

## 기저동맥 분지부 동맥류의 치료결과\*

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= Abstract =

### Management Outcomes of Basilar Bifurcation Aneurysms

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**Objective :** The authors analyzed the results of management outcomes for basilar bifurcation aneurysms treated with transcranial surgery and endovascular surgery.

**Methods :** At the authors' institution between May 1989 and December 1998, 47 aneurysms with 45 patients were treated with transcranial surgery including surgical clipping/wrapping and endovascular surgery for basilar bifurcation aneurysms. The medical records and neuroimaging studies of the patients were reviewed retrospectively.

**Results :** Of the 45 patients, 87 percent of the aneurysms were ruptured and 13% unruptured. Forty six percent of the patients had multiple aneurysms including basilar bifurcation aneurysm. Of the 39 patients with subarachnoid hemorrhage, 77% were in good neurological status(Hunt Hess grade - ), 23% were in poor grade(H - H grade - ).

Thirty two patients were treated with transcranial surgery and 15 patients were treated with endovascular surgery. Two patients who had treated with wrapping surgery later bled during follow - up period and treated with endovascular surgery. The management outcome of the transcranial surgery was : Glasgow outcome scale(GOS) 66%, GOS 12.5%, GOS 6.3%, GOS 6.3% and GOS (death) 9.4%. The major causes of morbidity related to transcranial surgery were perforator occlusion, vasospasm and retraction injury.

The management outcome of the endovascular surgery was : GOS 66.7%, GOS 6.7%, and GOS 26.7%. The major causes of mortality related to endovascular surgery were related to intraoperative aneurysmal bleeding.

**Conclusion :** This report documents that more than 75% of patients undergoing treatment either transcranial or endovascular surgery can expect good clinical outcomes. Treatment modality in management of basilar bifurcation aneurysm must be carefully selected based on various considering factors.

**KEY WORDS :** Basilar bifurcation aneurysm · Transcranial surgery · Endovascular surgery.

(basilar bifurca - (clipping)  
tion aneurysm) 1/2 가 가  
5 8% 20)29) 5)8)10)12 - 14)22)25)30)  
가 , (endovascular surgery)  
가 , ,  
(perforators) 2)9)27)

1999 가

대상 및 방법

1989. 6 - 1999. 6  
 Age : 22 - 73 y.o.(mean : 56.5)  
 Sex : 32 females(71%)  
 Multiple aneurysm : 20(44.4%)  
 Classification  
 Ruptured 39  
     Basilar tip aneurysm 32  
     Other accompanied aneurysm 7  
 Unruptured 6  
     Dizziness 3  
     Stroke 1  
     Moyamoya disease 1  
     Mass effect 1  
 Size of aneurysm\*  
     Small 26  
     Large 18  
     Giant 1

\* : small = >10 mm ; large = 10 - 24mm ; giant = 25mm

가 6 . 39  
 가 가 32 (82.1%) ,  
 가 7 . 39  
 H - H grade 4 , grade 19 , grade  
 7 , grade 8 , grade 1 .  
 Hunt - Hess grade(H - H grade) 6  
 1 , 3 ,  
 Glasgow 1 .  
 outcome scale(GOS) (>10mm)가 26 , (10 - 24mm)가 18  
 가 가 7 (>25mm)가 1 . 45  
 3 , 32 15 .  
 6 32  
 가 23 , wrapping 가 9  
 (Table 2). 2  
 11 (0  
 1,260 51 ) , ( 3 )  
 45 3.4% , 56.5 12 . subtemporal approach  
 (22 73 ) , 13 32 가 10 , trans - sylvian approach가 22  
 가 71% . 가 20 (44.4%) , orbitozygomatic approach가 7 .  
 (Table 1). 2 32  
 wrapping 가 4 , H - H grade 5 , grade 가  
 가 가 14 , grade 가 6 , grade 가 3 .  
 45 39 GOS 21 ,  
 (86.7%) , GOS 가 4 , GOS 가 2 , GOS 가 2 , GOS  
 가 3 (Table 3). 3 2  
 1  
 (Table 4).  
 3 3 ,  
 1 .  
 27 (85%) .

Table 2. Treatment modalities of the aneurysms(n = 47)

Transcranial surgery	32
Method of aneurysm treatment	
Clipping	23
(with extracorporeal circulation : 2)	
Wrapping	9
Approach	
Subtemporal	10
Transsylvian	22
Orbitozygomatic	7
Endovascular coiling(GDC*)	15

\* : GDC = Guglielmi detachable coil

**Table 3.** Results of management (n = 47)

GOS*					
Preoperative neurological grade					
Transcranial surgery					
no SAH <sup>†</sup>		2	1	1	
H-H <sup>‡</sup>	-	17			2 3
H-H	-	2	3	1	
Total		21	4	2	2 3
Endovascular surgery					
no SAH		2			
H-H	-	6	1		3
H-H	-	1	1		1
Total		9	2		4
Size of aneurysm <sup>§</sup>					
Transcranial surgery					
Small		14	2	1	2
Large		7	2		3
Giant				1	
Total		21	4	2	2 3
Endovascular surgery					
Small		5	2		1
Large		4			3
Total		9	2		4

\* : GOS = Glasgow outcome scale  
 † : SAH = subarachnoid hemorrhage  
 ‡ : H-H = Hunt & Hess grade  
 § : small = <10mm ; large = 10 - 24mm ; giant = ≥ 25mm

**Table 4.** Comparison of major causes of morbidity & mortality between transcranial and endovascular surgery

	Transcranial surgery	Endovascular surgery
Mortality	Perforator occlusion medical problem	Intraoperative bleeding preoperative poor neurological grade
Morbidity	Perforator occlusion vasospasm retraction contusion	Intraoperative bleeding inadvertent vascular occlusion

28  
 5 (17.9%)  
 가 7  
 15  
 가 13 , 가 2  
 9 (1 17 ) , 3 heparin  
 15  
 가 2 , H - H grade -  
 가 10 , grade - 가 3

가 8 , 가 7  
 15 GOS 10 , GOS  
 가 1 , GOS 가 4 . 4  
 3 , 1  
 H - H grade  
 3  
 1 , 1 ,  
 (dissection)가 1 .  
 1  
 wrapping 2  
 1  
 , 1 가  
 고 찰  
 가 . 가  
 ,  
 가  
 Samson<sup>26)</sup> 303 81%  
 good outcome , Peerless<sup>21)</sup> 8%  
 25% 6 10% 3)9)11)24)30)  
 78% good outcome  
 가  
 3)11)21)  
 (temporary clipping)  
 17)  
 wrapping  
 wrapping  
 20),  
 Guglielmi



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