

# Guglielmi

1

3 .

.

4 .

5 .

.

2

: (Acom) Guglielmi (GDC)

, :

Acom GDC

18 14 ,

가 2 2 2 16

Hunt Hess , grade 0가 2 , grade I 3 , grade II가 5 , grade

III가 1 , grade IV가 3 , grade V가 2 . 1 20mm

3mm 12mm 5mm 가 10 .

Glasgow outcome scale(GOS) 가 .

: 13 10 3

90% . 5

2 , 2

가 , 1

. 2 - 1

1 13

GOS 2

GOS I 2 Hunt Hess IV V .

: GDC Acom

Acom 가

가 , , .

Guglielmi (Guglielmi detachable coil, GDC, Boston Scientific Corporation, Boston, USA) 가 ,

(endovascular treatment) 1991 Guglielmi (anterior communicating artery, Acom) (3-7).

(1,2) Acom

(3-7). GDC 가

30-40% (8-10). Acom

1 , (8,9,11-15) GDC 가 (16).

2 가

3 가

4 가

5 가

\* 1995 (02-1995-191)

1998 12 29 1999 3 2 .

: Guglielmi

가 Hunt Hess  
grade 0( )가 2 (2/16), grade I 3  
(3/16), grade II가 5 (5/16), grade III가 1 (1/16), grade  
IV가 3 (3/16), grade V가 2 (2/16)  
1 20mm  
3mm 12mm  
가 10  
4mm  
6 30  
( 15 ) 가  
가 ( )  
Acom 6F  
GDC 18 (sheath) 5-6F (thin wall guiding  
(Table 1). 18 82 catheter, Envoy(r), Cordis Omniguide(r), MIS)  
55 가 10 , 가 8  
14 2 가  
2 (parent artery) 가  
가 road-mapping  
(3 ), (2 1 Tracker-18(r) (Boston Scientific  
, Corporation, Boston, USA)  
(5 ), Tracker-10(r) Fastracker-10(r) (Boston  
가 Scientific Corporation, Boston, USA)  
(5 ), Y- Y-  
(2 ), 5,000  
(1 ) 1000cc 1-2  
가 2

Table 1. Summary of the Results.

Case No.	Age/ Sex	Presentation	Hunt & Hess Classification	Size of An. (Max./Neck)	GDC Embolization	Used GDC10 Length (cm)	Complication	Outcome
1	60/M	SAH	Grade II	4mm/2mm	Success (partial, 95%)	22	none	good recovery
2	57/M	VA	Grade 0	10mm/3mm	Success (complete)	160	none	good recovery
3	52/F	SAH	Grade II	4mm/3mm	fail (d/t wide neck) surgery		none	good recovery
4	18/F	Postop.		4mm/3mm	fail (d/t wide neck)		none	
5	65/F	SAH	Grade IV	8mm/3mm	fail (d/t tortuous ICA) surgery		none	good recovery
6	47/F	Postop.		3mm/2mm	Success (complete)	10	None	good recovery
7	52/M	SAH	Grade IV	5mm/2mm	Success (complete)	8	Thromboembolism	dead
8	70/M	SAH	Grade II	3mm/2mm	Success (complete)	16	None	good recovery
9	44/M	SAH	Grade V	8mm/3mm	Success (complete)	139	None	good recovery
10	57/M	SAH	Grade II	3mm/2mm	Success (partial, 90%)	12	None	good recovery
11	64/F	SAH	Grade III	6mm/3mm	Success (complete)	36	None	good recovery
12	46/M	VA	Grade 0	20mm/4mm	Success (partial, 90%)	GDC18 135	None	good recovery
13	40/F	SAH	Grade V	4mm/2mm	Success (complete)	26	vasospasm (before Tx.)	dead
14	60/M	SAH	Grade I	8mm/2mm	Success (complete)	41	None	good recovery
15	75/M	SAH	Grade IV	12mm/3mm	fail (d/t coil fracture) surgery		coil fracture	good recovery
16	38/M	SAH	Grade II	8mm/3mm	Success (complete)	40	None	good recovery
17	82/F	SAH	Grade I	4mm/2mm	Success (complete)	20	None	good recovery
18	66/F	SAH	Grade I	5mm/3mm	fail (d/t tortuous ICA) surgery		None	good recovery

Note : SAH ; Subarachnoid hemorrhage, VA ; deceased visual acuity, An.; aneurysm, Max.; maximum, Tx ; treatment, d/t ; due to, ICA ; internal carotid artery

parinization)

