

XLVIII Reunión Anual
**SOCIEDAD ESPAÑOLA DE
NEURORRADIOLOGÍA**



Caballerizas Reales · Palacio de la Magdalena | **SANTANDER**

24 - 26 de octubre de 2019

ACTUALIZACIÓN EN NUEVAS TÉCNICAS DE EMBOLIZACIÓN DE ANEURISMAS

Pedro Navia

Hospital Universitario La Paz



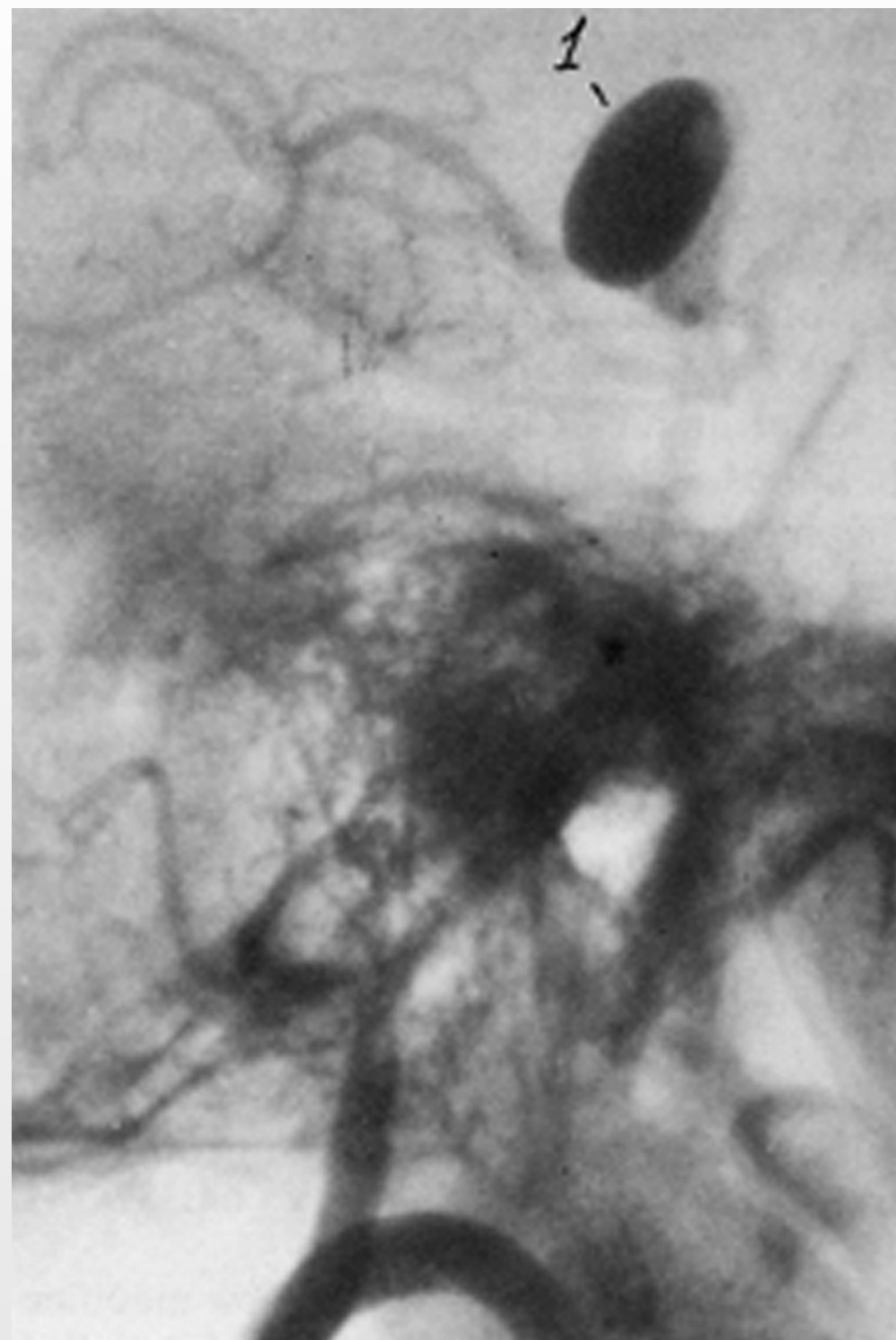
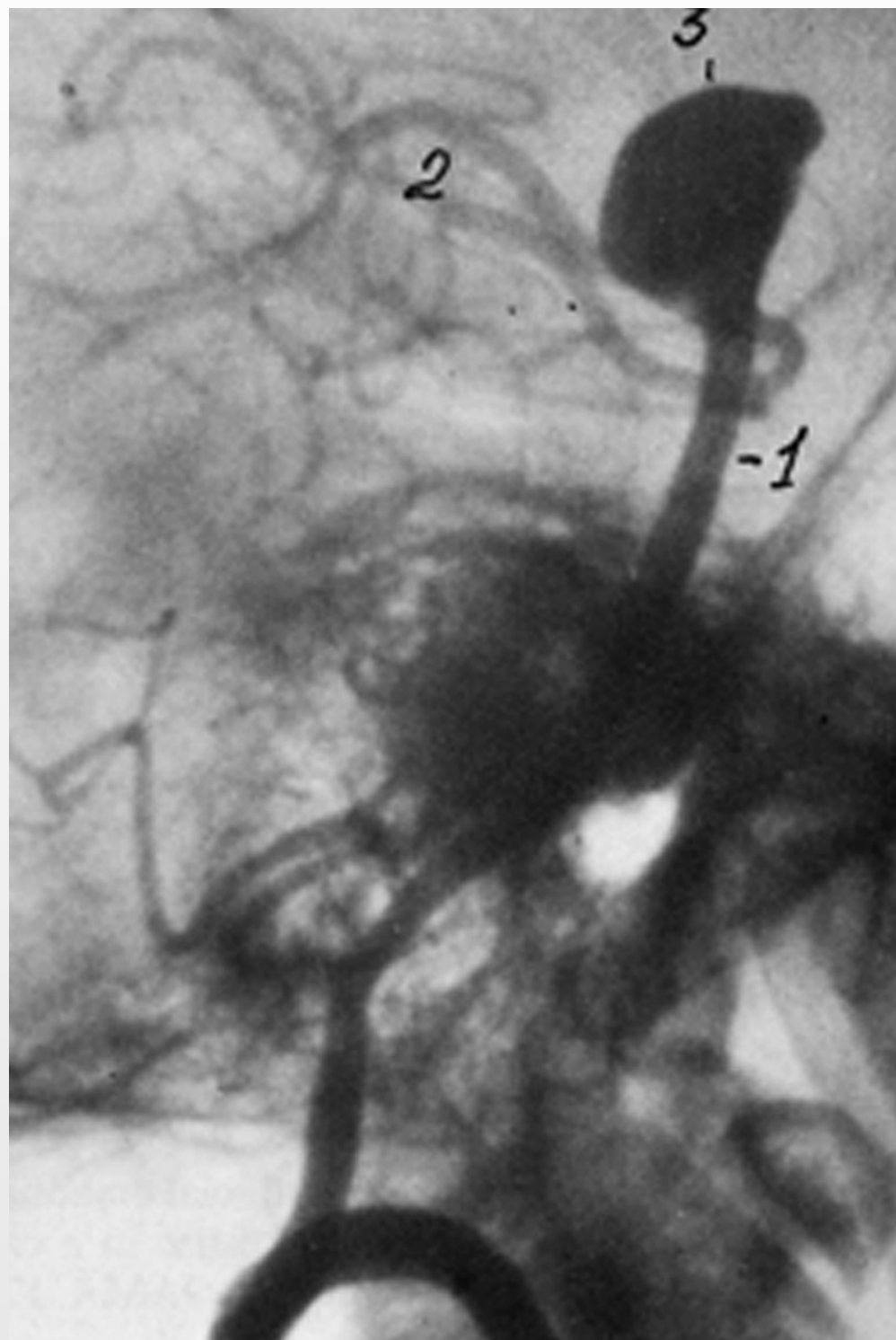
1974. **Serbinnenko**, Instituto Neuroquirúrgico Burdenko de Moscú.

300 pacientes tratados endovascularmente con balones para oclusión de:

- Arterias.
- Fístulas carótido-cavernosas.
- Aneurismas cerebrales.

J Neurosurg 41: 125-145, 1974





Guglielmi G. Interventional Neuroradiology 13: 217-224, 2007

1989 **Guglielmi**, UCLA.

Idea el sistema GDC. Viñuela, Sepetke y Engelson.



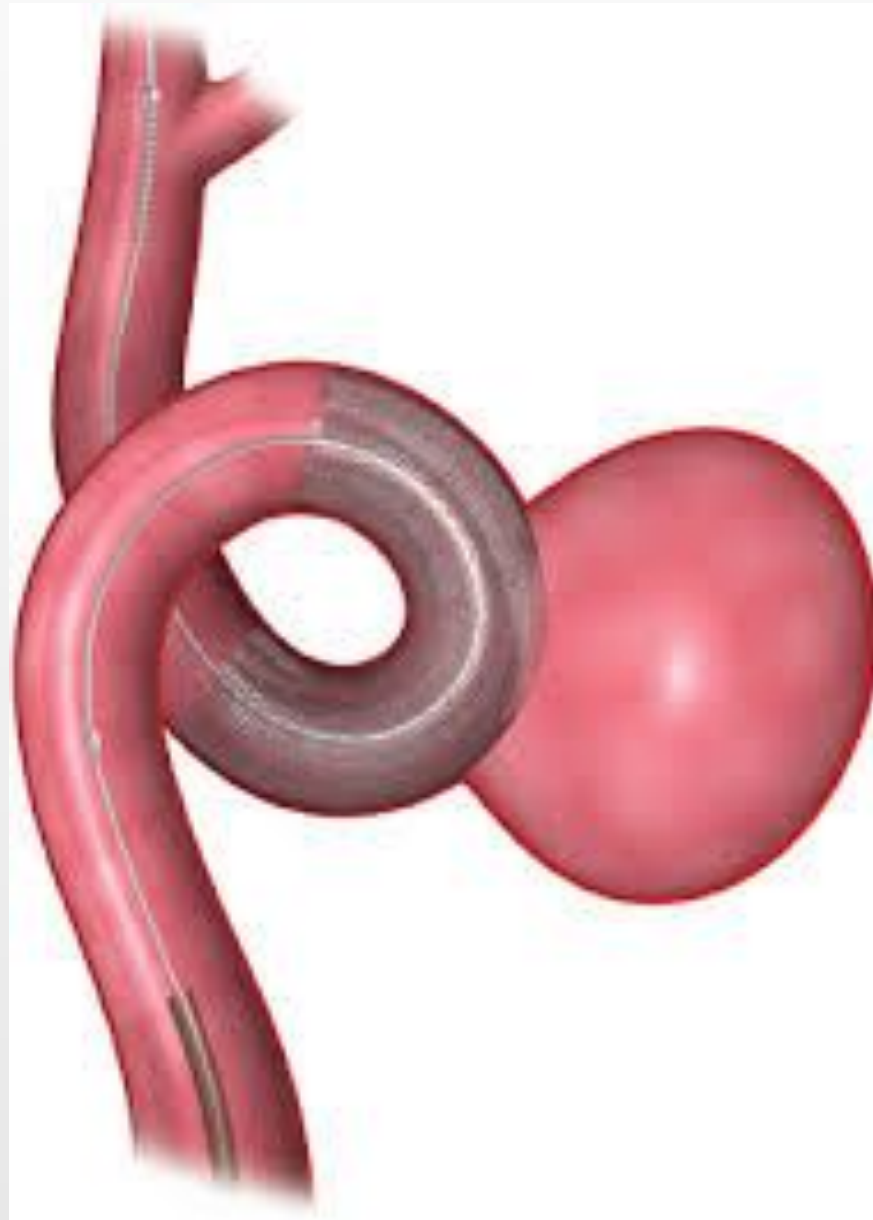
6 de marzo de 1990
2 coils para aneurisma cavernoso. UCLA.

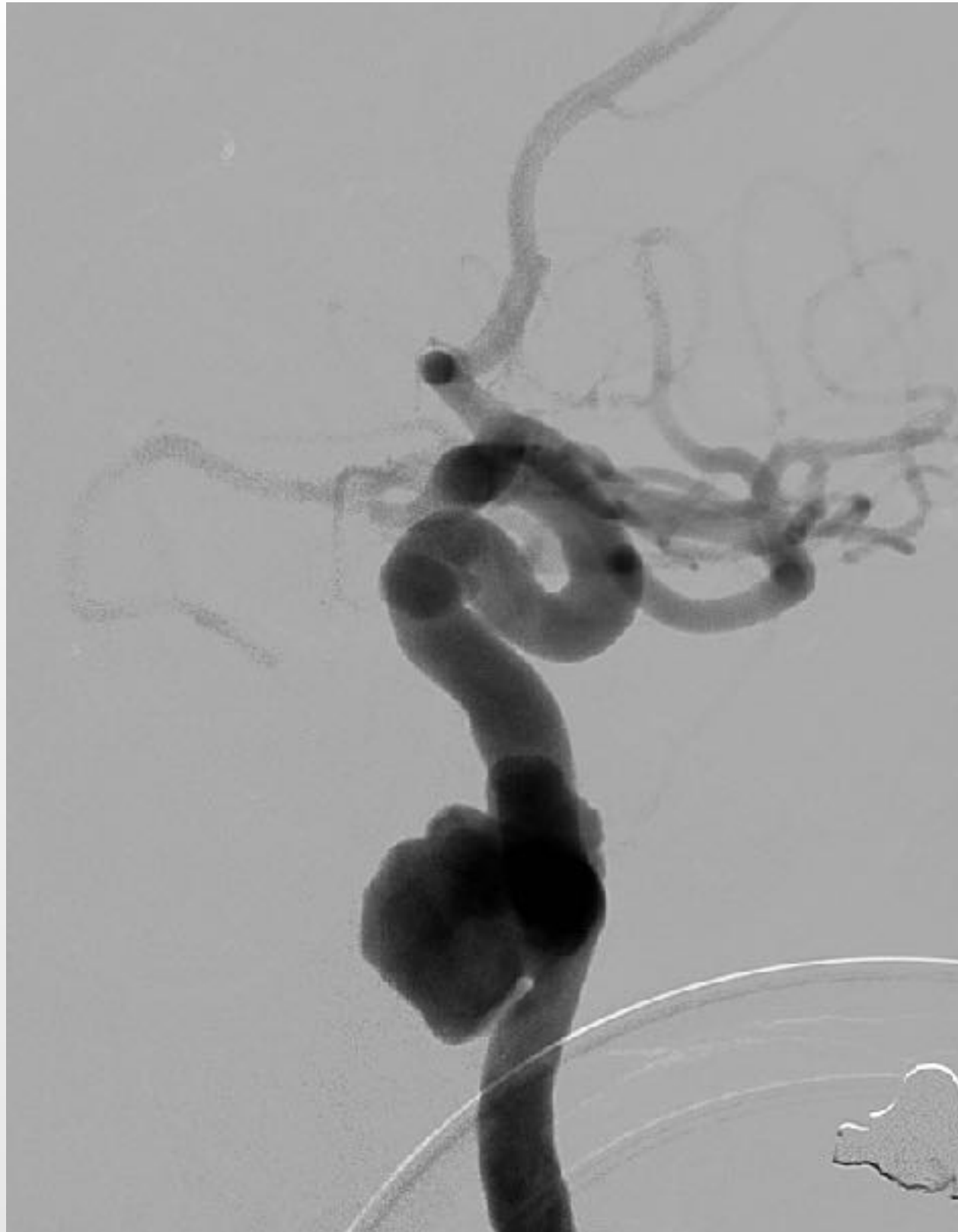




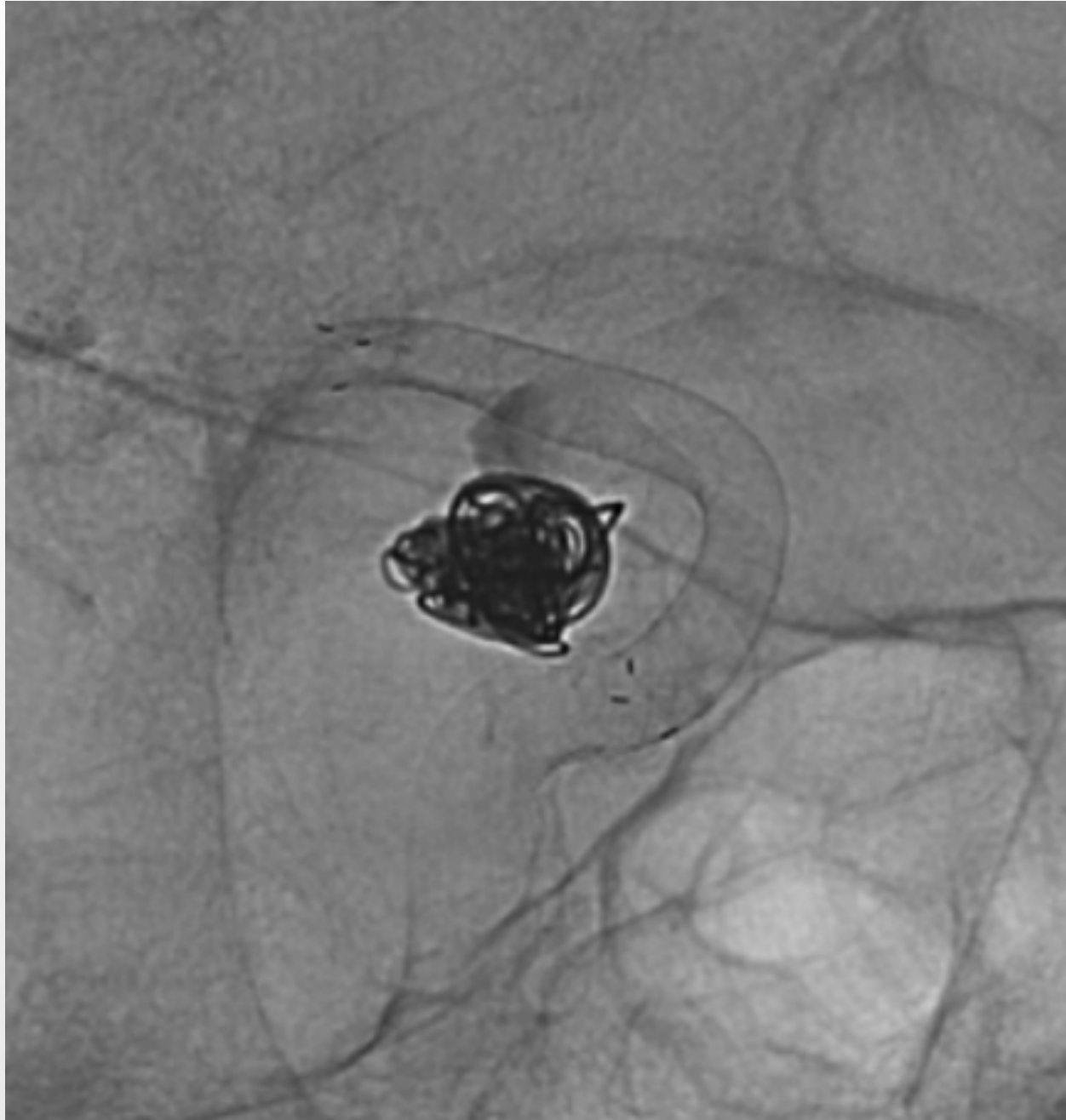
Guglielmi G. Interventional Neuroradiology 13: 217-224, 2007

STENT FD

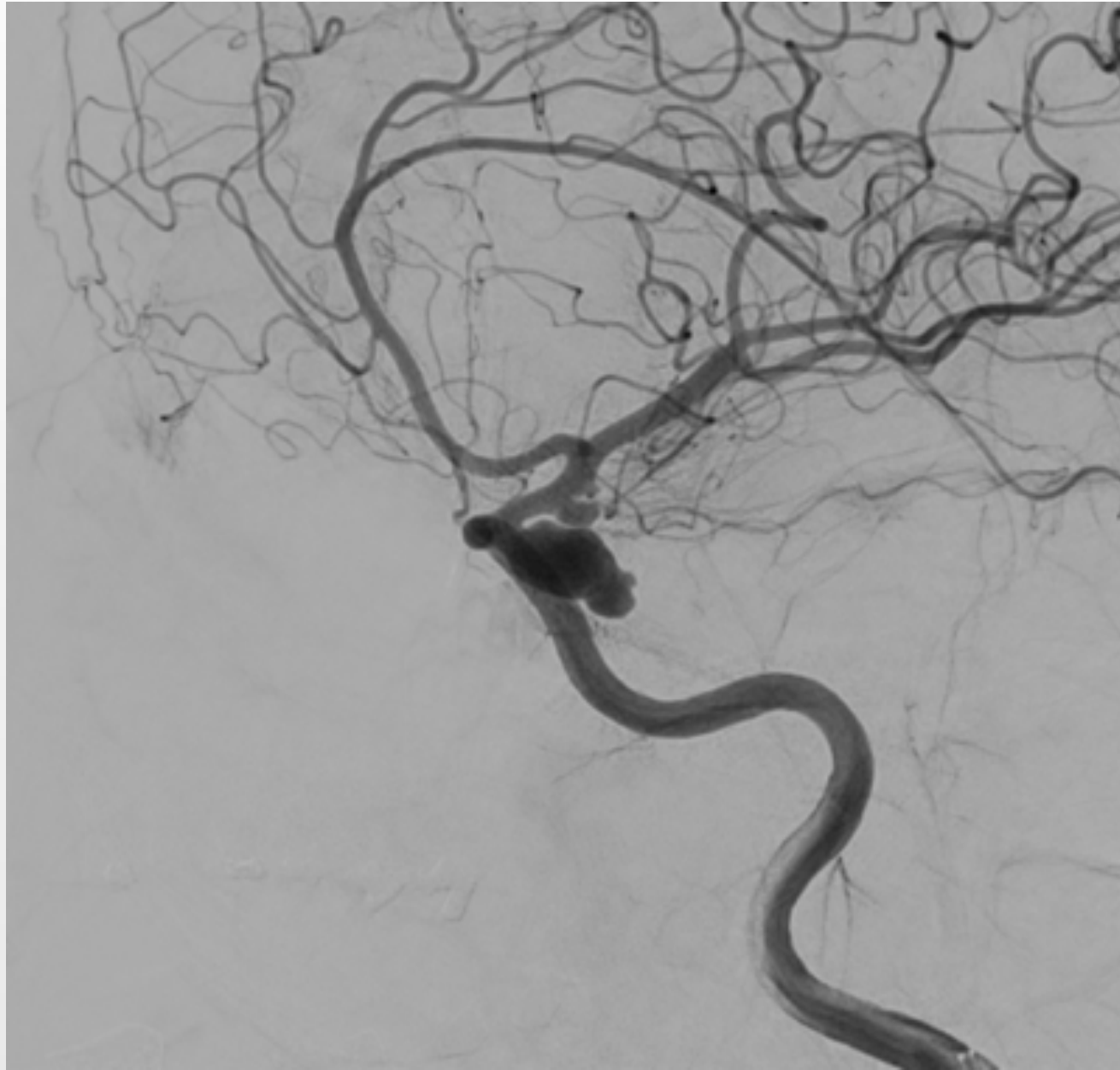


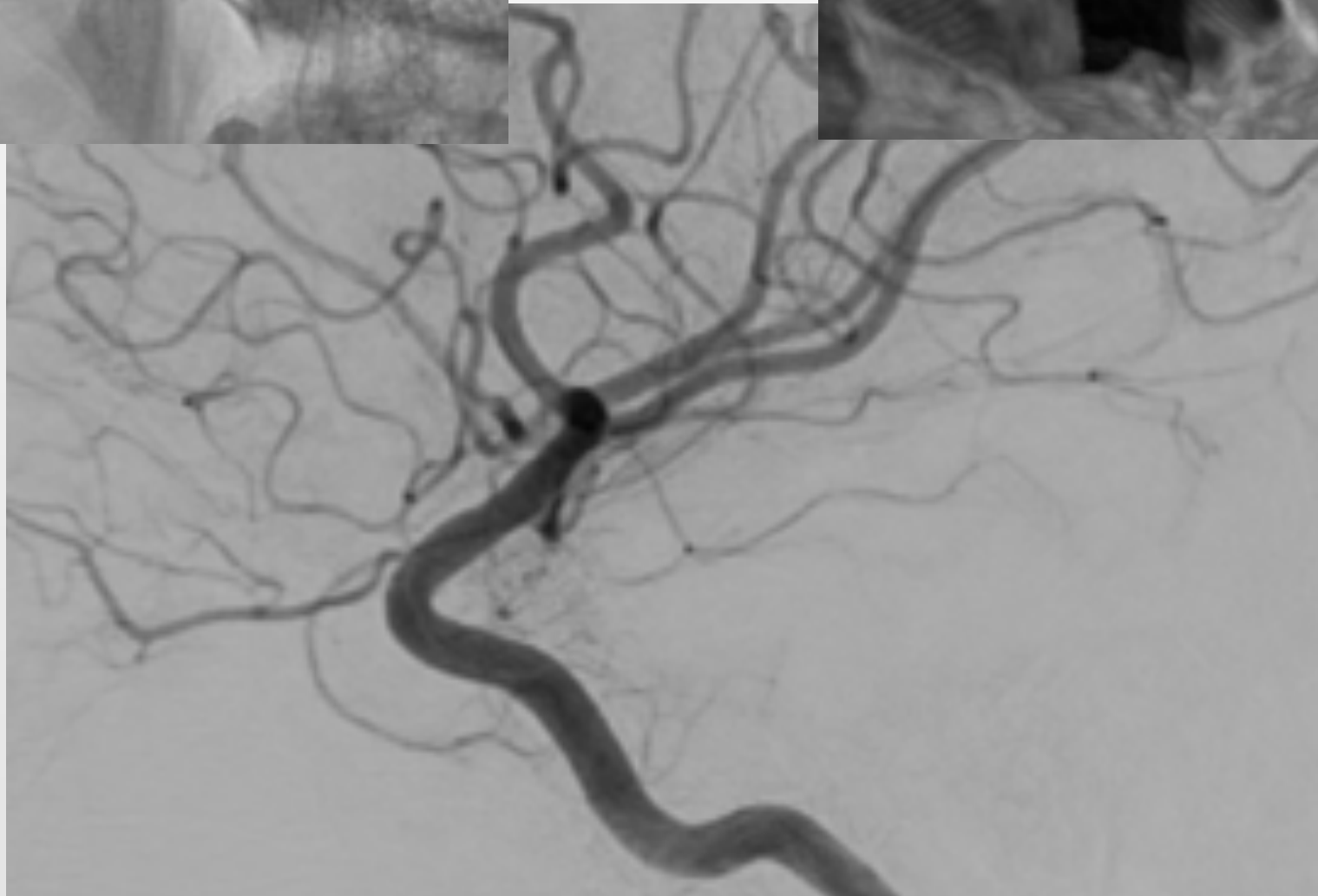
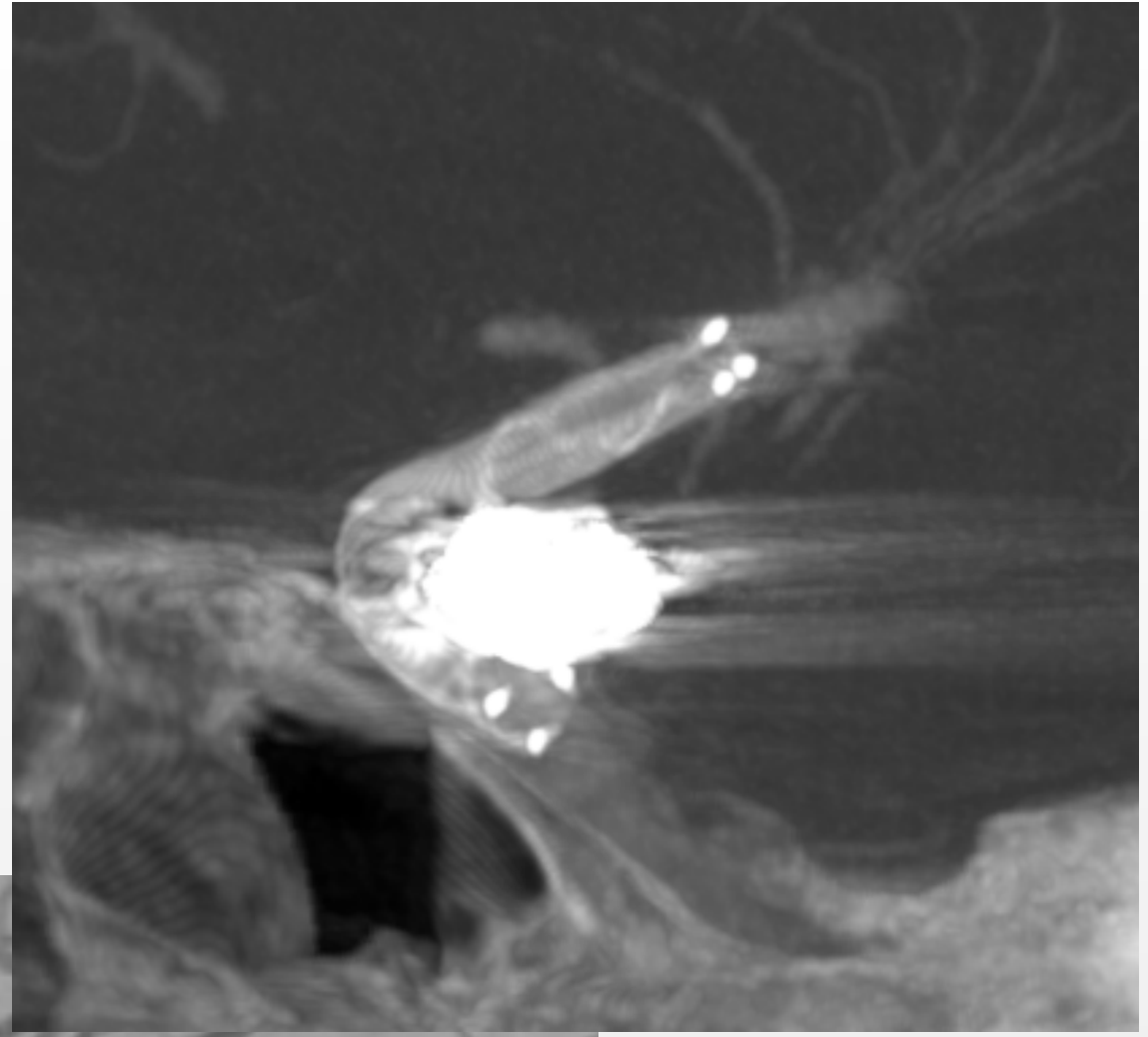
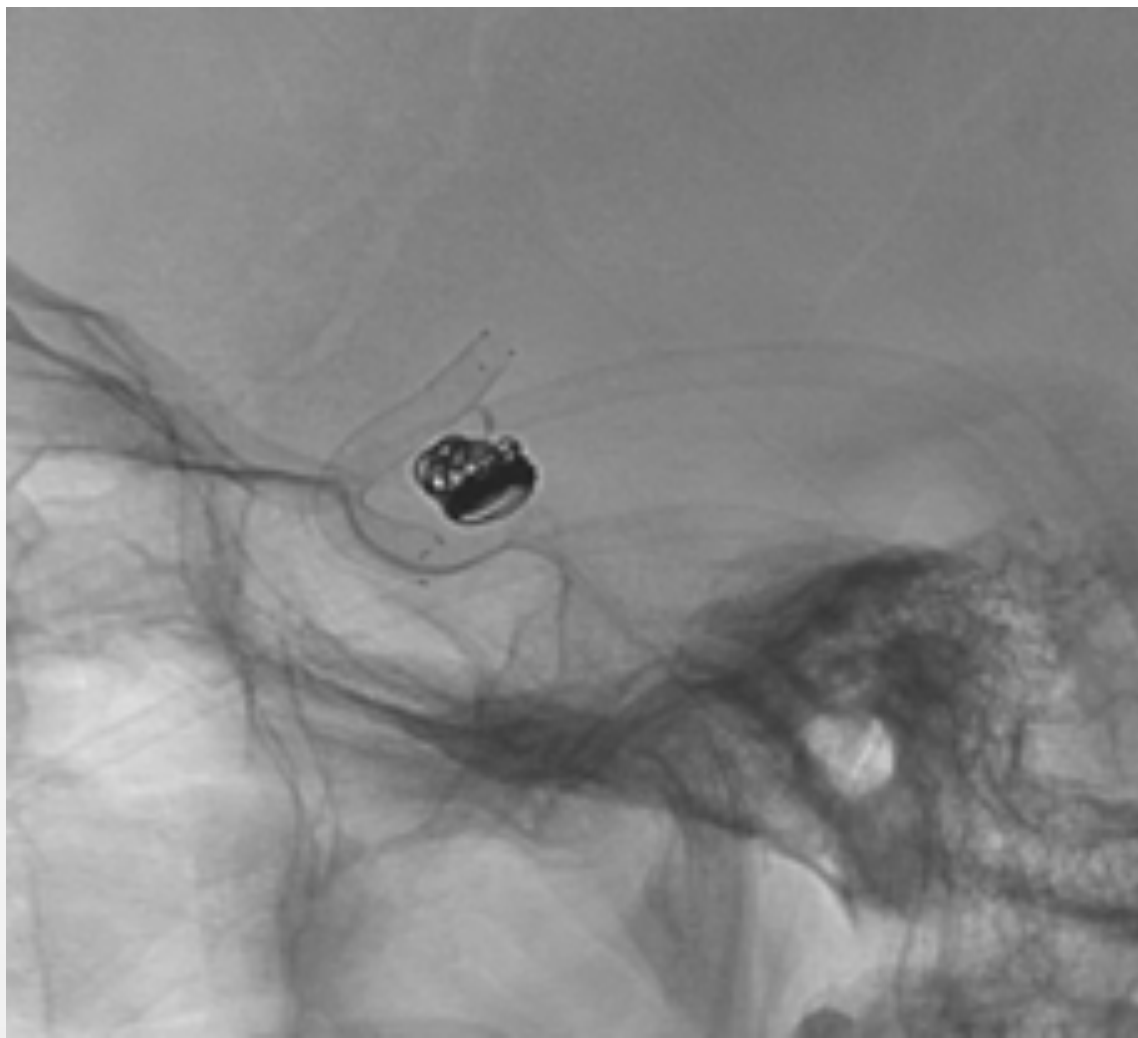


RECANALIZACIONES



ANEURISMAS MÚLTIPLES





Control 6 meses

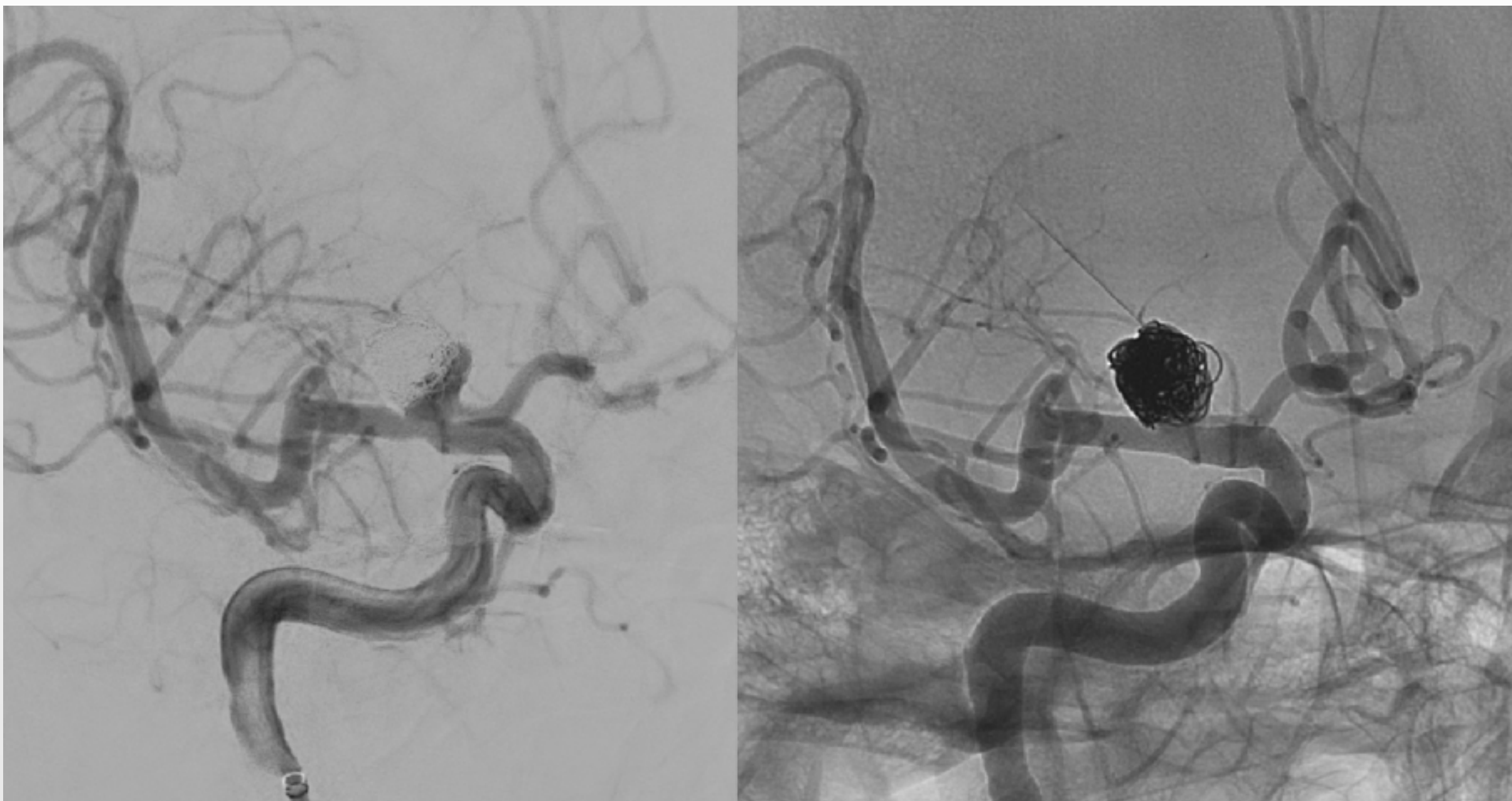
44 pacientes.

