FLOW DIVERTORS IN POSTERIOR CIRCULATION: OUR EXPERIENCE

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Ankara

Disclosures:
Consultancy and Proctorship for Medtronic/Covidien, *,**
Consultancy and Proctorship for Microvention *
Consultancy and Proctorship for Sequent *
Non paid senior advisory board member for Siemens*

KORU HASTANELERİ

BAYINDIR HASTANELERİ

882 aneurysms treated w different Flow Diversion techniques

Homemade FD (68 aneurysms)

- ***Telescopic stenting (stent in stent) - 54 aneurysms***
- ***Y stent flow diversion in bifurcations - 14 aneurysms***

Dedicated FD (814 aneurysms)

- ***PIPELINE:685 aneurysms (591 pts)***
- ***FRED:83 aneurysms (78 pts)***
- ***SILK: 42 aneurysms (39 pts)***
- ***P64: 4 aneurysms (4 pts)***

2007 – 2016 FD experience:

- ***712 pts, 814 aneurysms (84% PIPELINE, 10% FRED, 6% SILK AND P64)***
- 74 giant , 221 large and 519 small aneurysms (36% large-giant, 64% small)
- Mean FD number = 1.19
- **741 aneurysm in ant circ (91%),**

  73 aneurysms in post circulation (9%)

- ***12 basilar artery trunk aneurysms (4 small, 3 large , 2 giant , 3 fusiform aneurysms)***

  2 distal basilar, 4 midbasilar and 6 prox basilar segment
- ***6 SCA aneurysms***
- ***4 AICA aneurysms***
- ***11 PICA aneurysms***
- ***9 PCA (P1-P3) aneurysms***
- ***29 VA aneurysms (17 intradural, 12 extradural), 40% of PC FD experience***
- ***2 VB arteriosclerotic aneurysms with clotted mass***

Treatment of intracranial aneurysms using the pipeline flow-diverter embolization device: long-term follow-up results.

Saatci I, Yavuz K, Ozer C, Geyik S, Cekirge HS. AJNR 2012 Sep;33(8):1436-46.

(DATA OF 251 ANEURYSMS TILL SEPTEMBER 2011) ***(7.6% was in post circulation)***

Clinical results of 712 pts 814 aneurysms

- ***Mortality: 12 pts (1.8%)***

  ischemic event in 2 pts , spontaneous par hematoma in other 3, early post tx SAH in 4, after tx of giant VB arterioscle aneurysms in 2 pts and in 1. pt after tx of H&H gr 4 SAH

  Permanent morbidity at discharge: 14 pts (2%) 2 due to bleeding , 10 due to ischemic event

- ***Spontaneous parench hematoma 5 pts***

- ***Post op early transient neurologic morbidity developed in 13 pts (1.8%)***

  Spontaneous frontal hematoma related to medication

  Mass effect worsening in 4 pts ;

  (vision abnormality in 2/3 pts improved but still have deficit which they had initially; in one permanent); 1/1 brainstem symptoms cleared in 4 weeks

  Mild ataxia after tx of basilar trunk aneurysm due to small cerebellar ischemic event resolved in 24 hours

  Mild ischemic events completely resolved within 24-48 hours in 7 pts

- **All 13 left hospital w mRS scale of 0-1**

- ***Late Neurologic adverse events:***

  SAH: 1 pt (in the 4th mo): no clinical sequela; retreated.

  Parenchymal hematoma: 5 pts

Although post circ aneurysms were only 9% of all FD cases, 31% of all morbi-mortality was due to post circulation aneurysm's tx…

COMPLETE OCC LATE AT LATER FUS up to 5 years 96.2%

Clinical results of 73 post circ aneurysms in 68 pts with FDs

Mortality: 6 pts (8.7%)

- *ischemic event in 2 pts after tx of mid and upper basilar aneurysms,*
- *spontaneous par hematoma in 1 pt,*
- *post tx SAH in 1,*
- *and in 2 pts after tx of giant VB arterioscle aneurysms*

Permanent morbidity at discharge: 2 pts (2.9%)

- *due to ischemic event in both due to brain stem ischemic lesions after midbasilar and upper basilar trunk aneurysm tx. One showed full recovery, the other was mRS 2 at 1 year FU.*

Out of 62 pts available for FU

15 pts had 6 month , 31 pts had 1-2 years , 14 pts had 3-5 years FU..

Complete occlusion rate at 6 month 87% , 91% at 1-2 years and 97% at 3-5 years with retx in 2 pts.

in the rest of 4% stable class 5 flow remodelling

Our sample size is pretty similar to Intrepid and our results shows similarity in regards to posterior circulation aneurysms with higher complication rate (11,6% morbi-mortality). However, our complication rate is lower than Intrepid since either we have more VA aneurysms with less VB arteriosclerotic aneurysms or are more carefull about antiaggregation testing with high rescheduling rates w Plavix especially since 2005 for any stenting procedures. Additionaly, we quitted using Klopidogrel since Jan 2013..

•Neurological morbidity and mortality rate was 8.4% (67/793), ***highest in the posterior circulation group (16.4%, 9/55)*** and lowest in the ICA <10mm group (4.8%, 14/294) (p=0.01).
•

•Ischemic stroke rates were 4.7% (37/793), ***highest in posterior circulation patients (7.3%, 4/55)*** and lowest in the ICA<10mm group (2.7%, 8/294) (P=0.16).

•Neurological mortality was 3.8% (30/793), ***highest in the posterior circulation group (10.9%, 6/55)*** and lowest in the anterior ICA<10mm group (1.4%, 4/294) (P<0.01).

Results from the International Retrospective Study of Pipeline Embolization Device (IntrePED): A Real World Experience

David Kallmes, M.D.[1], Ricardo Hanel, M.D., Ph.D.[2], Demetrius Lopes, M.D.[3], Edoardo Boccardi, M.D.[4], Alain Bonafe, M.D.[5], Saruhan Cekirge, M.D.[6], David Fiorella, M.D.[7], Pascal Jabbour, M.D.[8], Elad Levy, M.D.[9], Cameron McDougall, M.D.[10], Adnan Siddiqui, M.D.[9], Istvan Szikora, M.D.[11], Ph.D., Henry Woo, M.D.[7], Felipe Albuquerque, M.D.[10], Hormozd Bozorgchami, M.D.[12], Shervin R. Dashti, M.D., Ph.D. [13], Josser Delgado Almandoz, M.D.[14], Michael Kelly, M.D., Ph.D.[15], Raymond Turner, IV, M.D.[16], Britton Keith Woodward, M.D.[17], Waleed Brinjikji, M.D.[1], Giuseppe Lanzino, M.D.[1], Pedro Lylyk, M.D.[18]

- *12 basilar artery trunk aneurysms (4 small, 3 large , 2 giant , 3 fusiform aneurysms)*

