

가
Guglielmi Detachable Coil

가 4 가 29 - 49 가 3
4 가 4 2

가
GDC 2 2

, 1 1
(sylvian fissure)

(Hunt-Hess Grade) 2 II, 1 III , 1
2 , (P1 segment)

system 1 GDC 10 Cirrus balloon occlusion
: 4 3 , 1 95% 1

1 ,
1 6

Guglielmi Detachable Coil (

GDC) GDC Moret (7) GDC

가 가 가 (1-6). 가

¹
²
1998 11 13 1999 5 27

GDC

가
가 4
4 가 , 2
4 가
4 가
1 , 1

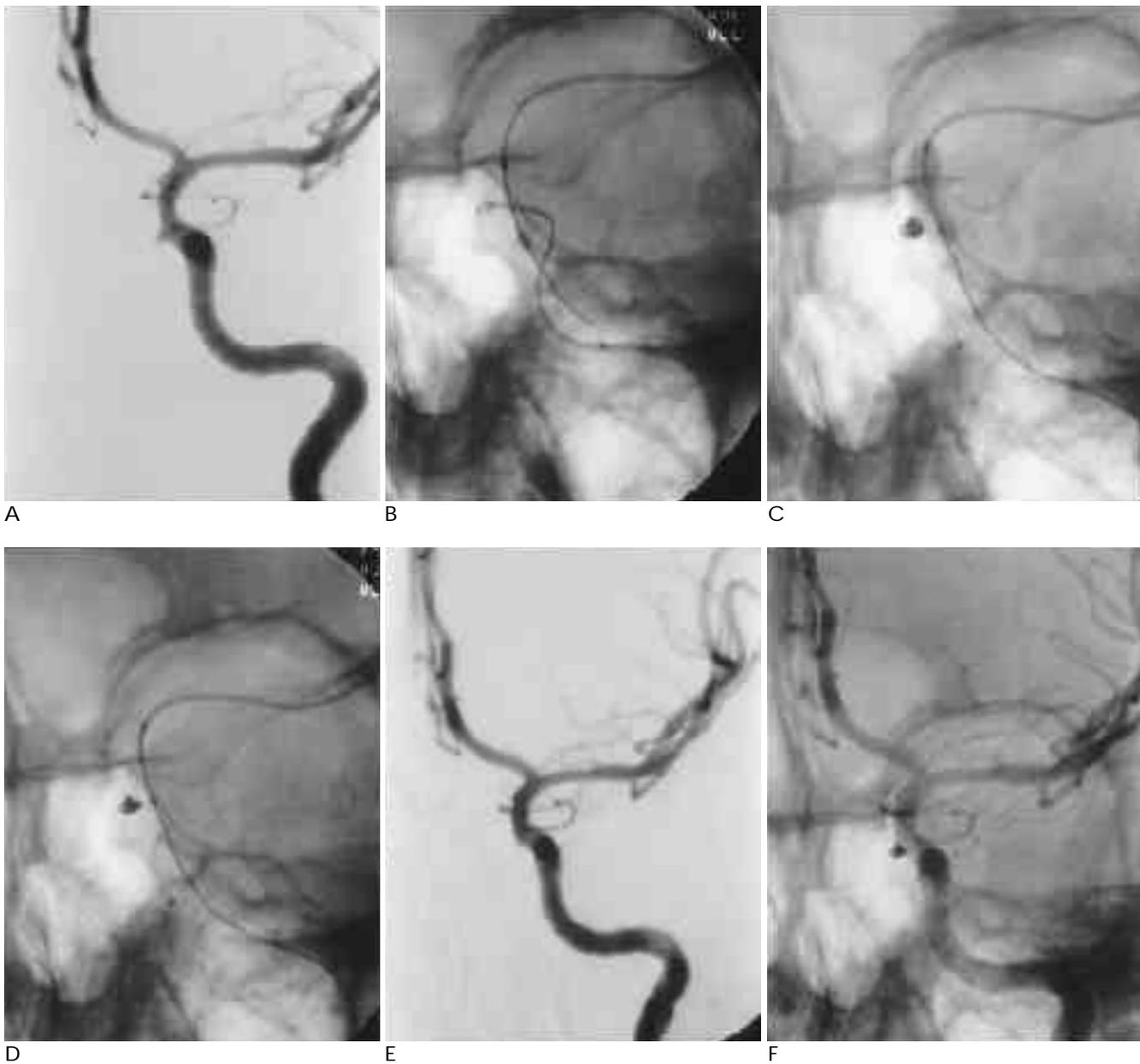


Fig. 1. Case 2. Working projection views demonstrating balloon assisted technique.
A. A wide-necked aneurysm is seen in the left internal carotid artery.
B. The non-detachable balloon is placed across the neck of the aneurysm and then the microcatheter is placed inside the aneurysm. The initial portion of coil is seen within sac.
C. The balloon is inflated across the neck of the lesion while the coil is delivered.
D. The balloon is deflated. If no displacement of the coil is observed, the coil is detached.