FD en los siguientes 15 días de HSA.

- **20 pacientes (45%) - complicaciones relacionadas con la intervención.**
- **12 pacientes (27%) con déficits neurológicos permanentes.**
- **5 re-rupturas (11%).**

ten Brinck MFM, Jäger M, de Vries J, et al. Flow diversion treatment for acutely ruptured aneurysms. Journal of NeuroInterventional Surgery Published Online First: 24 August 2019. doi: 10.1136/neurintsurg-2019-015077

PIPELINE VANTAGE



2020

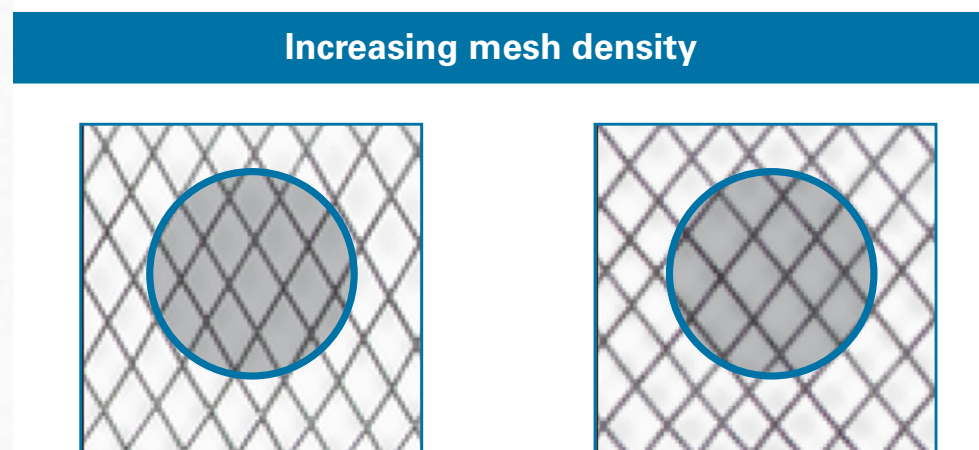
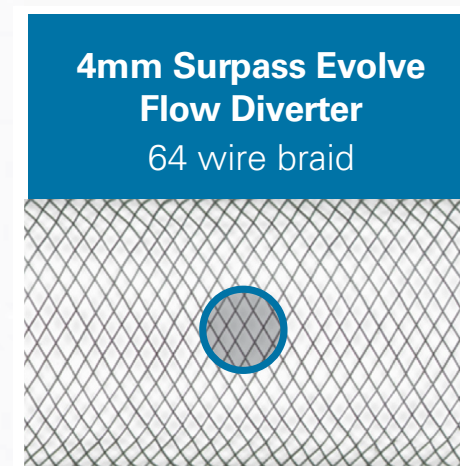
**Nueva generación de FD.
Microcatéter 0.021”**

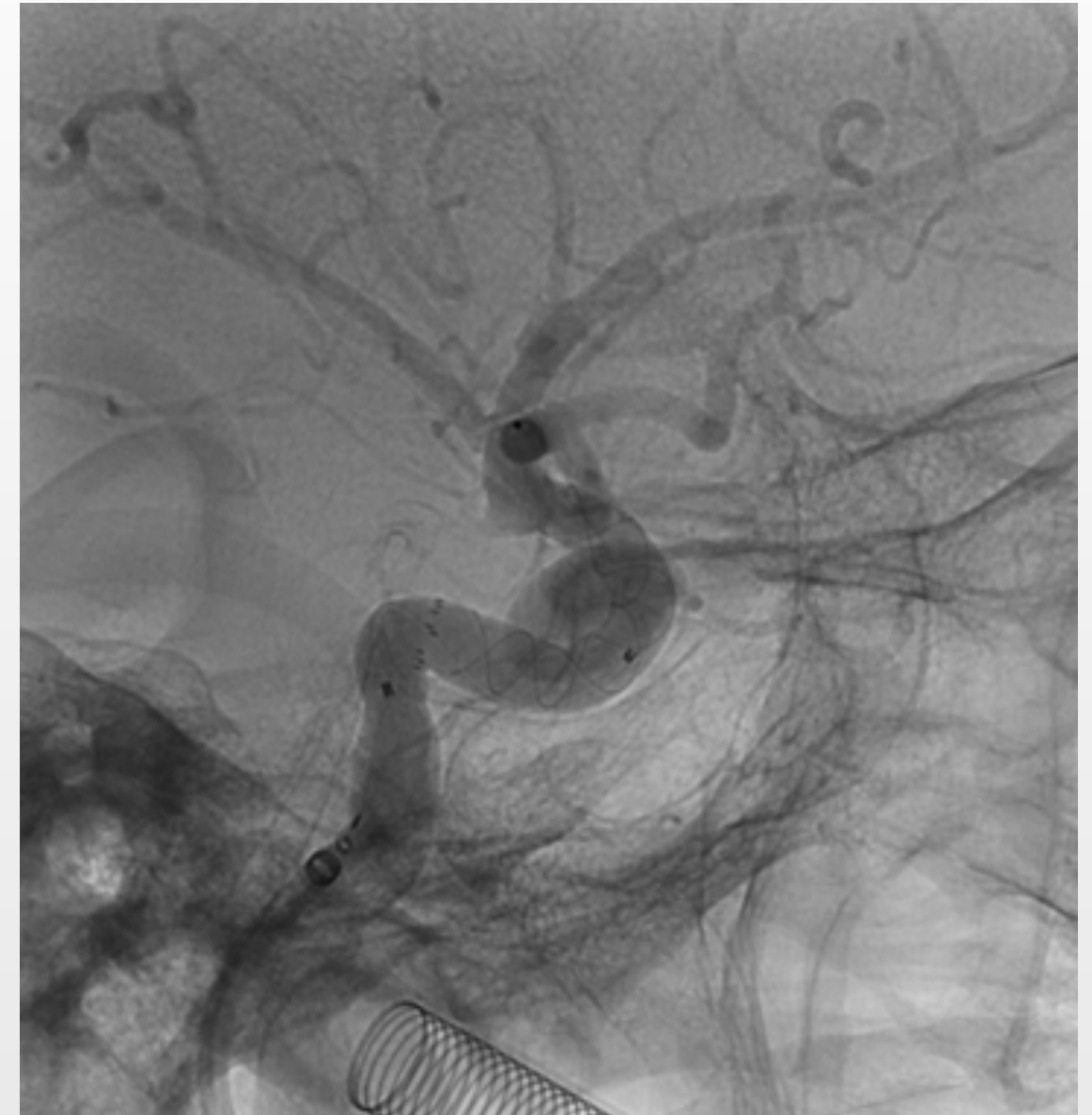
SURPASS EVOLVE



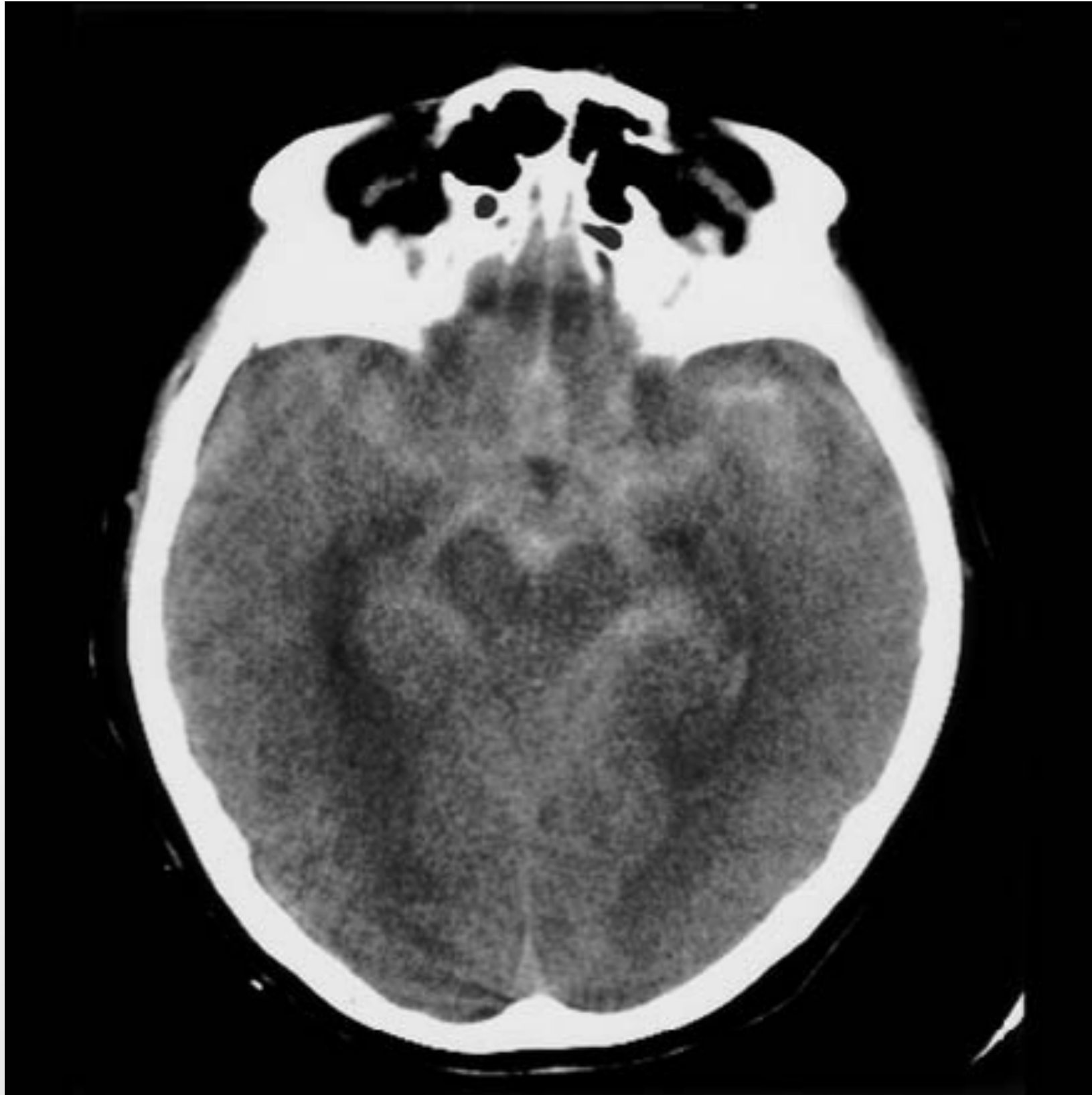
**FD de cromo-coblato.
12 filamentos radiopacos de platino-tungsteno.
Microcatéter XT-27.
Arterias de 2-5 mm.**

		Labeled diameters (mm)				
		2.5	3.25	4.0	4.5	5.0
	Unconstrained diameter	2.7	3.7	4.2	4.7	5.2
	Recommended parent vessel diameter	2.0-2.5mm	>2.5-3.25mm	>3.25-4.0mm	>4.0-4.5mm	>4.5-5.0mm
	# of wires	48	64			
Length (mm)	12	FD25012	FD32512	FD40012	FD45012	
	15	FD25015	FD32515	FD40015	FD45015	FD50015
	17		FD32517	FD40017	FD45017	
	20	FD25020	FD32520	FD40020	FD45020	FD50020
	25		FD32525	FD40025	FD45025	FD50025
	30			FD40030	FD45030	FD50030
	40				FD45040	FD50040

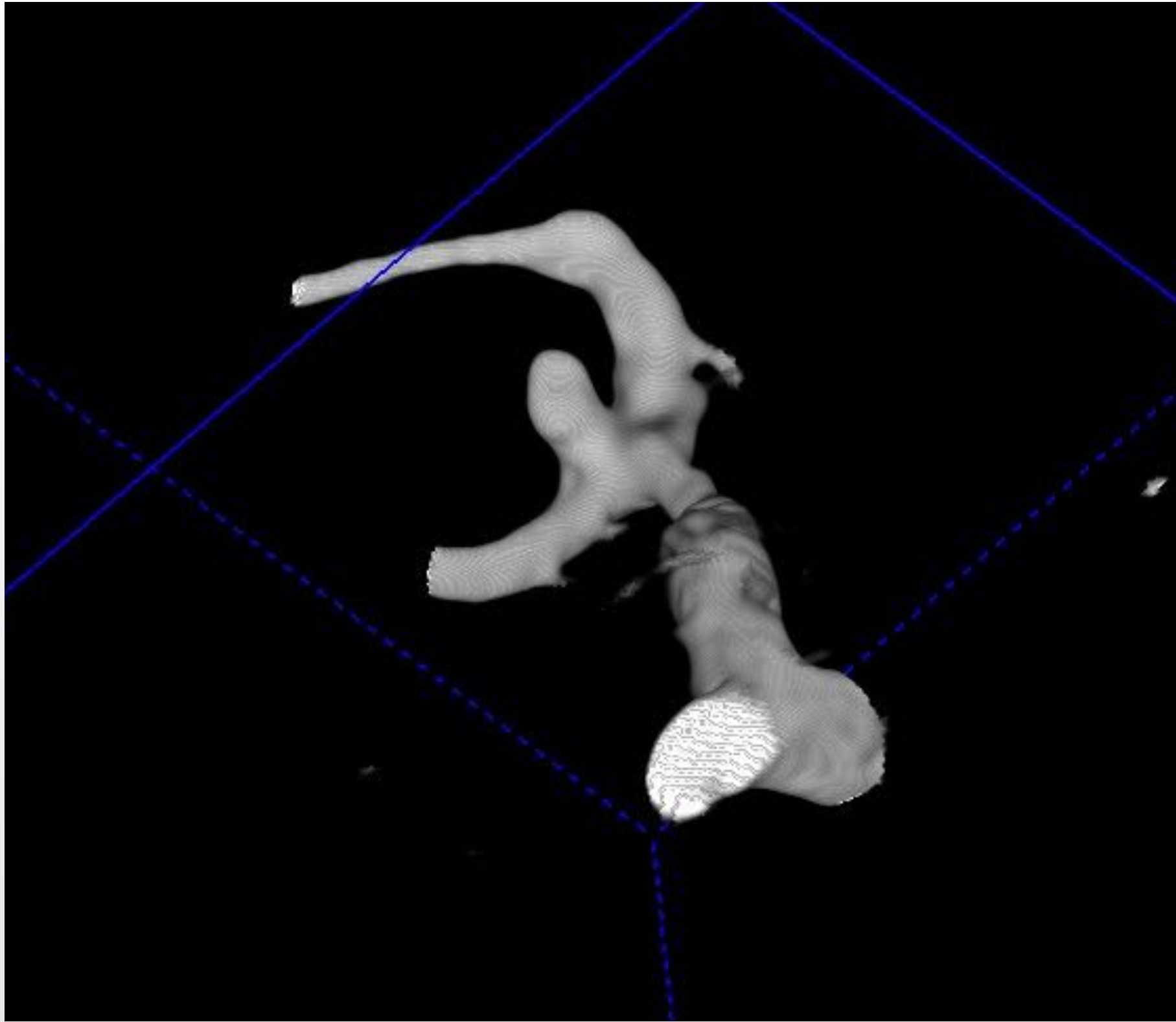




2020
Evolución del P48



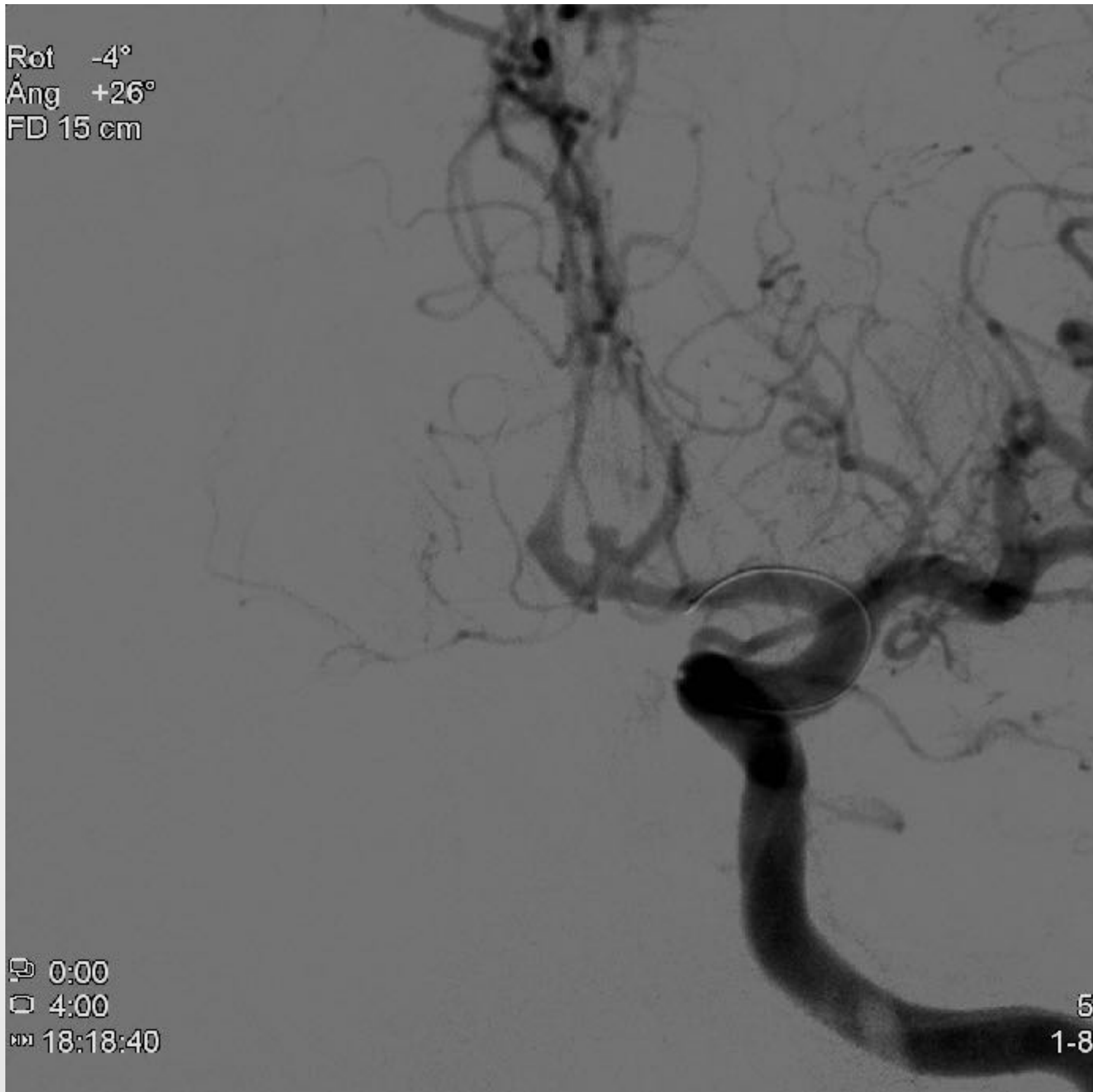
Pedro Navia



Rot -4°
Áng +26°
FD 15 cm

0:00
4:00
18:18:40

5
1-8



Rot -4°
Áng +26°
FD 15 cm



Post-embolización

0:00
3:00
MM 18:36:01

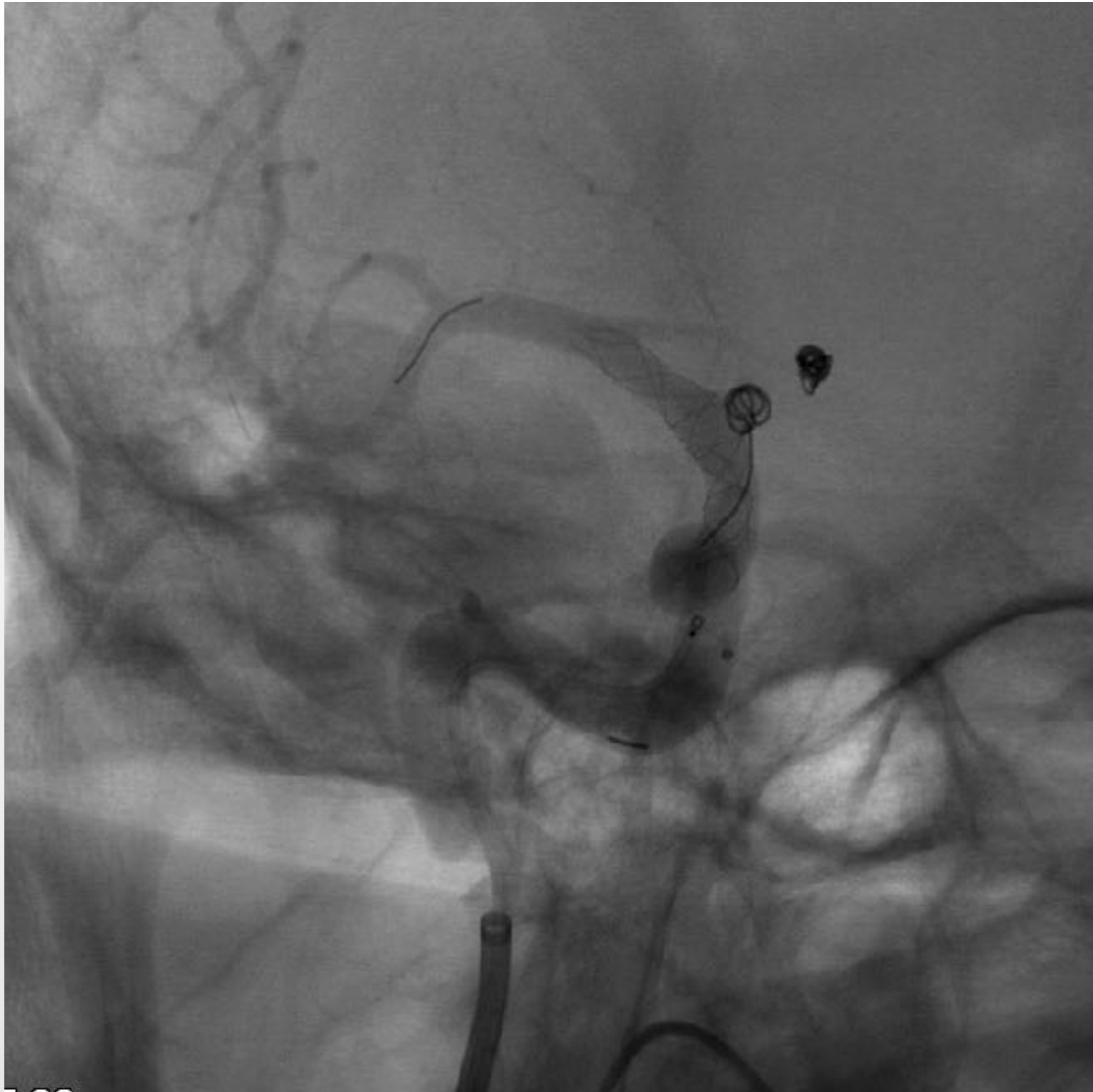
9
1-6



Rot +11°
Áng -37°
FD 19 cm







Rot +21°
Áng -37°
FD 15 cm



Post-embolización

0:00
3:33
21:23:32

13
1-9



SILK VISTA

2020

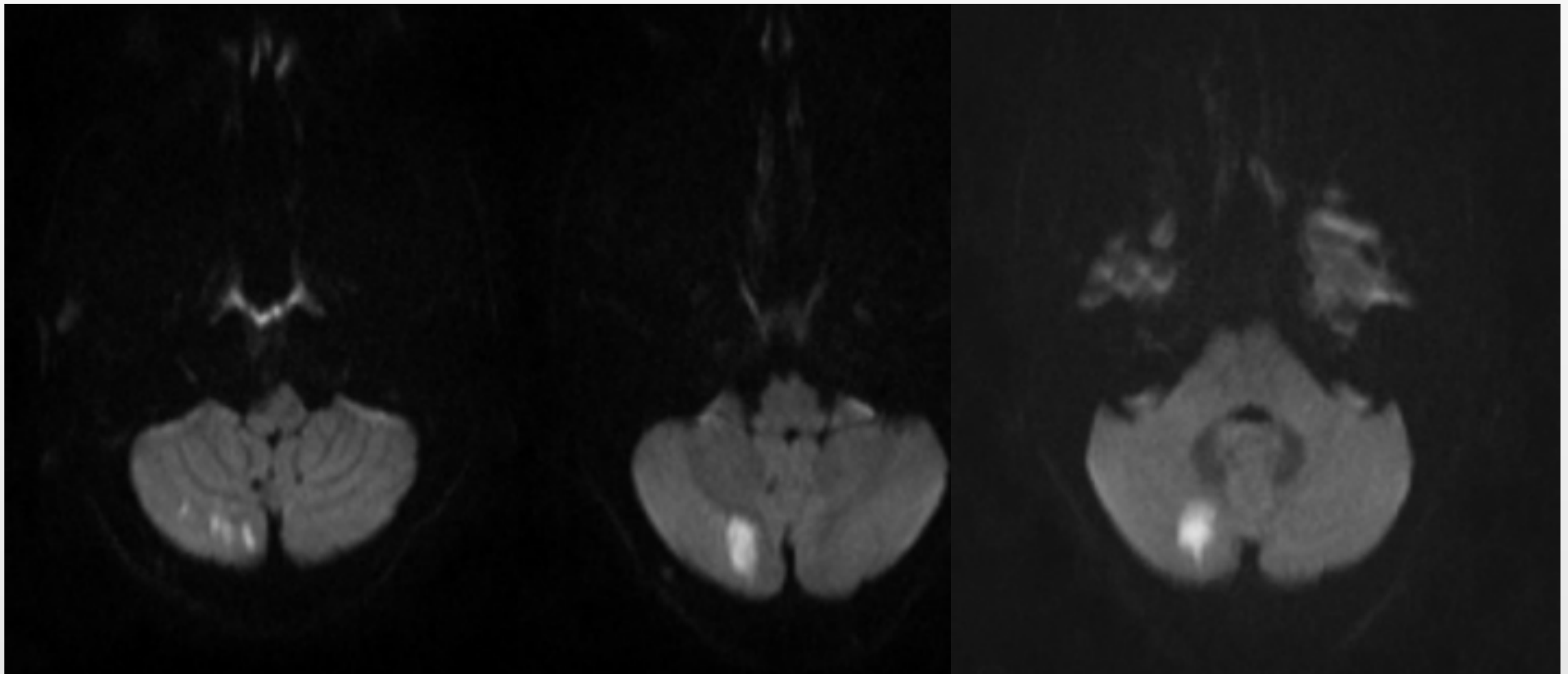
Evolución del Silk vista baby

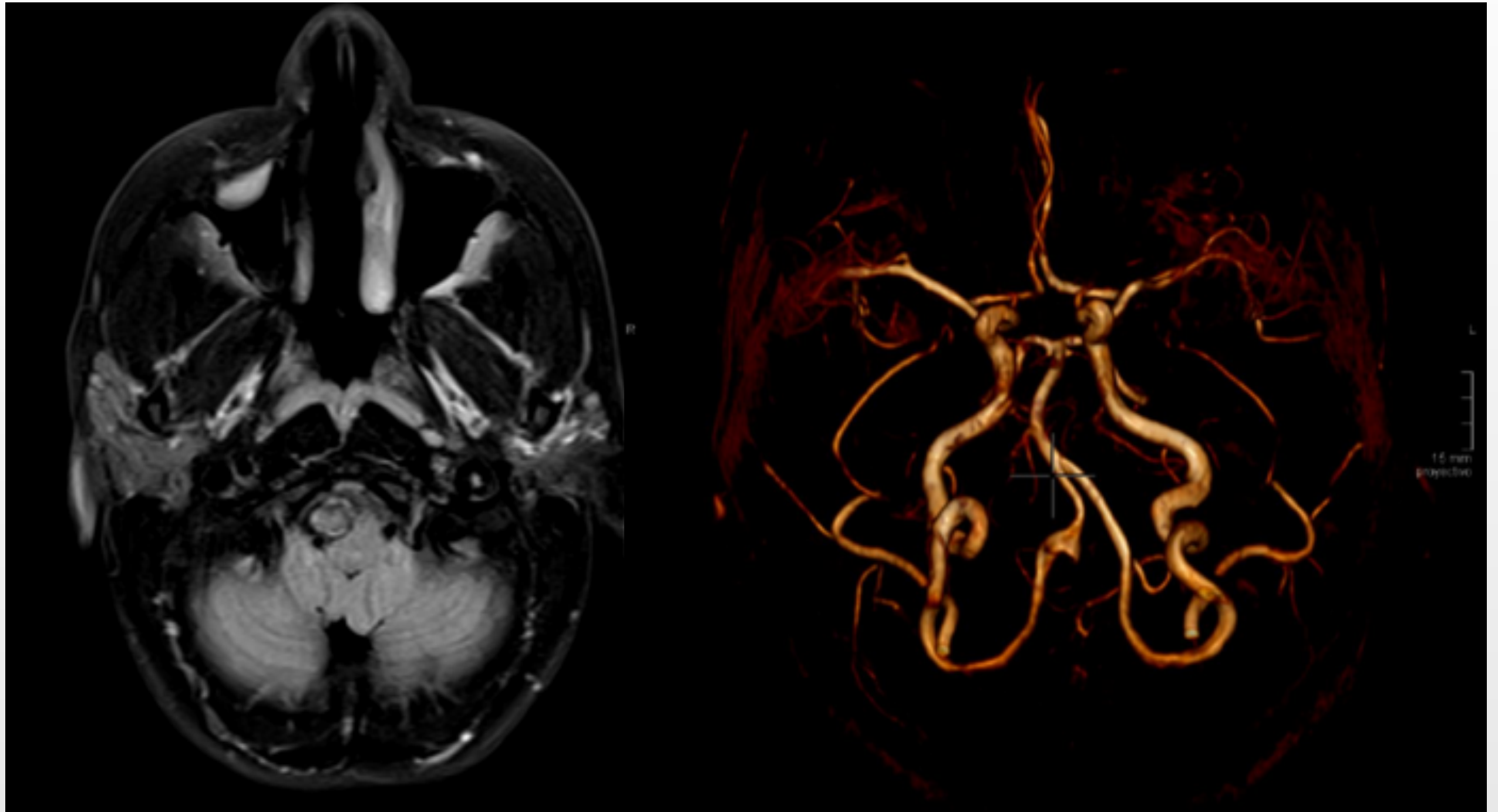


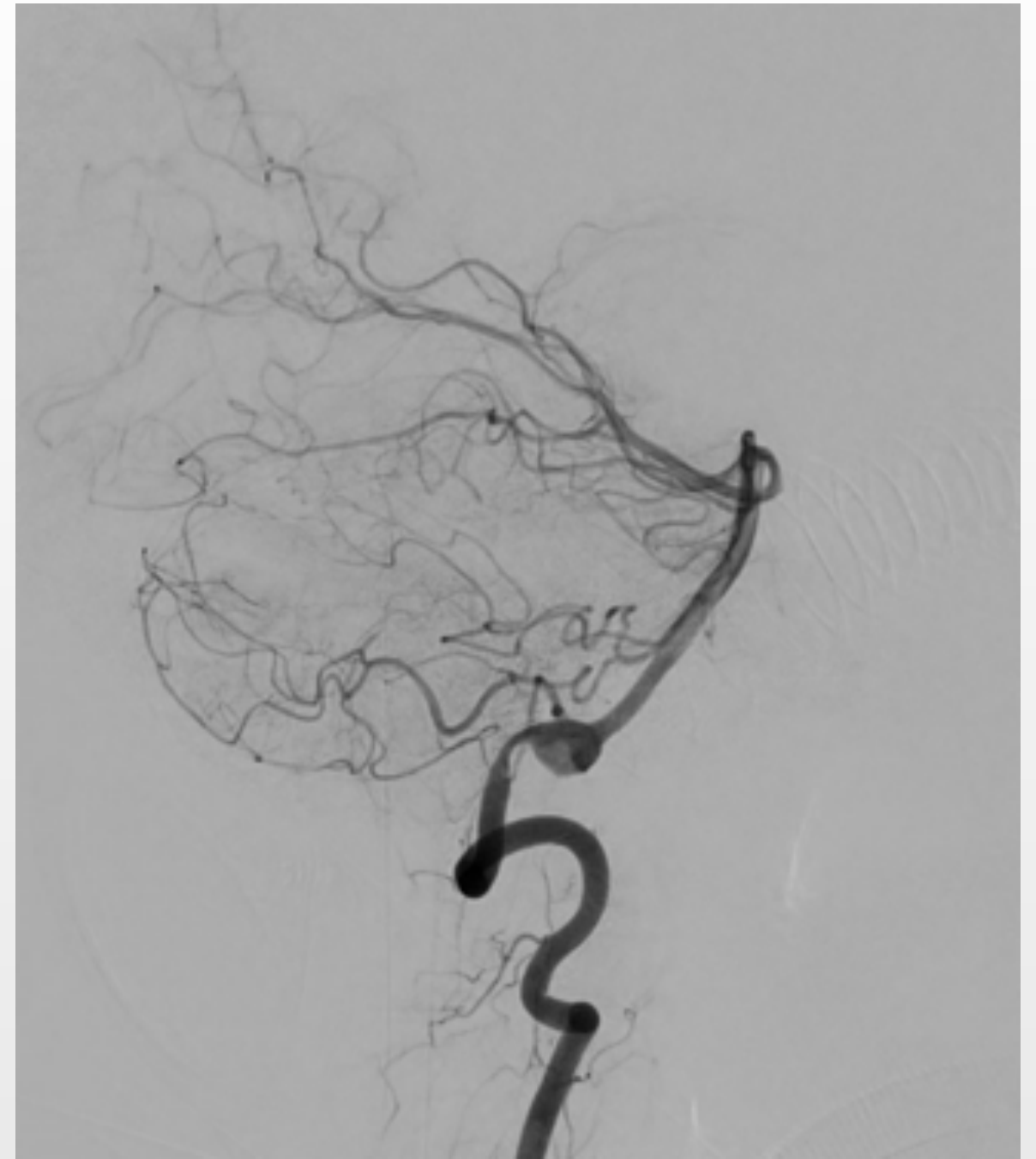
**FD de acero inoxidable con membrana de polímero microporoso.
Montado en un microcatéter balón (presión nominal 6 ATM).
Postdilatación con balones de 7 mm.
Diámetros de 3.25-4.5 mm y longitud de 15-25 mm.
2 marcas radiopacas a cada lado.**

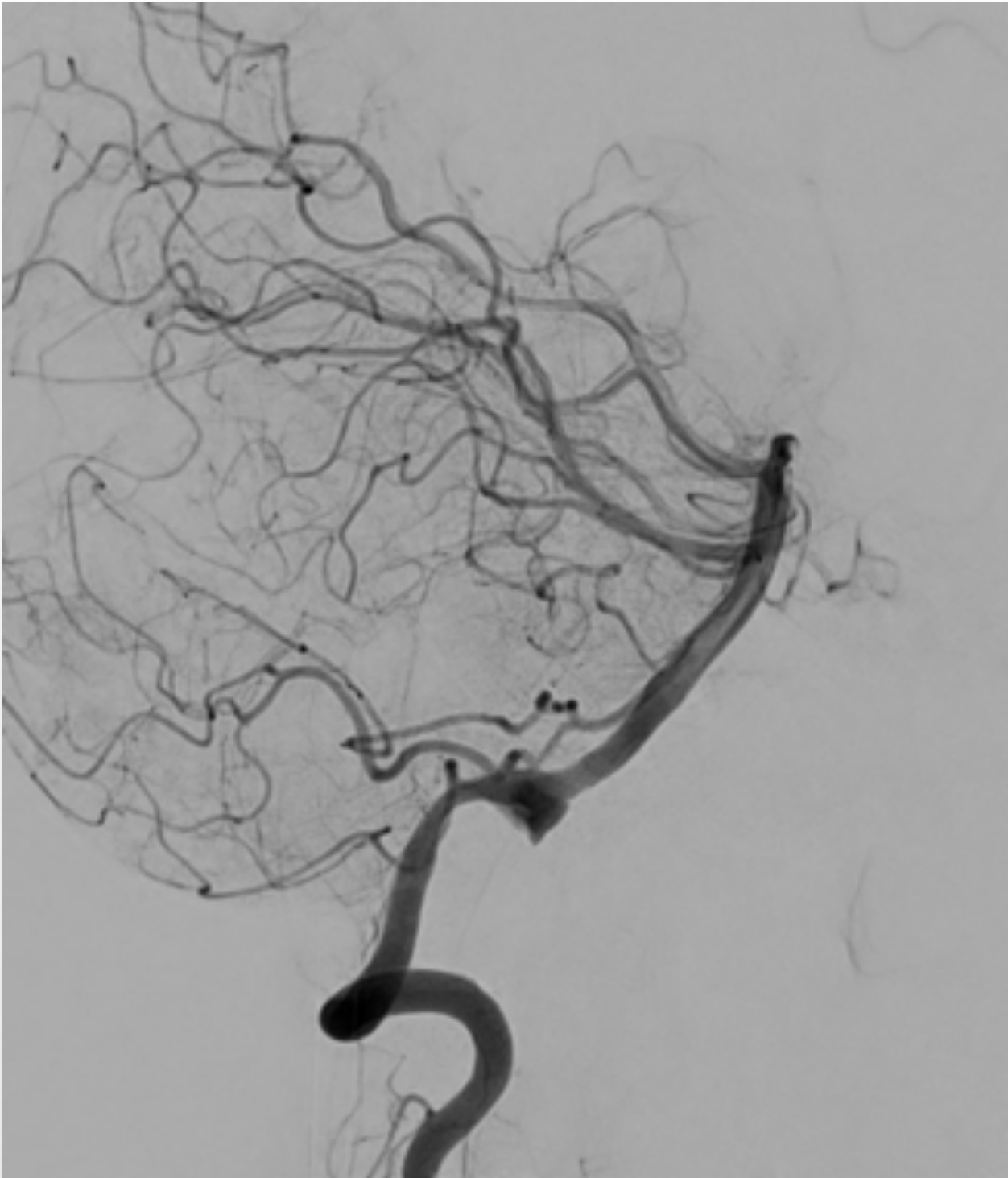
39 años. Fumadora.