  2 distal basilar, 4 midbasilar and 6 prox basilar segment
- *6 SCA aneurysms*
- *4 AICA aneurysms*
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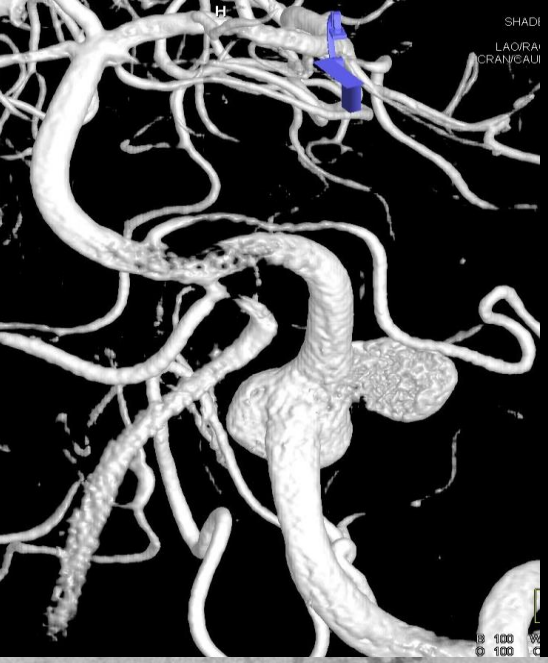
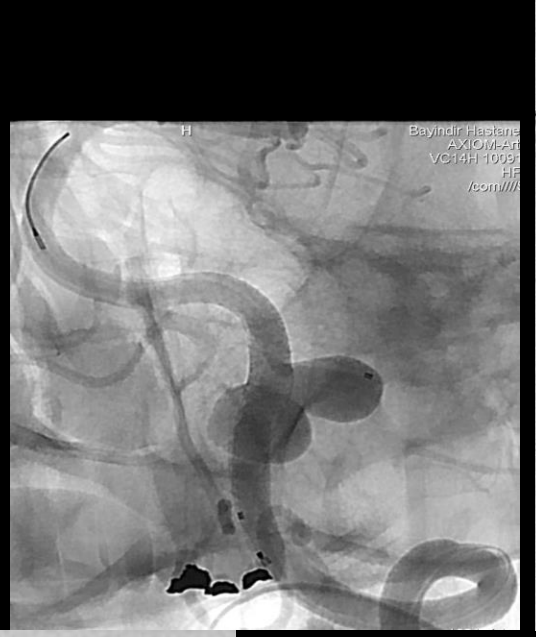
- *2 VB arteriosclerotic aneurysms with clotted mass*

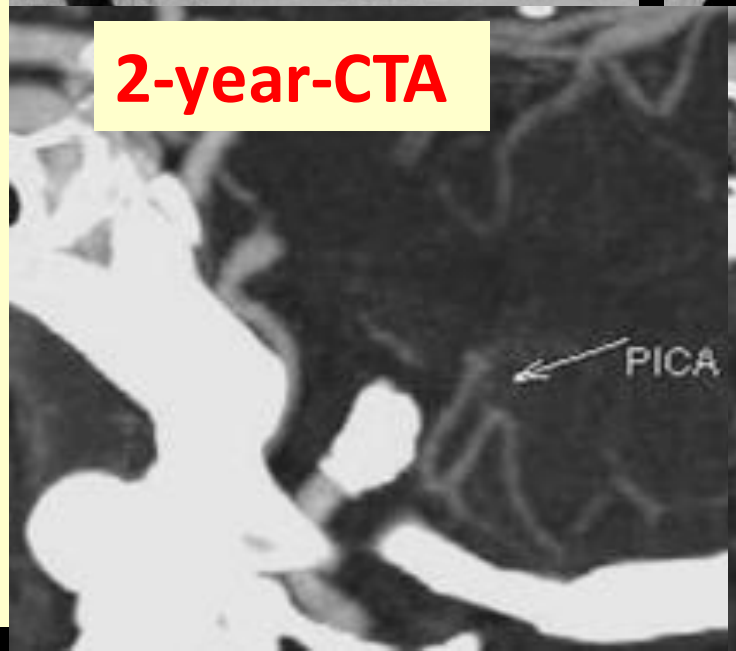




1 year control

•*One of the most important part of the revolutionary changes in aneurysm tx created by FDs has been making the treatment possible for aneurysms* ***with an important vessel coming off the sac..which used to be the major limitation for endovascular treatment.. We described a new aneurysm occlusion process called "FLOW REMODELLING" .***

•***When a Pipeline placed at the neck of the aneurysm with an important vessel coming off the aneurysm sac, according to the flow demand of that vessel, aneurysm sac shows "FLOW REMODELLING" . usually completed with excellent reconstruction w full vessel patency…***



Cekirge HS, *Saatci I*, ***A New Aneurysm Occlusion Classification after the Impact of Flow Modification.*** *AJNR Am J Neuroradiol. 2015 Aug 27. [Epub ahead of print]*

Class 1: Complete occlusion of the aneurysm sac. When there is a branch integrated with the aneurysm sac, ie, coming off the aneurysm, at any point of the sac, further analysis is carried out with subgroups

1A: Complete occlusion with the full patency of the integrated branch

1B: Complete occlusion with the branch reduced in caliber

1C: Complete occlusion with no antegrade filling of the branch

Class 2: Neck filling

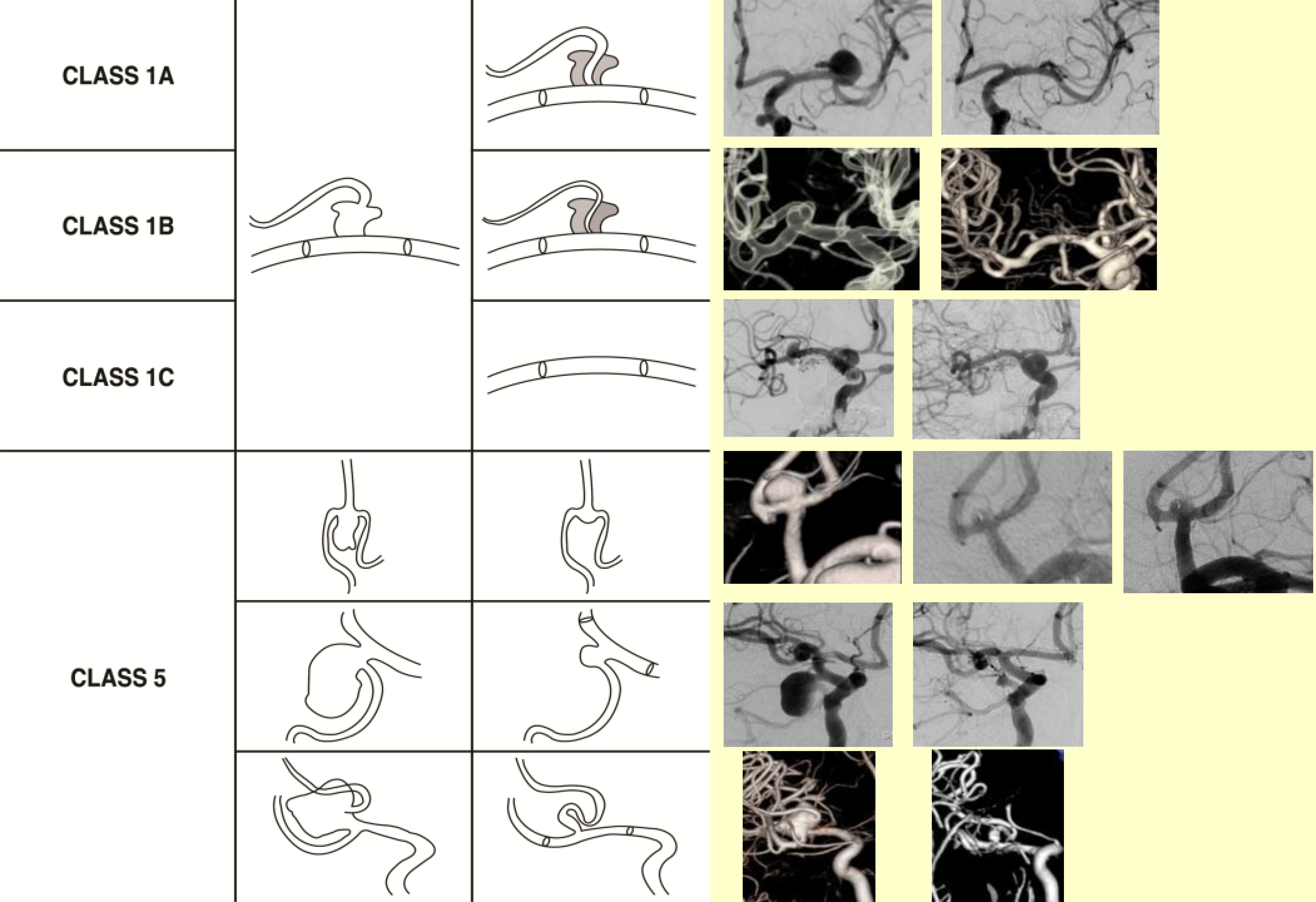
Class 3: Incomplete occlusion with aneurysm filling