(systemic he- 3 (packing) 가

가

3,000 가 1

1,000 가 48

aPTT 24 2 24 가 road-mapping 가

24 가

(steam shaping)

18 1 3 14

(short diameter)

1-6 1

Glasgow Outcome Scale (GOS)

가

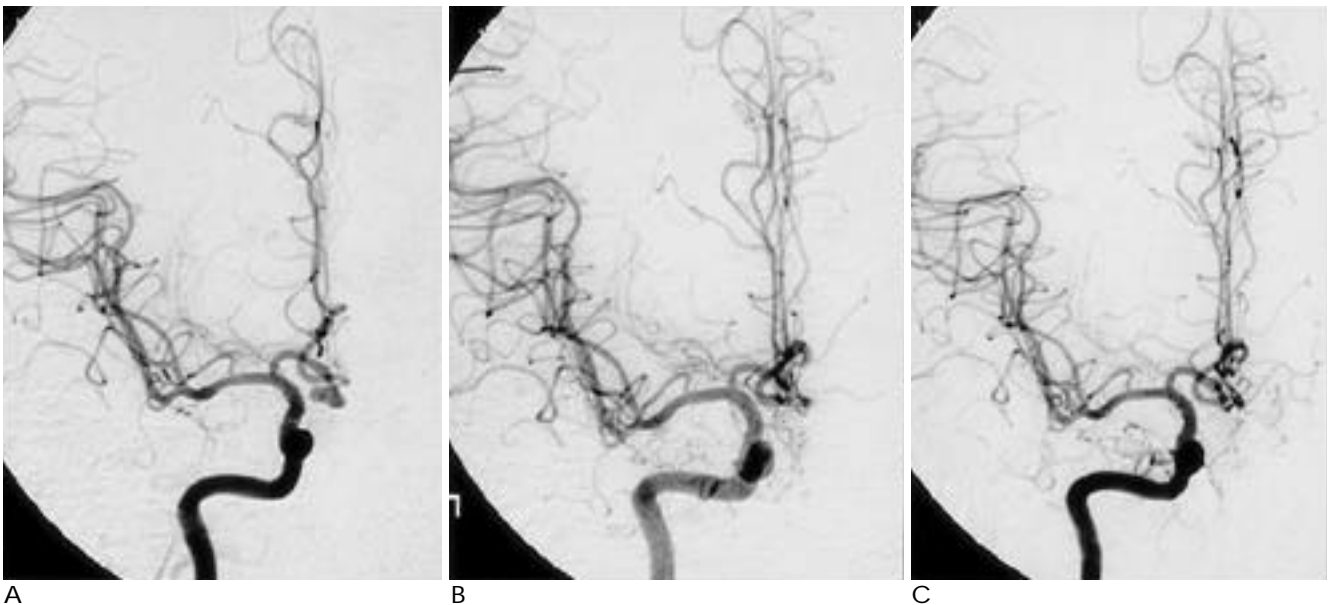
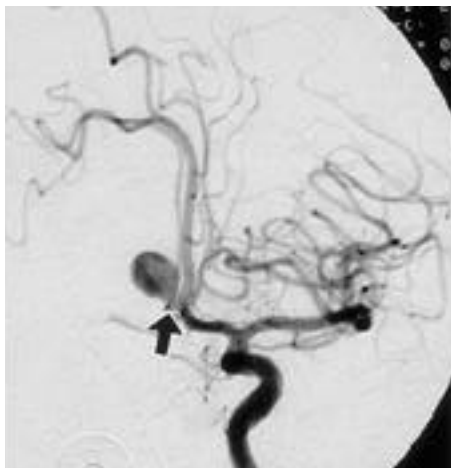


Fig. 1 . A sixty-year-old man with Grade I subarachnoid hemorrhage (case 14). Right internal carotid angiogram before embolization (A) shows an aneurysm arising from the right anterior communicating artery. The aneurysmal sac was occluded with GDC-10 and postembolization angiogram (B) shows complete occlusion of the aneurysm with preservation of the anterior communicating artery patency. Follow-up angiogram 8 months after treatment (C) shows no coil migration or compact modification without evidence of recurrent aneurysm.