Episodios de cefalea, mareo y visión borrosa de 2 semanas de evolución.

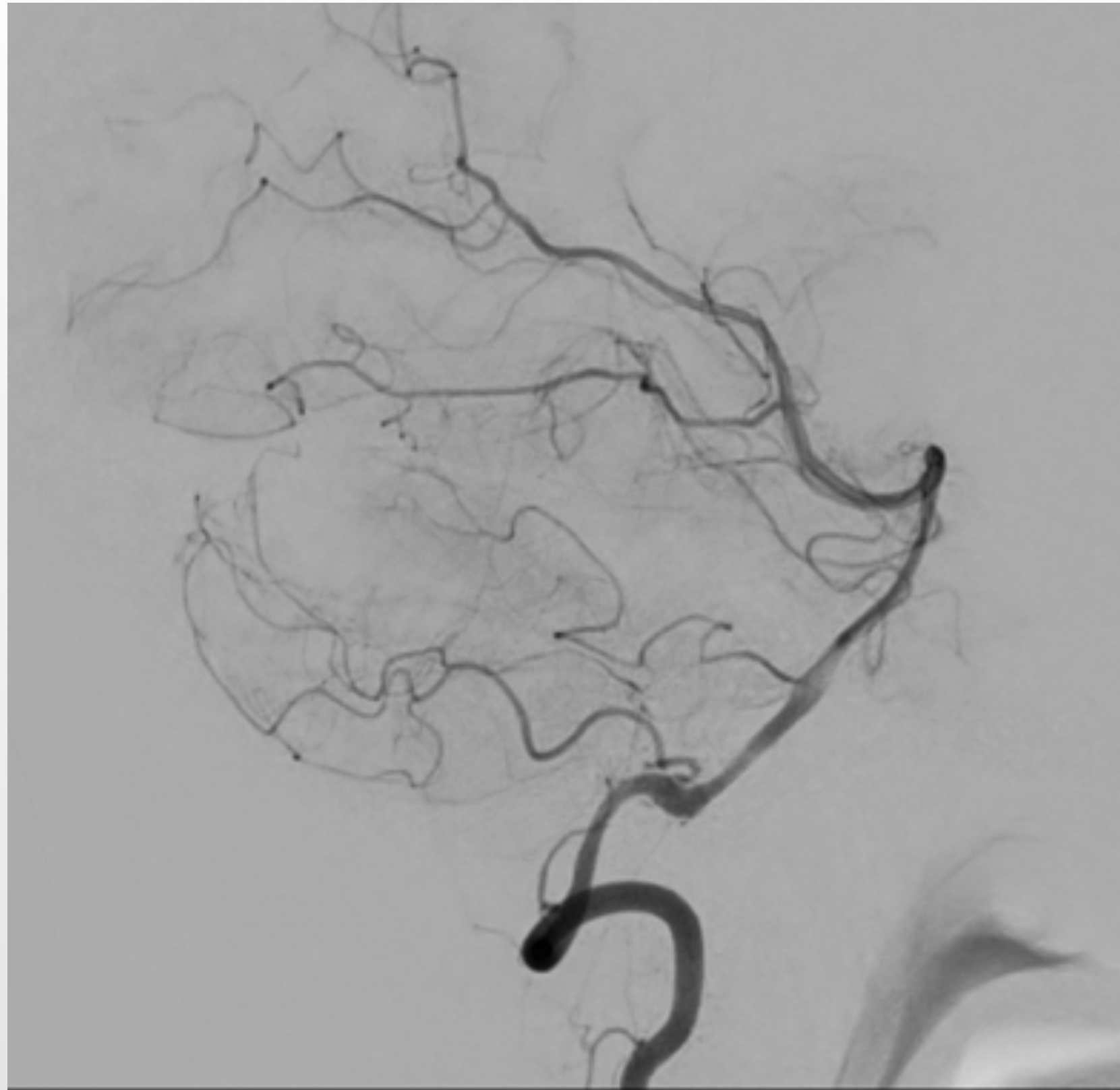


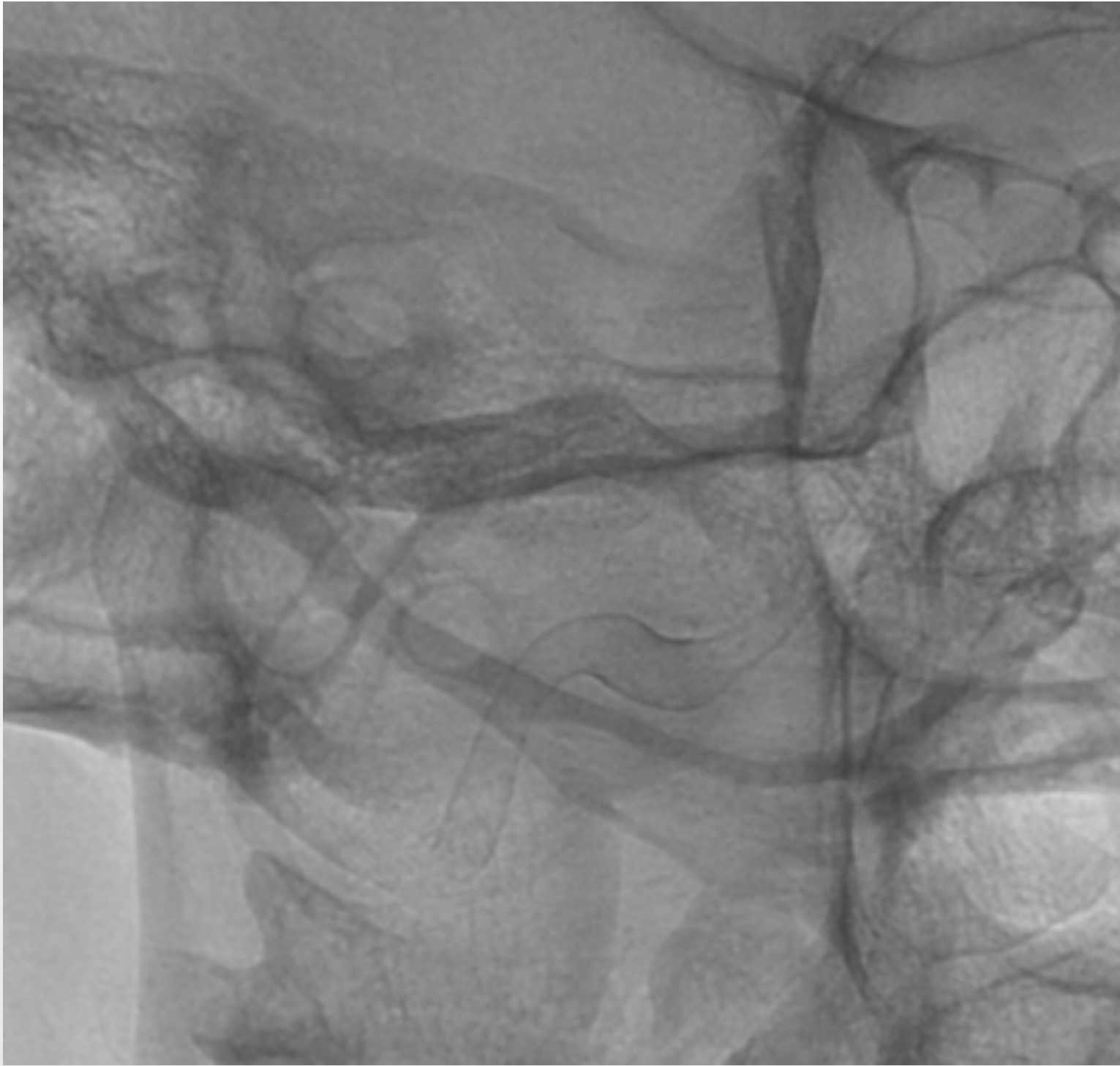




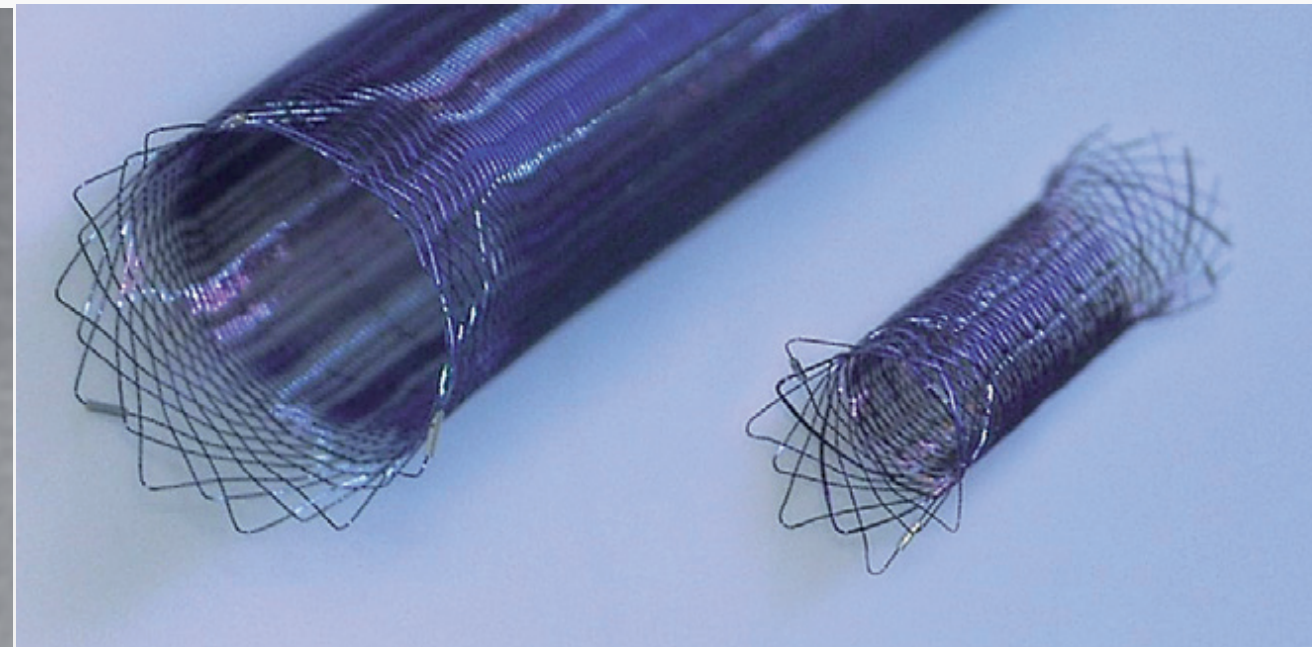
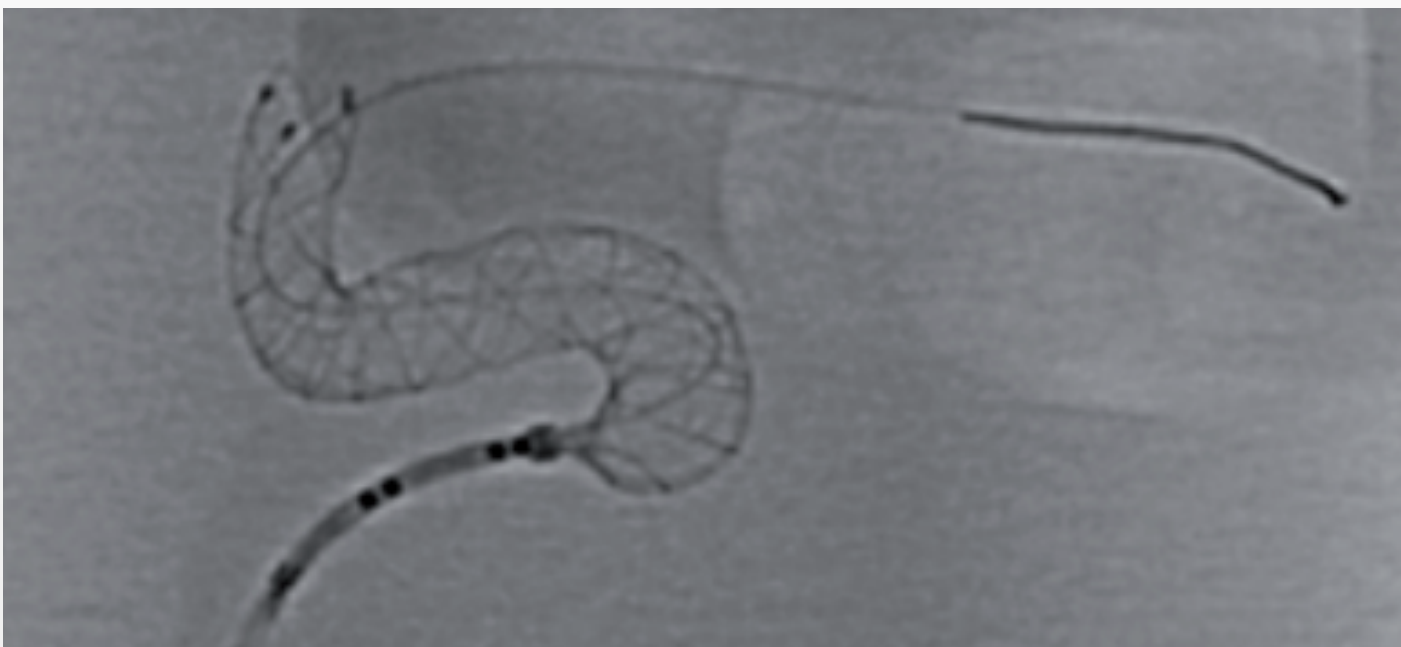


Control 6m





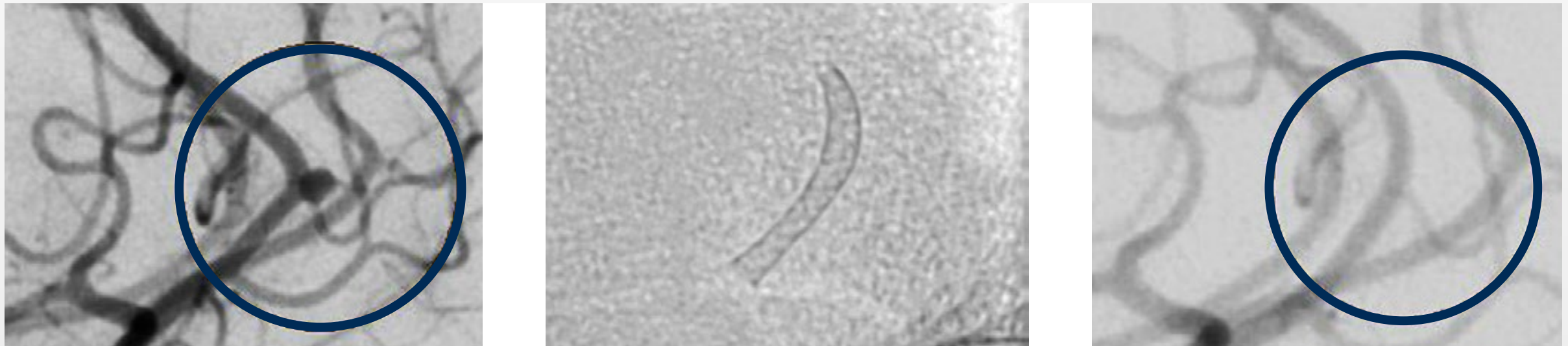
DERIVO MINI



FD con 48 hilos de nitinol y platino
Recubrimiento BlueXide (biocompatibilidad y endotelización)
Arterias de 1.5-3.5 mm
Microcatéter 0.021”

DERIVO MINI

Labelled DERIVO [®] mini Dimensions (mm)	Reference Number	Device Diameter (mm)	Device Length (mm)	Recommended Vessel Diameter (mm)	Required Microcatheters for Delivery (Inch)
2.5 x 15	01-000428	2.5	15	1.5–2.5	0.021
2.5 x 20	01-000429	2.5	20	1.5–2.5	0.021
2.5 x 20 w/o tip	01-000432	2.5	20	1.5–2.5	0.021
2.5 x 25	01-000430	2.5	25	1.5–2.5	0.021
2.5 x 25 w/o tip	01-000433	2.5	25	1.5–2.5	0.021
3.0 x 15	01-000422	3.0	15	2.0–3.0	0.021
3.0 x 20	01-000423	3.0	20	2.0–3.0	0.021
3.0 x 20 w/o tip	01-000426	3.0	20	2.0–3.0	0.021
3.0 x 25	01-000424	3.0	25	2.0–3.0	0.021
3.0 x 25 w/o tip	01-000427	3.0	25	2.0–3.0	0.021
3.5 x 15	01-000416	3.5	15	2.5–3.5	0.021
3.5 x 20	01-000417	3.5	20	2.5–3.5	0.021
3.5 x 20 w/o tip	01-000420	3.5	20	2.5–3.5	0.021
3.5 x 25	01-000418	3.5	25	2.5–3.5	0.021
3.5 x 25 w/o tip	01-000421	3.5	25	2.5–3.5	0.021



FD con 48 hilos de nitinol rellenos de Platino
Arterias de 1.75-3 mm
Microcatéter 0.021”

Compatible with 0.021" MC


REF	Max. vessel diameter [mm]	Implant length in max. vessel [mm]*	Min. vessel diameter [mm]	Implant length in min. vessel [mm]*
P48-MW-200-9	2	9	1.75	9.9
P48-MW-200-12	2	12	1.75	12.8
P48-MW-200-15	2	15	1.75	16.1
P48-MW-300-9	3	9	2	12.7
P48-MW-300-12	3	12	2	16.4
P48-MW-300-15	3	15	2	21.3
P48-MW-300-18	3	18	2	25

Microguía independiente

Case Report



The p48_HPC antithrombogenic flow diverter: initial human experience using single antiplatelet therapy

Pervinder Bhogal¹ , Carlos Bleise²,
Jorge Chudyk², Ivan Lylyk², Nicolas Perez²,
Hans Henkes^{3,4} and Pedro Lylyk²

Journal of International Medical Research
0(0) 1–11
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DOI: 10.1177/0300060519879580
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HPC

Hydrophilic Polymer Coating

Review Article

Anti-thrombogenic coatings for devices in neurointerventional surgery: Case report and review of the literature

Hans Henkes^{1,2}, Pervinder Bhogal³ , Marta Aguilar Pérez¹,
Tim Lenz-Habijan⁴ , Catrin Bannewitz⁴, Marcus Peters⁵ ,
Christina Sengstock⁶, Oliver Ganslandt⁷, Pedro Lylyk⁸
and Hermann Monstadt⁴


INR INTERVENTIONAL
NEURORADIOLOGY

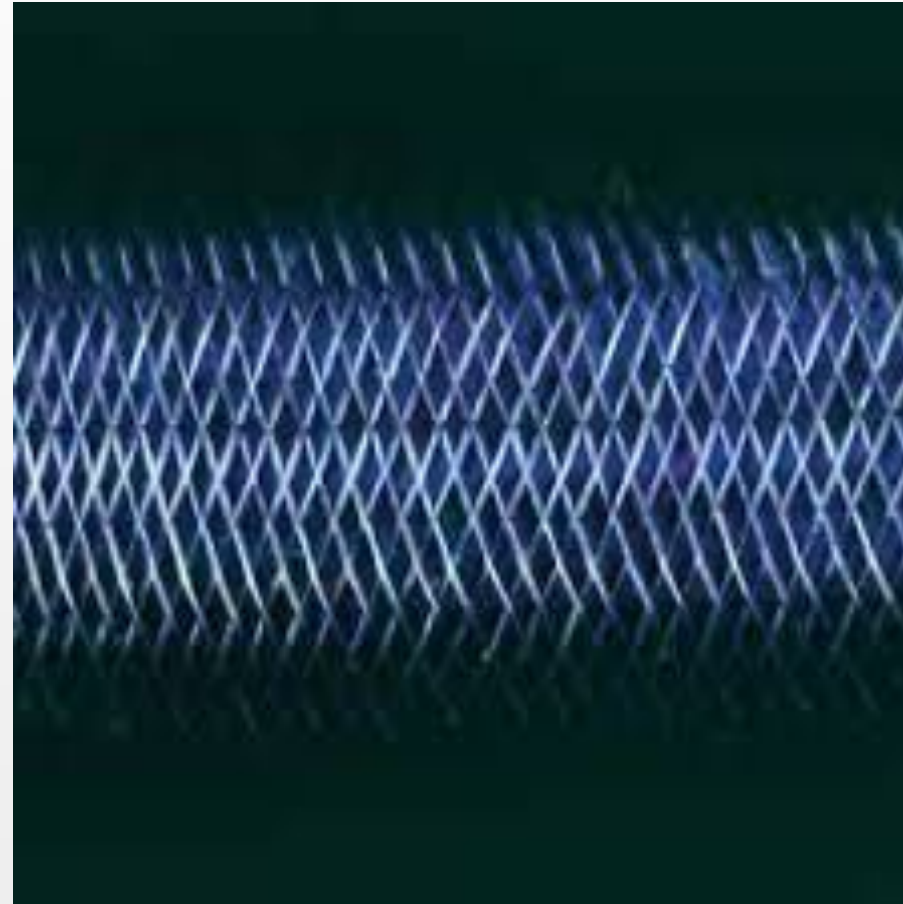
Interventional Neuroradiology
0(0) 1–9
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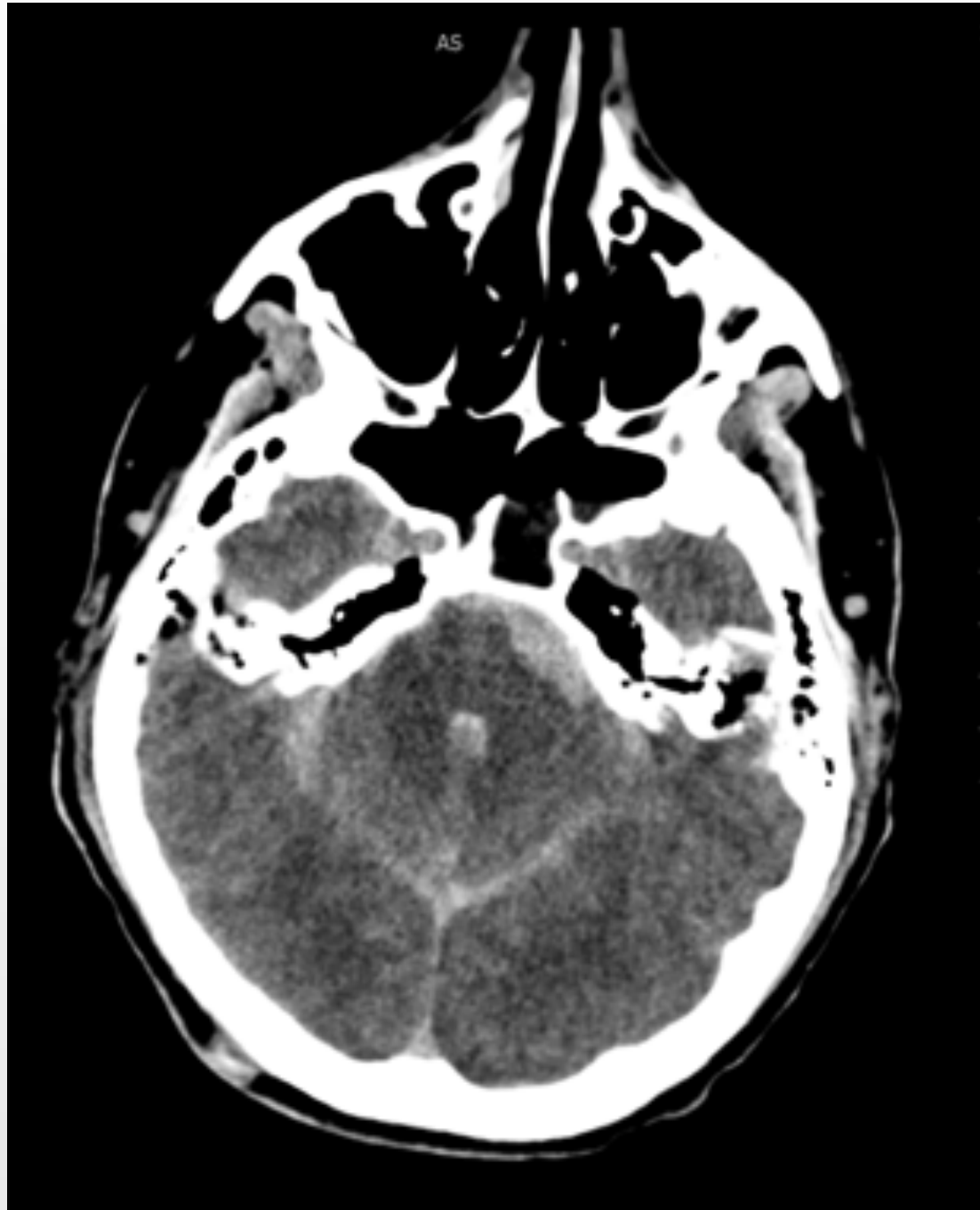
SILK VISTA BABY

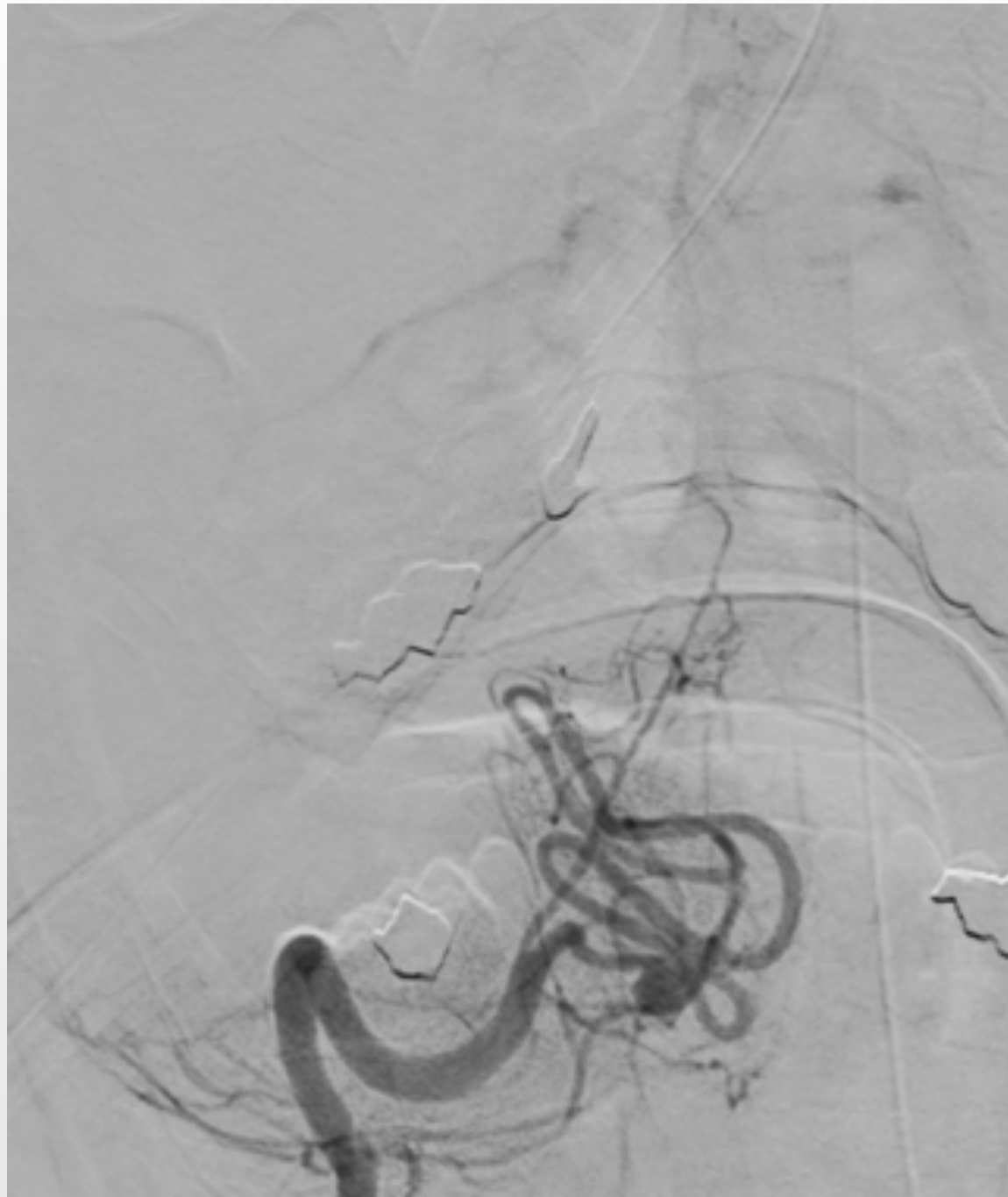


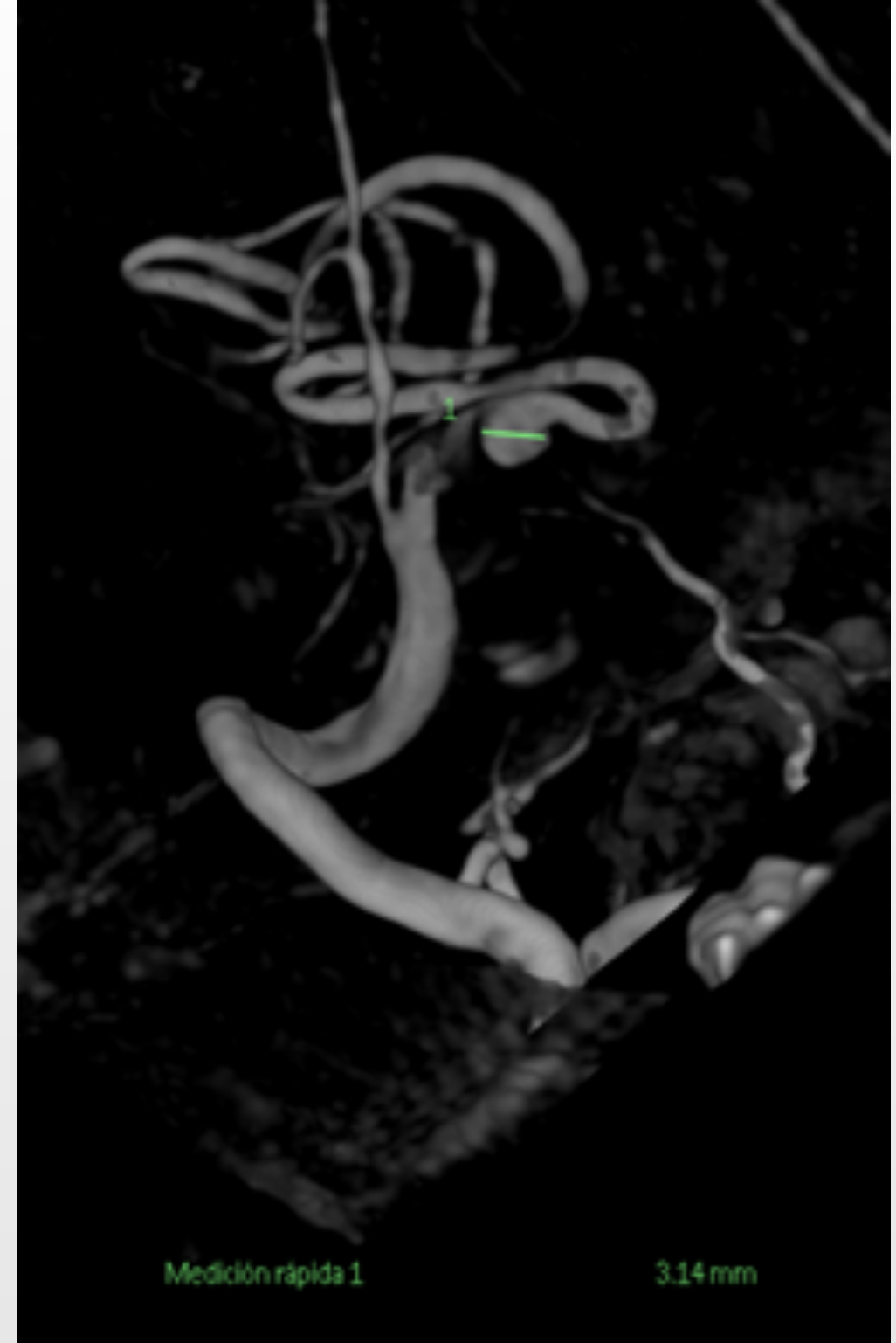
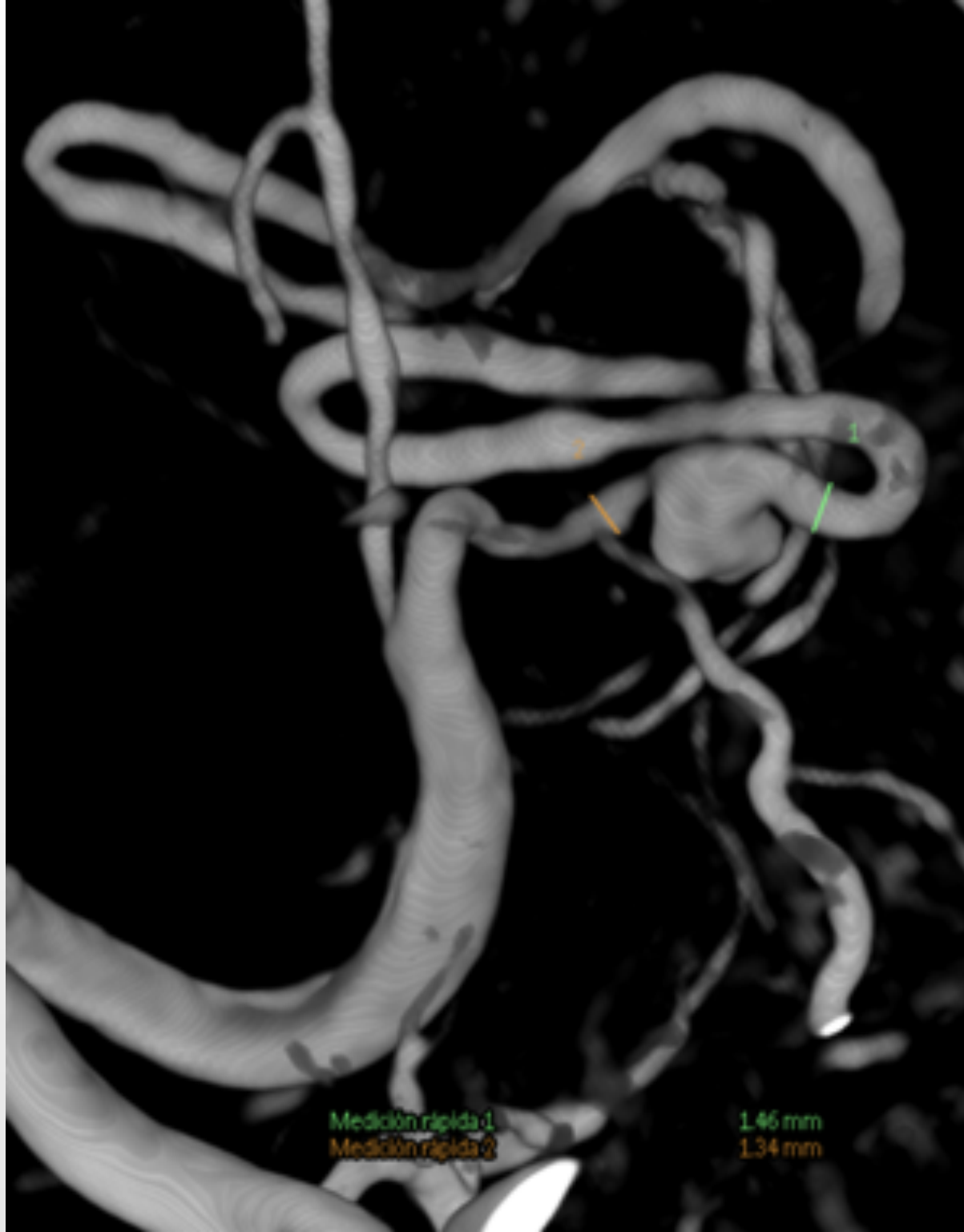
FD con 48 hilos de nitinol y platino
Arterias de 1.5-3.5 mm
Microcatéter 0.017"

SILK VISTA BABY

Reference	Nominal stent		Unconstrained stent		Delivery catheter I.D.
	Ø (mm)	Length (mm)	Ø (mm)	Length (mm)	
SILK_V_2,25x10	2,25	10,5	2,5	8	.017"
SILK_V_2,25x15	2,25	16	2,5	12	.017"
SILK_V_2,25x20	2,25	22	2,5	15,5	.017"
SILK_V_2,75x10	2,75	12,5	3,0	9	.017"
SILK_V_2,75x15	2,75	17	3,0	12	.017"
SILK_V_2,75x20	2,75	22	3,0	15	.017"
SILK_V_2,75x25	2,75	26,5	3,0	18,5	.017"
SILK_V_3,25x10	3,25	11	3,5	8,5	.017"
SILK_V_3,25x15	3,25	16,5	3,5	12,5	.017"
SILK_V_3,25x20	3,25	21	3,5	15	.017"
SILK_V_3,25x25	3,25	26	3,5	18	.017"









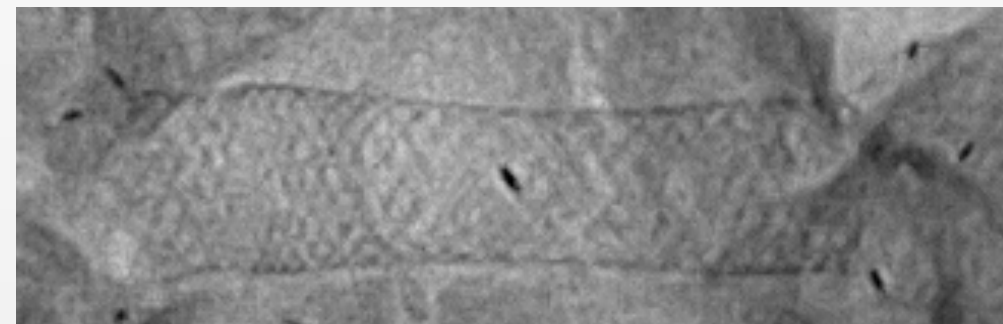
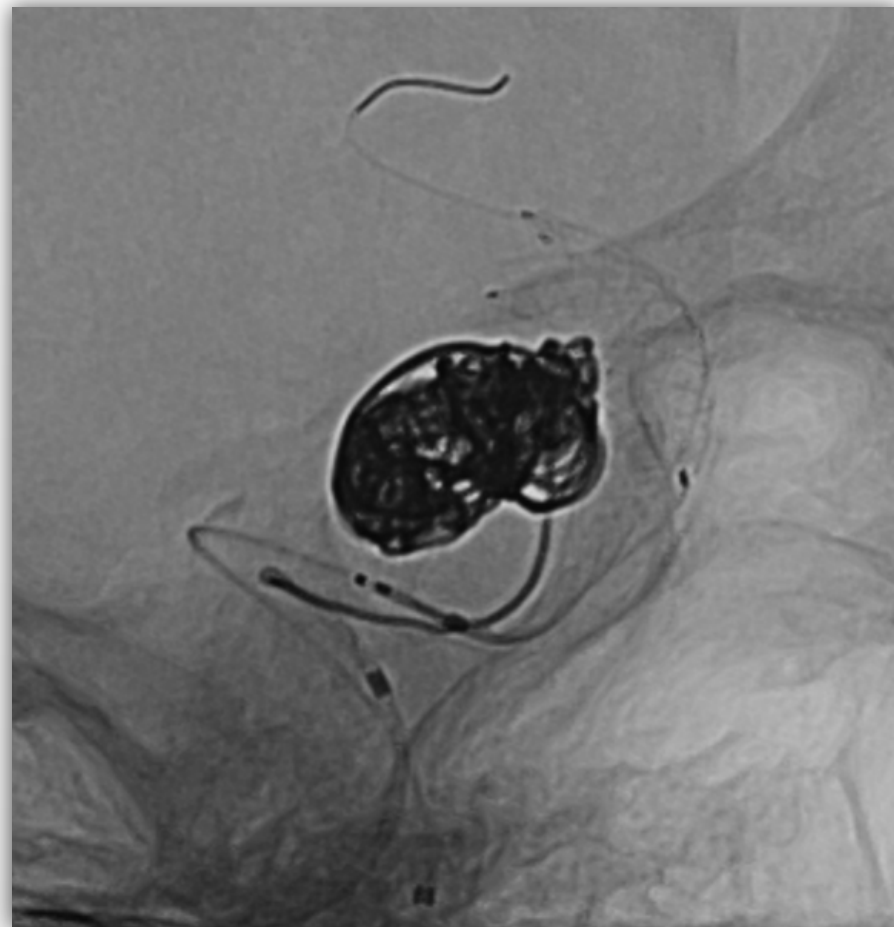


Pre



Control 3 meses





Derivador de baja densidad.