Class 4: Aneurysm filling. This class is reserved for an immediate postoperative result based on end-of-treatment DSA; after extraand/or intrasaccular flow modification treatment

4A: With contrast stagnation

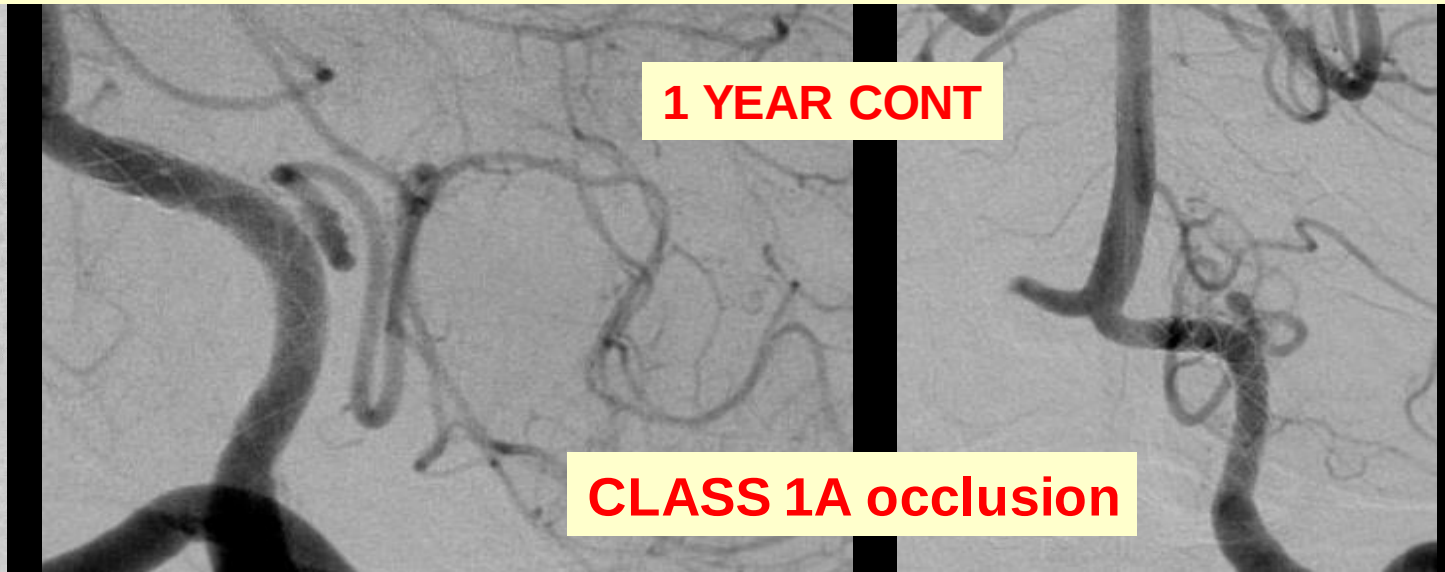
4B: Without contrast stagnation

Class 5: Stable remodeling with flow modification. Filling in the neck region, which stays unchanged or reduced; to be included in this group, there have to be at least 2 consecutive control angiographies. Exceptionally, 1 control angiography could be sufficient for definition of class 5, only in selected cases of contrast filling the branch coming off the sac, with an appearance of a different vessel course than the original, eg, tortuous or dilated, given that it is in continuation with the parent artery with no sac filling


