

두개외 경동맥 협착증에 대한 스텐트 삽입술의 추적 결과

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Follow-up Results of Stent Placement for Extracranial Carotid Artery Stenosis

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ABSTRACT

Background and Objectives : Carotid artery stenting has evolved as a potential alternative to carotid endarterectomy in patients (pts) with significant carotid artery stenosis. We evaluated the feasibility and long-term outcome of carotid artery stenting in selected pts at high surgical risk. **Materials and Methods :** Between May, 1996 and September 1998 we performed carotid artery stenting at 35 lesions in 25 pts. There were 23 males and 2 females. Mean age was 63.2 ± 6.6 (range 54 - 77). Eighty four percent (21/25) of the pts had significant coronary artery disease. Sixty four percent (16/25) of the pts had significant peripheral artery lesions. Sixty percent (15/25) of the pts had neurologic symptoms or non-disabling stroke. We used Wallstent in 32 lesions and Palmaz stent in 3 lesions. Carotid stenting was undertaken in 33 internal carotid, 1 common carotid and 1 external carotid lesions. Bilateral carotid stenting was undertaken in forty percent (10/25) of the pts. **Results :** Carotid stenting was successful in all lesions. One patient died due to massive cerebral hemorrhage 3 days after carotid stenting, who had undergone stenting as a rescue procedure for failed endarterectomy. One major stroke developed during procedure with partial recovery. For the combined endpoint of strokes and death within 30 days of procedure, the incidence was 8% and 5.7% in terms of pts and procedures, respectively. On follow-up (12 \pm 7 months), we found neither neurologic complications nor death. Angiographic and/or duplex sonography which were performed at 5.5 month in all (18) eligible pts with 24 lesions revealed no evidence of stent deformity or restenosis (50% of diameter stenosis). Mean angiographic stenosis was 20% on follow-up angiography. **Conclusion :** Carotid artery stenting can be performed with high success and low complication rate in pts with significant carotid artery stenosis especially at high surgical risk. Follow-up clinical outcome of average 12 month was good with low restenosis rate. (Korean Circulation J 1998;28(11):1820-1827)

KEY WORDS : Carotid arteries · Stenosis · Stents · Carotid endarterectomy.

: 1998 11 5

: 1999 1 5

: , 120 - 752

134

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서론

1980 Kerber

가
1 50
가
200

3 1 가
1)2)

가

8-13)

14)

가
가

대상 및 방법

NASCET(North Am -
erican Symptomatic Carotid Endarterectomy Trial)

대 상

1996 6 1998 9
60%

70%
2 17% 가 ()
)³⁾ ACAS(Asympto -
matic Carotid Atherosclerosis Study)

asu

2 (5)
electronic caliper

Takay -

60% 2.7
53% 가 가⁴⁾ ECST
(European Carotid Surgery Trial)

80% 3 11.6%
60%⁵⁾

SPECT

가

(stent supported carotid angioplasty)

가

가

18%
5.8% 3³⁾
7.6 27% (5.5%),
(5 9%)³⁾⁶⁾

방 법

14)

Seldinger

5F Newton(Mallinckrodt Medical Inc.,
60% St Louis, MO) Headhunter(Meditech, Waterto -

wn, MA)

On - line QCA(Quantitative Co -
mputer - assisted Analysis)

가 60%

2

aspirin 100 200 mg ticlopidine 500 mg cil -
ostazol 200 mg , ticlopidine
1 , cilostazol 2 , aspirin

(guidewire exchnage technique)

7 8F long sheath(80 100 cm)

2 cm 0.014 inch

Traverse

(predilation) 3.5 4.0 cm, 20 mm

non - compliant NC Cobra(Scimed, Maple Grove,
MN) 4 10

(predilation)

0.018 inch

Roadrunner (Cook inc., Bloomington, IN)

가

Peripheral Wallstent(Schneider Europe AG,
Blach, Switzerland) , Palmaz

(Johnson & Johnson Interventional Systems,
Warren, NJ) 가

25%

5 6 mm Ultr -
athin(Meditech, Watertown, MA) Symmetry ba -
lloon(Meditech, Watertown, MA)

결 과

임상특징

25 35

23 , 2 63.

2 ± 6.6(54 77) (Table 1).

(non - disabling stroke),

15 (60%) . 21 (84%)

, 16 (64%)

16 (64%),

8 (32%),

(200 mg/dl) 14 (56%)

2

21 (84%)

NASCET

가

22 (88%) (Table 1).