Filamentos de nitinol con interior de platino.

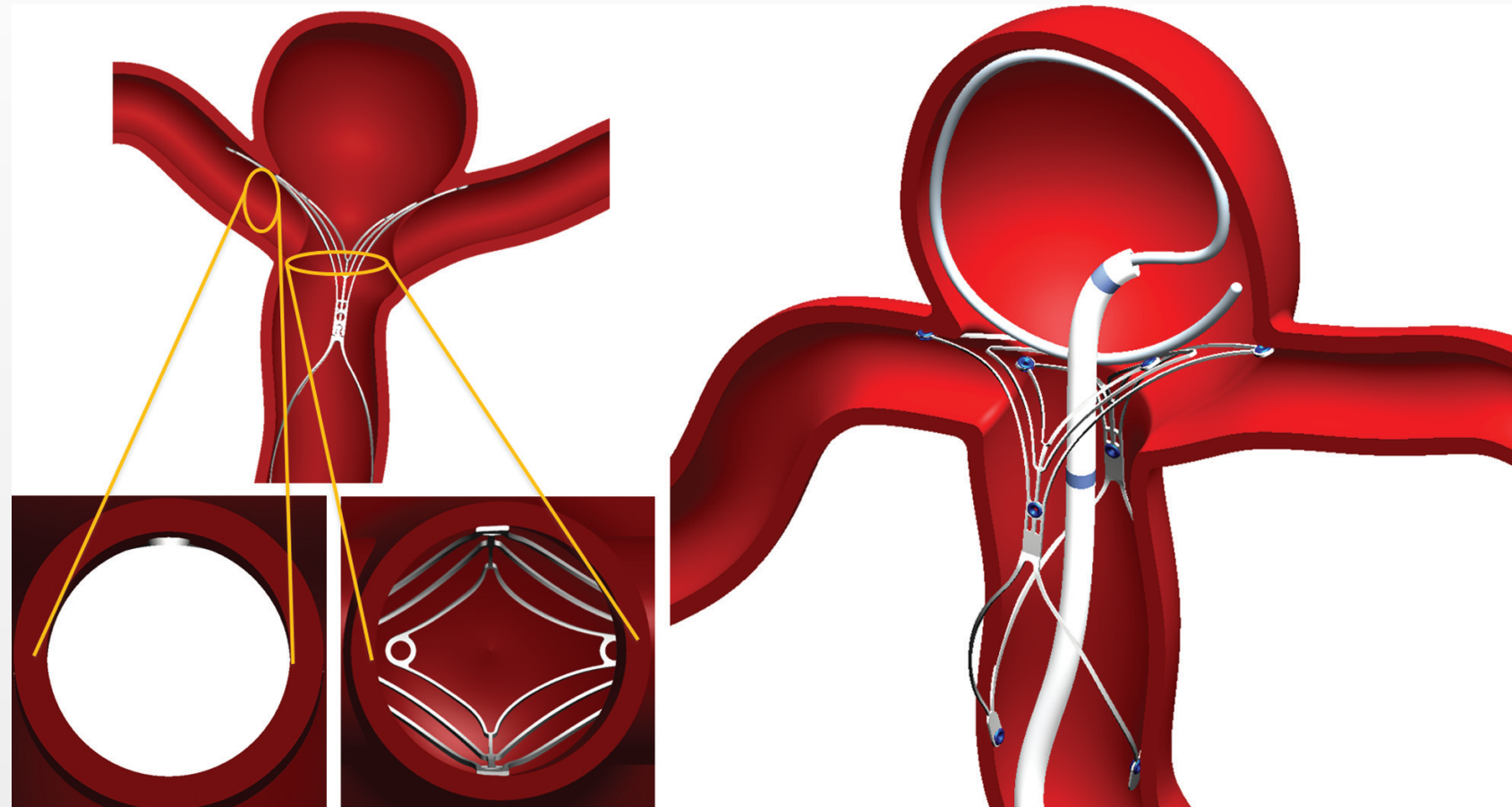
Recubrimiento BlueXide: menor trombogenicidad y mejor biocompatibilidad.

Dispositivo reposicionable hasta más del 95% y recuperable.

Microcatéter de 0,0165”.

ACCERO



Labelled ACCERO [®] Stent Ø (mm)	Labelled ACCERO [®] Stent Length (mm)	Reference Number	Recommended Vessel Ø (mm)	Recommended MC for Delivery (inch)
2.5	10	01-00800	1.5 – 2.5	0.0165-0.017
	15	01-00801		
	20	01-00802		
3.5	10	01-00806	2.5 – 3.5	
	15	01-00807		
	20	01-00808		
	25	01-00841		
4.5	15	01-00813	3.5 – 4.5	
	20	01-00814		
	25	01-00842		

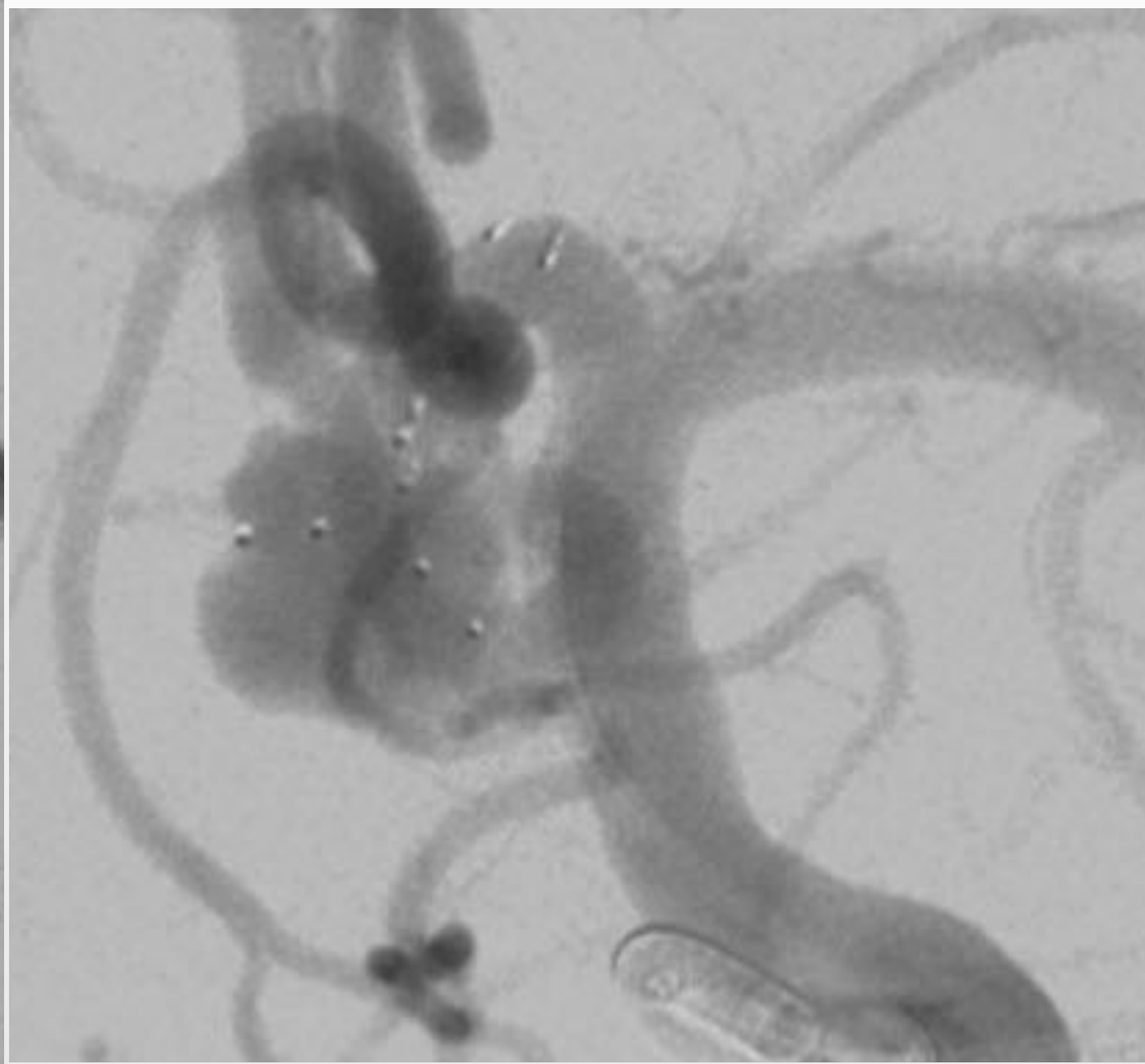
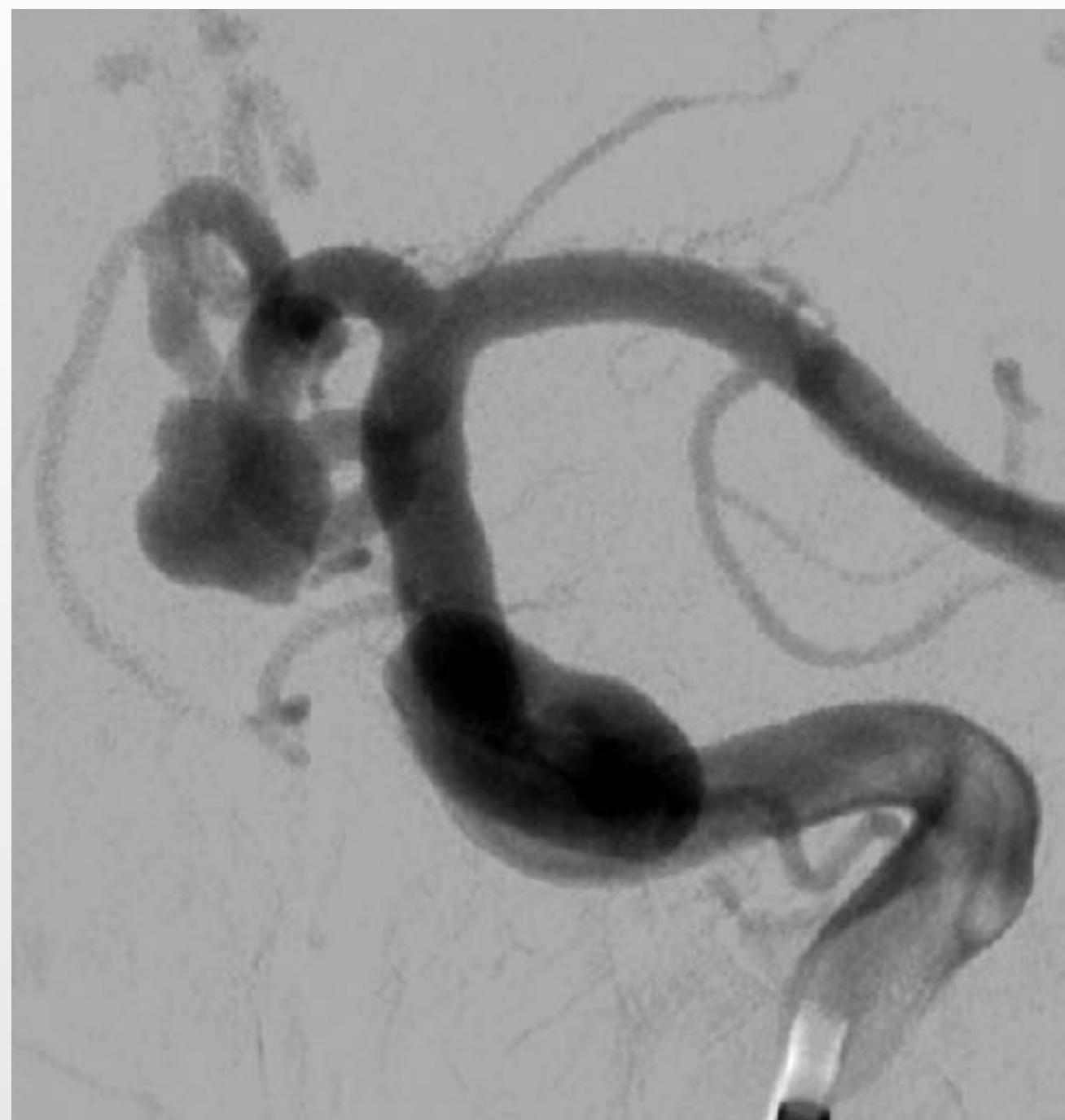


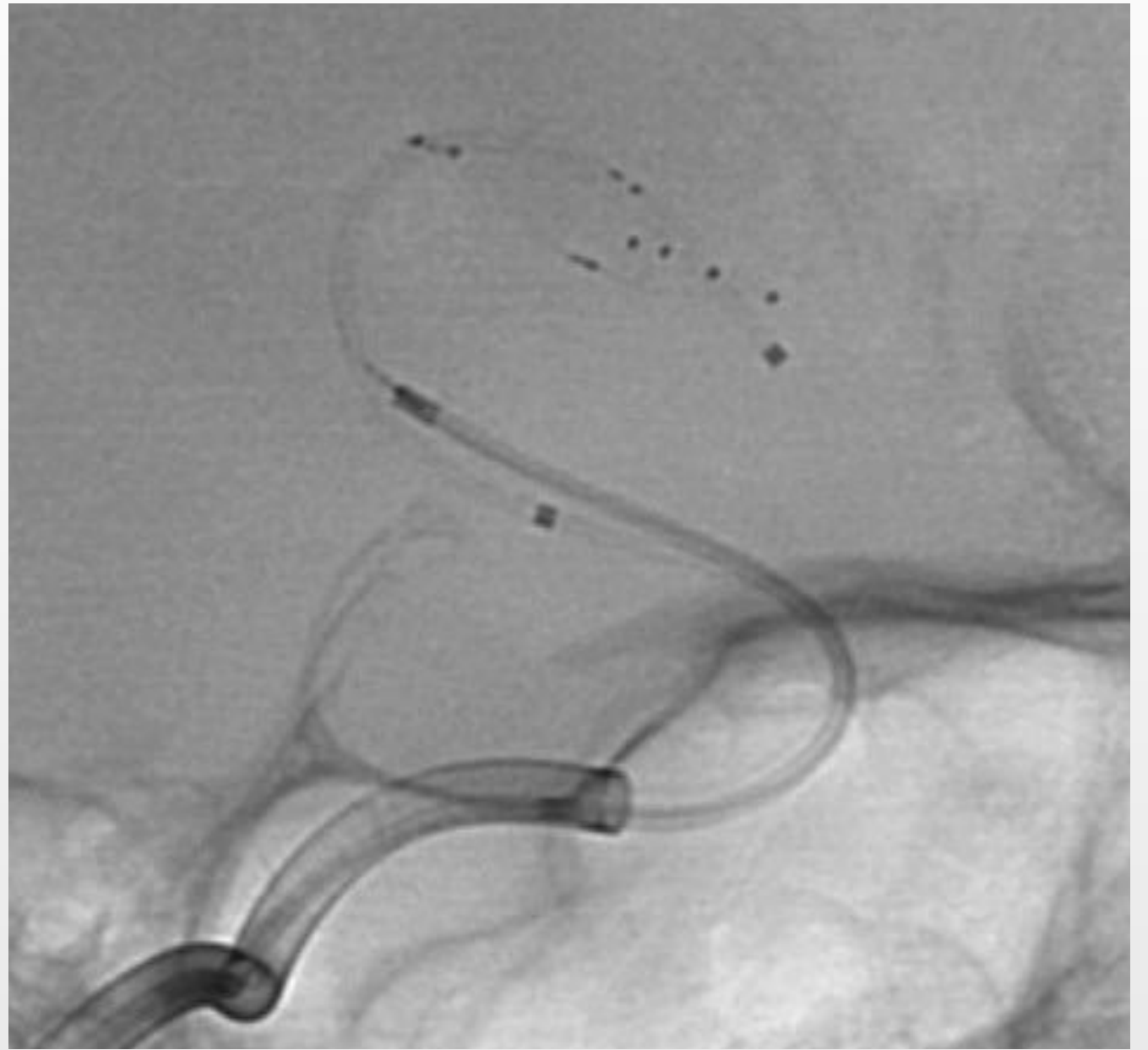
Estructura de nitinol con hojas distales que cubren el cuello
Arterias de 2.7 - 4.5 mm
8 marcas radiopacas
Largado electrolítico
Microcatéter 0.021”

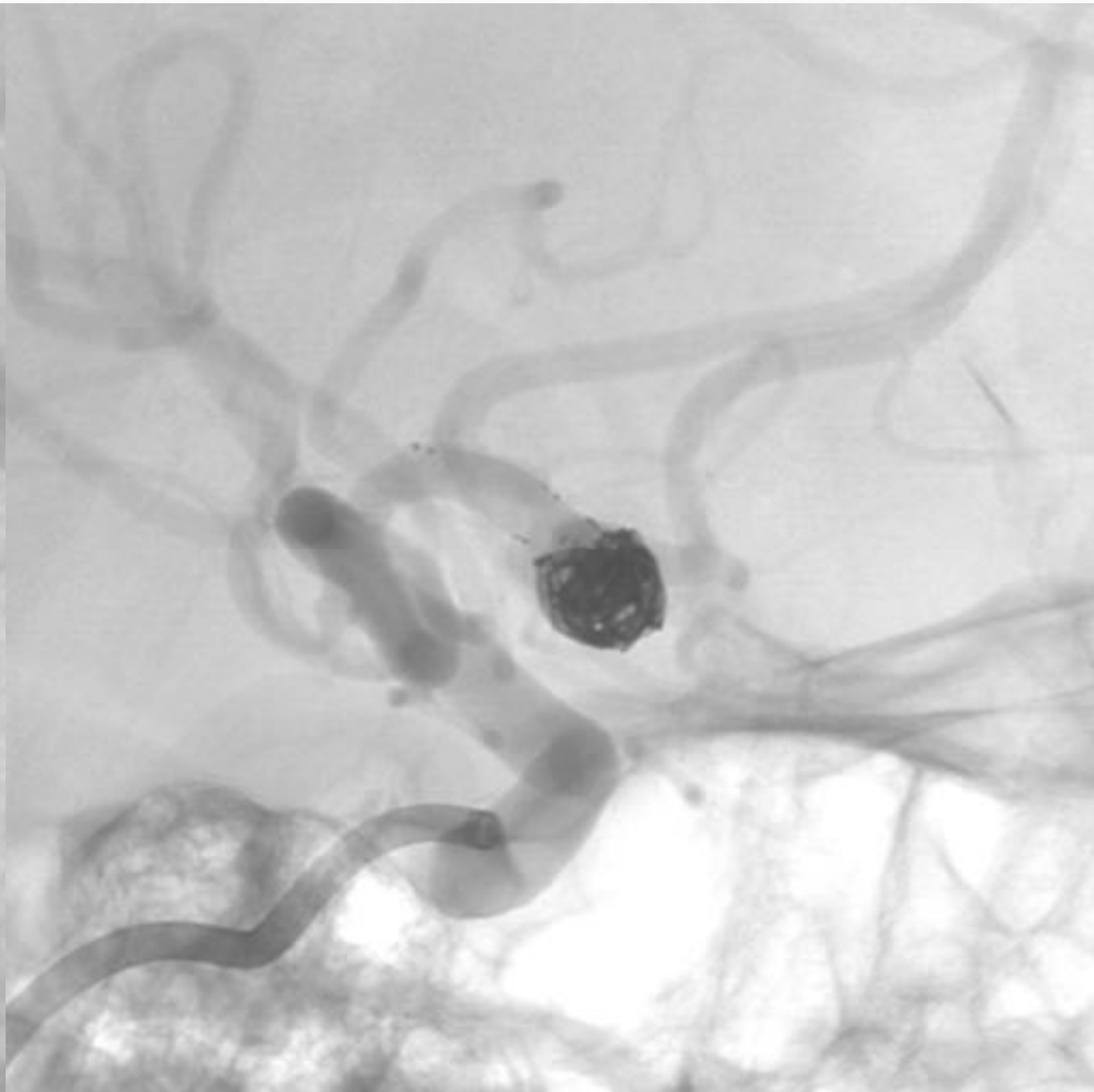
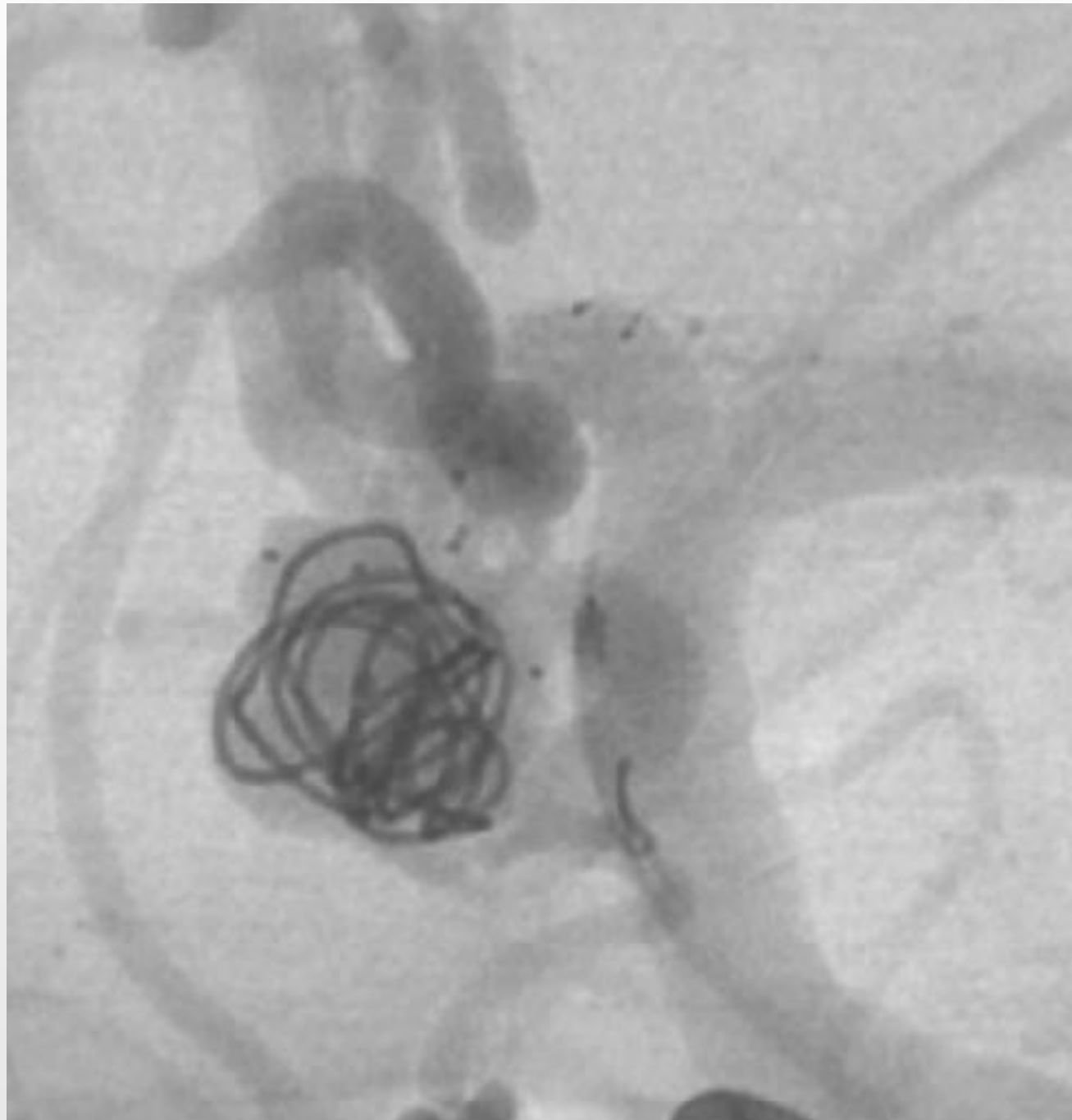
Gory B et al. PulseRider Stent-Assisted Coiling of Wide-Neck Bifurcation Aneurysms: Periprocedural Results in an International Series. AJNR 2016, 37 (1) 130-135; DOI: <https://doi.org/10.3174/ajnr.A4506>

PulseRider® Aneurysm Neck Reconstruction Device

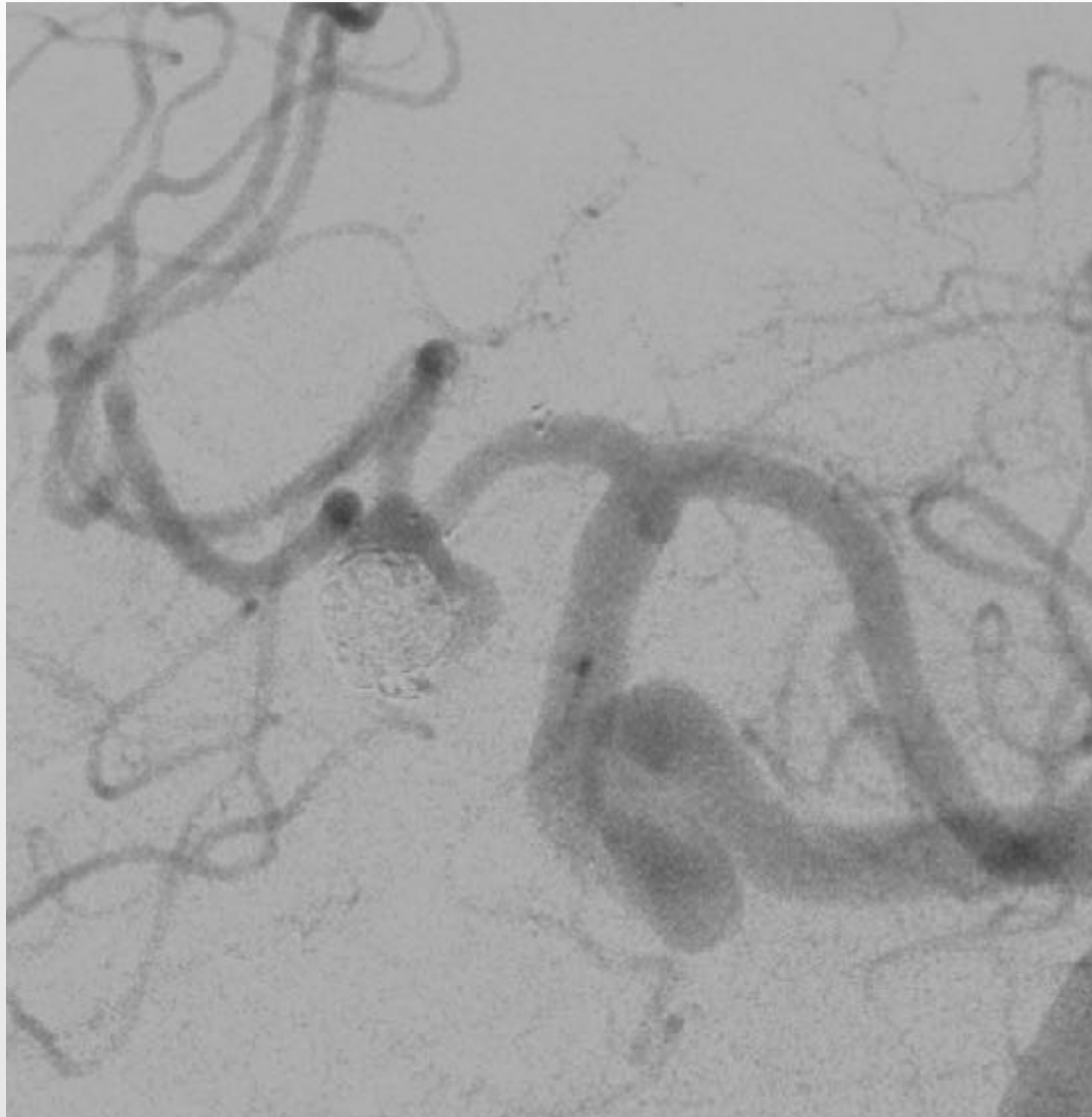
Implant Shape	Catalog Code	Parent Vessel Diameter (mm)	Arch Width (mm)
 T-Shape	201E	2.7 – 3.5	8.6
	203E	3.5 – 4.5	8.6
	211E	2.7 – 3.5	10.6
	213E	3.5 – 4.5	10.6
 Y-Shape	301E	2.7 – 3.5	8.6
	303E	3.5 – 4.5	8.6
	311E	2.7 – 3.5	10.6
	313E	3.5 – 4.5	10.6

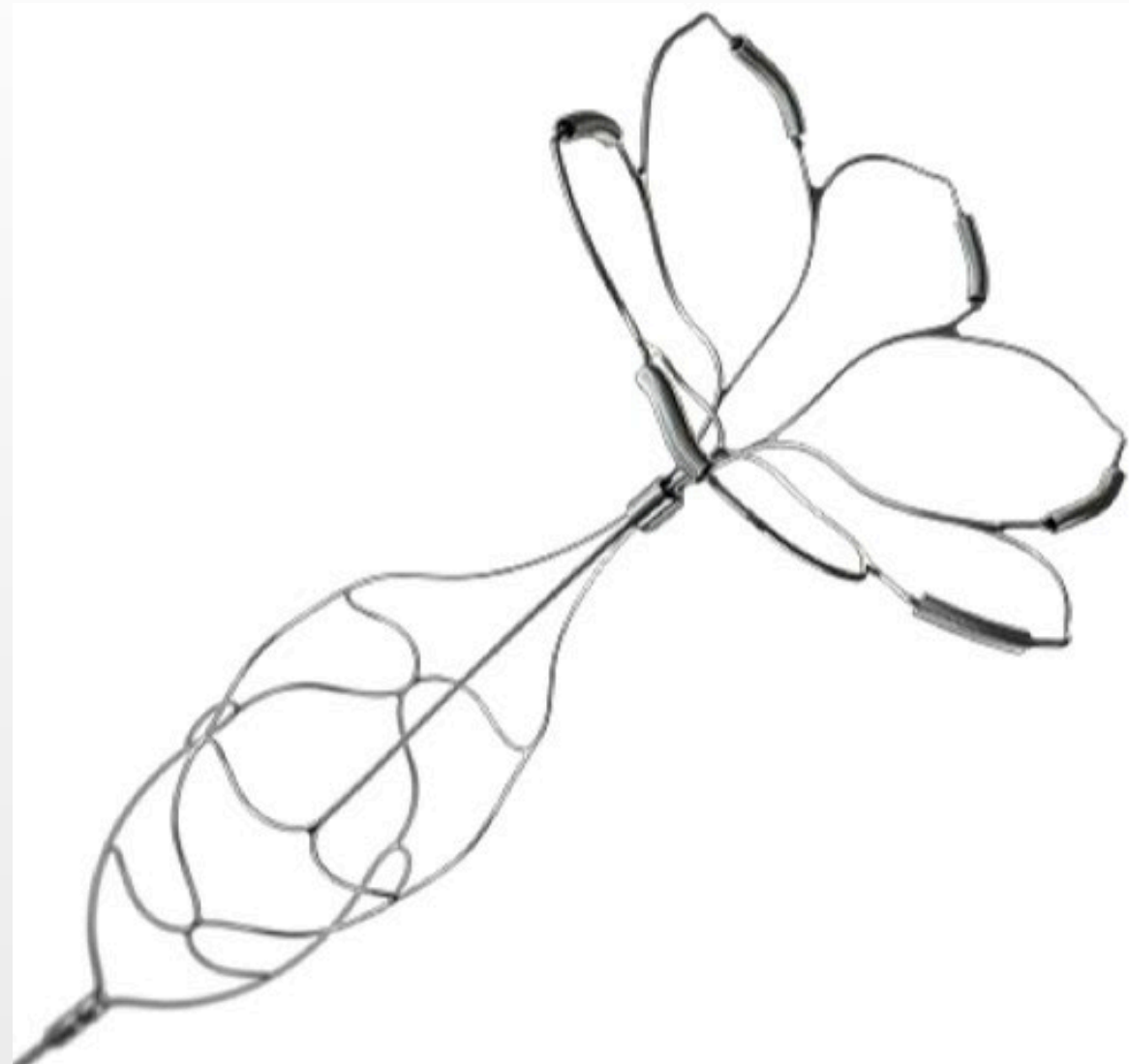




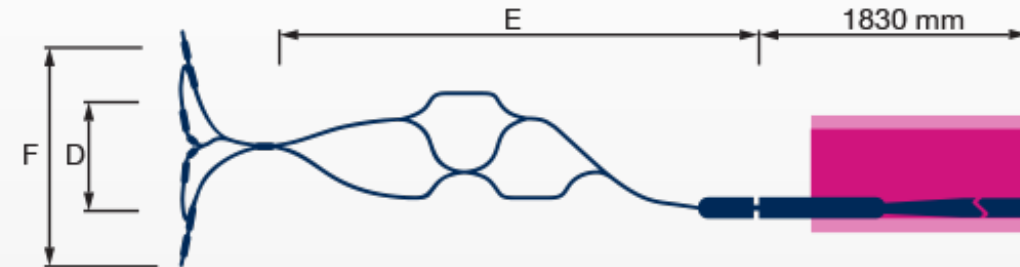
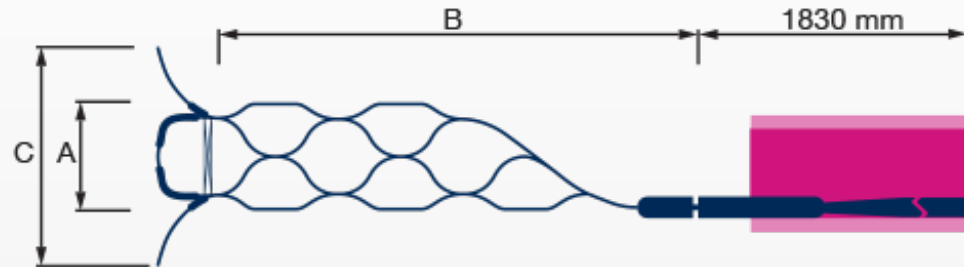


Control 2 años





Estructura de stent con corona distal con 6 pétalos
Arterias de 1.75-3 mm
Largado electrolítico
Microcatéter 0.021”



pCONUS*

Shorter shaft	Shaft diameter	Shaft length	Crown diameter	Vessel diameter
REF	A [mm]	B [mm]	C [mm]	[mm]
PCON-4-20-5-F	4	20	5	2.5-3.7
PCON-4-20-6-F	4	20	6	2.5-3.7
PCON-4-20-8-F	4	20	8	2.5-3.7
PCON-4-20-10-F	4	20	10	2.5-3.7
PCON-4-20-12-F	4	20	12	2.5-3.7
PCON-4-20-15-F	4	20	15	2.5-3.7