CLASS 1A
CLASS 1B
CLASS 1C
CLASS 5

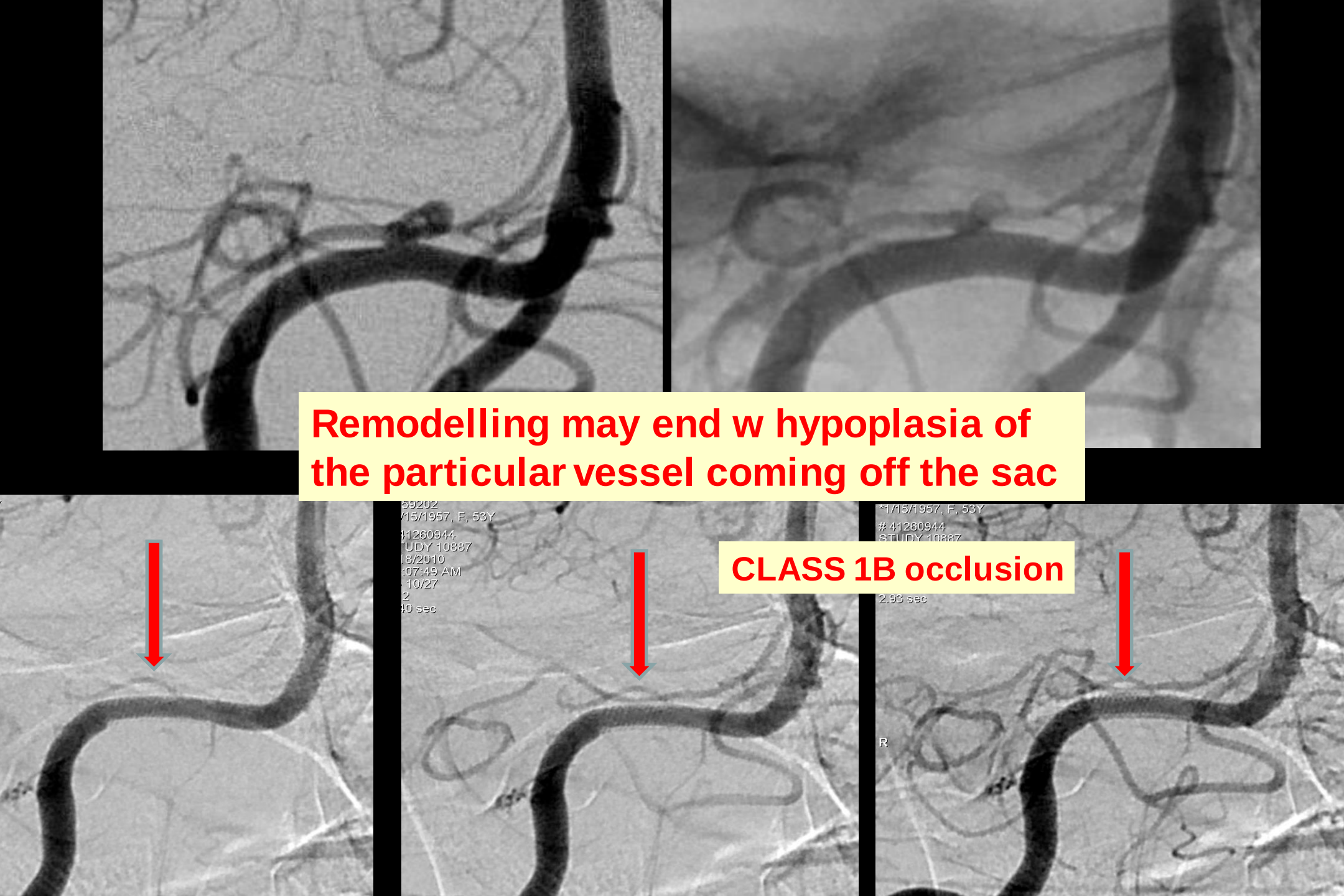
70 yo female presented w SAH, underwent surgery w failed clipping– wrapped. Referred 2 weeks after the bleed

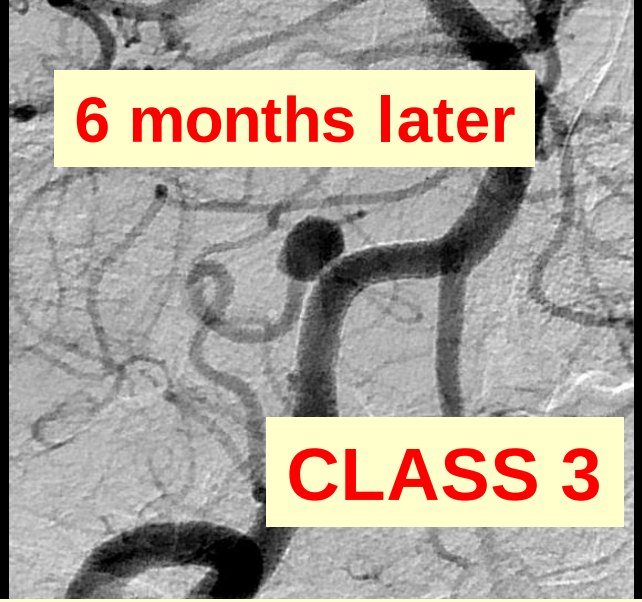
Flow remodelling of aneurysms is strongly effected by the flow demand of that particular vessel coming off the sac…If there is a flow demand , vessel keeps its patency while aneurysm is closed..

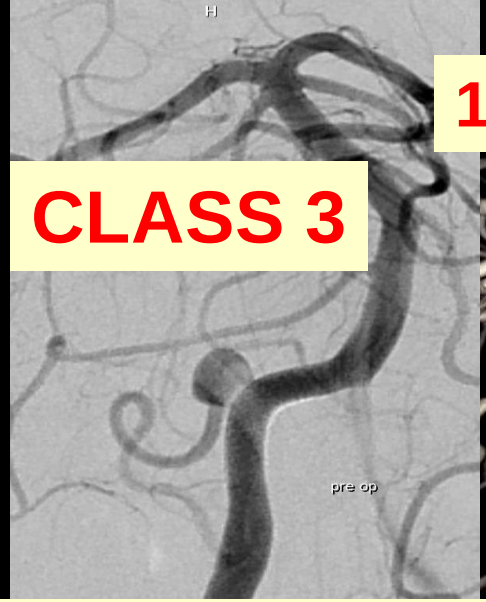


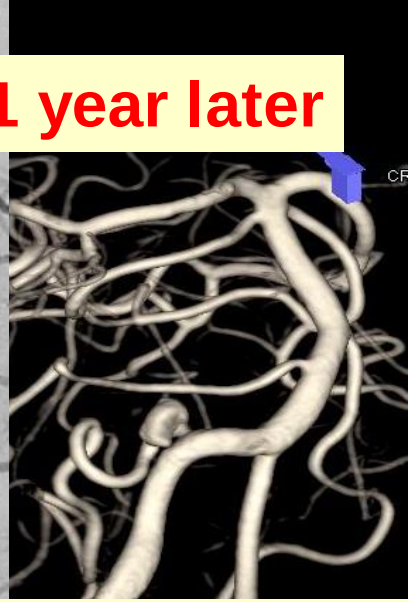
1 YEAR CONT

CLASS 1A occlusion

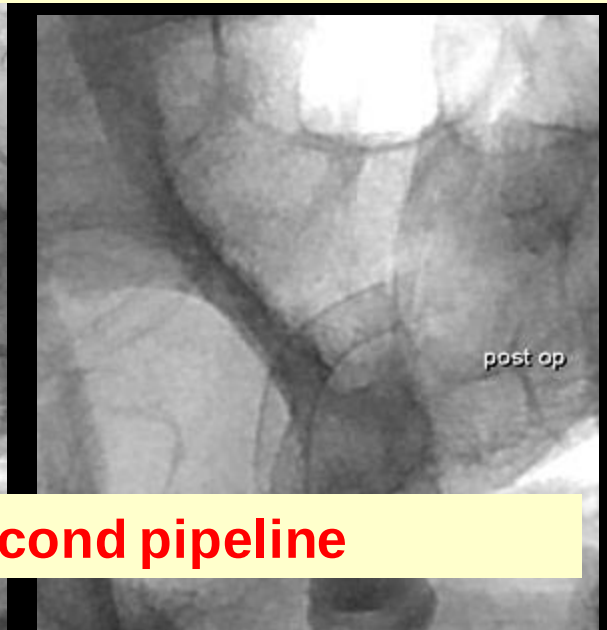

Remodelling may end w hypoplasia of the particular vessel coming off the sac
CLASS 1B occlusion
2.93 sec
R