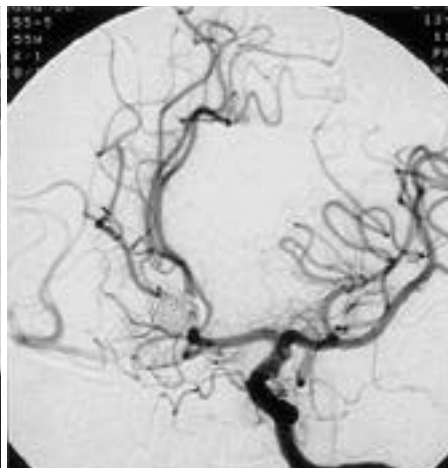
: Guglielmi

(Fig.

4). 5 가  
13 (13/18) GDC 10 가  
(Fig. 1 - 3) 3 90% 8cm 2 8 가 2 1  
160cm 53cm 가 2 1  
12 (Fig. 1, 2).  
5 (5/18) GDC (tortuosity)  
2 , 2 GDC 2 1  
가  
1 가  
1 가



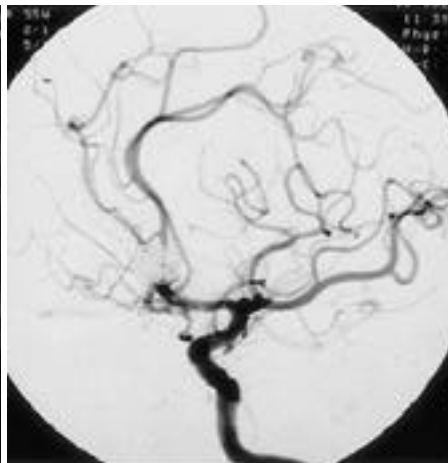
A



B



C

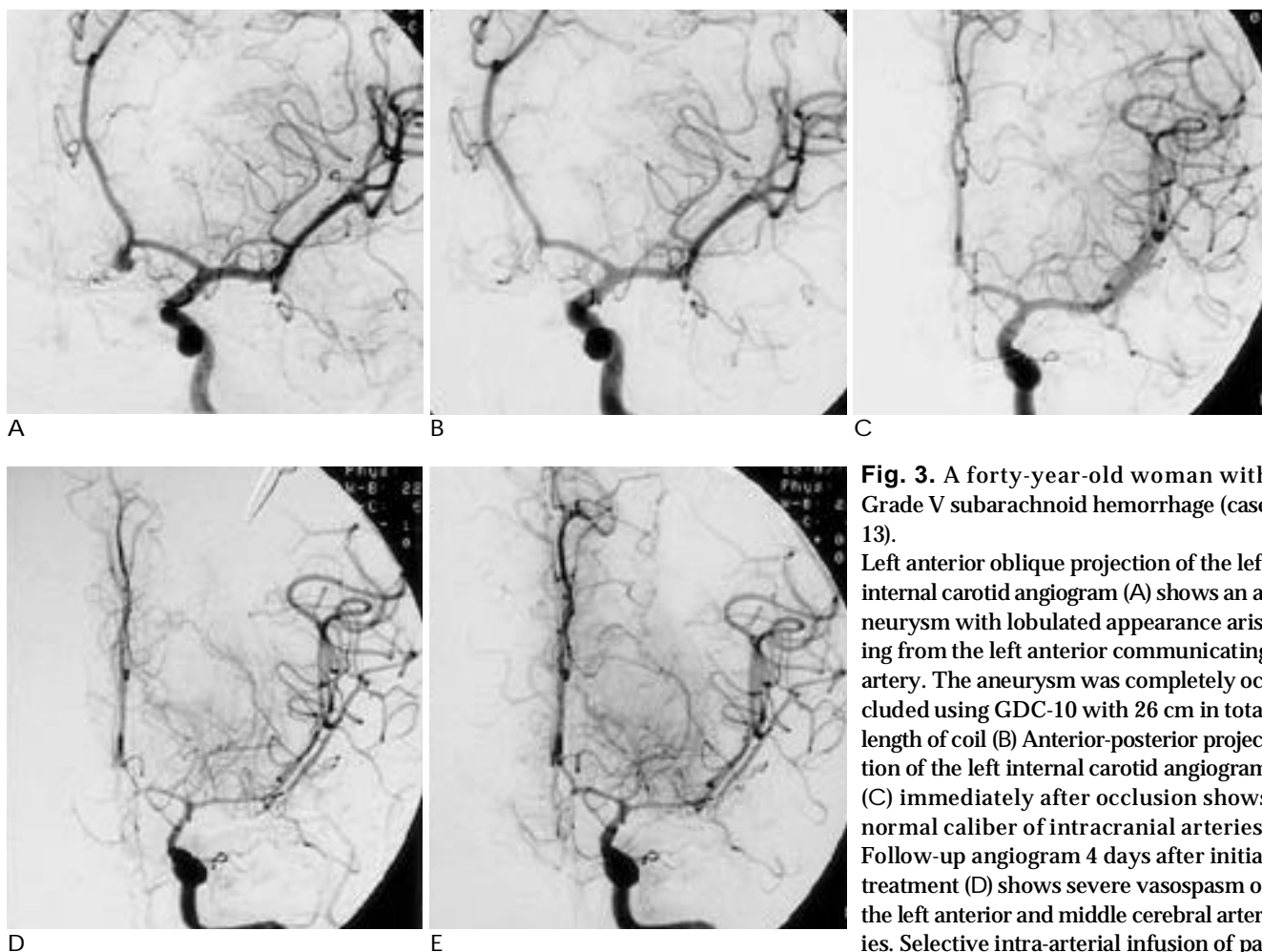


D

Fig. 2. A fifty-seven-year-old man with unruptured aneurysm (case 2).

Left internal carotid angiogram before embolization (A) shows an aneurysm arising from the anterior communicating artery of the opposite side and a short segment of the anterior communicating artery is visualized (arrow). The aneurysm was superselected via the left internal carotid, left anterior cerebral and anterior communicating arteries. The lesion was treated with GDC-10 and entire portion of the sac was occluded (B) with preservation of the anterior communicating artery. Densely packed coil mass is seen on plain radiography after treatment (C). Follow-up angiogram 12 months after treatment (D) shows stable result without any change of coils.

1  
(stretch fracture)  
GDC 1991 Guglielmi  
가가  
1991 1992 GDC  
