

중증 뇌동맥류 환자의 조기 수술에 있어서 뇌압 측정의 중요성

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= Abstract =

Significance of Intracranial Pressure Monitoring in Early Surgery for Poor-Grade Aneurysm Patients

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Objective : Patients with poor grade aneurysm usually present with increased intracranial pressure(ICP), even those without an intracranial clot. Based on this fact, the present study investigated a significance of intracranial pressure monitoring in those patients.

Patients and Methods : A total of 60 patients with Hunt and Hess Grade Ⅱ (50 patients) or Ⅲ (10 patients) were treated for aneurysmal subarachnoid hemorrhage(SAH) during a 3-year-period, and intraparenchymal ICP was measured in the majority, immediately after arrival to the emergency room. Early surgery including intraoperative ventriculostomy was undertaken within 3 days after SAH. An ultraearly surgery was performed without preceding angiogram or ICP monitoring in patients with large sylvian hematomas, highly suggestive of middle cerebral artery aneurysm. Outcomes were assessed by the Glasgow Outcome Scale(GOS) at 6 months.

Results : In overall, favorable outcome(GOS scores 1-2) was seen in 27(54.0%) of admission Grade Ⅱ and 1(10.0%) of admission Grade Ⅲ patients. Of the 38 surgical patients with preoperative ICP monitorings, 25 patients (80.6%) exhibiting ICP values of less than 40mmHg showed favorable outcome, however, no patients with ICP values above 40mmHg recovered(Fisher's exact test, $p=0.0001$).

Conclusion : It is concluded that a preoperative ICP above 40mmHg before ventriculostomy indicate significant vital brain destruction as intractable intracranial hypertension, and Grade Ⅱ patients at admission with an ICP below 40mmHg can be of benefit from early surgical intervention while Grade Ⅲ patients still remains unfavorable.

KEY WORDS : Intracranial pressure monitoring · Poor grade · Aneurysm.

서 론

중증 뇌동맥류 환자는 대개 뇌압 상승을 동반한다. 본 연구는 뇌압 측정의 중요성을 규명하기 위하여, Hunt-Hess Grade Ⅱ 또는 Ⅲ의 뇌동맥류 환자 60명을 대상으로, 수술 후 6개월째 Glasgow Outcome Scale(GOS)을 이용하여 예후를 평가하였다. 수술 전 뇌압을 측정하여 40mmHg 이하인 환자 25명(80.6%)은 양호한 예후를 보였으나, 40mmHg 이상인 환자 13명(100%)은 양호한 예후를 보이지 않았다(Fisher's exact test, $p=0.0001$).

결론적으로, 수술 전 뇌압이 40mmHg 이상인 환자는 중대한 뇌손상을 시사하며, Hunt-Hess Grade Ⅱ 환자 중 수술 전 뇌압이 40mmHg 이하인 환자는 조기 수술적 개입에서 이익을 얻을 수 있으나, Grade Ⅲ 환자는 양호한 예후를 기대할 수 없다.

대상 및 방법

(Table 2).

1995 1 1997 12
 Hunt - Hess

60

Table 1

50

10

15

(38)

2

38

15

5

. 60

42

3

가

Table 1. Clinical data for 60 patients in Hunt-Hess grade or

Feature	Grade	Grade
Age(mean)	36 - 90(58.5)	51 - 71(61.4)
Sex(M : F)	16 : 34	5 : 5
Aneurysm location		
ICA and P-com	8	2
A-com and ACA	20	4
MCA	9	2
Basilar	1	1
Multiple	12	1
Total	50	10

ICA : internal carotid artery, P-com : posterior communicating, A-com : anterior communicating, ACA : anterior cerebral artery, MCA : middle cerebral artery

Table 2. Reasons for nonsurgical treatment in 18 patients

Reasons	No of cases
Irreversible brain destruction	4
Rebleeding	3
Vasospasm	2
Too old age	1
Poor vital sign	1
No angiographic filling	1
Discharge against	6

sylvian

4

가,

Glasgow Outcome

Scale(GOS) 가

GOS 1 2

(favorable),

GOS 3, 4, 5

(poor)

Fisher's exact test

p 0.05

결 과

15

5

5

4 25mmHg

35mmHg

1

28 (46.7%)

27 (54.0%)

1 (10.0%)

38.1%(42

16)

88.9%(18

16)

(Fisher's exact test,

p=0.0005)(Table 3).