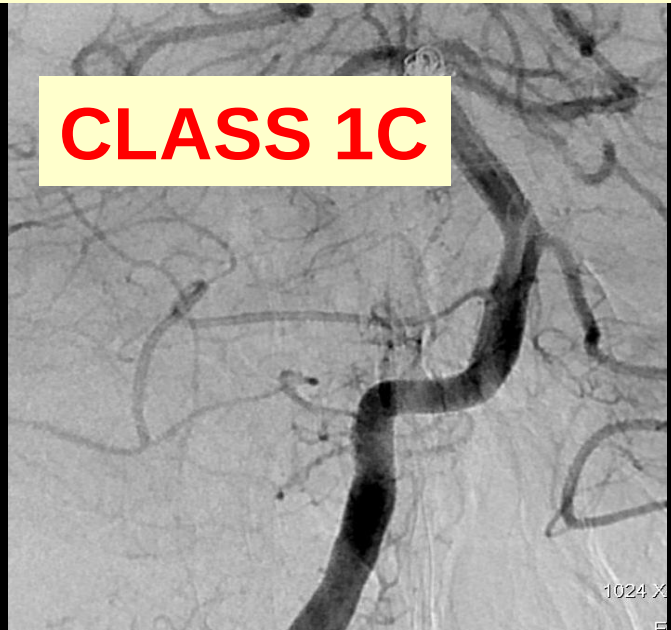




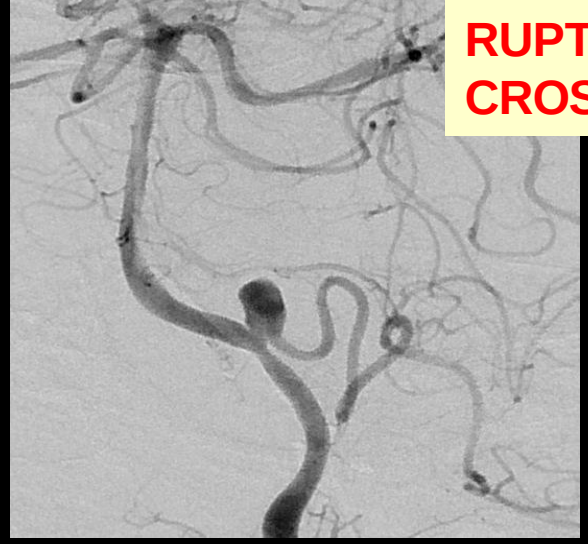
If the Flow demand of particular vessel is not strong or exist, the remodelling process ends with progressive asymptomatic occlusion of that vessel coming off the aneurysm sac..But, it sometimes takes longer than expected needing retx…

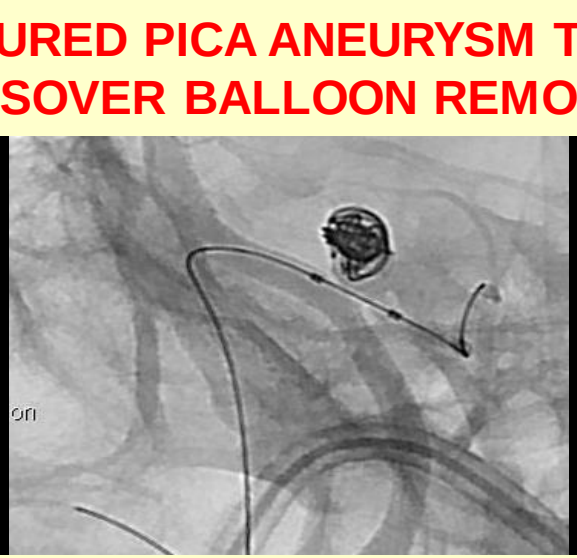


Retreatment with second pipeline

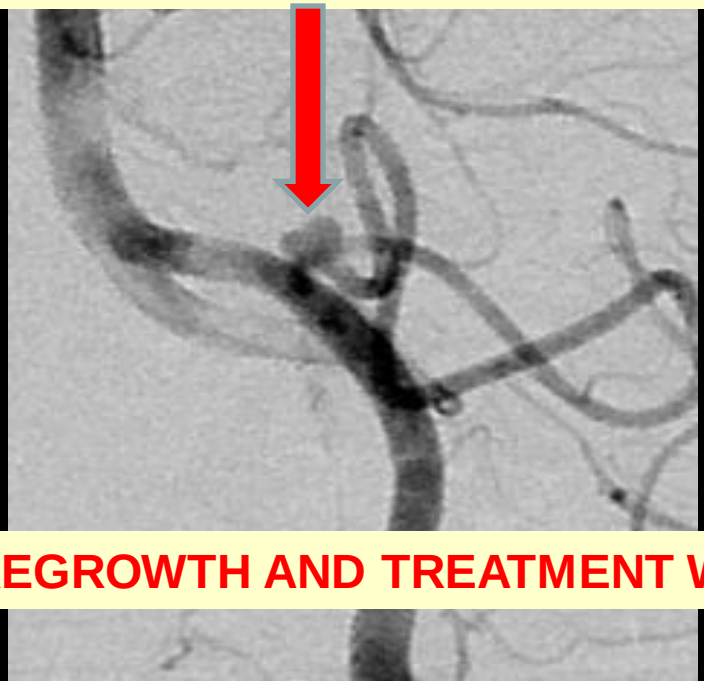


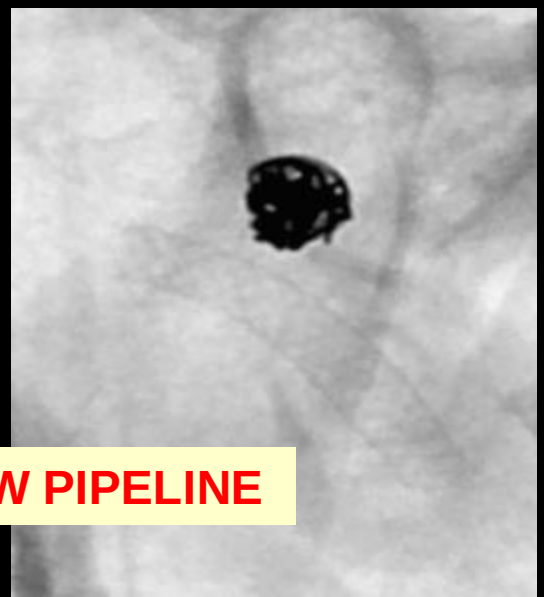
RUPTURED PICA ANEURYSM TX WITH CROSSOVER BALLOON REMOD