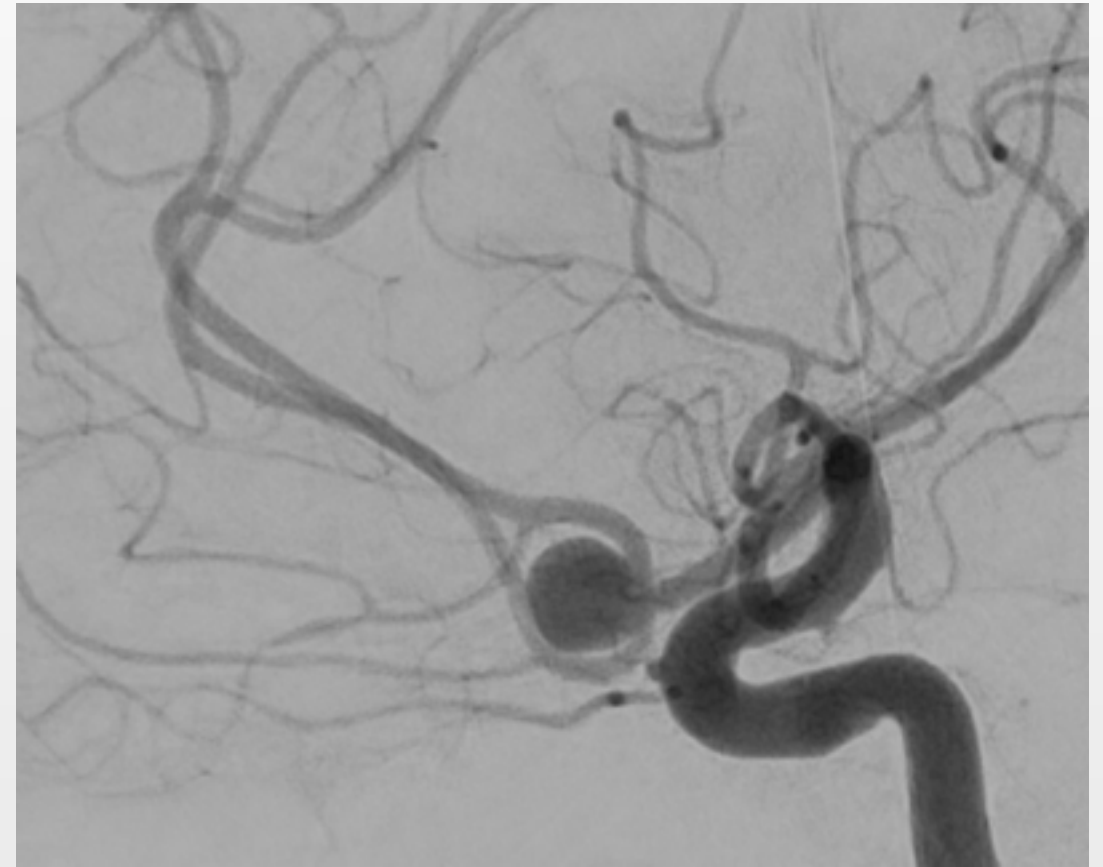
Longer shaft	Shaft diameter	Shaft length	Crown diameter	Vessel diameter
REF	A [mm]	B [mm]	C [mm]	[mm]
PCON-4-25-5-F	4	25	5	2.5-3.7
PCON-4-25-6-F	4	25	6	2.5-3.7
PCON-4-25-8-F	4	25	8	2.5-3.7
PCON-4-25-10-F	4	25	10	2.5-3.7
PCON-4-25-12-F	4	25	12	2.5-3.7
PCON-4-25-15-F	4	25	15	2.5-3.7

pCONUS mini	Shaft diameter	Shaft length	Crown diameter	Vessel diameter
REF	A [mm]	B [mm]	C [mm]	[mm]
PCON-3-20-4-F	3	20	4	2.2-2.7

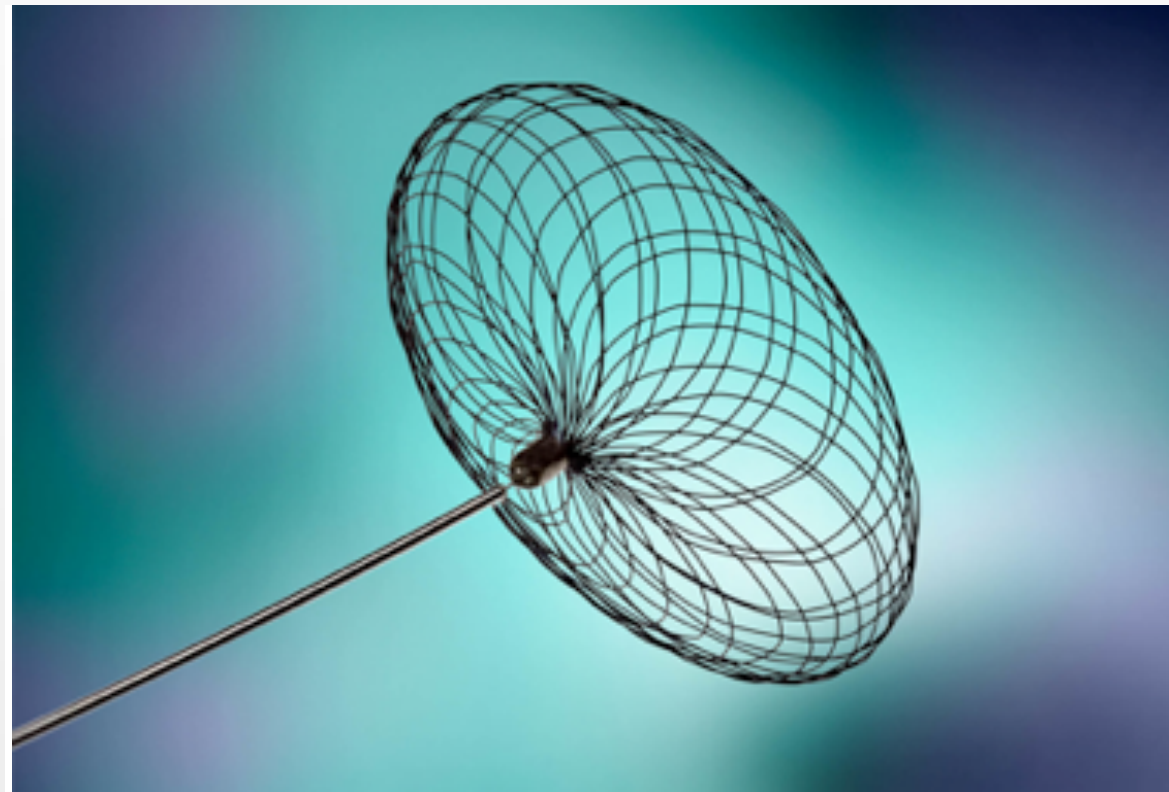
pCONUS 2

	Shaft diameter	Shaft length	Crown diameter	Vessel diameter
REF	D [mm]	E [mm]	F [mm]	[mm]
PCON2-4-15-5	4	15	5	2.5-3.7
PCON2-4-15-6	4	15	6	2.5-3.7
PCON2-4-15-7	4	15	7	2.5-3.7
PCON2-4-15-8	4	15	8	2.5-3.7
PCON2-4-15-10	4	15	10	2.5-3.7
PCON2-4-15-12	4	15	12	2.5-3.7
PCON2-4-15-15	4	15	15	2.5-3.7

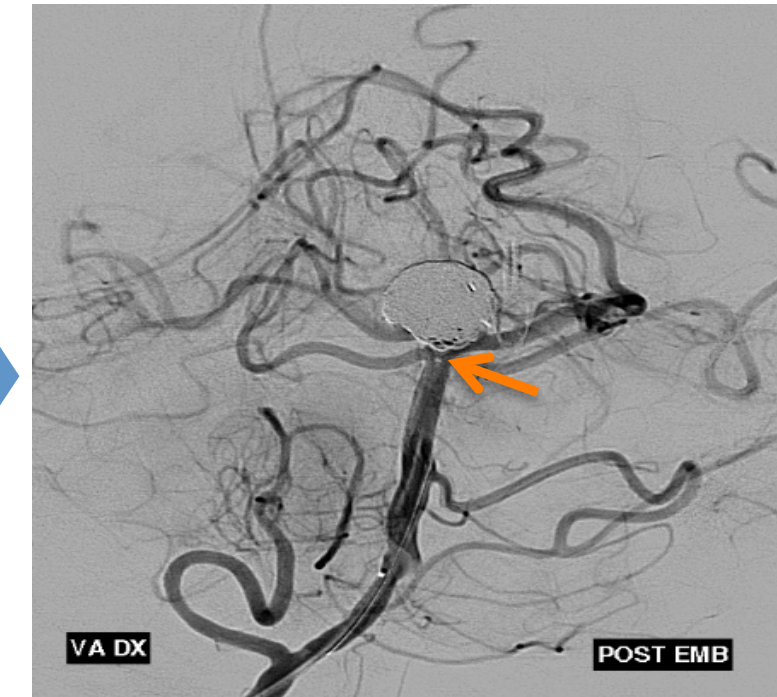
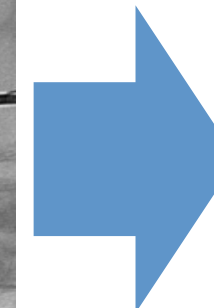
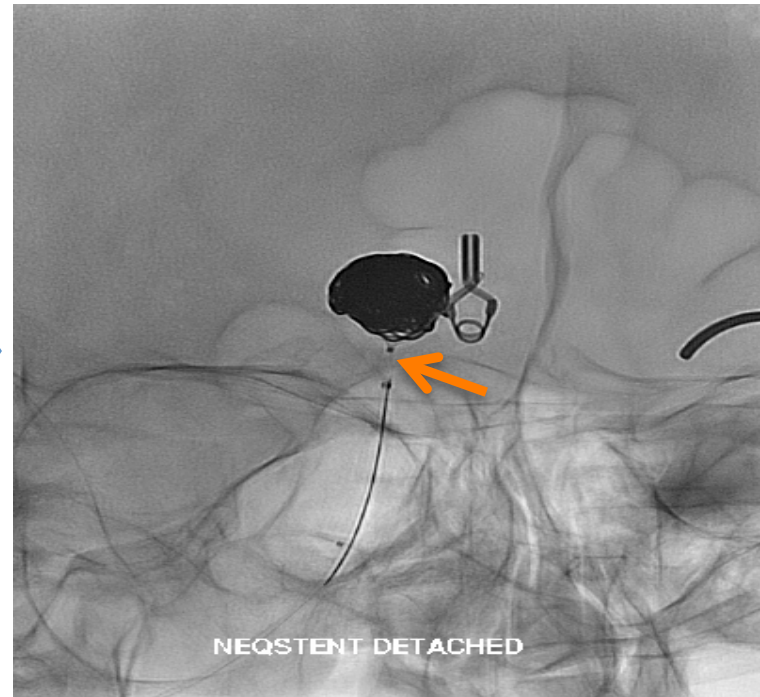
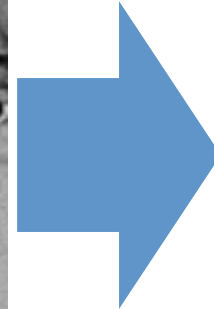
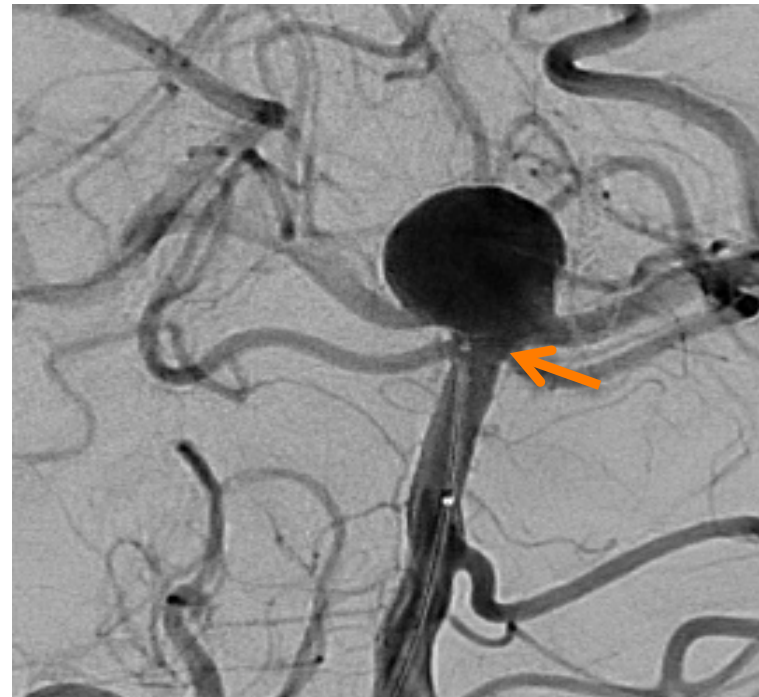
*pCONUS 1 is also available without nylon net upon request.



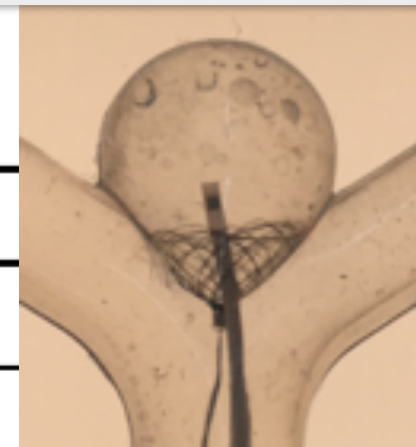


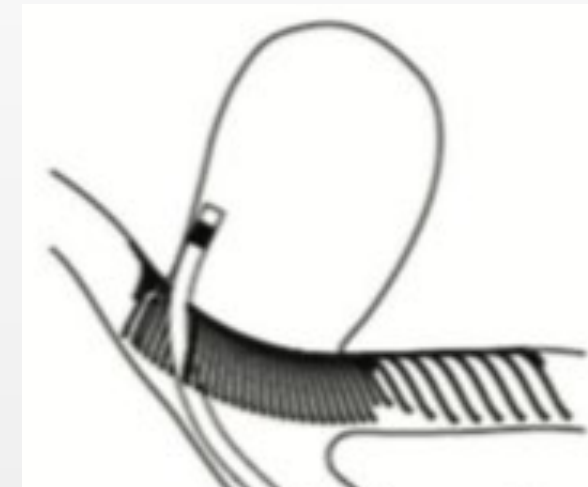


**Tratamiento asociado a coils.
Microcatéter 0.027”
Largado electrolítico.**



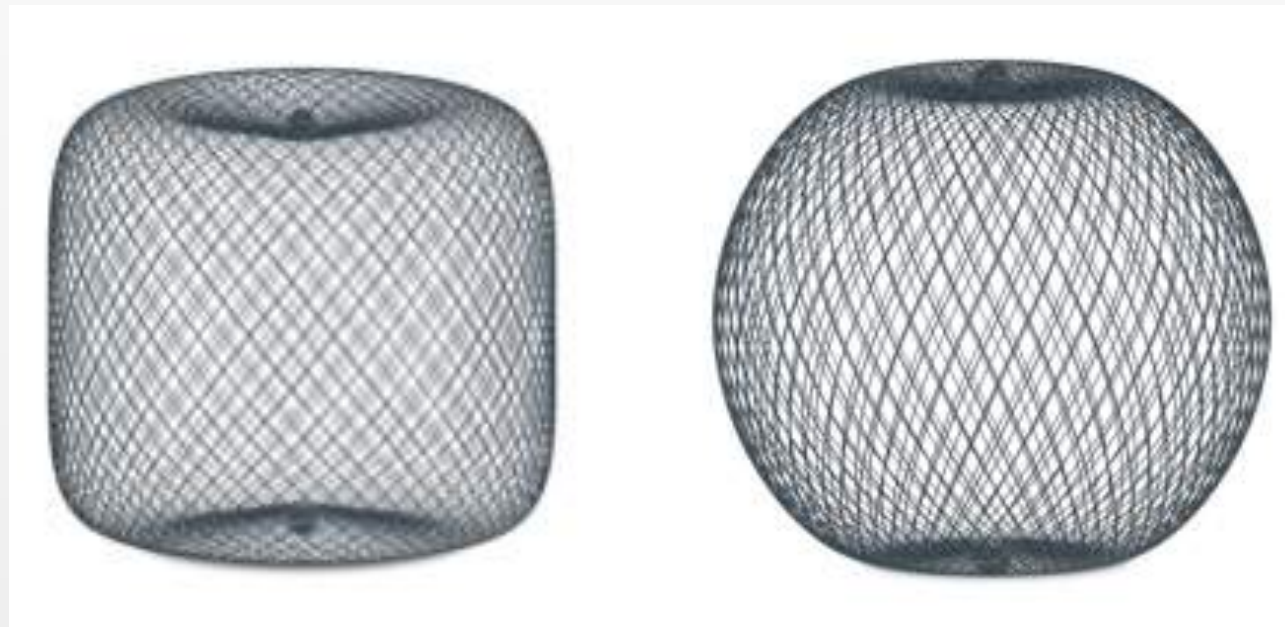
REF (Catalog Number) – Diameter	Aneurysm Neck (mm)
NQS07 – 7 mm	3.0 - 5.0
NQS09 – 9 mm	4.0 – 6.0
NQS11 – 11 mm	5.0 – 8.0





Aneurismas de bifurcación
Nitinol con 6 marcas radiopacas
Diámetro 3.6 mm. Longitud 7.5 mm
Para arterias de 2 - 3.25 mm
Microcatéter 2.4F
Microguía de 0.014”

WEB



**Implante intrasacular tridimensional.
Malla “MicroBraid” de hilos de Nitinol y Platino.
Microcatéter 0.017”
Largado electro-térmico.
Sin necesidad de doble antiagregación.**

WEB



**Implante intrasacular tridimensional.
Malla “MicroBraid” de hilos de Nitinol y Platino.
Microcatéter 0.017”
Largado electro-térmico.
Sin necesidad de doble antiagregación.**

WEB



2010



2013



2014



2015



VIA 33

VIA 27

VIA 21

CATHETER SIZE

2017



VIA 17

WEB™ DL

- Original platform
- Dual Layers

WEB™ SL and SLS

- Single layer
- Lower profile

EV Technology

- Enhanced Visualization (Nitinol w/ platinum core)

21 System

- Lower profile
- 4-7 mm devices

17 System

- Lower profile
- 3-7 mm devices
- ½ sizes: 3.5 mm and 4.5 mm
- 2 mm height for sizes 3-5 mm

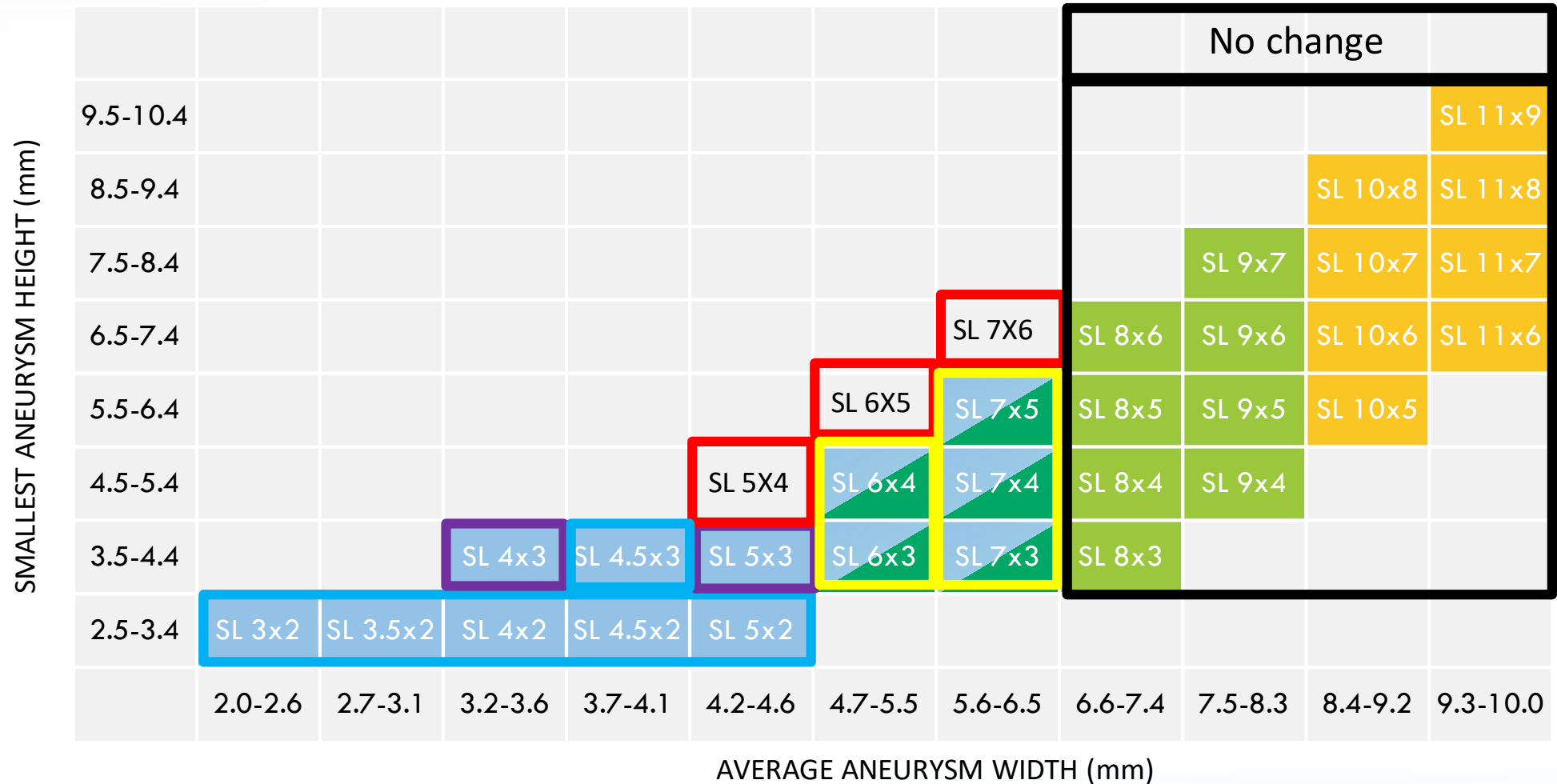
WEB

New Sizes (17 System)

17 system replace 21 system

Sizes available in 17 & 21 system

Discontinued 21 System Sizes



DELIVERY CATHETER





WEB

WEBCAST

French
Observatory
("FROBS")

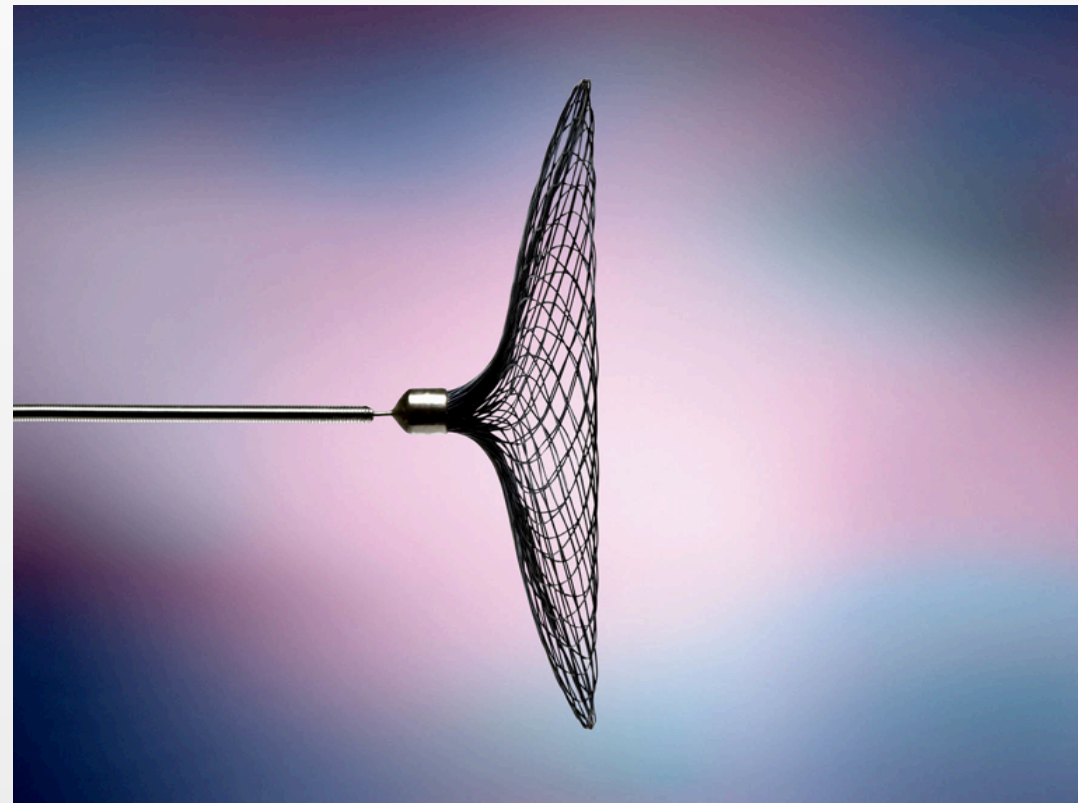
- **Baja tasa de complicaciones isquémicas y hemorrágicas.**
- **Disminución de las dosis de radiación.**
- **Evita la doble antiagregación.**
- **Tratamiento duradero y con bajas tasas de retratamiento.**

WEBCAST 2

WEB-IT

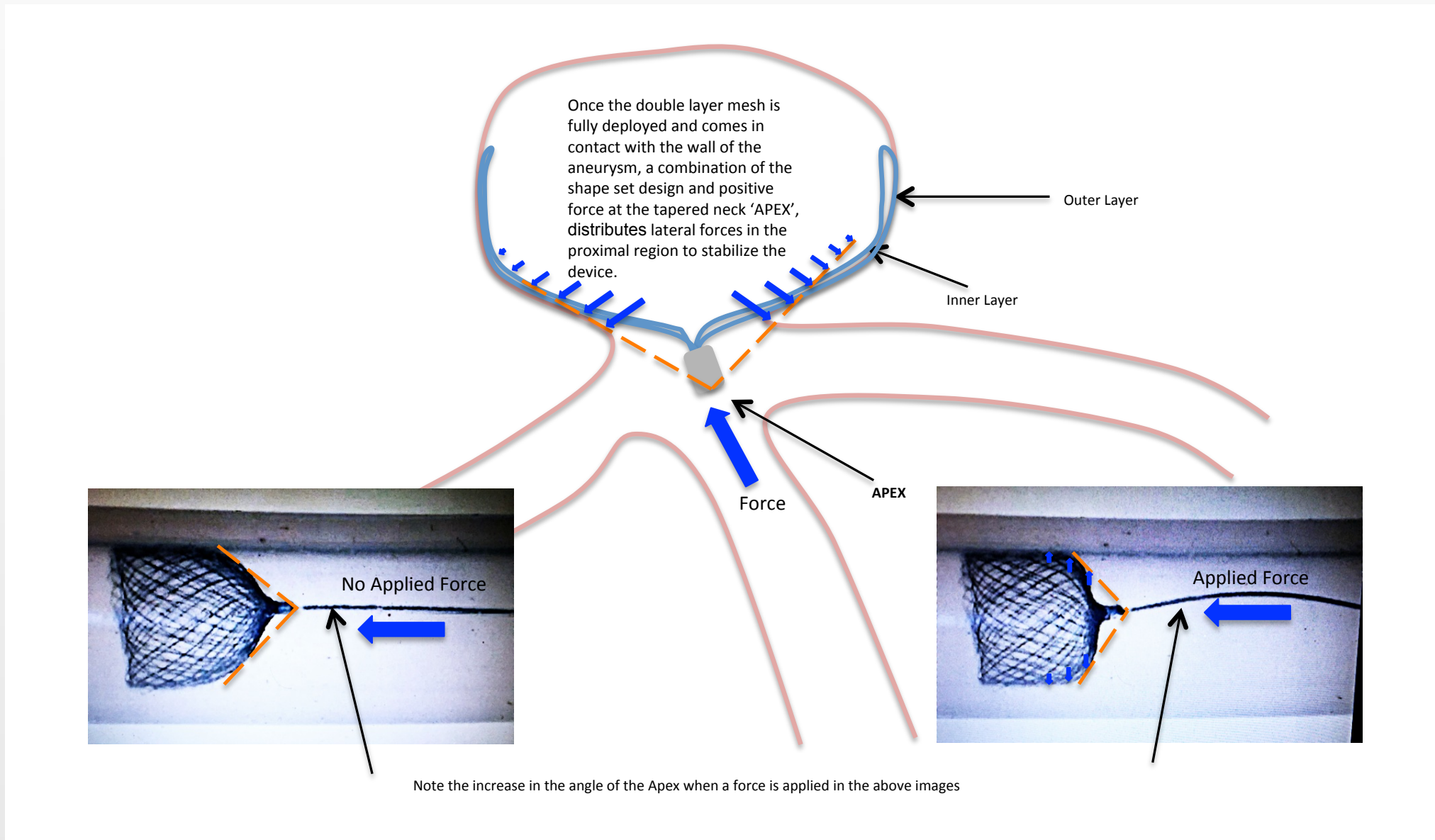
- **Curva de aprendizaje.**
- **No indicado para todos los aneurismas: cuellos muy anchos, arterias naciendo del aneurisma, polilobulados, aneurismas laterales.**

CLARYS



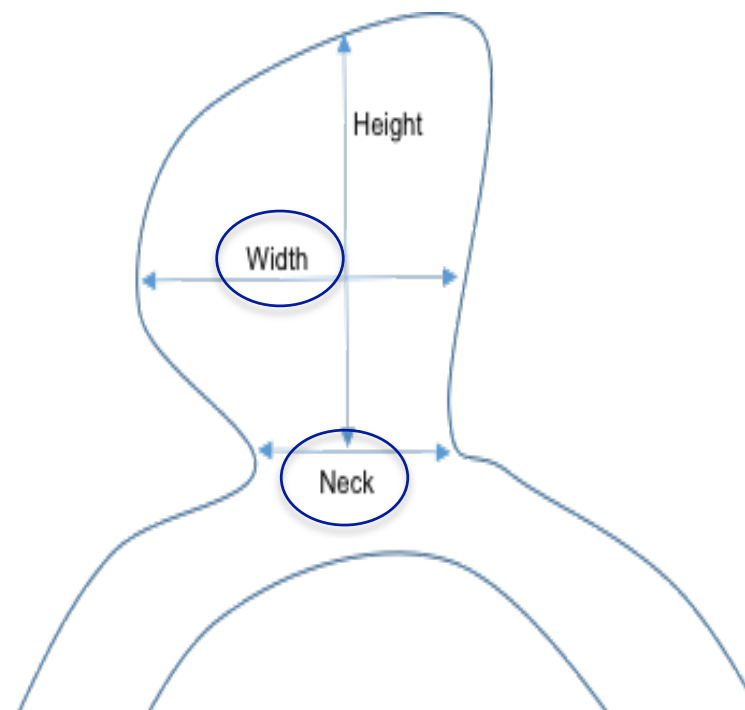
**Tratar el cuello del aneurisma.
Sin necesidad de doble antiagregación.
Microcatéter 0.027”
Largado electrolítico.**

Contour



Contour

REF (Catalog Number) – Diameter	Aneurysm Neck (mm)	Aneurysm Width (mm)
CNS05 – 5 mm	2.0 - 3.0	2.0 - 3.5
CNS07 – 7 mm	3.0 - 5.0	3.0 - 5.5
CNS09 – 9 mm	4.0 - 6.0	5.0 - 7.5
CNS11 – 11 mm	5.0 - 8.0	7.0 - 8.5

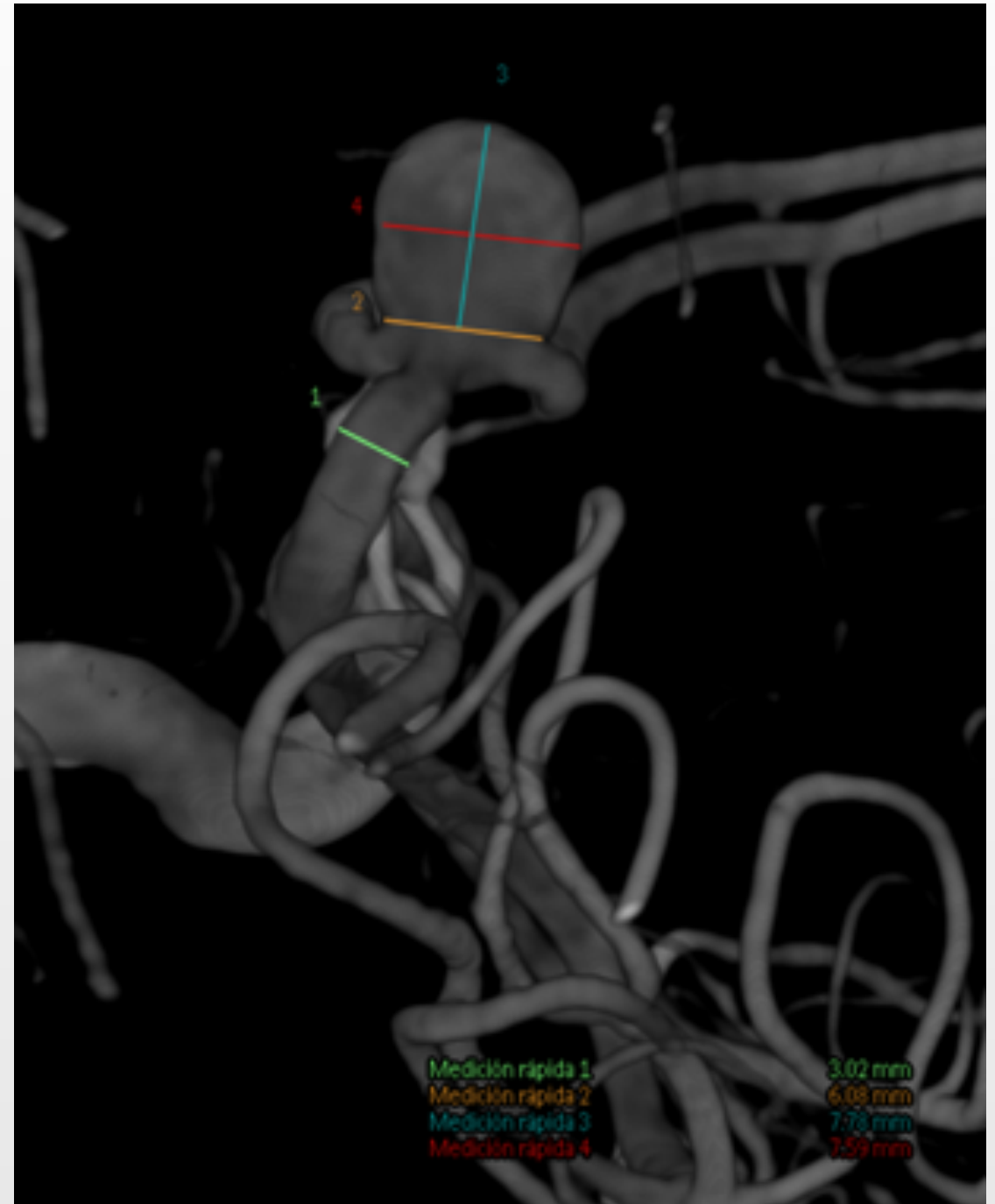
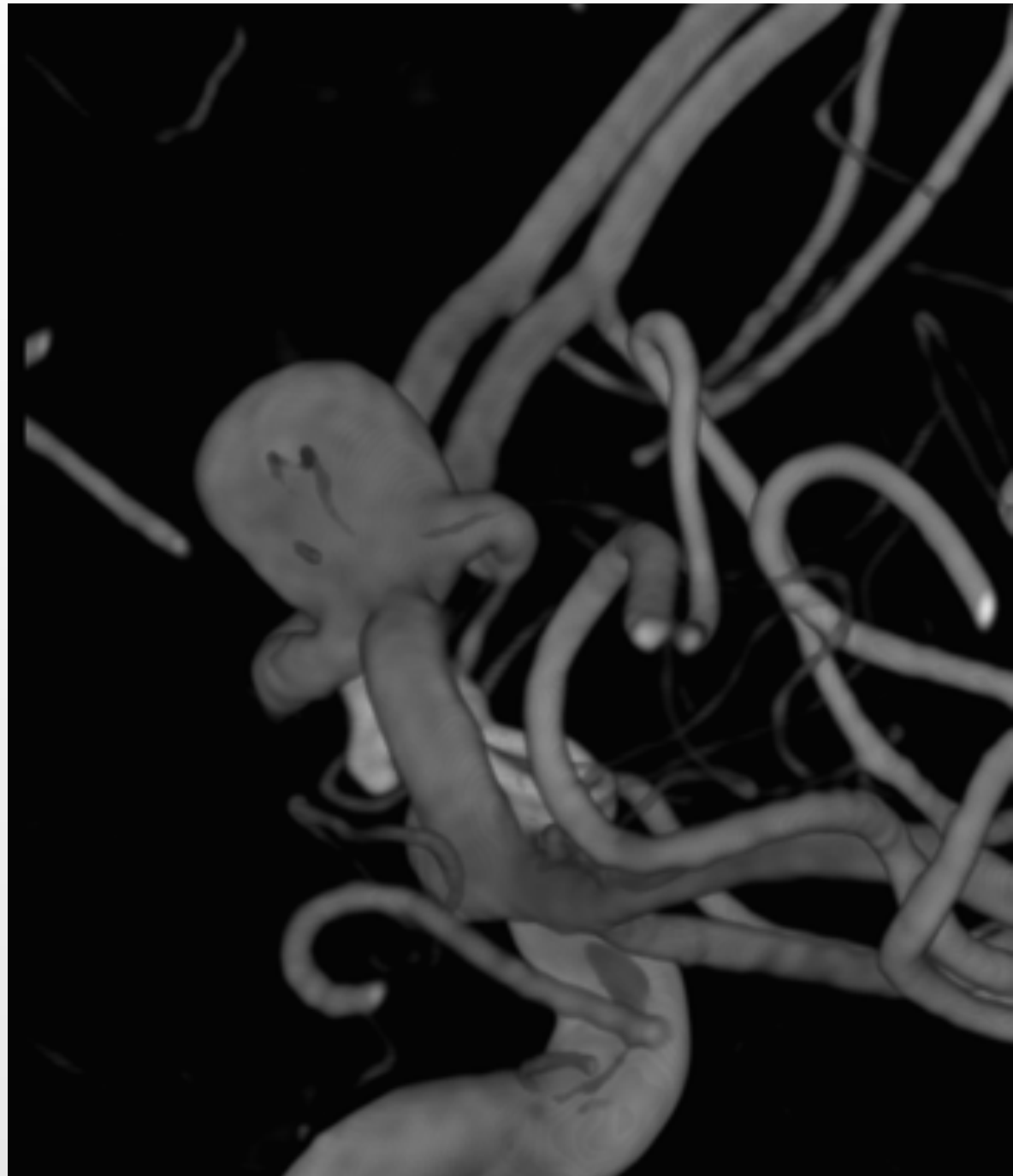


