 100% in group A and B, respectively. Angiographic and clinical restenosis rate at 6 months follow-up were 60%, 36% in group A and 65%, 44% in group B, respectively (P=NS). Multivariate analysis showed that several factors affected the angiographic restenosis rate as follows ; a) male gender (M : F=76.9% : 25.0%, p<0.001), b) AMI (AMI : stable angina pectoris=72.7% : 66.7%, p<0.001), c) lesion length d) residual stenosis. In conclusion, there were no statistical differences of restenosis and complication rate between the two groups. Our data support single long stenting is acceptable and economically more favorable for long diffuse lesion, compared to multiple conventional stenting. (**Korean Circulation J 1998;28(9):1465-1472**)

KEY WORDS : Long complex lesion · Stent.

서 론

74~98%

1-4)

가

: 1998 4 29

: 1998 9 25

: , 405 - 220

1198 가

: (032) 460 - 3674 · : (032) 460 - 3117

E - mail : dkjin@ghil.com

(long balloon) , cardiac scintigraphy . 가 . 가

19) , , .

15 - 18) 스텐트삽입술 50% ,

가 20 mm .

as -

pirin 300 mg , ticlopidine 500 mg 4

. aspirin

long, single 1 ticlopidine , ticlopidine

conventional, multiple aspirin 5

1 hepa -

rin . 1 aspirin warfa -

rin . heparin

heparin .

대상 및 방법

결 과

대 상

1996 7 1997 2 대 상(Table 1)

50% 50 . 가

20 mm 가 25 10 : 6 ,

가 , 가 62.0±9.2 .

2 가 7 , 가 3 ,

(Gianturco Roubin(GR) - II stent, 가 2 , 가 13 .

=40 mm) Palmaz - Schatz(PS) 가 24 , Cook

quantitative coronary angiogram 가 10 , Micro 가 7 , GR 가 4

(reference diameter), (mi - , Nir 가 3 , Cordis 가 1 , Jo

nimal luminal diameter), (percent dia - 가 1 . 2 50

meter stenosis) . 가 14

11 . 25

19 : 6 60.2±9.0

6 가 16 ,

가 2 , 가 4 ,

가 2 , 가 1 .

GR (wire coil type, length = 40 mm)

50% (diame - , 1

ter stenosis) . 가 9 , 가 2 , 14

Table 2. 관동맥 조영술상 특징

	가 (n=25)	(n=25)	p-value
(mm)	3.4 ± 0.4	3.2 ± 0.4	0.100
(mm)	29.4 ± 6.5	32.8 ± 5.9	0.062
(mm)	0.7 ± 0.5	0.5 ± 0.5	0.257
(mm)	3.3 ± 0.4	3.0 ± 0.5	0.075
(%)	78.9 ± 15.6	83.3 ± 16.9	0.337
(%)	3.5 ± 11.6	4.8 ± 15.2	0.738
(mm)	1.60 ± 1.25	1.79 ± 0.81	0.656
()	1.04 ± 0.08	1.06 ± 0.08	0.513
(%)	-40.4 ± 39.4	-56.6 ± 27.8	0.282
(%, 6)	60 (6/10)	64.7 (11/17)	NS
(%)	36 (9/25)	44 (11/25)	NS
(%)	96 (24/25)*	100 (25/25)	NS
() CVA(1), Hematoma(2/3)**		CVA(1), Hematoma(3/3)**	NS

* : We cannot perform the intervention due to failure of passing of guidewire in one patient

** : (Number of patient receive the transfusion/Number of patient developing the hematoma)

NS : not significant

고 안 가 , Bourassa¹²⁾ 가
 al¹¹⁾ 가 , 2) , 3) 1)
 가 , (multivariate analysis)
 74~98% Her -
 1-4) mans¹³⁾ (static
 , Zidar,⁴⁾ Raymenants,⁵⁾ Tenaglia⁶⁾ and dynamic criteria)
 (abrupt closure) ,
 , Ellis⁷⁾ (roughness index) 가 - ,
 (acute closure)가 140 가
 2 가 , 가
 , 45 , 가 , , 1)
 , 가 , 가
 7가 2) 가 가
 , 가 , 가
 6가 가
 Myler,⁸⁾ Hermans,⁹⁾ Savage¹⁰⁾ 가 , ,