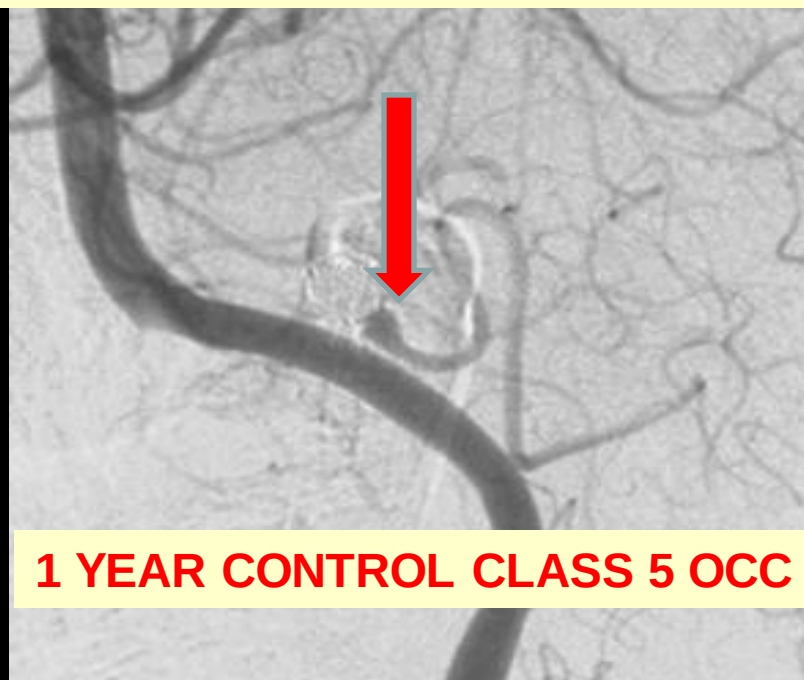


Flow remodelling process is not always completed with perfect reconstruction but remodelling of the aneurysm sac may end up with stable remnant that become continuation of the vessel with flow demand…