E. At the end of the procedure, complete occlusion is seen.
F. An unsubtracted view reveals remodeling of the coil and no evidence of protrusion of the coil into the parent artery.

(sylvian fissure)

(Hunt - Hess Grade) 2 II, 1

III, 1
2

(P1 segment)

1 (Table 1). DSA Angiostar (Siemens, Erlangen, Germany)

가

(Introducer sheath)

5F 6F

5000 IU

2500 - 3000 IU/h

Activated Coagulation Time (ACT) ACT 4 - 6

48

ACT 2

5F 6F

(Envoy Guiding catheter, Cordis, Miami lakes, FL, U.S.A.)

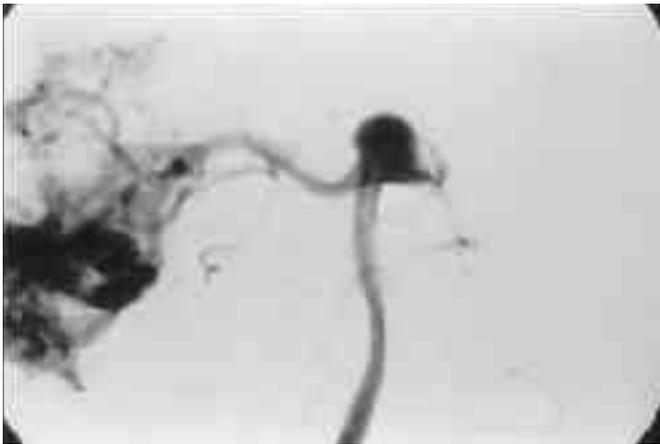
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(Cirrus Balloon Occlusion System, Medtronic MIS, Sunnyvale, CA, U.S.A.) 6F

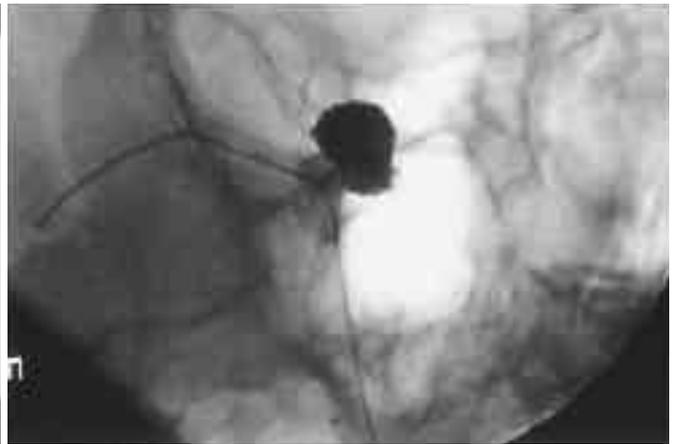
5F

(Tracker 10, Target Therapeutics, Fremont, CA, U.S.A.)

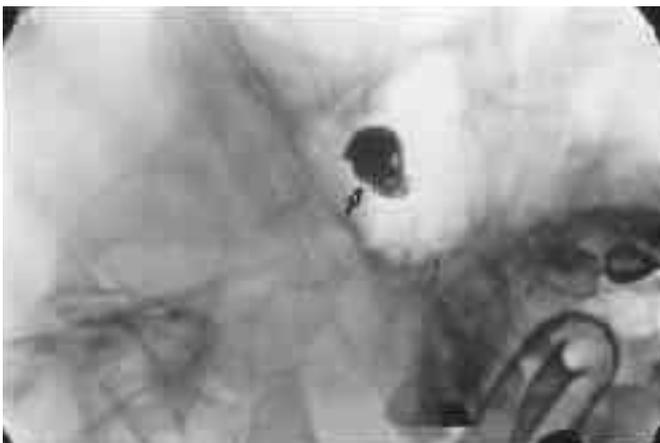
GDC(GDC10, Target Therapeutics, Fremont,