8 (32%)

4 (50%),

4 (50%)

4 (16%)

3

(12%)

2

3 (12%) . 1

10

혈관조영 및 시술결과

25 , 35

100% . 1

가

. 35 17 (49%)

Table 1. Baseline clinical characteristics of patients

| | N | % |
|--|--------------|-----|
| Patients | 25 | 100 |
| Mean age(range) , year | 63 (54 - 77) | |
| Male | 23 | 92 |
| Coronary artery disease | 21 | 84 |
| Peripheral artery disease | 16 | 64 |
| Hypertension | 16 | 64 |
| Smoker(within 1 year) | 21 | 84 |
| Dibetes | 8 | 32 |
| Hypercholesterolemia | 14 | 56 |
| NASCET exclusion criteria | 22 | 88 |
| Symptomatic | 15 | 60 |
| TIA | 4 | 16 |
| Stroke | 11 | 44 |
| Previous endarterectomy | 1 | 4 |
| Bilateral carotid stenting | 10 | 40 |
| Combined coronary stenting | 8 | 32 |
| Hypercholesterolemia:total cholesterol | 200 mg/dl | |

Table 2. Target lesion characteristics

| | N | % |
|------------------------|----|-----|
| Total | 35 | 100 |
| Right common carotid | 1 | 3 |
| Left external carotid | 1 | 3 |
| Right internal carotid | 16 | 46 |
| Left internal carotid | 17 | 49 |
| Bilateral carotid | 11 | 44 |

Table 3. Angiographic results

Unit : mm

| | |
|--------------------------------------|-----------------|
| Reference artery diameter | 5.0±0.6 |
| MLD, prestent (% diameter stenosis) | 1.3±0.9(78±12%) |
| MLD, poststent (% diameter stenosis) | 4.8±1.2(4± 8%) |
| MLD, follow up (% diameter stenosis) | 4.0±1.4(20± 7%) |
| acute gain | 3.5±1.3 |
| Late loss | 0.8±0.5(18%) |

MLD : minimal luminal diameter

, 16 (46%), , 1 (2.9%)
9%) , 1 (2.9%)
(Table 2).

(60%)
11 (44%) 10 (40%)
, 가 8
(80%, 8/10), () 가 2
(20%, 2/10)

32 (91%) Wallstent , 3 (9%)
Palmaz
가 8 (23%),
가 2 (6%)

78±12%(60 99%) , 4±8%
(- 28 20%) (Minimal lumi -
nal diameter, MLD) 1.3±0.9 mm 4.8±1.2 mm
가 3.5 mm acute gain (Table 3).

1 (3.8%) 3 (13)

1 (3.8%) (major stroke)

(poststent dilatation)

가

추적 관찰 결과

6 가 18 , 24

5.5±2.6

17 23 (96%),

8 12 (50%),

6 , 10 (42%)

50%

4.8±1.2 mm

4.0

±1.4 mm 0.8 mm(18 %) late loss

(Table 3).

가

12.0±7.0 (1 28)

고 찰

가 75%

1 1.3%, 75% 10.5%

.¹⁵⁾ NASCET 70

99% 26%, 28%

2

(trans -

ient monocular blindness) 17%,

(hemispheric transient ischemic attack)

42% .³⁾

20 40%

(50%) (50 79%)

7 23%

(80 100%)

.¹⁶⁾

50 79%

17% 38 1 0.85%, 3 18)

3.6%, 5 5.4% 80 99% 20.6% 7-9)

23 , 2048 가 98.6% 가 2 7% 20)

가 NASCET 2 가 8F

21.3% 9F 가 75% 99%

가 26.3% 73.2% 가 3)

가 NASCET 70% 21)

26% 30) (complication rate) - 8-13)20)

3) ACAS 60% 1.5 9% 6)22)23)

5 11.0% 8%, 5.

5.1% 30% 7%

가 4)

30 60% 가 ECST 7%, NASCET 5.8%, 3-5)

가 protected angioplasty 2%

가 70% 10)

가 NASCET ACAS

. PVI

(Pittsburg Vascular Institute) 83%

85% 가 NASCET

ACAS 13)24)25)

50,000 70,000 가

18%

, Sundt 5.5 18
(Sundt class ,) 24 Duplex
(Su - 50% 5 mm
ndt class ,) 3.7% 8.1%,
1.3% 2.9% 2 (26)
가 , 가 5 11%
(6)(28)
가
가 92% 4 가
(16%) , 1 (4%)
, 10 (40%) Yadav Dietrich
American Heart Associa -
tion 60% (8)(13) 12 (1 28
, 70% 3%) 가 1
6 7%
(27) 가
90%
가
가 Wallstent Palmaz
3 가 Palmaz
1 가
3 가
collapse가 Wallstent
(13)(29) Wallstent
strut ,
2 가
, , co -
mpressibility
Yadav 6 4.
9% , Dietrich 7.6 4.5%, Therone
4%, 24 4.8% (8-10)(20)
가

가 49%(17/35), 46%
 가 (16/35), 2.9%(1/35), 2.9%(1/35) . 10(40%)
 30) . Wallstent 91%(32/35), Palmaz 9%(3/35)
 가 100 결 과 :
 35
 가 100% . 78 ±
 12% 4 ± 8% 1
 31)
 가 , 1
 () 30
 , , 가 가 8%(2/25) 5.7%(2/35)
 가 12 ± 7
 가 6 18 , 24
 가
 50%
 가 8 (12)
 20%
 결 론 :

요 약

연구배경 :

중심 단어 :

1997

가

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대상 및 방법 :

1996 6 1998 9
 25 35 -
 63.2 ± 6.6 23 , 2
 60%(15/25) . 84%
 (21/25)
 64%(16/25)

- ion of proximal carotid stenosis during distal bifurcation endarterectomy. *AJNR* 1980;1:348-9.
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