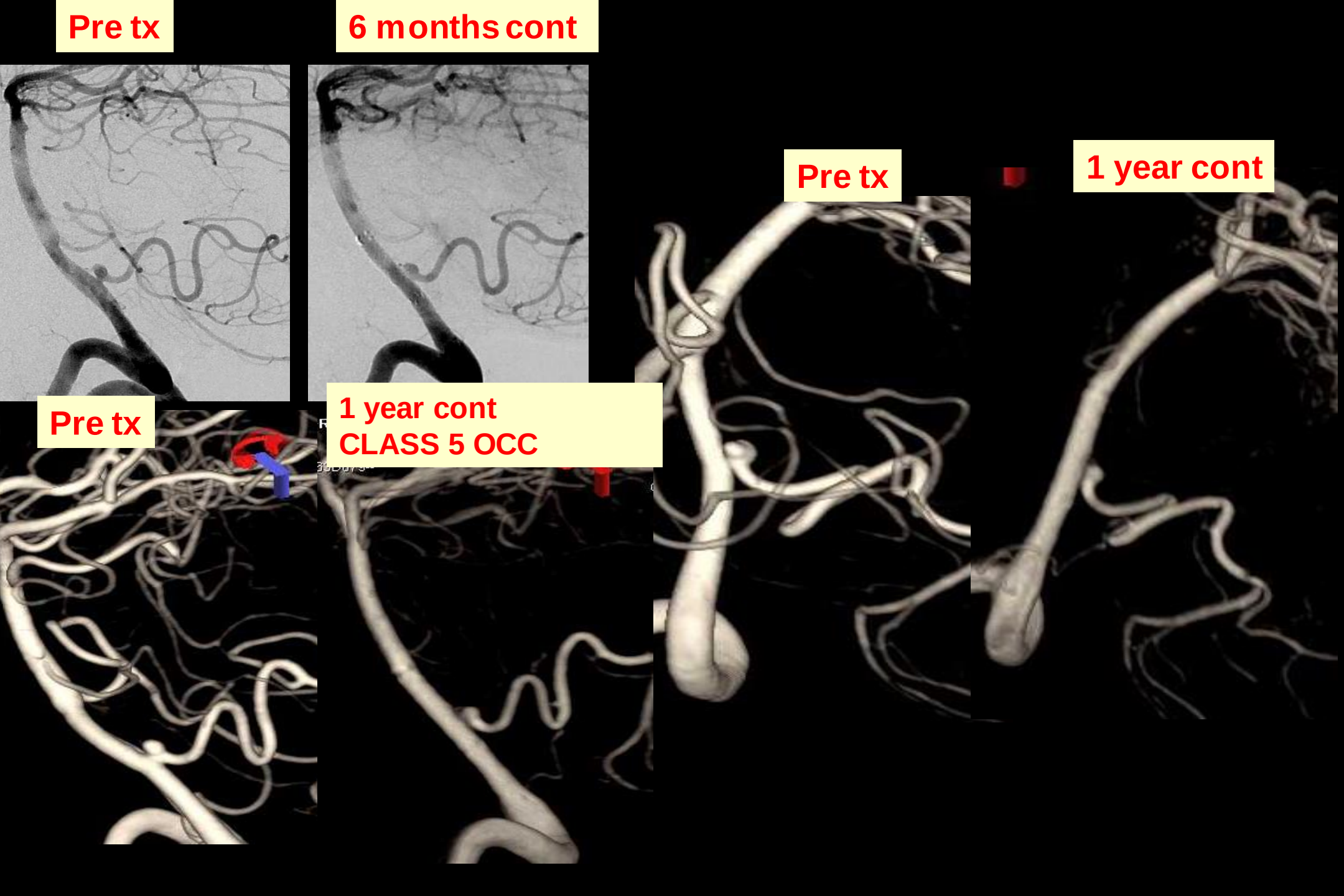


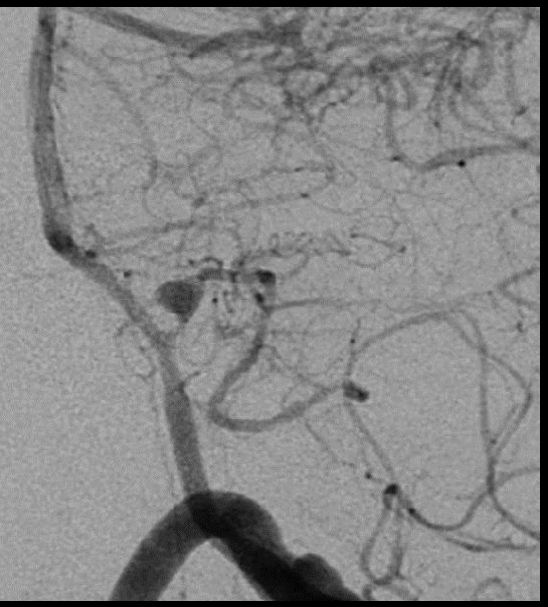


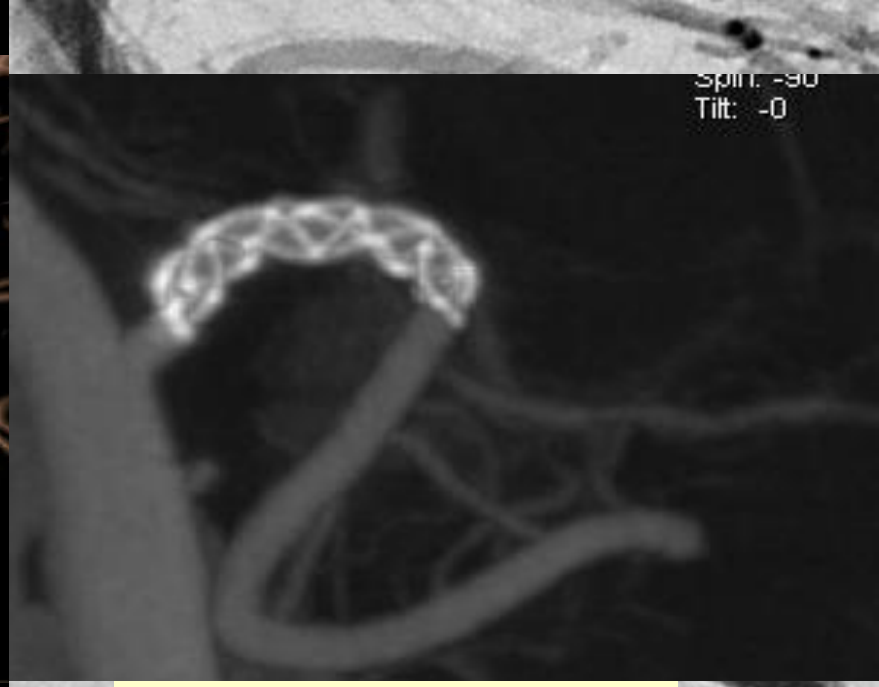
REGROWTH AND TREATMENT W PIPELINE



1 YEAR CONTROL CLASS 5 OCC

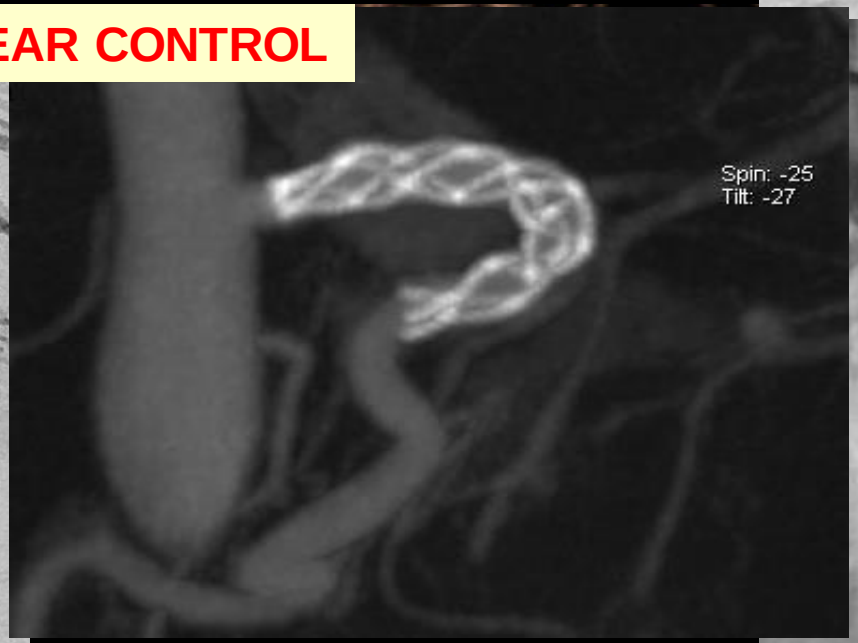

Pre tx
6 months cont
Pre tx
1 year cont
CLASS 5 OCC
Pre tx
1 year cont

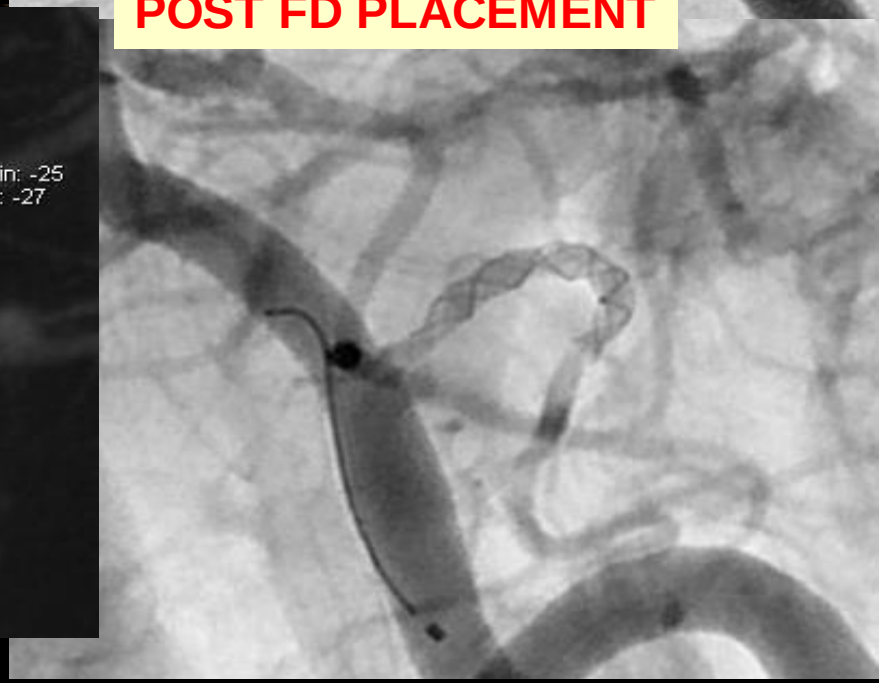