가¹⁹⁾ Edward¹⁸⁾ GR
 PS , GR 가
 6
 , Tenaglia¹⁴⁾ 10 mm 가
 PS
 , 97% ,
 90% 가 6%
 major dissection 11% 2
 50~55%

가
 가 6
 , Sha -
 knovich¹⁵⁾ 3 PS , 50 2
 54 가 25 ,
 , 98.2% , 87% 가 25
 (elective CABG) 3 (5.6%) NYHA IV
 , (subacute 1 2
 thrombosis) 2 . Maiello , 가 2 ,
¹⁶⁾ 20 mm 가 89 3 가
 2.4 PS IVUS
 (intravascular ultrasound) , 93%
 , 4~6 가 96%(1 guidewire
 35% . Fausto) , 100%
¹⁷⁾ 13 mm 가 50 , 100%
 GR 6
 , 27% 가 60%
 , 35% , 64.
 . Maiello 7% 44%

Fausto Maiello 3.06~3.31
 mm 3.11 mm 가 ,
 15.6~15.8 mm, 32 mm
 가 (unsta -
 Fausto GR ble coronary syndrome)
 , Maiello PS , GR , Wiktor (가
 , 11 가 8 72.

Table 3. 한 개의 긴 스텐트 삽입군에서 재협착에 관여하는 요소들의 비교

	(11)	(6)	p-value
(:)	10 : 1	3 : 3	<0.001
Cholesterol (mg/dL)	181.0 ± 33.6	186.2 ± 31.3	0.780
(mm)	36.3 ± 4.0	30.6 ± 4.9	0.027
()	1.03± 0.07	1.06± 0.065	0.412
(%)	7.15± 9.1	12.6 ± 8.1	0.238
(mm)	0.43± 0.54	0.54± 0.48	0.684
(mm)	2.89± 0.32	3.02± 0.34	0.458
(mm)	3.13± 0.36	3.48± 0.48	0.115

Table 4. 한 개의 긴 스텐트 삽입군에서 성별 관동맥 조영술상 특징

	(n=11)	(n=4)	p-value
(mm)	3.2 ± 0.4	3.3 ± 0.5	0.78
(mm)	32.3 ± 5.5	33.4 ± 4.9	0.73
(mm)	0.3 ± 0.5	0.8 ± 0.4	0.06
(mm)	2.9 ± 0.3	3.0 ± 0.4	0.94
(%)	78.9 ± 15.6	83.3 ± 16.9	0.34
(%)	8.6 ± 8.9	10.5 ± 10.3	0.73
()	1.03± 0.08	1.06± 0.04	0.55
(%,)	67.7 ± 17.9	47.8 ± 19.4	0.08
(%, 6)	76.9 (10/13)	25 (1/4)	<0.001

7%)). (Table 3), 가 , 36% 44% 가 ((+) : (-) = 36.3 ± 4.0 mm : 30.6 ± 4.9 mm, p = 0.027). 가 (p=0.036) (p=0.009) 가 50% 가 가 67.7 ± 17.9%, 47.8% ± 19.4% , 1.07 ± 0.72 mm, 1.68 ± 0.57 가 GR II (= 40 mm) (p=0.075, p=0.15) (Table 17 (13 , 4) 4).

가)
 가 .
 요 약

연구배경 :

방 법 :

1996 7 1997 2
 50%

가 20 mm

결 과 :

1) 50 ~25
 25

2) 100%
 가 96%, 100% . 6
 60%, 36% 64.7%, 44%

3) (Gianturco-Roubin II stent,
 length = 40 mm)

; 1) (:
 = 76.9% : 25.0%, p<0.001), 2)
 (: = 72.7% : 66.