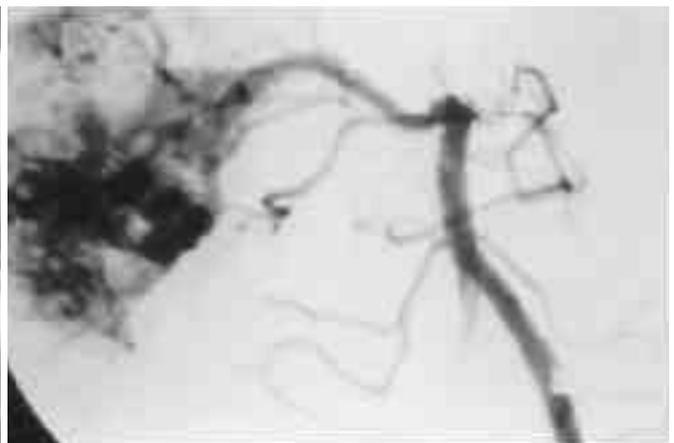
A



B



C



D

Fig. 2. Case 4. Basilar tip aneurysm with AVM in right temporal lobe.

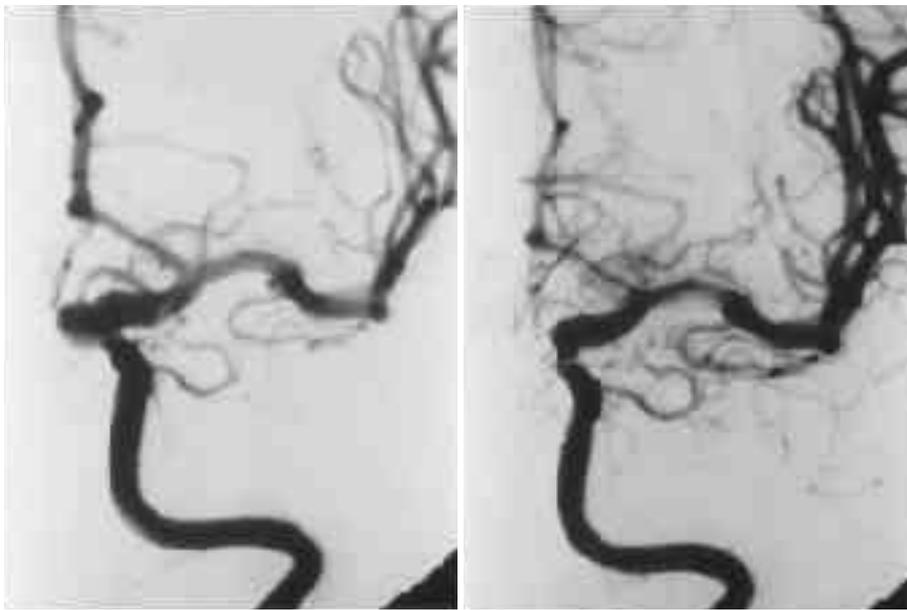
A. Wide-necked aneurysm before treatment.

B. Temporary inflation of the balloon across the neck of the aneurysm.

C. The concave appearance of the mesh of coils (arrow) is seen across the neck of the aneurysm.

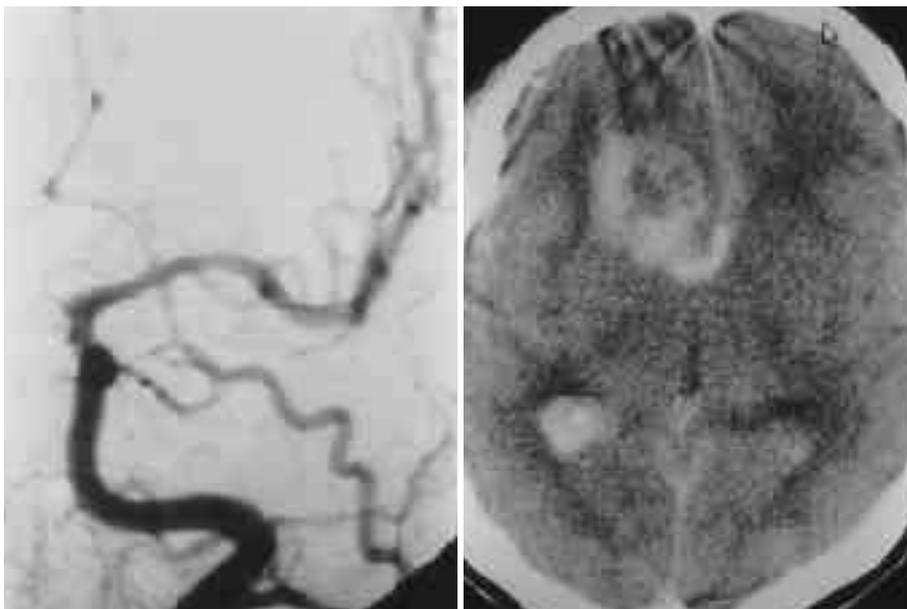
D. Total obliteration of the aneurysm after treatment.