32

21 (65.6%)

, 6

, 3

, 2

(Table 4).

38

29 (76.3%)

Table 3. Outcome based on management protocol

Result*	Supportive care only			Craniotomy		
	G	G	Total	G	G	Total
Favorable	2	0	2	25	1	26
Poor	13	3	16	10	6	16
Total	15	3	18	35	7	42

G : Hunt-Hess grade

* : Favorable : Glasgow Outcome Scale(GOS) 1 - 2,

Poor : GOS 3 - 5

Supportive care vs craniotomy, Fisher's exact test, p=0.0005

Table 4. Causes of poor outcome in 32 subarachnoid hemorrhage patients

Causes	No.(%)
Initial hemorrhage	21 (65.6)
Vasospasm	6 (18.8)
Rebleeding	3 (9.4)
Respiratory failure	2(6.2)

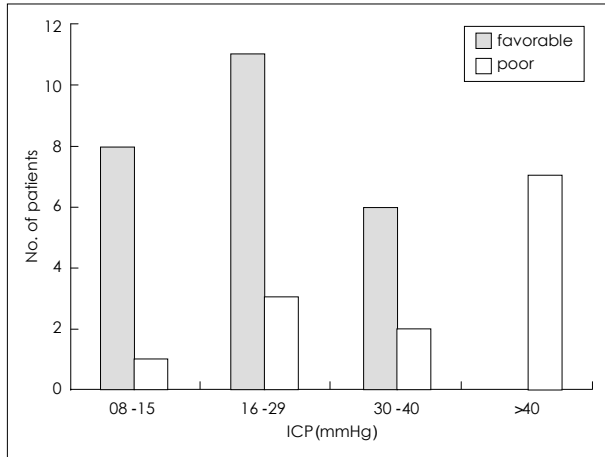


Fig. 1. Outcome of 38 surgery patients related to the level of ICP. ICP < 40 mmHg vs >40 mmHg, Fisher's exact test, p=0.0005.

Table 5. Outcome of 38 surgery patients related to the level of ICP

Results	ICP (mmHg)	
	40 (%)	>40 (%)
Favorable	25 (80.6)	0
Poor	6 (19.4)	7 (100)
Total	31	7

Fisher's exact test, p=0.0001

Table 6. Mean ICP according to clot location

Clot location	Mean ICP (mmHg)*
IVH	32.2 ± 7.3
ICH or SDH	28.2 ± 3.9
ICH+IVH	27.9 ± 5.0
SAH	28.3 ± 3.7

IVH : intraventricular hemorrhage, ICH : intracerebral hemorrhage, SDH : subdural hemorrhage, SAH : subarachnoid hemorrhage

* : mean ± standard error

30%

8)

16mmHg
 8 (88.9%), 16~29mmHg
 30~40mmHg 6 (75.0%)
 , 40mmHg
 (Fig. 1).
 25 (80.6%)
 65.8%(38 25)
 40mmHg 가
 (Fisher's exact test,
 p=0.0005)(Table 5).
 가 (Table 6)
 sylvian

5)7)18)26)
 15mmHg
 11 (78.6%),
 가 13)14)21)24)
 가 1)2)11)
 가 18)26)
 가 4)10)
 가 20) 22)
 가

고 찰

Hunt - Hess

1)9)23)25)28)

가

가

가

1)8)27)

1)20), 5)6) 40mmHg 가 .

15)20)25)28) 가 1 .

가

가

16) . Bailes¹⁾ 87.5% 20cmH₂O 16mmHg 가 76.3% 30cmH₂O 50cmH₂O 65.7% (65.8%) .

3), 가

가

가

(fiberoptic device) mmHg

5 35mmHg 가

1 가

17)19), 8), 8) 2

Miller¹²⁾ 40mmHg 25mmHg 가 40 mmHg 80%

결론

3 Hunt - Hess (50) (10) 60

3 sylvian

6 Glasgow Outcome Scale 27(54.0%) , 1(10.0%) 38

40mmHg 25(80.6%) 40mmHg

40mmHg 40

가

가

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