(1,2)  
(3-7). GDC  
papaverin  
(Fig. 3). GDC(r)  
13  
1  
GOS I  
Hunt Hess grade  
GOS -  
IV V  
2 35  
(1). GDC  
(perfprating artery)



**Fig. 3.** A forty-year-old woman with Grade V subarachnoid hemorrhage (case 13).

Left anterior oblique projection of the left internal carotid angiogram (A) shows an aneurysm with lobulated appearance arising from the left anterior communicating artery. The aneurysm was completely occluded using GDC-10 with 26 cm in total length of coil (B) Anterior-posterior projection of the left internal carotid angiogram (C) immediately after occlusion shows normal caliber of intracranial arteries. Follow-up angiogram 4 days after initial treatment (D) shows severe vasospasm of the left anterior and middle cerebral arteries. Selective intra-arterial infusion of papaverine was performed and angiogram

after infusion (E) shows partial response in vasospasm. Despite repeated papaverine infusion, the patient died due to cerebral ischemia.

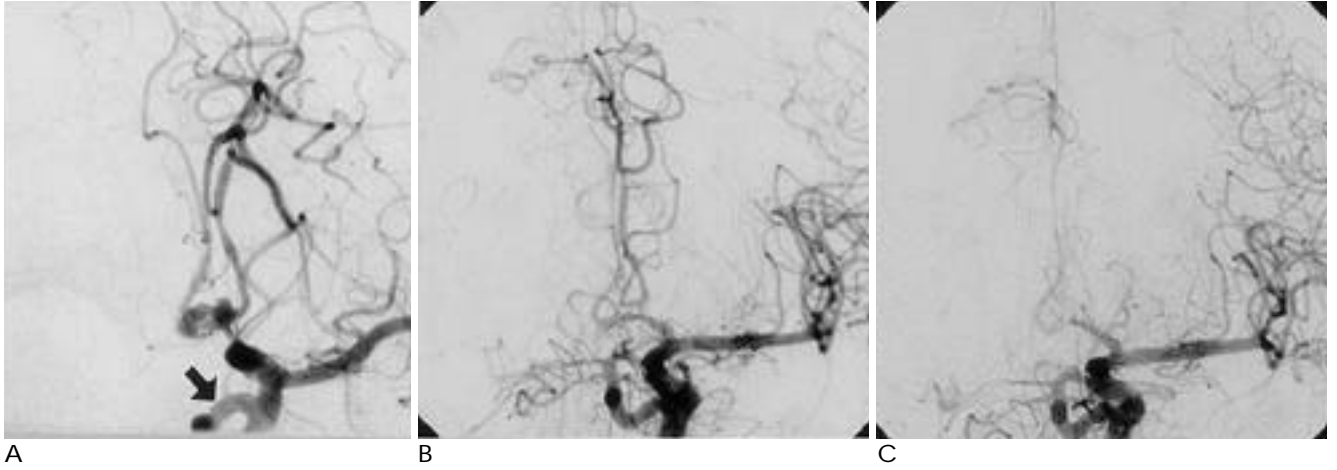


Fig. 4. A fifty-two-year-old woman with Grade II subarachnoid hemorrhage (case 3).