7%, p<0.001).
 (: = 36.3 ± 4.0 mm : 30.6 ± 4.9
 mm, p=0.027), (p=0.036)
 (p=0.009) 가

결 론 :

중심 단어 :

REFERENCES

- 1) Kaul U, Upasani PT, Agarwal R, Bahl VK, Wasir HS. *In-hospital outcome of percutaneous transluminal coronary angioplasty for long lesions and diffuse coronary artery disease. Cathet Cardiol Diagn* 1995;35:294-300.
- 2) Appleman YEA, Piek JJ, Strikwerds S, et al. *Randomized trial of excimer laser angioplasty vs. balloon angioplasty for treatment of obstructive coronary artery disease. Lancet* 1996;347:79-84.
- 3) Goudreau E, DiSciascio G, Kellt K, et al. *Coronary angioplasty of diffuse coronary artery disease. Am Heart J* 1991;121:12-9.
- 4) Zidar JP, Tenaglia AN, Jackman JD, et al. *Improved acute results for PTCA of long coronary lesions using long angioplasty balloon catheters. J Am Coll Cardiol* 1992; 19:34A.
- 5) Raymenants E, Bhandari S, Stammen F, De Scheerder ID, et al. *Effects of angioplasty balloon material and lesion characteristics on the incidence of coronary dissection in 2150 dilated lesions. J Am Coll Cardiol* 1003;21:291A.
- 6) Tenaglia AN, Fortin DF, Califf RM, et al. *Predicting the risk of abrupt closure after angioplasty in an individual patient. J Am Coll Cardiol* 1994;23:1004-11.
- 7) Ellis SG, Roubin GS, King SB III, et al. *Angiographic and clinical predictors of acute closure after native vessel coronary angioplasty. Circulation* 1988;77:372-9.
- 8) Myler R, Shaw R, et al. *Lesion morphology and coronary angioplasty: Current experience and analysis. J Am Coll Cardiol* 1992;19:1641-52.
- 9) Hermans WR, Foley D, et al. *Usefulness of quantitative and qualitative angiographic lesion morphology, and clinical characteristics in predicting major adverse cardiac events during and after native coronary balloon angioplasty. Am J Cardiol* 1993;72:14-20.
- 10) Savage MP, Goldberg S, Hirshfeld JW, et al. *for the M-Heart Investigators. Clinical and angiographic determin-*

- ants of primary coronary angioplasty success. *J Am Coll Cardiol* 1991;17:22-8.
- 11) Hirshfeld JW Jr, Schwartz JS, Jugo R, et al. Restenosis after coronary angioplasty: A multivariate statistical model to relate lesion and procedure variables to restenosis. *J Am Coll Cardiol* 1991;18:647-56.
 - 12) Bourassa MG, Lesperance J, Eastwood C, Schwartz L, Cote G, Kazim F, et al. Clinical, physiologic, anatomic and procedural factors predictive of restenosis after percutaneous transluminal coronary angioplasty. *J Am Coll Cardiol* 1991;18:368-76.
 - 13) Hermans WR, Foley DP, Rensing BJ, Serruys PW. Morphologic changes during follow up after successful percutaneous transluminal coronary balloon angioplasty: Quantitative angiographic analysis in 778 lesions-further evidence for the restenotic paradox. *Am Heart J* 1994;127:483-94.
 - 14) Tenaglia AN, Fortin DF, Califf RM, et al. Predicting the risk of abrupt vessel closure after angioplasty in an individual patient. *J Am Coll Cardiol* 1994;23:1004-11.
 - 15) Shakhovich A, Moses JW, Undemir C, Cohen NT, et al. Procedural and short term clinical outcomes in multiple Palmaz-Schatz stents (PSSs) in very long lesions/dissections. *Circulation* 1995;92:1-535.
 - 16) Miello L, Hall P, Nakamura S, et al. Results of stent implantation of diffuse coronary disease assisted by intravascular ultrasound. *J Am Coll Cardiol* 1995; February Special Issue:156A.
 - 17) Fausto F, Gilberto N, Luiz M, Marinella C, et al. Elective Gianturco-Roubin stent in long lesions: Angiographic restenosis and its predictors. *The Journal of Invasive Cardiology* 1996;8:44.
 - 18) Edward TA Fry, James BH, Thomas FP, Frank SS, Duane CB, Charles MO, et al. Comparison of Gianturco-Roubin and Palmaz-Schatz coronary stenting: Angiographic results, In-hospital events, and 6 month outcome. *The Journal of Invasive Cardiology* 1996;8:44.
 - 19) Mark F, Cindy G, Roberts DS. *The new manual of interventional cardiology*. p281, Michigan, Physician's Press, 1996