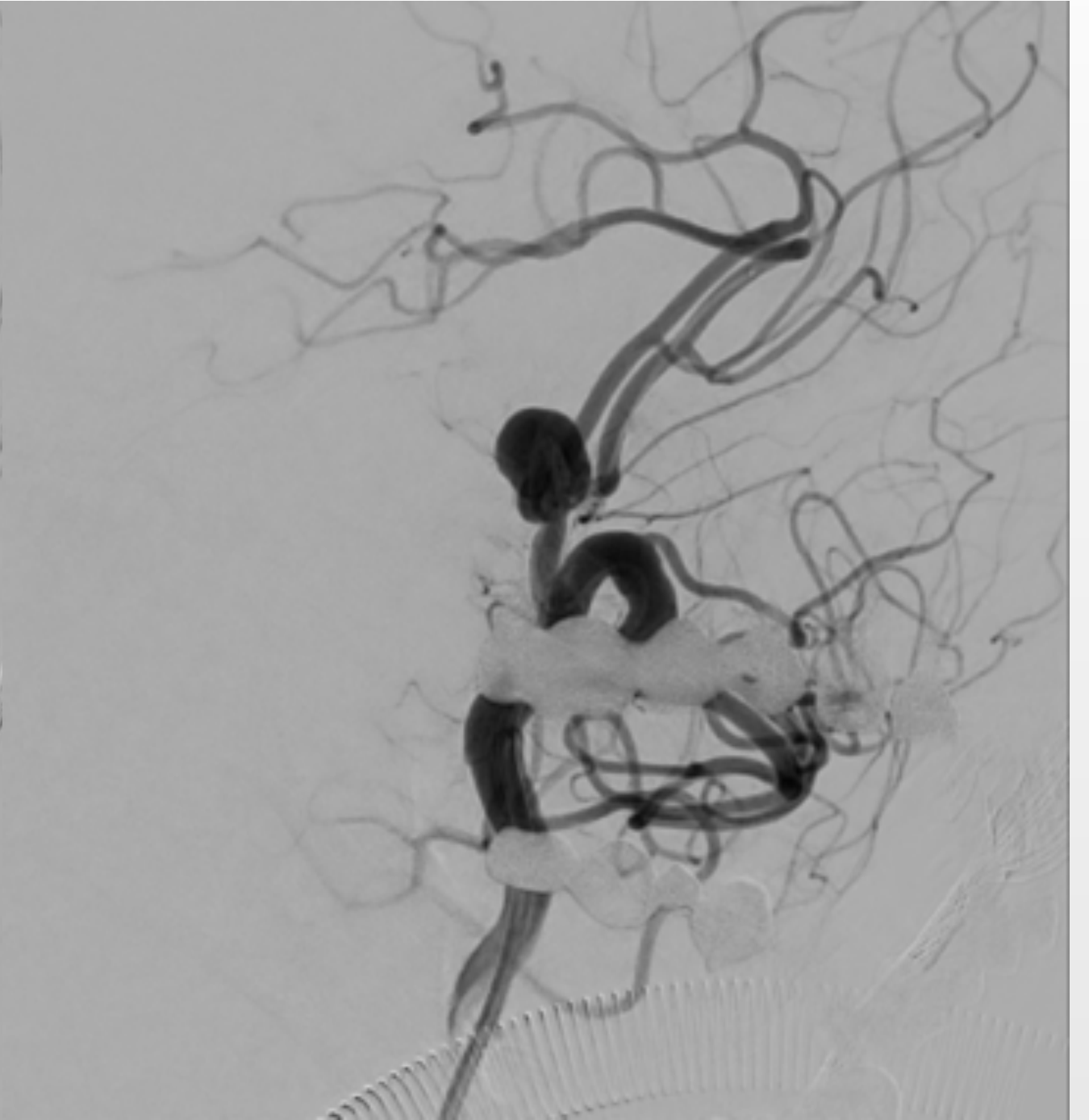
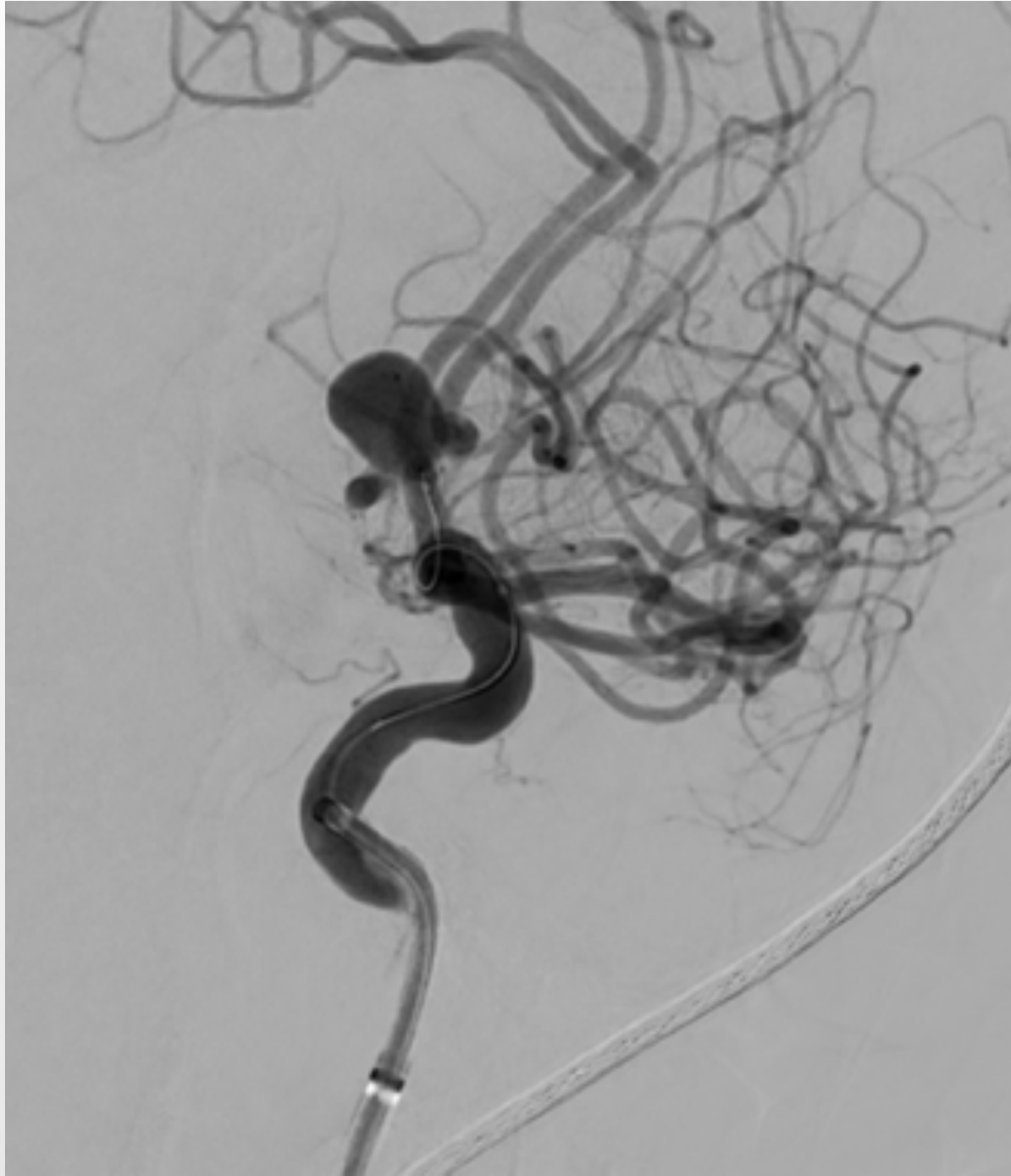
Tamaño según la medida del cuello y el ancho del aneurisma.

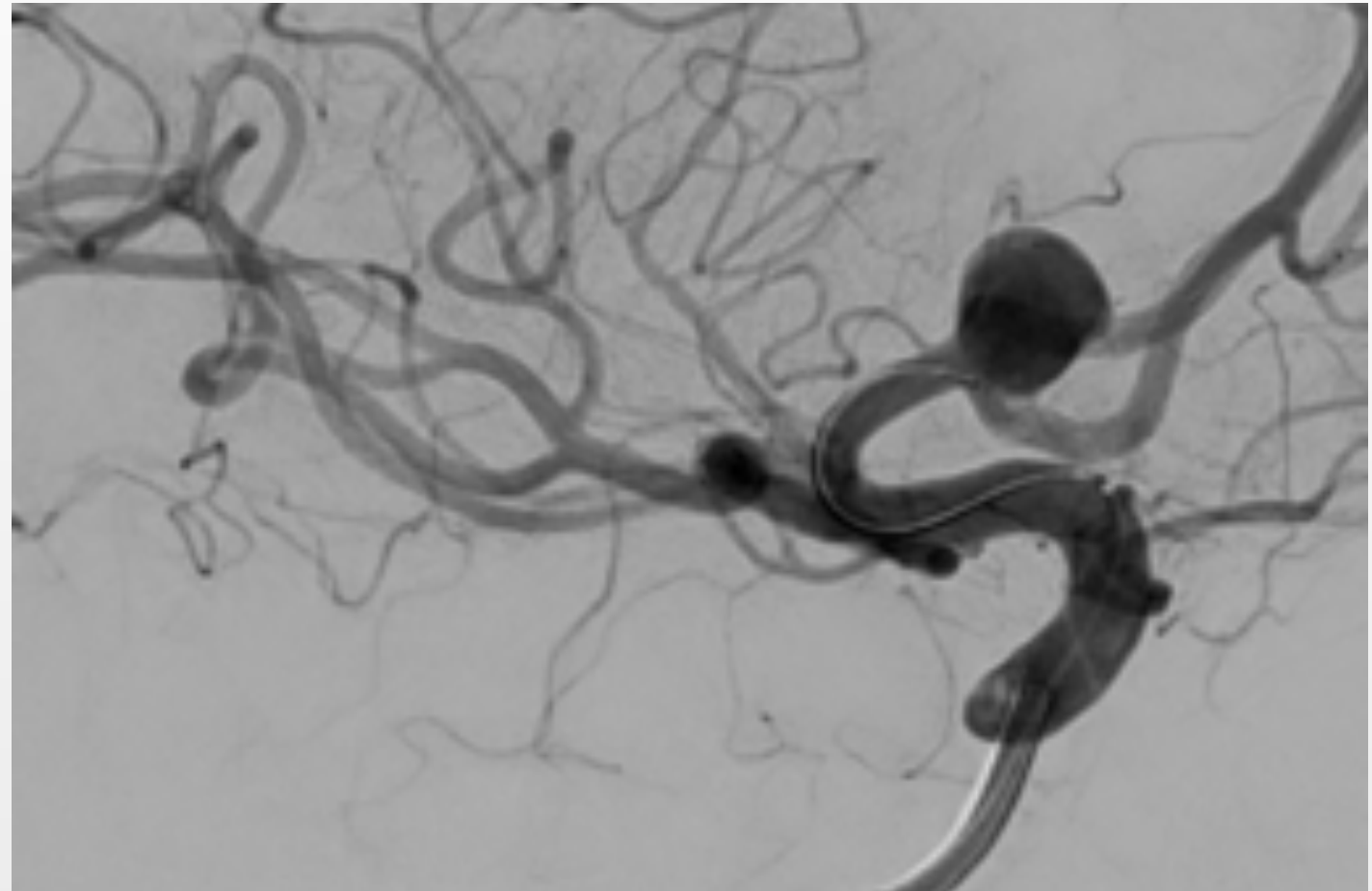
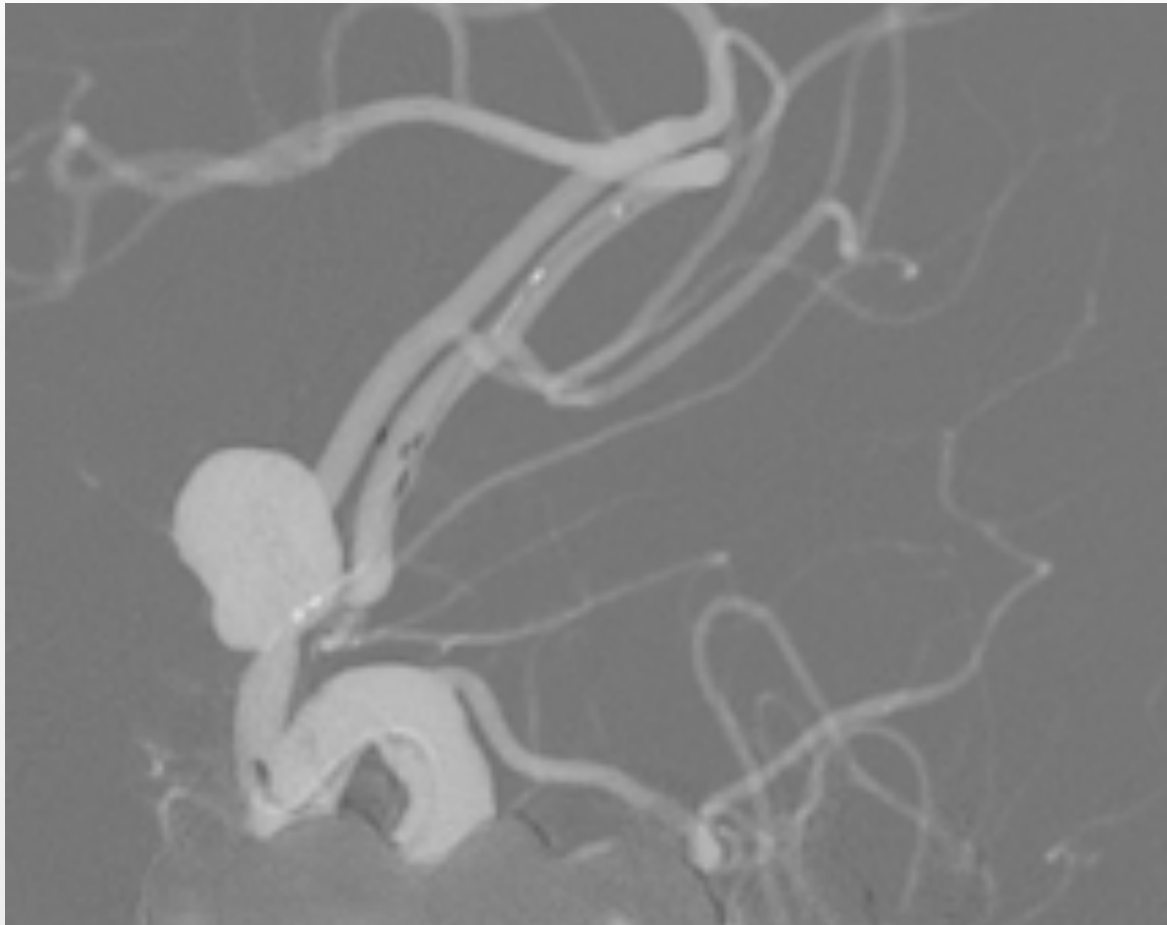
Contour

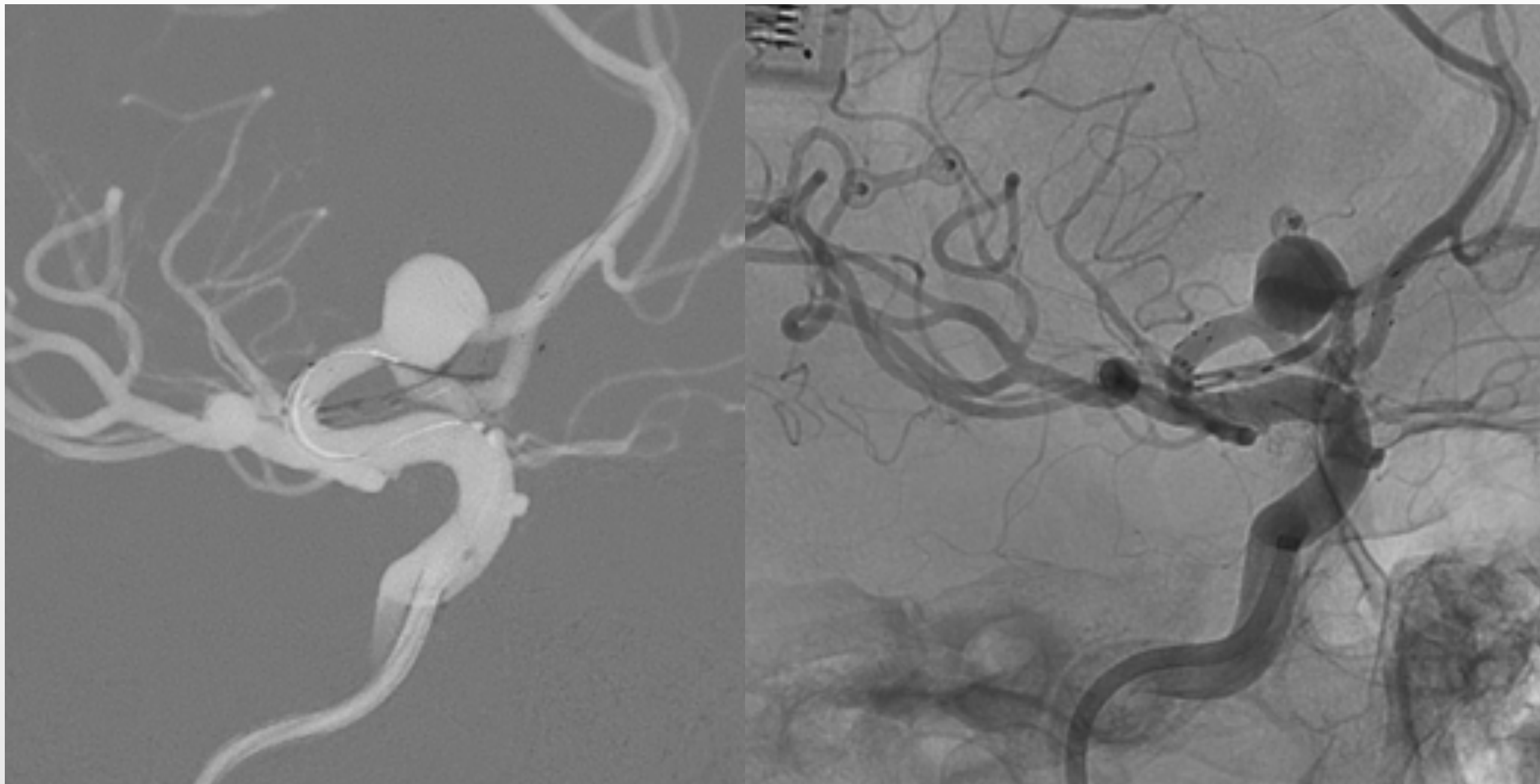


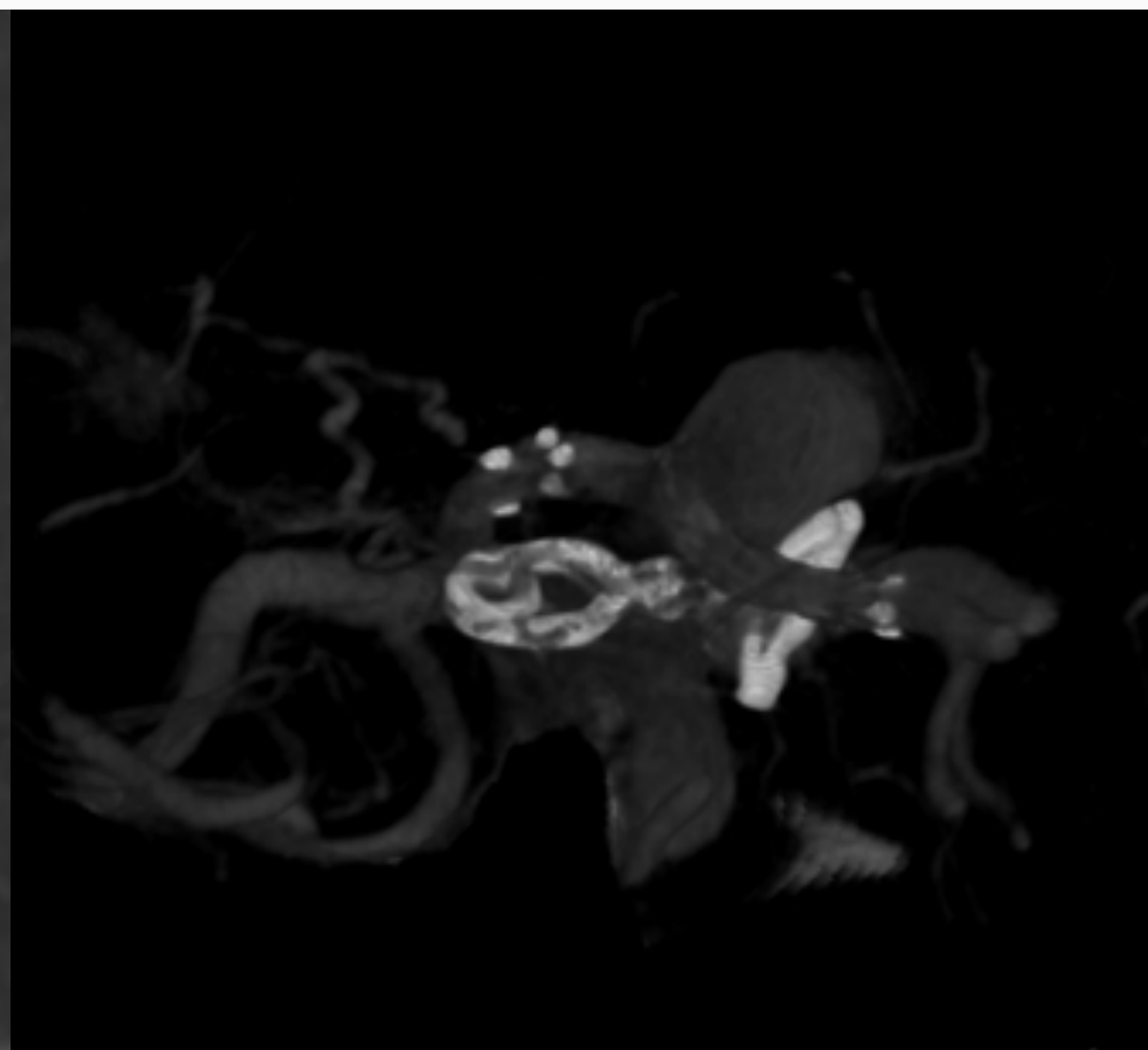
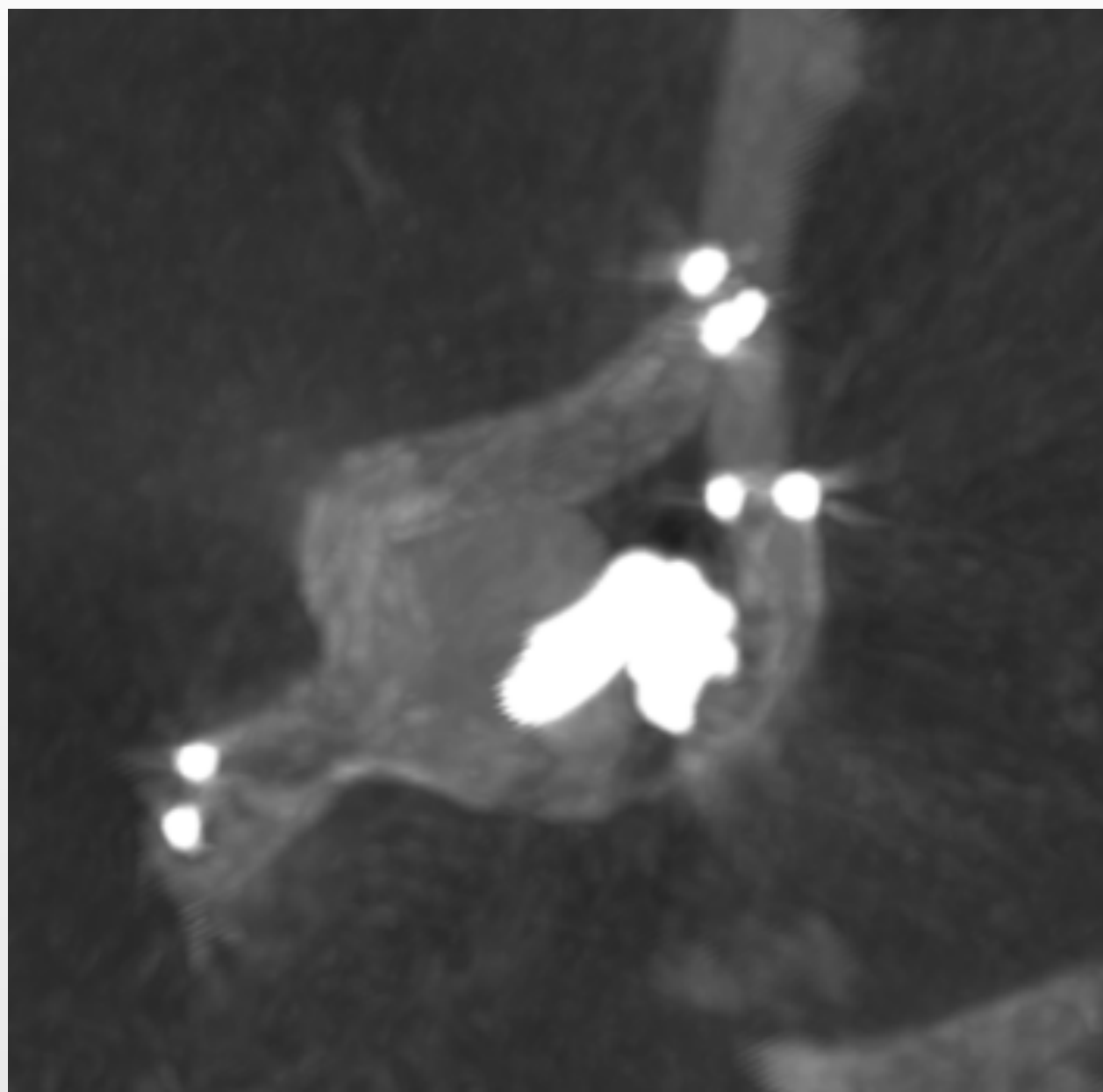
Y-STENT

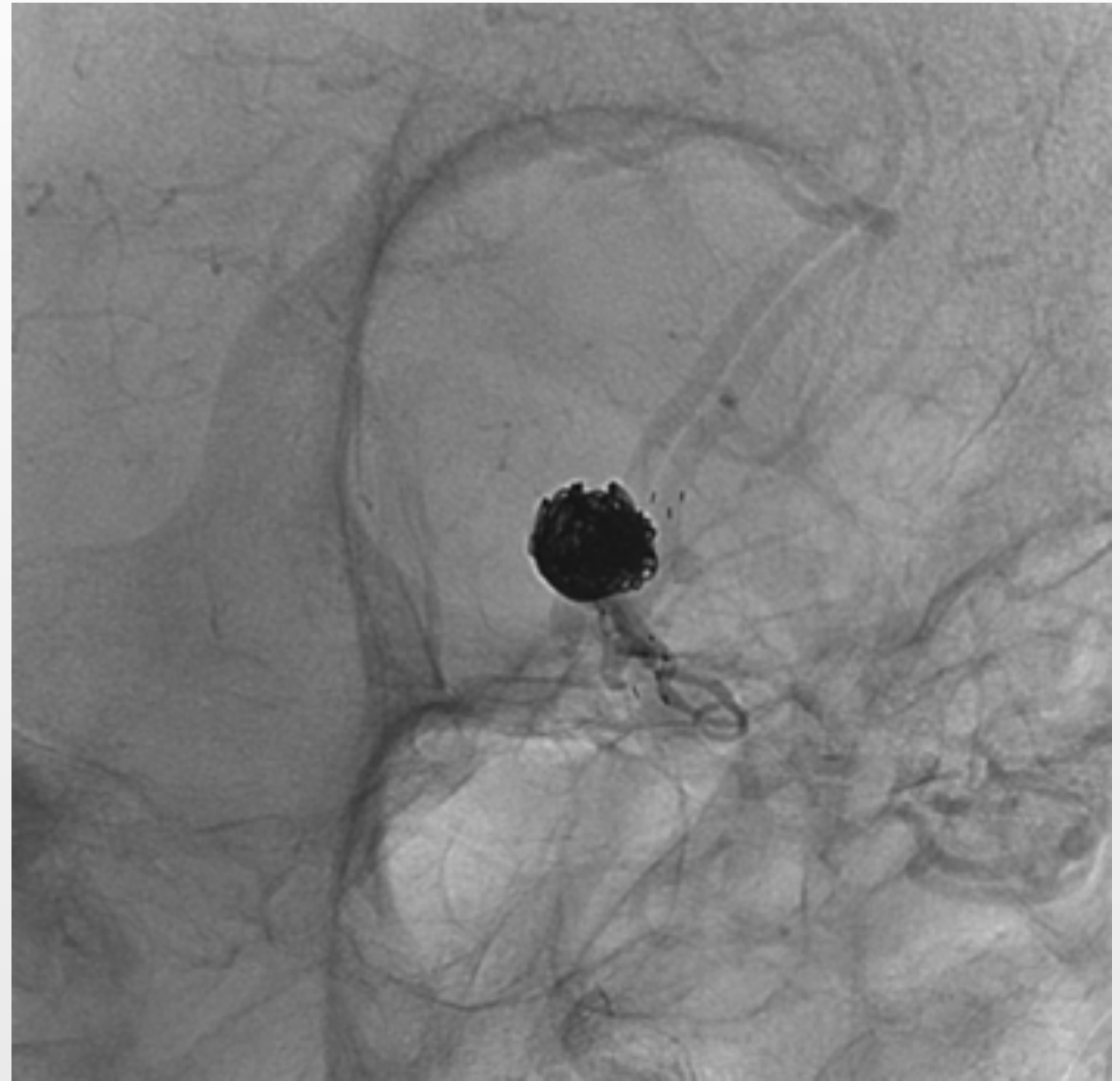
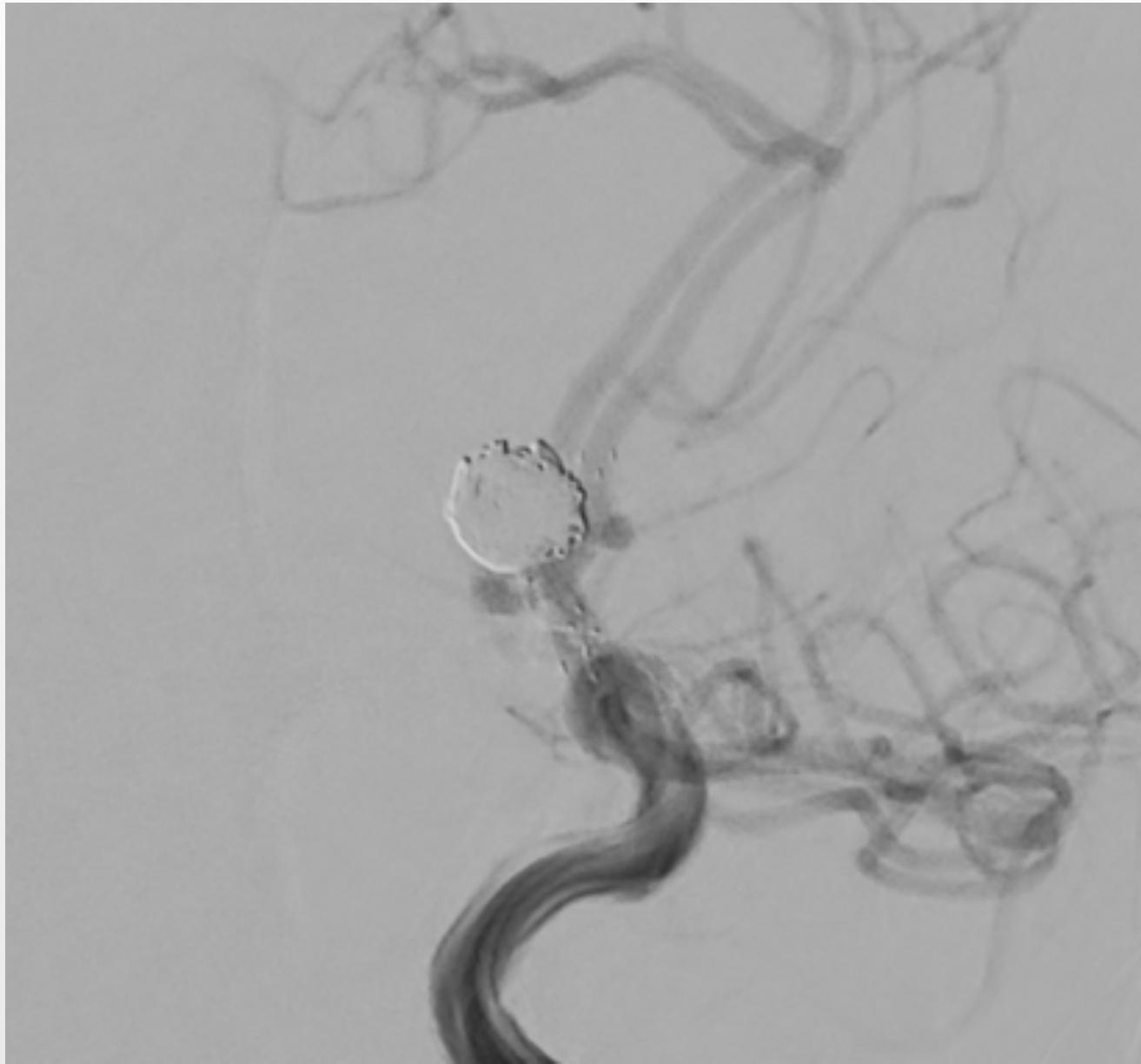