CA, U.S.A.)
 GDC
 (95%-99%)
 (95%)
 Glasgow Outcome Scale Score
 (GOSS)
 (Fig. 1).
 2, 1
 4 3 1
 1 95%
 가 (100%)



A

B



C

D

Fig. 3. Case 3. Surgical clipping of the anterior communicating artery aneurysm 1 month ago and endovascular treatment of the internal carotid artery aneurysm.

A. Wide-necked aneurysm in the left internal carotid artery before treatment.

B. Subtotal obliteration of the aneurysm after treatment.

C. In the emergency angiography, after 6 hours from GDC embolization, there reveals no change of the coils and no evidence of rebleeding of the aneurysm.

D. In the emergency CT, after 6 hours from GDC embolization, there reveals hematoma in the right frontal lobe, which is probably due to complication related to heparin.

Table 1. Clinical and Radiological Findings

Cases	1	2	3	4
Sex/Age	29/M	45/M	49/F	41/M
Presentation (Site of SAH)	SAH (Basal cistern)	SAH (Perimesencephalic)	SAH & ICH (Frontal lobe)	SAH (Sylvian fissure)
H-H Grade	II	II	III	Traumatic
Site of BA	PCA(P1)	ICA(ophthalmic)	ICA(ophthalmic)	Basilar tip
Sac(mm)	5	2.5	6	12
Neck(mm)	3	2	4	5
Length of Coil(cm)	25	4	41	185
Occlusion rate	Total	Total	Subtotal	Total
Outcome	Excellent	Excellent	Dead	Excellent
Associated	AVM, Multiple	-	Multiple	AVM

SAH; Subarachnoid hemorrhage
ICA; Internal carotid artery
Multiple; Multiple aneurysms
PCA; Posterior cerebral artery
AVM; Arteriovenous malformation
BA; Balloon assisted GDC embolization

. 3 (Fig. 1, Fig. 2), 가 GDC .
1 (Fig. 3), 가 GDC .
1 6 (Table 1), 가 (10),
가 GDC 4 3 , 1 95% (11-14).
가 (2, 5, 8), 가 85% GDC
가 15% 가 (15),
4 mm , 2mm 가
2 가 4 GDC
(9). 가 (11-13). , 가
4mm 1 road mapping
(2). 가
Moret (14) 가

				GDC
	가			
	가			
		가		
				Moret
(14)	58	3		
		1		
	가			가
				가
				GDC
Moret(14)				
				가
				GDC

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GDC Embolization of Wide-necked Cerebral Aneurysms Using Balloon-Assisted Technique¹

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Purpose : The main factor limiting endovascular treatment of intracranial aneurysms is the shape of the aneurysmal sac, especially the width of the neck. We describe an early experience and technical aspects of treating wide-necked cerebral aneurysm using a Guglielmi detachable coil (GDC) and simultaneous application of a temporary balloon.

Materials and Methods : Four cases of unruptured wide-necked cerebral aneurysm were treated with GDC, with simultaneous application of a temporary balloon. Patients were aged between 29 and 49 years. On admission, clinical presentation was subarachnoid hemorrhage (SAH) in all cases. Hunt and Hess grade was II in two cases, III in one case, and traumatic SAH in one case. In all patients angiography revealed an asymptomatic aneurysm after rupture of another aneurysm or traumatic SAH. The aneurysms were occluded with GDC-10, and a Cirrus balloon occlusion system was used simultaneously. All procedures were performed under endotracheal general anesthesia and systemic heparinization.

Results : All cases were treated successfully, without parent artery compromise. The occlusion rate at the end of the procedure was total in three cases and subtotal in one. In one case a heparin-related hematoma occurred during post-procedural treatment and the patient eventually expired. One patient underwent follow-up angiography after 6 months, and the coil was not changed.

Conclusion : An aneurysm may not be completely occluded, but with regard to coil compaction and parent artery preservation, the technique is an attractive alternative.

Index words : Aneurysm, cerebral
Aneurysm, therapy
Catheters and catheterization, technology

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