Left internal carotid angiogram with Waters projection (A) shows an aneurysm of the left anterior communicating artery with a daughter sac arising from the dome of the aneurysm and associated primitive trigeminal artery (arrow). GDC-10 with 6 cm in length was inserted and angiography before detachment (B) shows partial compromise of the parent artery with normal blood flow of the anterior cerebral artery in both sides and the aneurysmal sac is not visualized. Delayed angiogram after 15 minutes (C) shows progressive compromise of the parent artery with significantly decreased blood flow of the anterior cerebral artery. The coil was withdrawn with immediately relieved arterial occlusion and the patient underwent surgical clipping.

가 , (3). 가 가 .

(3-7) 가 (3), Acom

GDC 가 ,

가 , 가

(Fig. 2) (16).

가 GDC (pushability)

5 2 .

(1/14) 가

Acom (3,17)

(8-10) Acom Acom

Moret(16) 36 Acom

Acom 29

GDC 18

가 13 GDC

(8,9,11-15). Acom

(Fig. 4) 가 1 가

Acom Moret(16) Acom

5 4

가 GDC

Acom

Figure 4 is a flow diagram illustrating the results of Guglielmi detachable coil (GDC) embolization for saccular aneurysms. The diagram shows the progression from initial patient selection to final outcomes, including re-treatment and follow-up. Key data points include:

- 403 patients initially treated with GDC.
- 11 patients requiring re-treatment.
- 9 patients with residual aneurysms.
- 48 patients with no residual aneurysm.
- 1 patient died.
- 1 patient was discharged.
- 1 patient was lost to follow-up.

The diagram also shows the number of patients who were re-treated with GDC (11) and the number of patients who were re-treated with Acom (7). The final outcomes are summarized in the following table:

Outcome	Number of Patients
Initial Treatment (GDC)	403
Re-treatment (GDC)	11
Re-treatment (Acom)	7
Residual Aneurysm	9
No Residual Aneurysm	48
Death	1
Discharge	1
Lost to Follow-up	1

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10. , , .  
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## Endovascular Treatment of Anterior Communicating Artery Aneurysms with Guglielmi Detachable Coils<sup>1</sup>

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**Purpose:** To evaluate the usefulness, results, and technical problem of endovascular treatment in anterior communicating artery(Acom) aneurysm using a Guglielmi detachable coil(GDC).

**Materials and Methods:** We evaluated 18 patients with Acom aneurysm who underwent endovascular treatment with GDC. Their clinical presentations were subarachnoid hemorrhage (n= 14), decreased visual acuity (n= 2), and remnant aneurysm after surgical clipping (n= 2). Hunt and Hess grades of 16 pre-surgical patients were Grade 0 in two patients, Grade I in three, Grade II in five, Grade III in one, Grade IV in three and Grade V in two. The size of aneurysms was 20mm in one lesion that was classified as large, while other lesions with diameters ranging from 3 to 12mm were classified as small. The outcome of treatment and technical complications were analyzed. Clinical results were evaluated using the Glasgow outcome scale(GOS).

**Results:** Treatment was successful in 13 patients. Complete occlusion was observed in ten patients and partial occlusion in three. In five patients, the procedure failed to occlude the aneurysms because of proximal arterial tortuosity (n= 2), wide neck (n= 2) or coil fracture during the procedure (n= 1). Technical complications included thromboembolism (n= 1) and coil fracture during the procedure (n= 1). Among the 13 patients who were treated successfully, 11 were GOS I. Two patients died after treatment because of procedure-related thromboembolism in one patient and progressive vasospasm, demonstrated on angiography before treatment, in the other.

**Conclusions:** Treatment of Acom aneurysm using a GDC is useful and has many advantages compared to surgical clipping. Because of the anatomical characteristics of the Acom, however, technical failure may be more likely than in the case of posterior circulation aneurysm. Meticulous evaluation of aneurysms and adjacent arteries on angiography, as well as careful patient selection, is needed.

**Index words :** Aneurysm, intracranial  
Aneurysm, therapy  
Arteries, therapeutic blockade

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