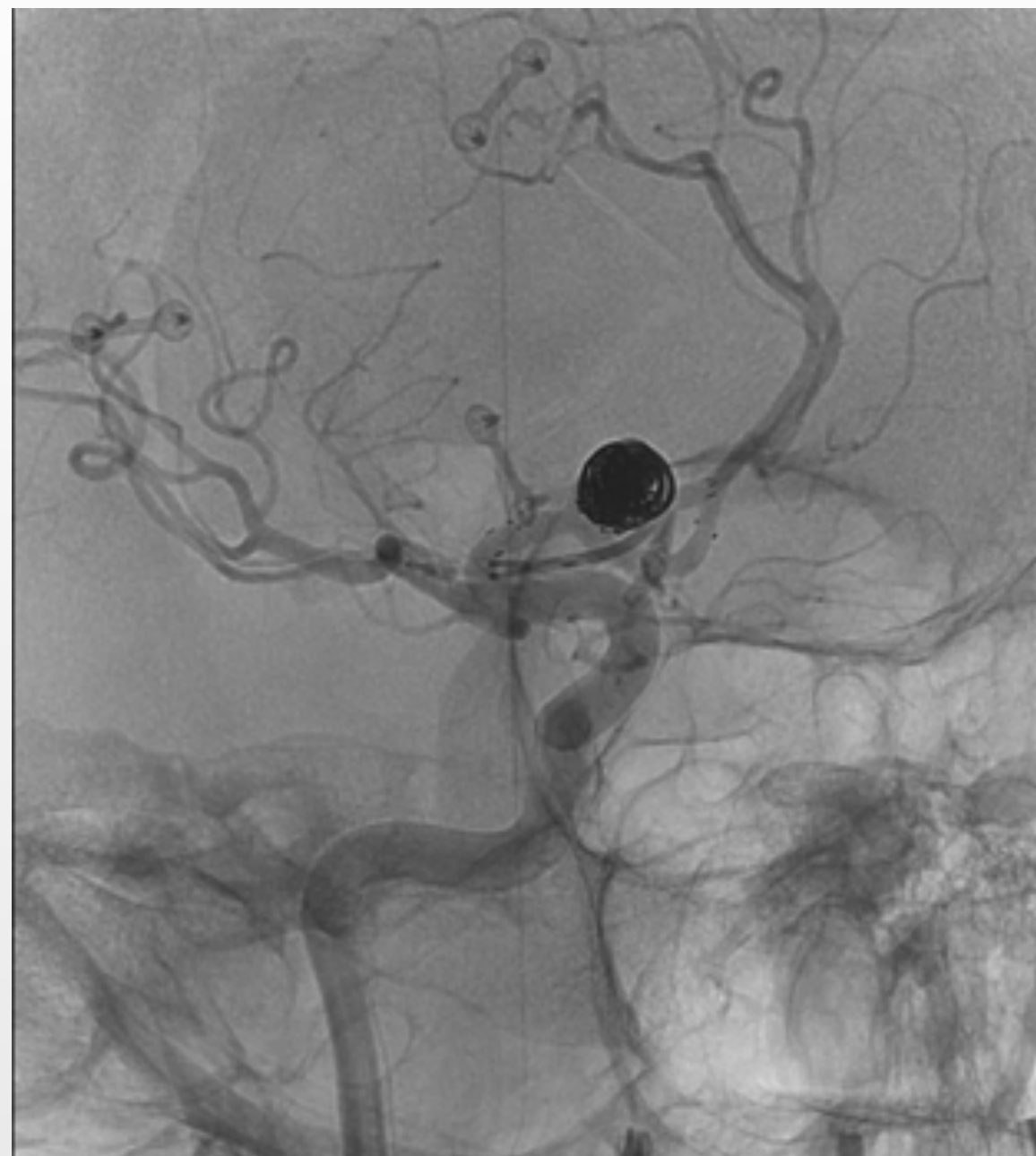




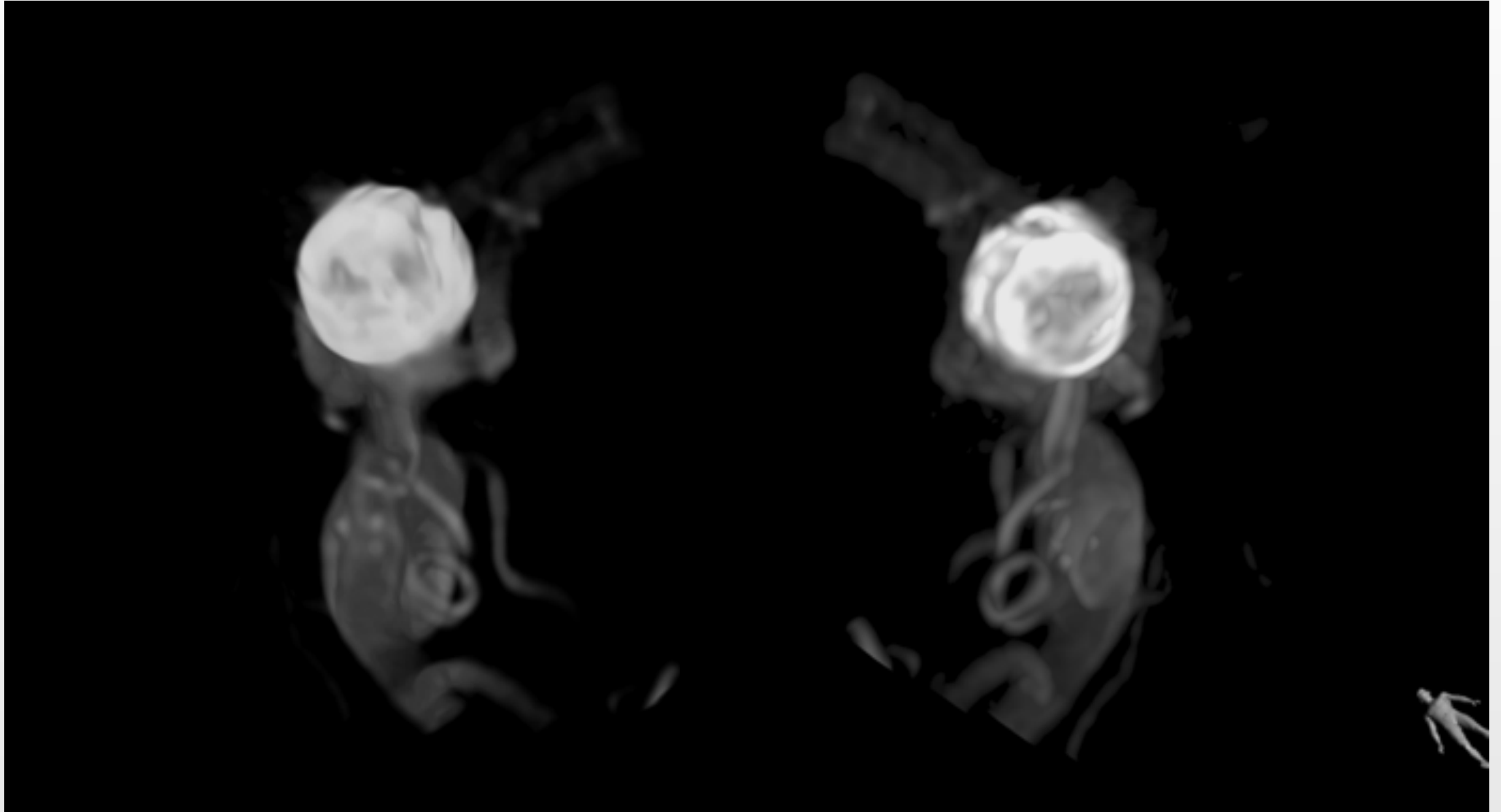








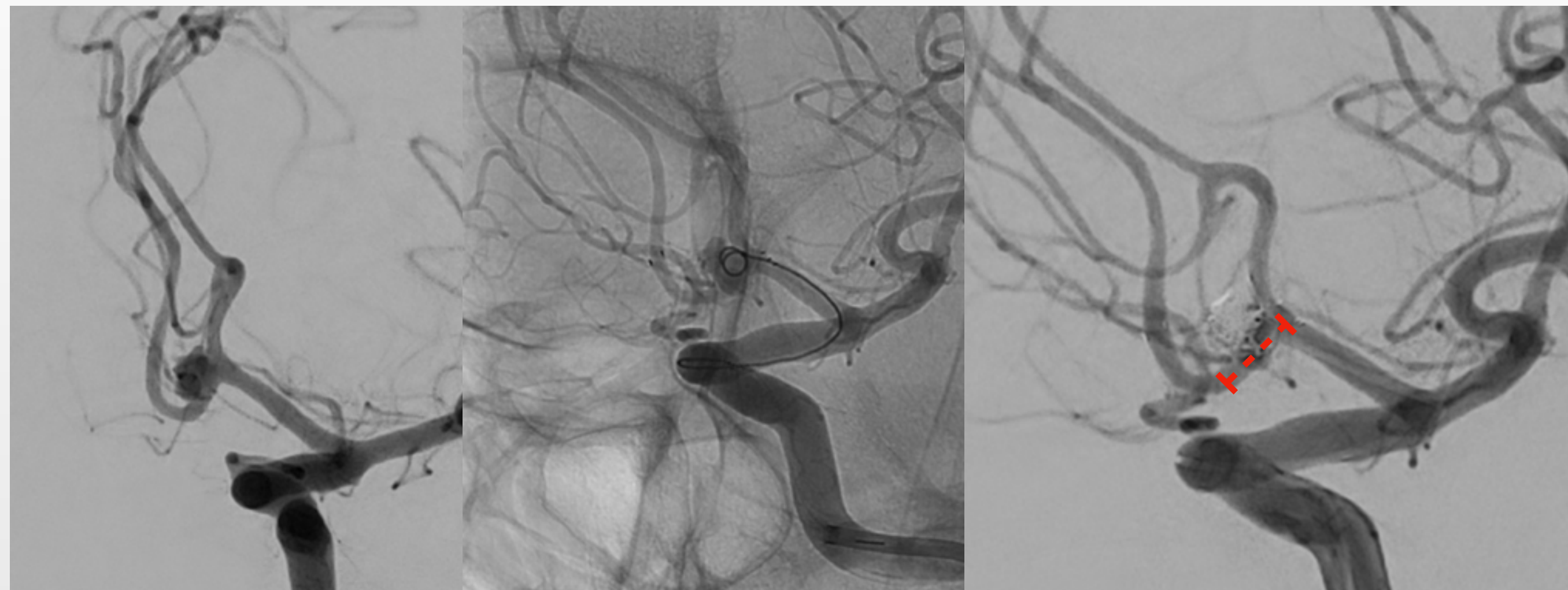
Control 6 meses



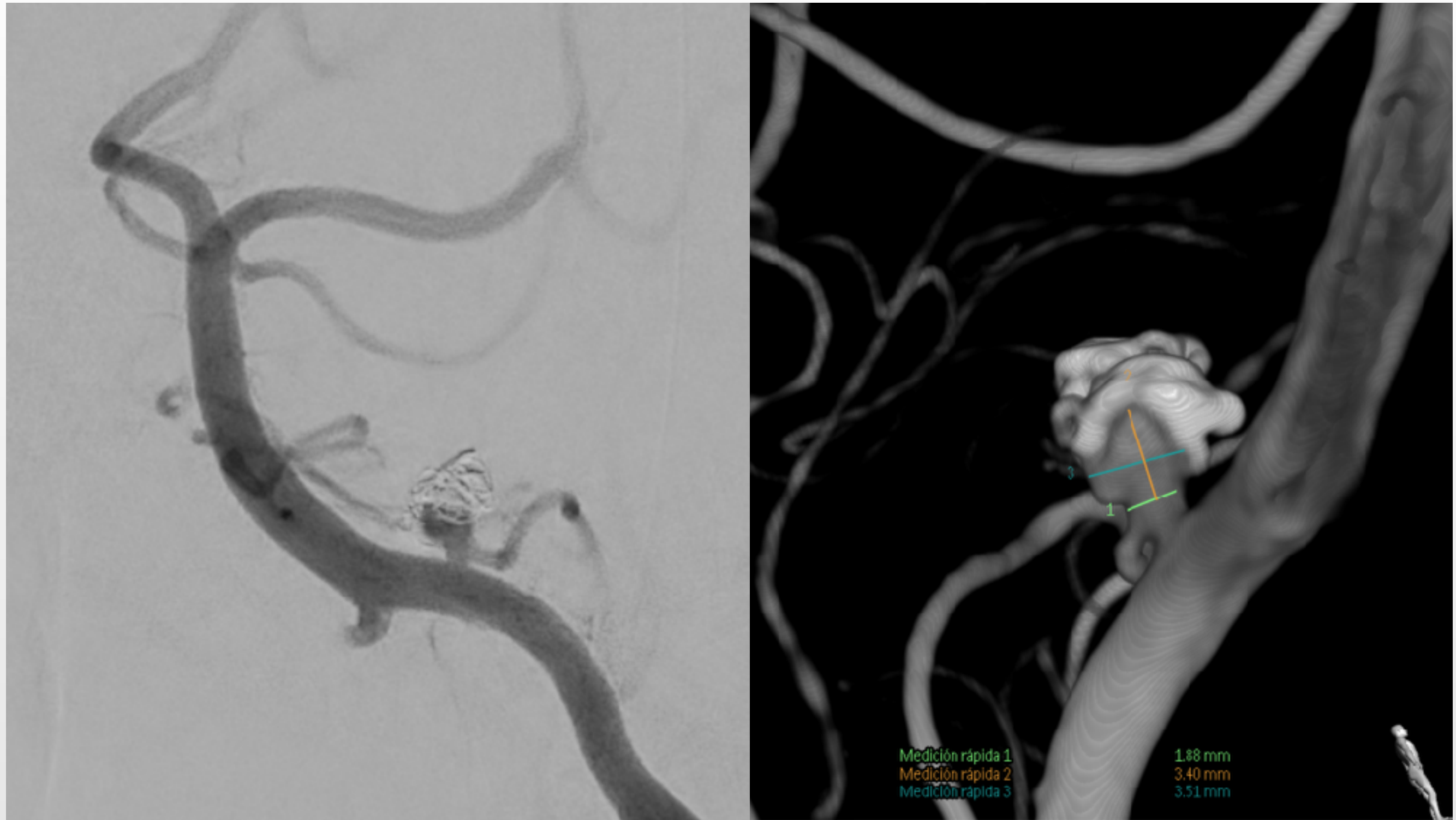
MEDIA T

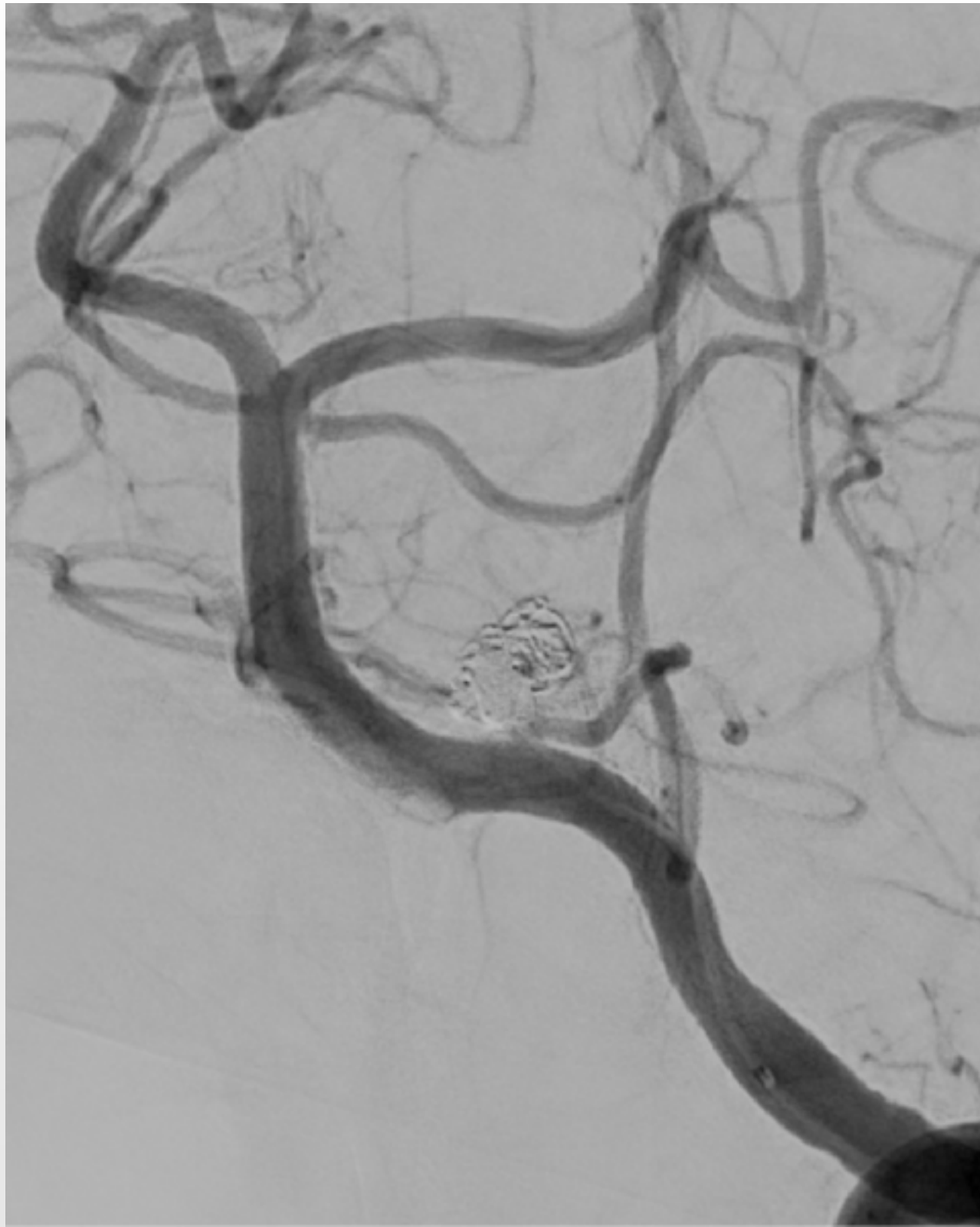


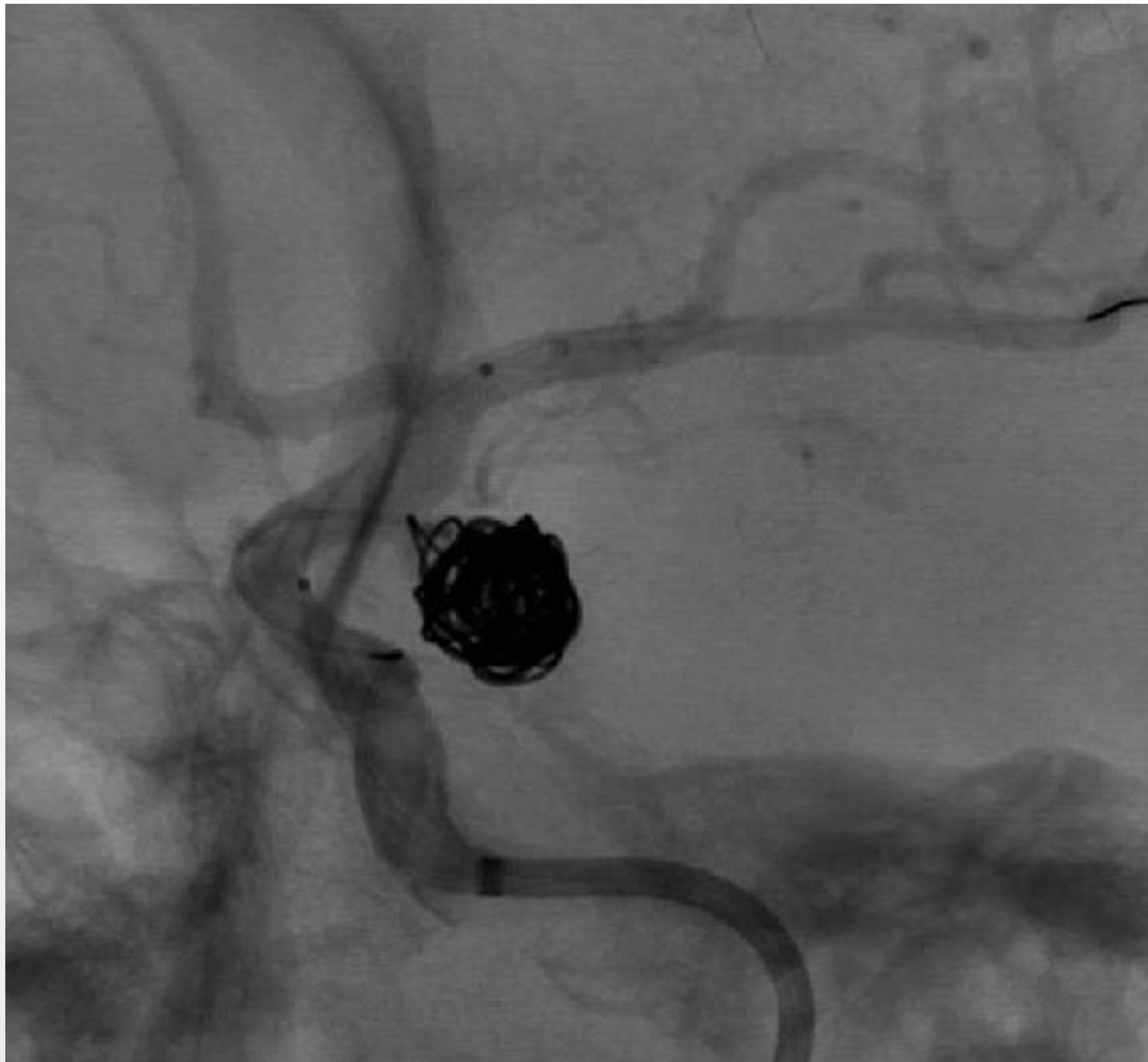




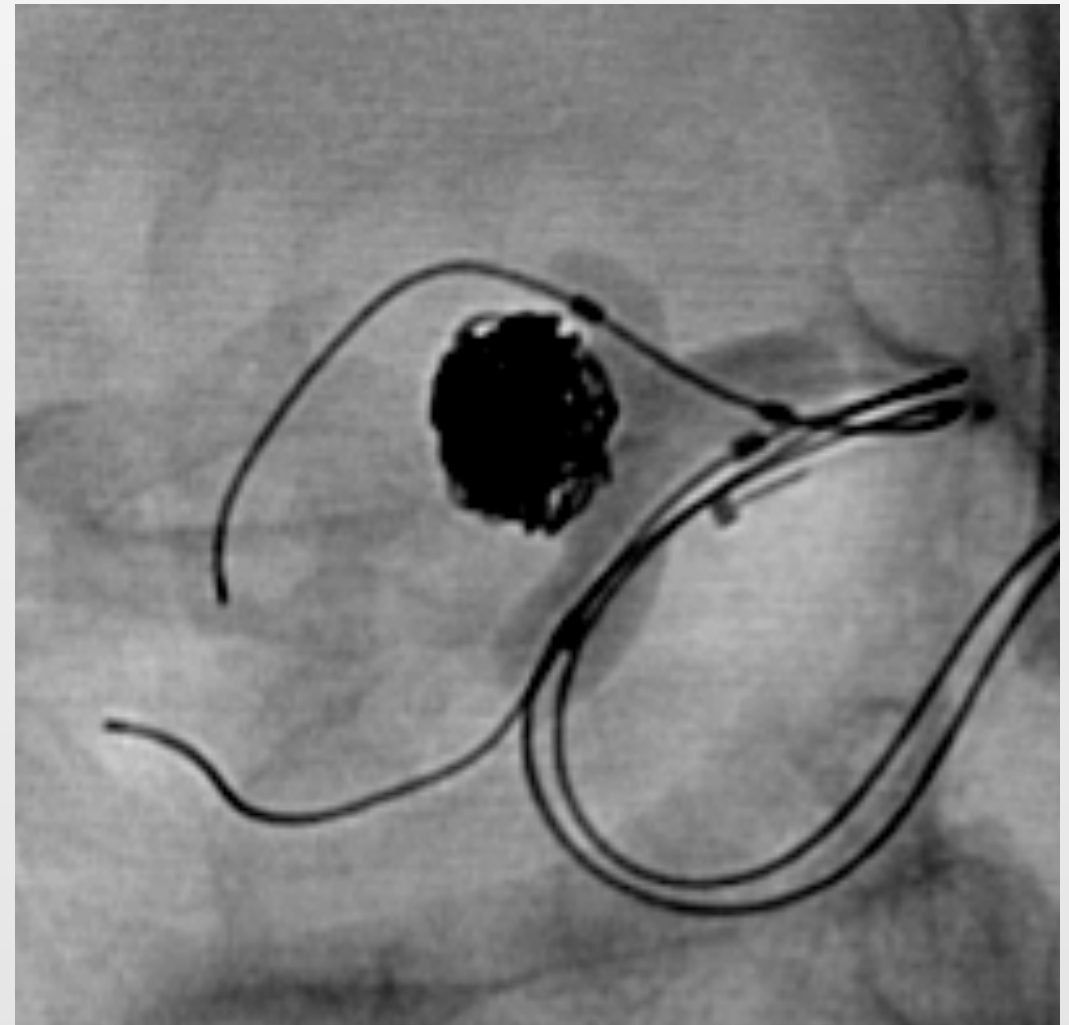
COILS

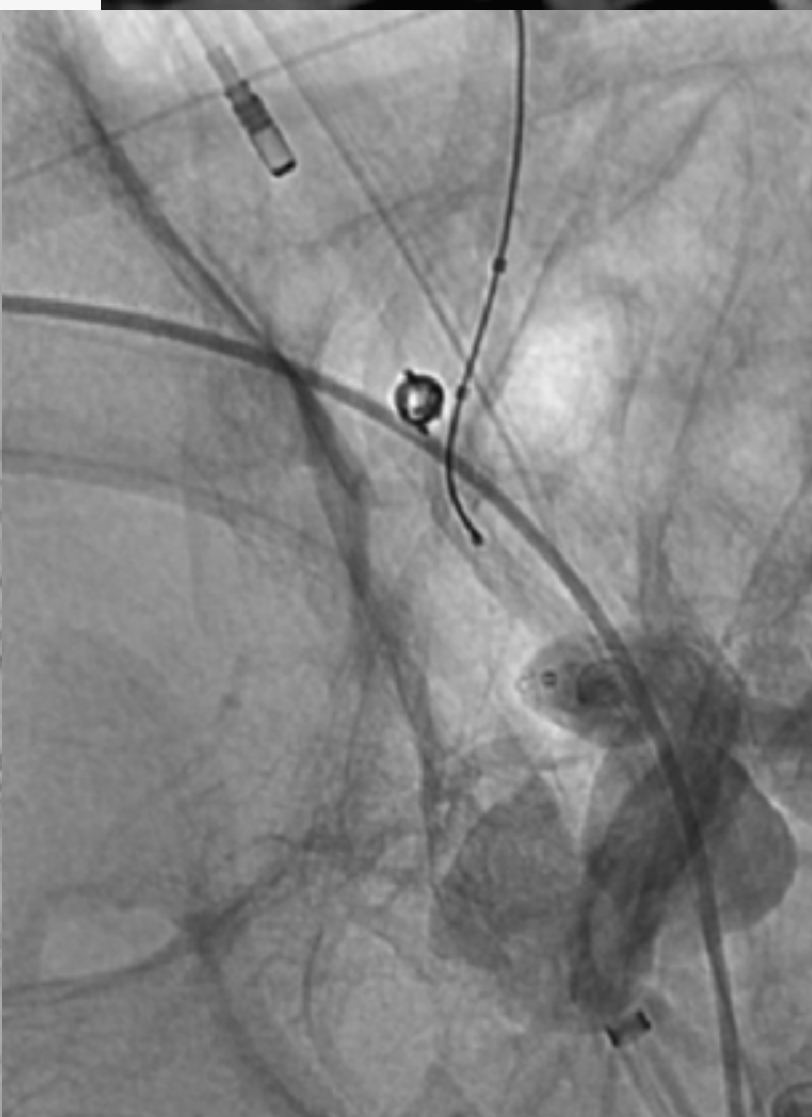
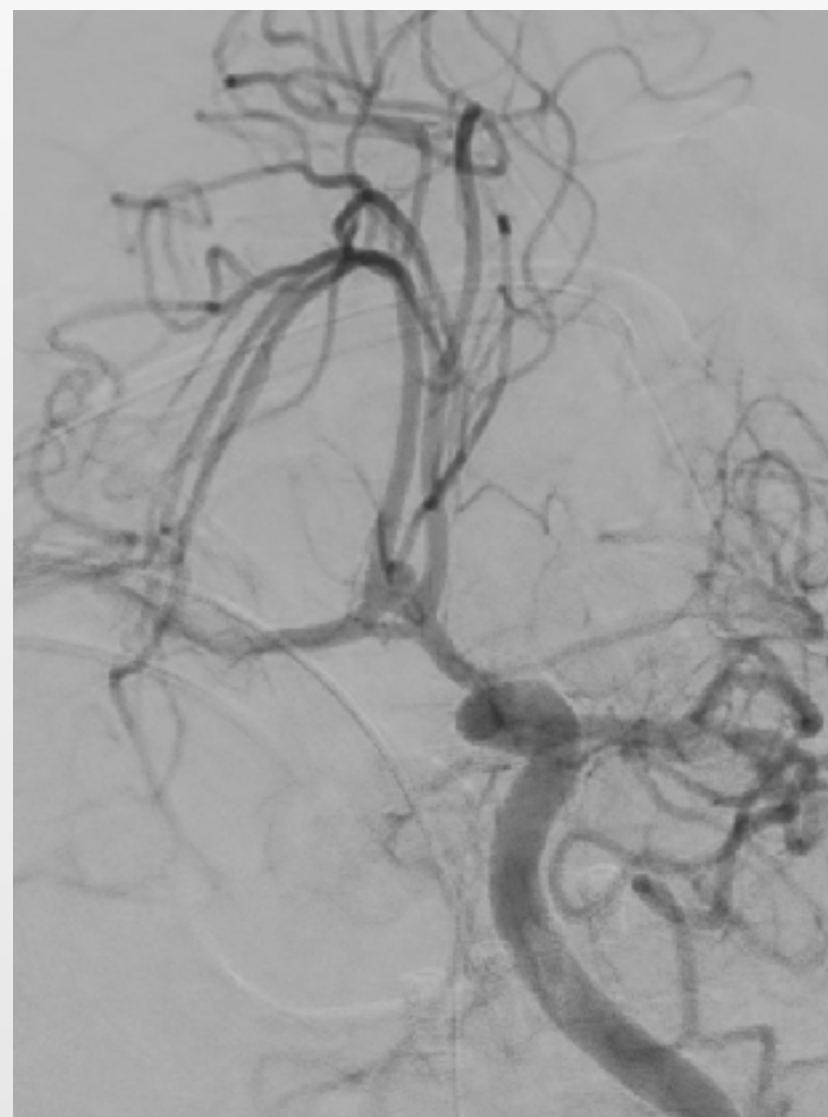
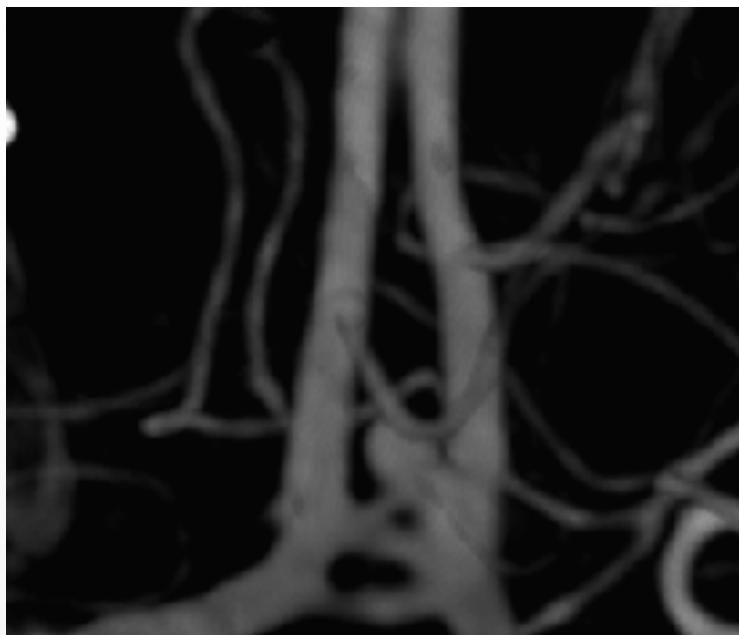


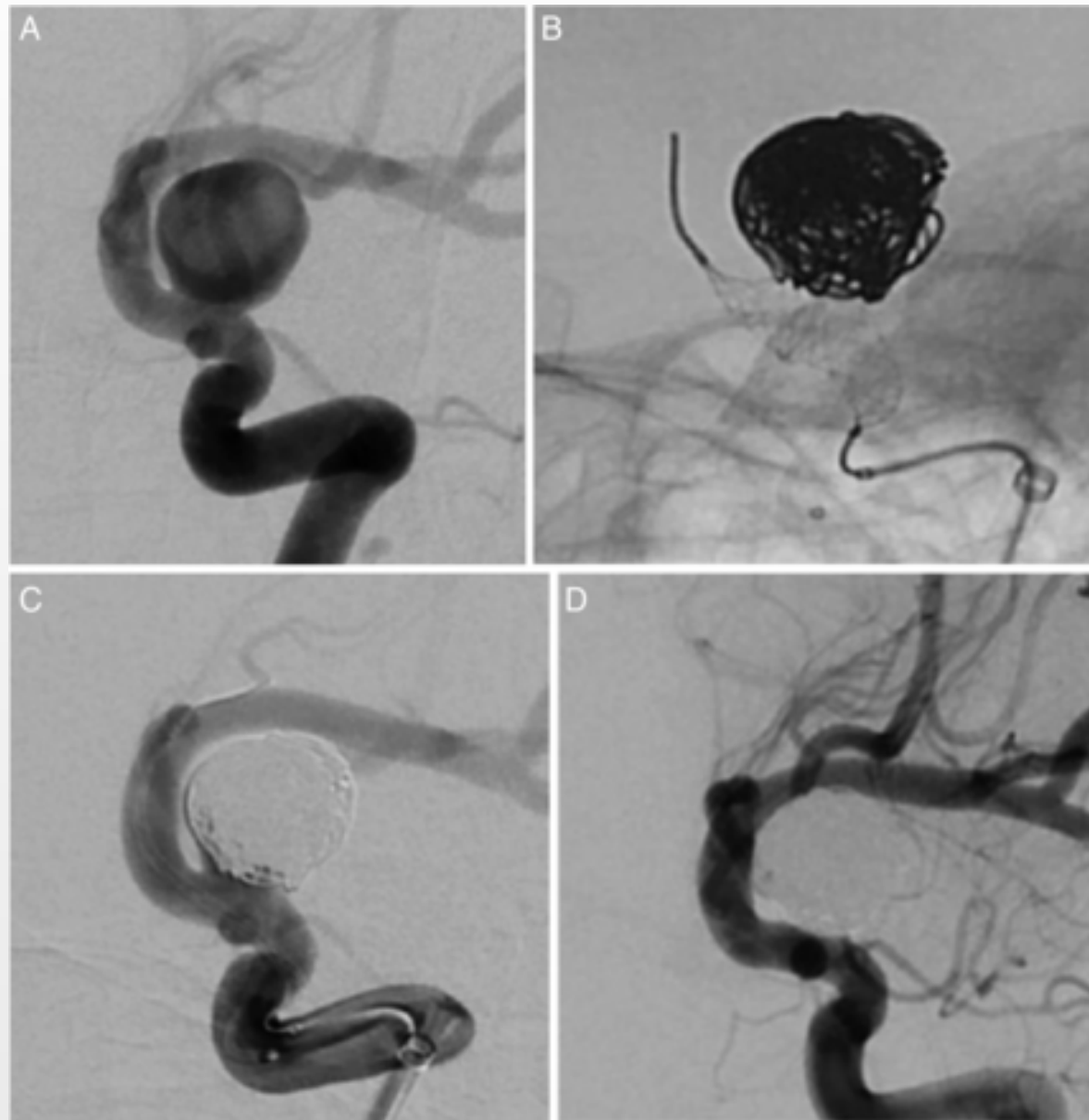




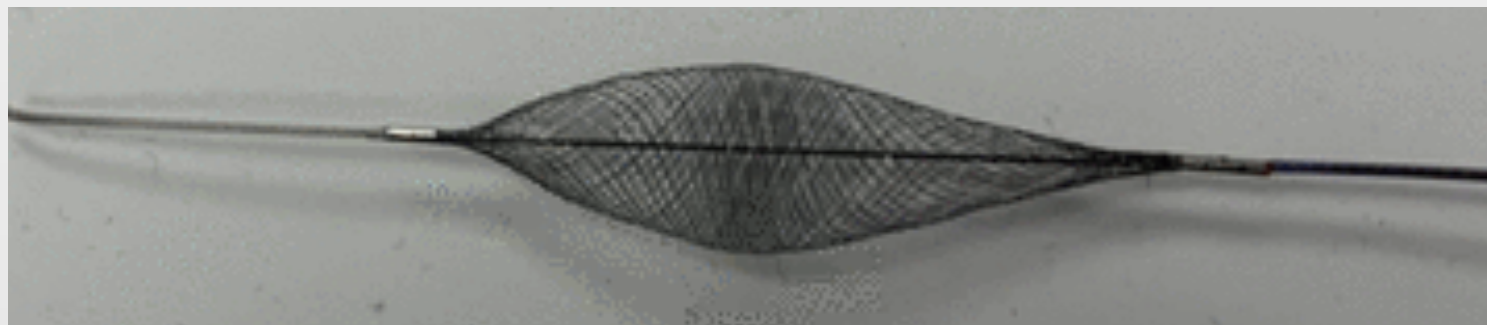
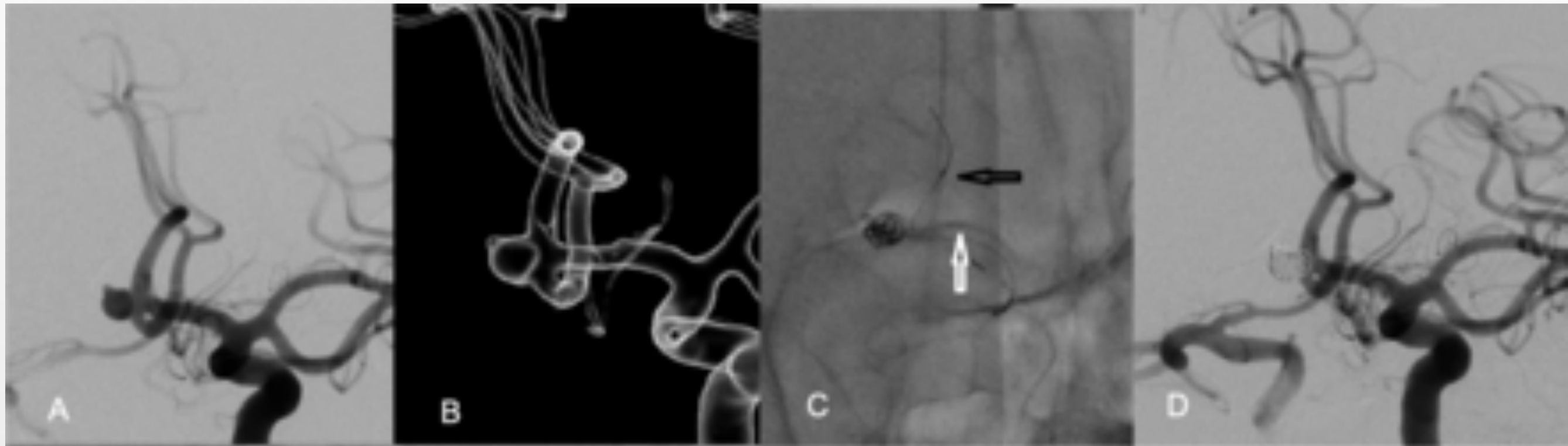
REMODELLING







ischer S, Weber A, Carolus A, et al/Coiling of wide-necked carotid artery aneurysms assisted by a temporary bridging device (Comaneci): preliminary experience *Journal of NeuroInterventional Surgery* 2017;**9**:1039-1097.



Sirakov S, Sirakov A, Minkin K, et al/Early clinical experience with Cascade: a novel temporary neck bridging device for embolization of intracranial aneurysms *Journal of NeuroInterventional Surgery* Published Online First: 21 September 2019. doi: 10.1136/ neurintsurg-2019-015338

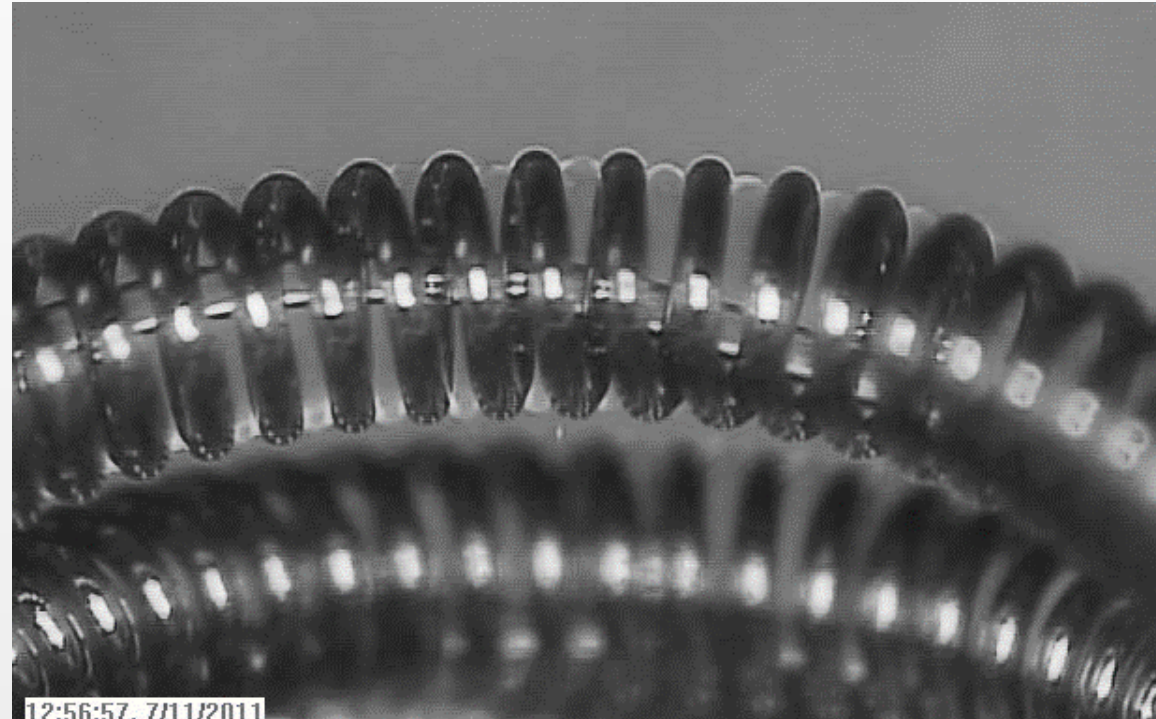
DOBLE MICROCATÉTER



DOBLE MICROCATÉTER



HYDROGEL COILS

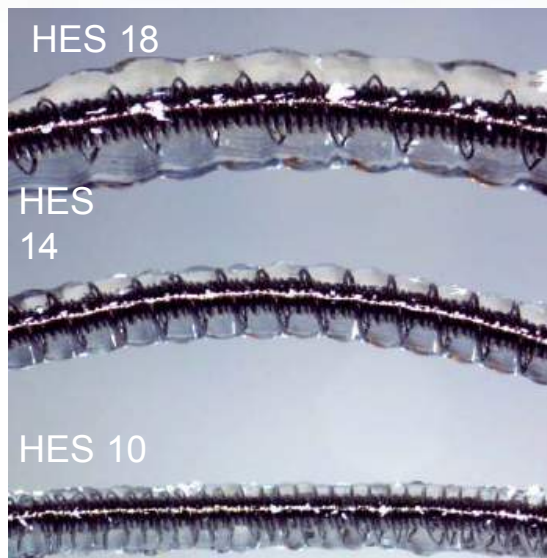


**Compuesto de co-polímeros sintéticos.
Construido con un diámetro máximo al que vuelve bajo hidratación.
Solo se expande donde hay espacio disponible.
Sin fuerza expansiva sobre la pared del aneurisma o los coils adyacentes.**

HYDROGEL COILS

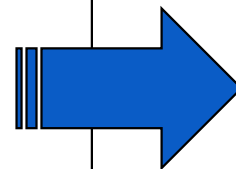
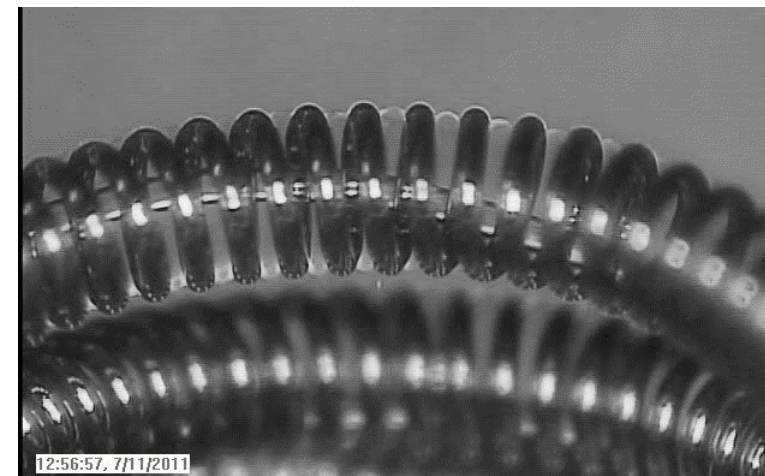
HydroCoil® Implants

1st Generation Technology



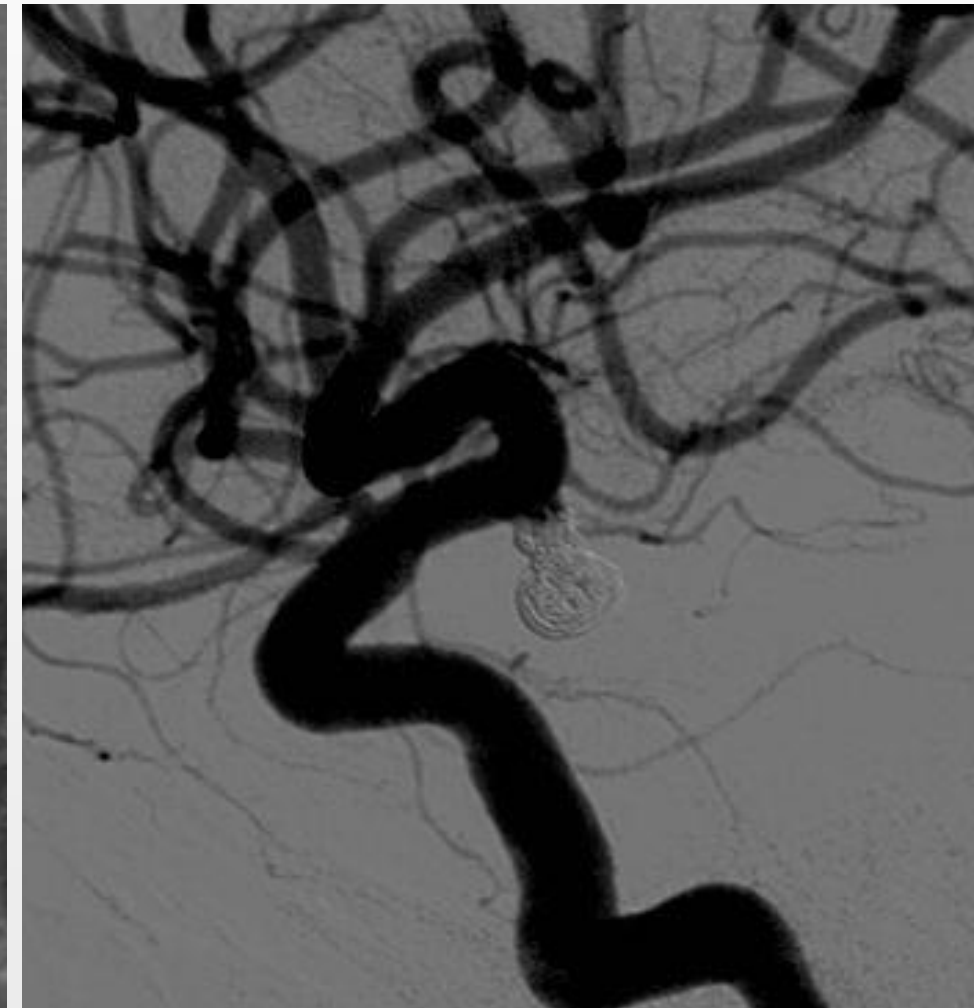
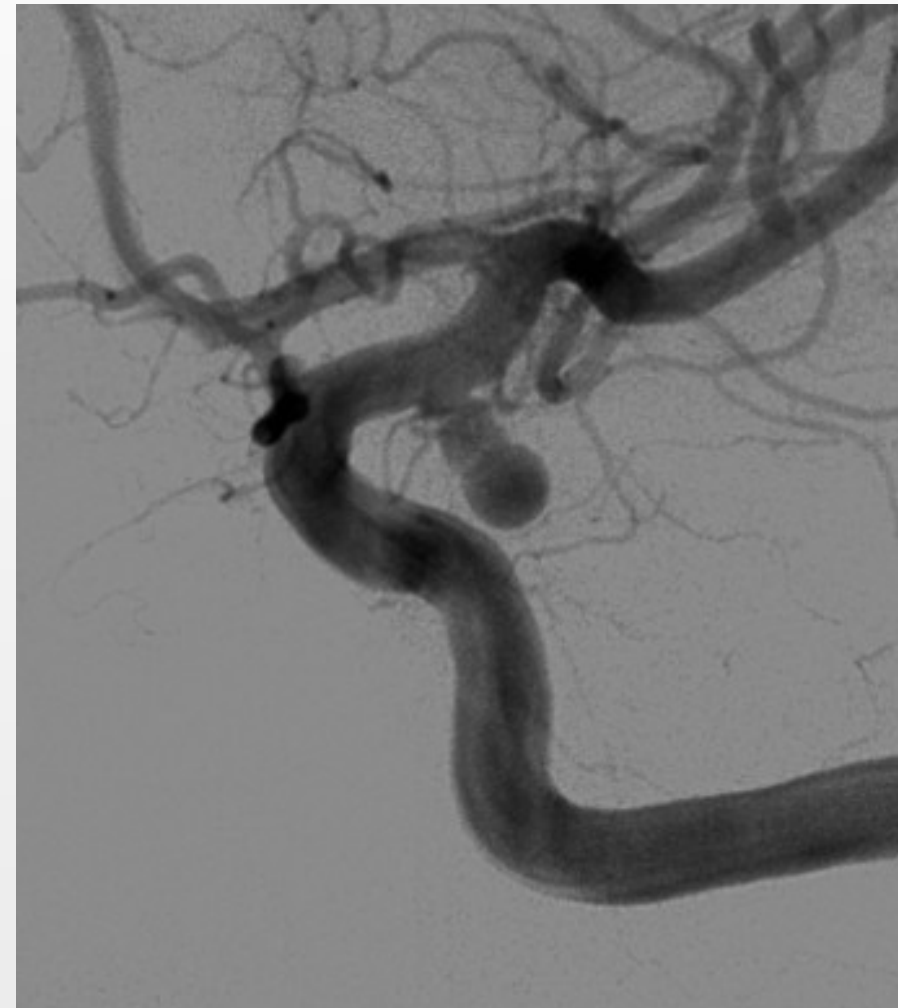
HydroFrame®, HydroSoft® 3D, HydroSoft® and HydroFill® Coils

2nd Generation Technology



ENSAYOS ALEATORIZADOS COMPARANDO CON COILS DE PLATINO:

- **GREAT STUDY: 513 pacientes.**
 - **HEAT STUDY: 600 pacientes.**
 - **HYBRID STUDY: 500 pacientes.**
- ◆ **RAGE STUDY: 1000 pacientes con aneurismas rotos.**



Diámetro 0.020".

Filamento de Platino con estructura interna de Nitinol sobre guía de Nitinol.

Microcatéter PX SLIM 0.025"

Mayor rapidez de tratamiento.

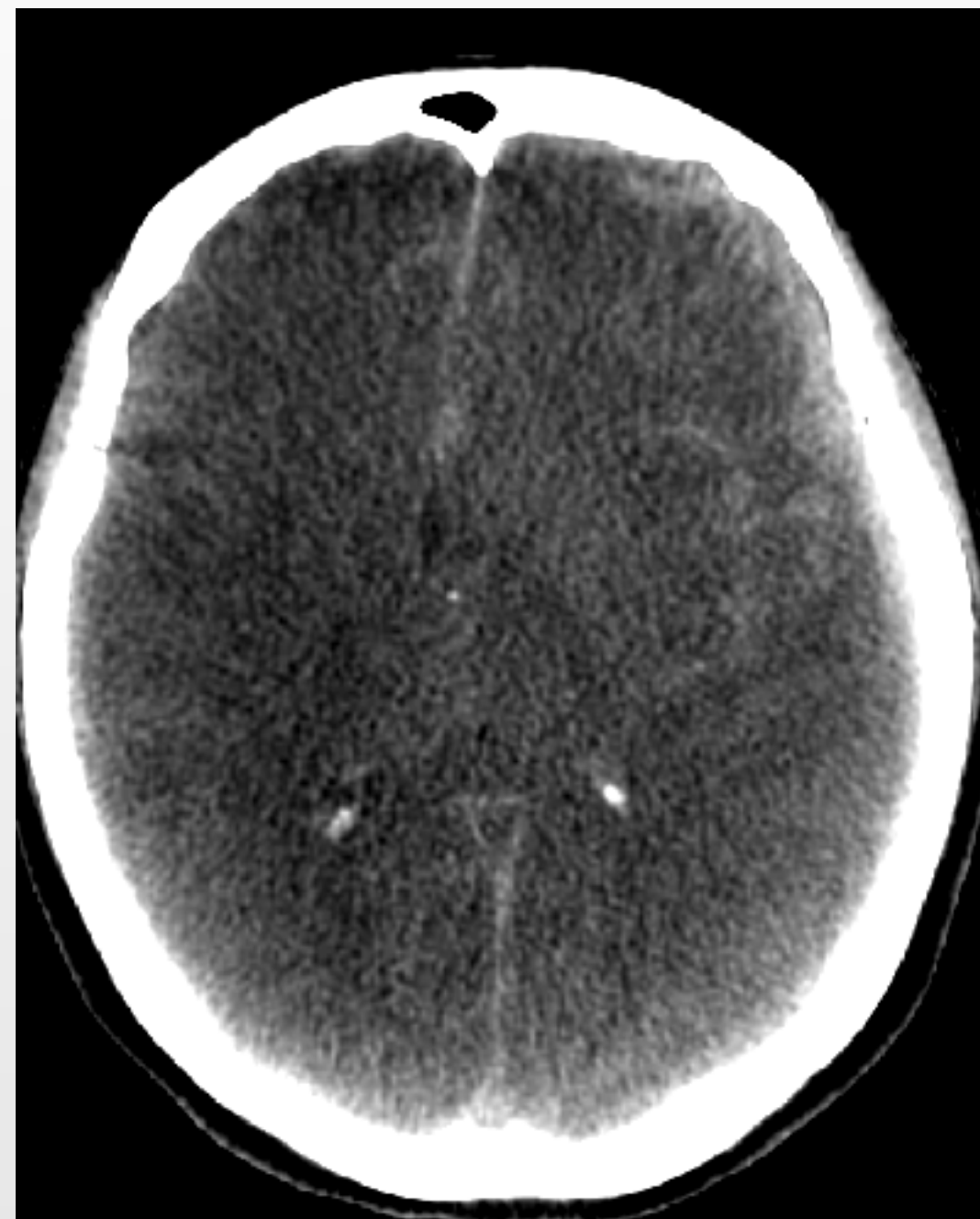
Disminución de la radiación.

SPECTRA GALAXY G3 MINI

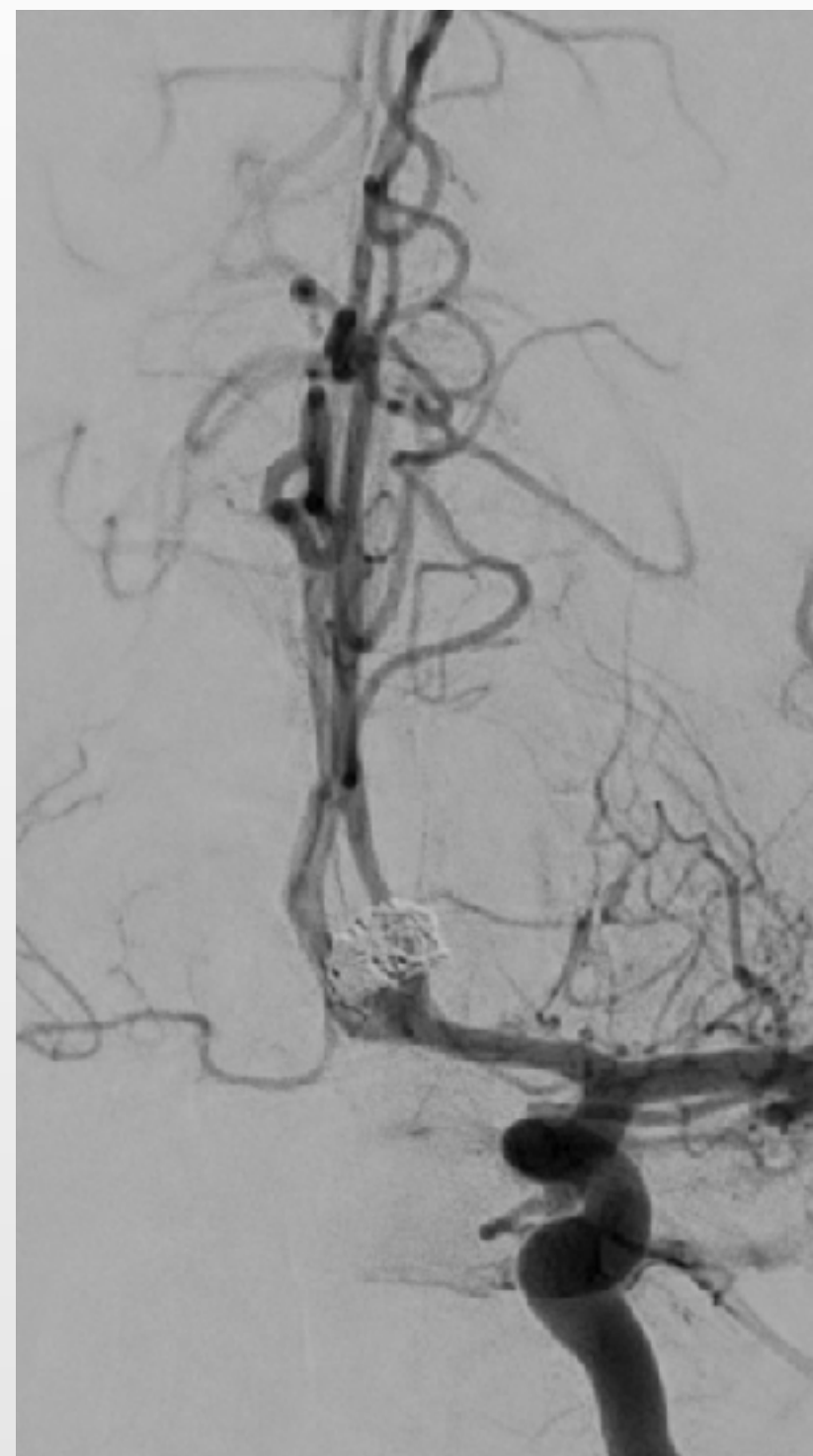
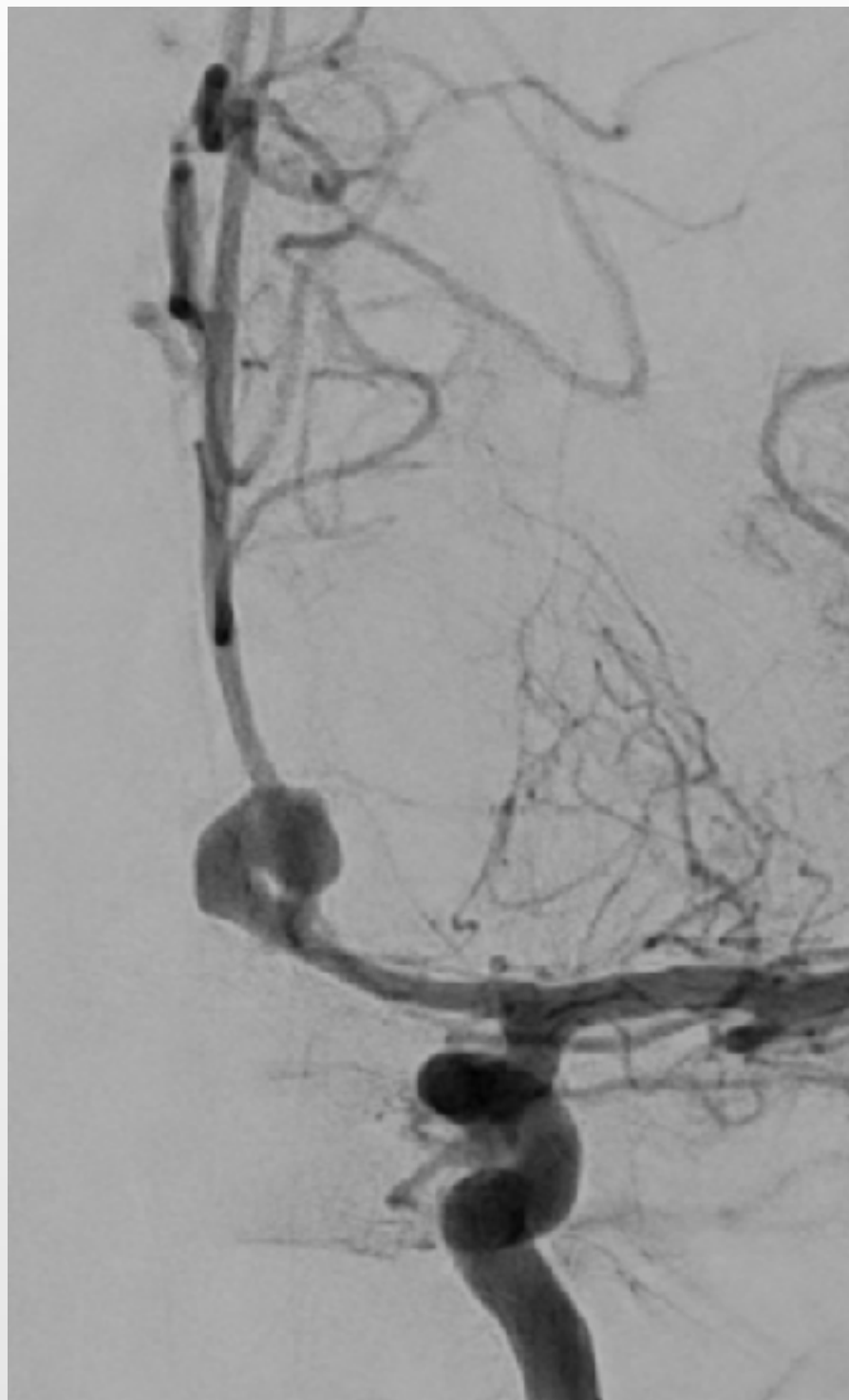


Diámetro de 0.009"

SPECTRA GALAXY G3 MINI



SPECTRA GALAXY G3 MINI





ED COILS



**Coils 0.010" muy blandos y flexibles.
Sistema de doble detección para la liberación (visual y auditiva).
Compatible con microcatéteres de 1.5 Fr.**



Coils 0.018"

Recubiertos por un polímero con memoria de forma.

Polímero poroso, biocompatible y no-inflamatorio.

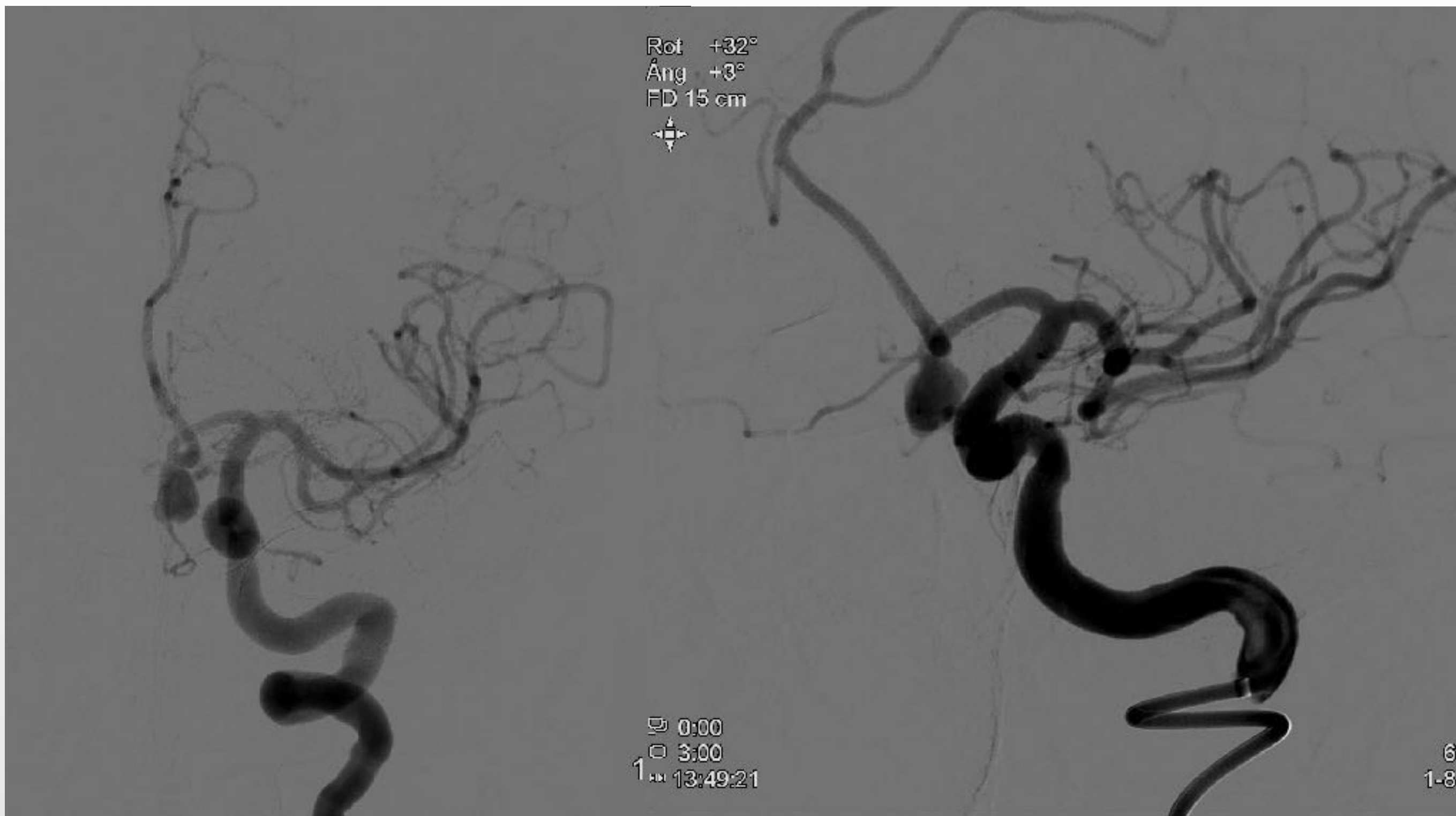
El polímero recluta células sanguíneas (plaquetas, fibroblastos...) promoviendo la trombosis. Crece 2,5 veces su tamaño. Ventana de 10 min. para cada coil.

Electrolargables.

Microcatéter 0.021" (0.017").

Aprobación mercado CE esta semana.

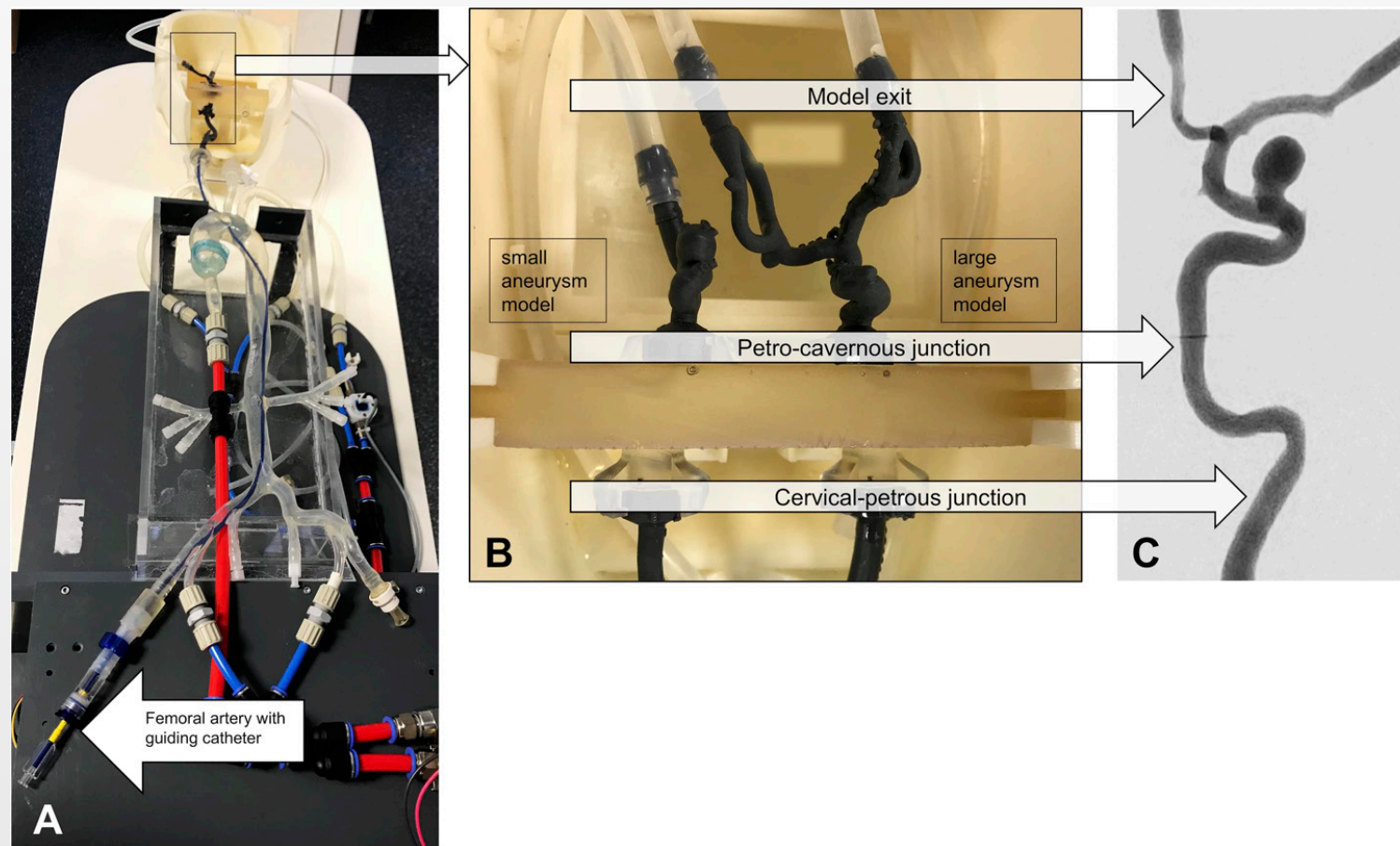
AVANCES EN ACCESO





Evaluation of a modular in vitro neurovascular procedure simulation for intracranial aneurysm embolization

Marie Teresa Nawka,¹ Johanna Spallek,² Juliane Kuhl,² Dieter Krause,^{1,2} Jan Hendrik Buhk,¹ Jens Fiehler,¹ Andreas Frölich¹

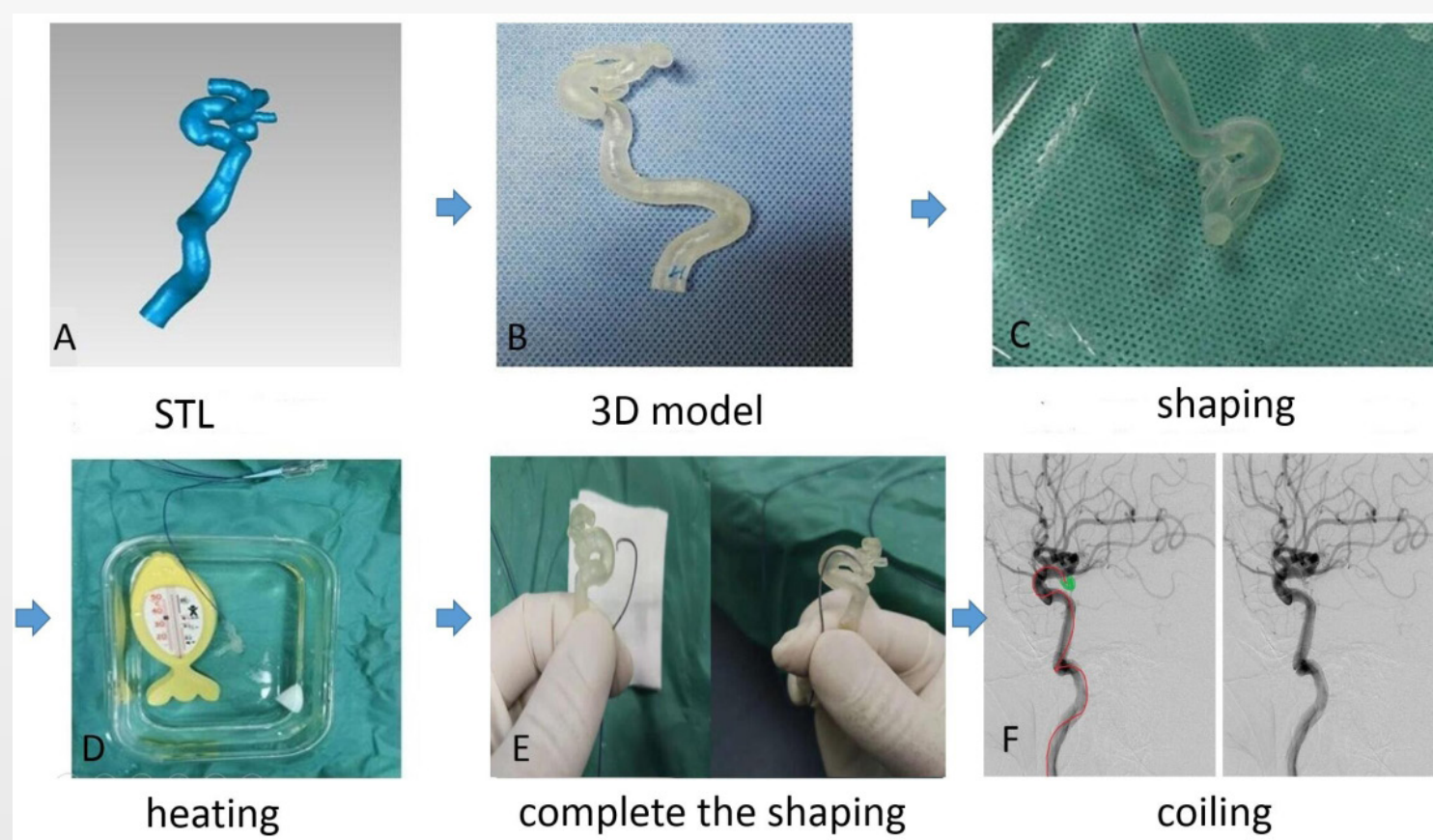


Nawka MT, et al. *J NeuroIntervent Surg* 2019;**0**:1–6. doi:10.1136/neurintsurg-2019-015073

ORIGINAL RESEARCH

Microcatheter shaping using three-dimensional printed models for intracranial aneurysm coiling

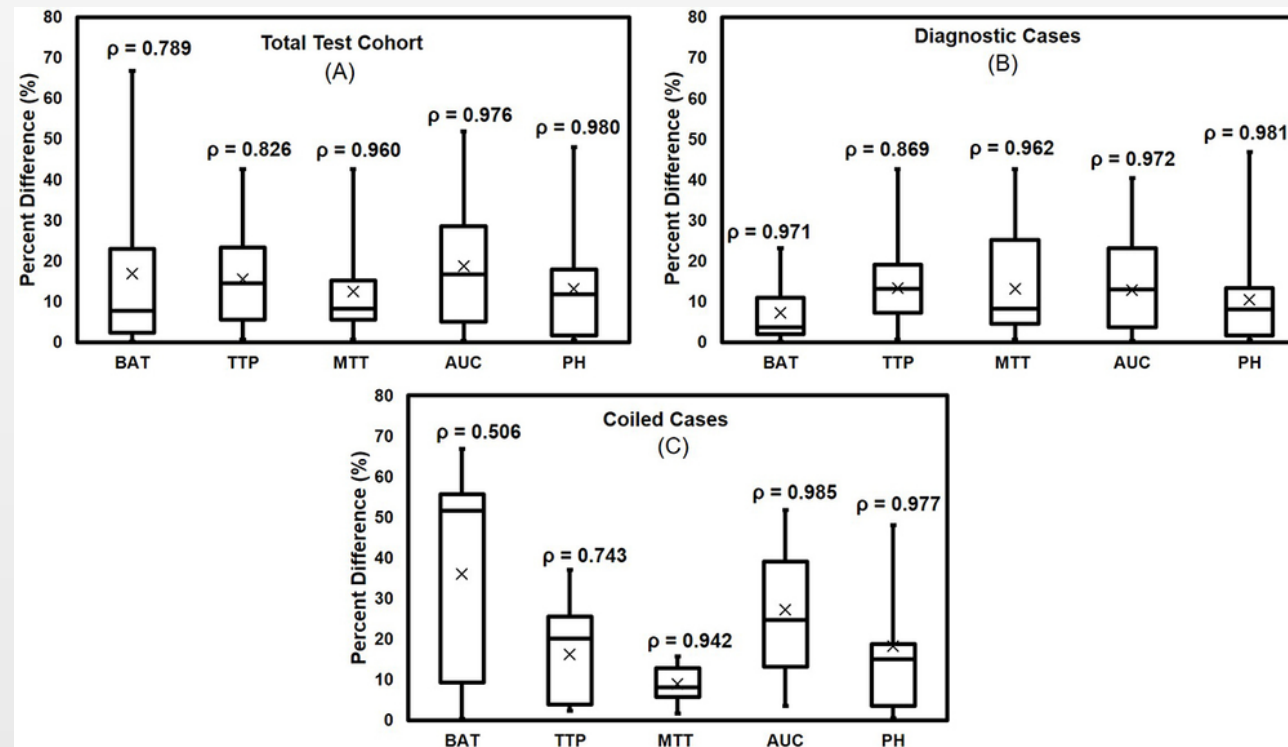
Y Xu,¹ W Tian,¹ Z Wei,¹ Y Li,¹ X Gao,² W Li,¹ B Dong¹



Xu Y, et al. *J NeuroIntervent Surg* 2019;**0**:1–3. doi:10.1136/neurintsurg-2019-015346

Automatic radiomic feature extraction using deep learning for angiographic parametric imaging of intracranial aneurysms

Alexander R Podgorsak,^{1,2,3} Ryan A Rava,^{2,3} Mohammad Mahdi Shiraz Bhurwani,^{2,3} Anusha R Chandra,^{2,3} Jason M Davies,^{3,4,5} Adnan H Siddiqui,^{3,4} Ciprian N Ionita^{1,2,3}



Podgorsak AR, et al. *J NeuroIntervent Surg* 2019;**0**:1–6. doi:10.1136/neurintsurg-2019-015214



Pedro Navia



Pedro Navia

Muchas gracias