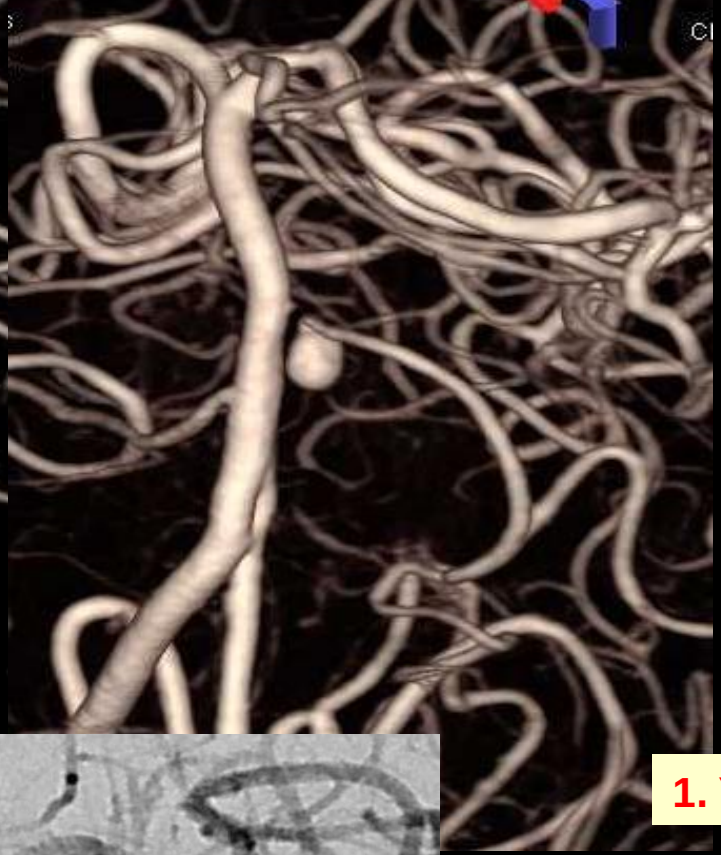


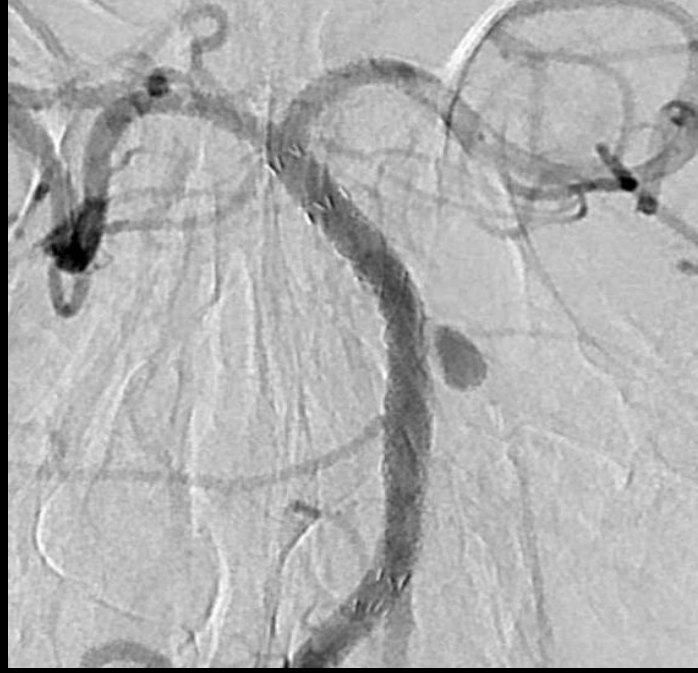
POST FD PLACEMENT

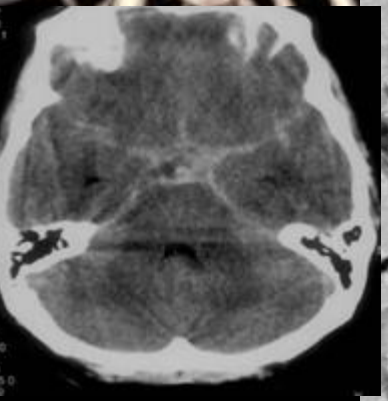
1 YEAR CONTROL

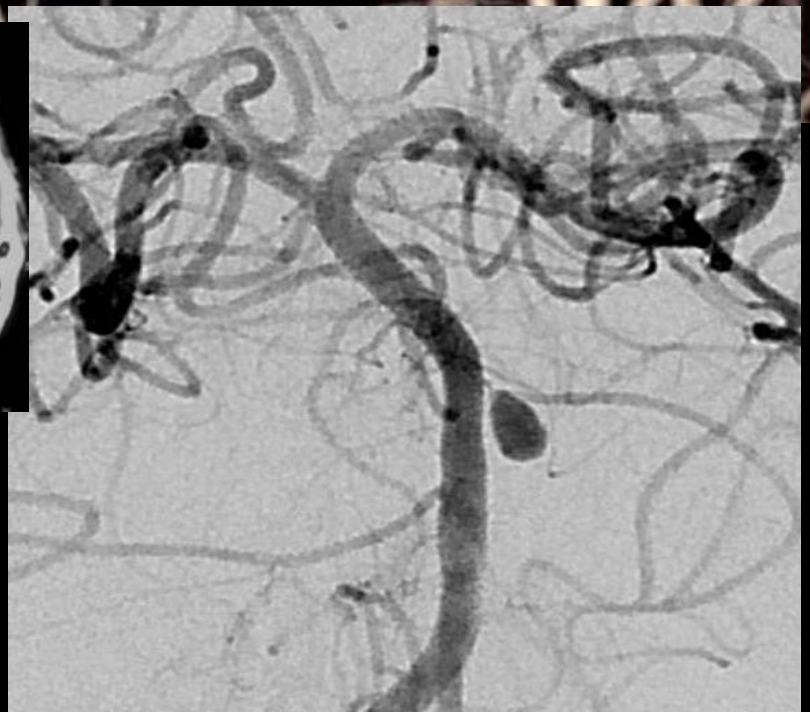




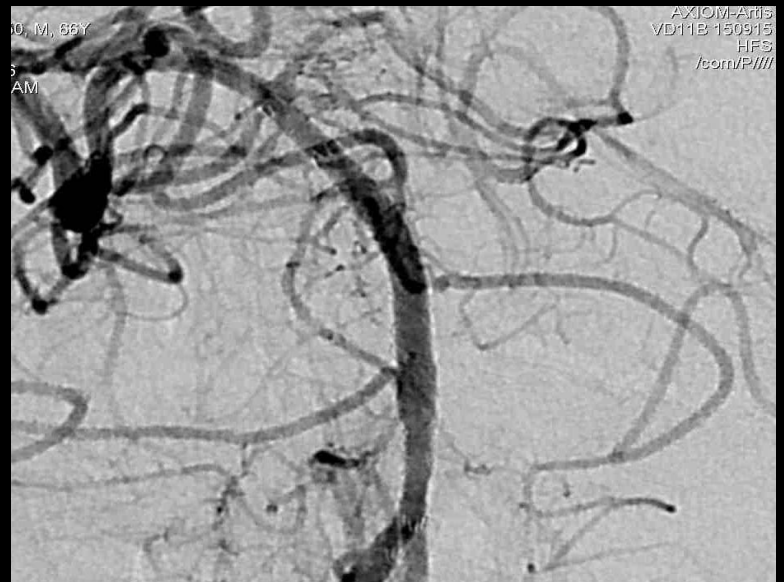




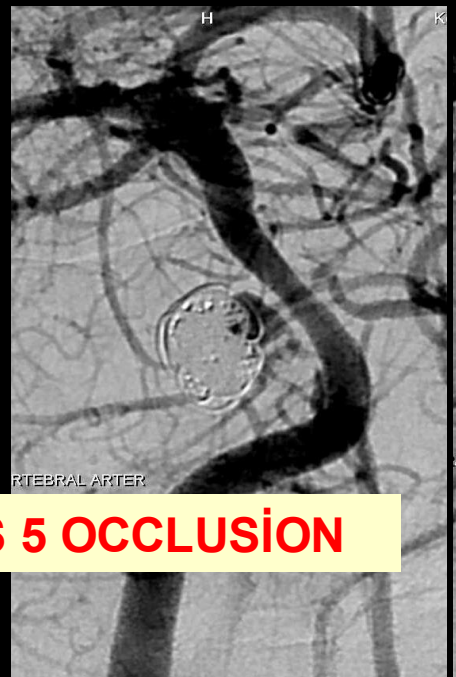


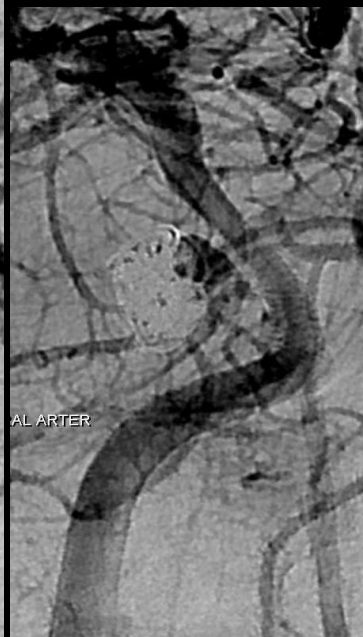


1. YEAR CONTROL, CLASS 1A OCC

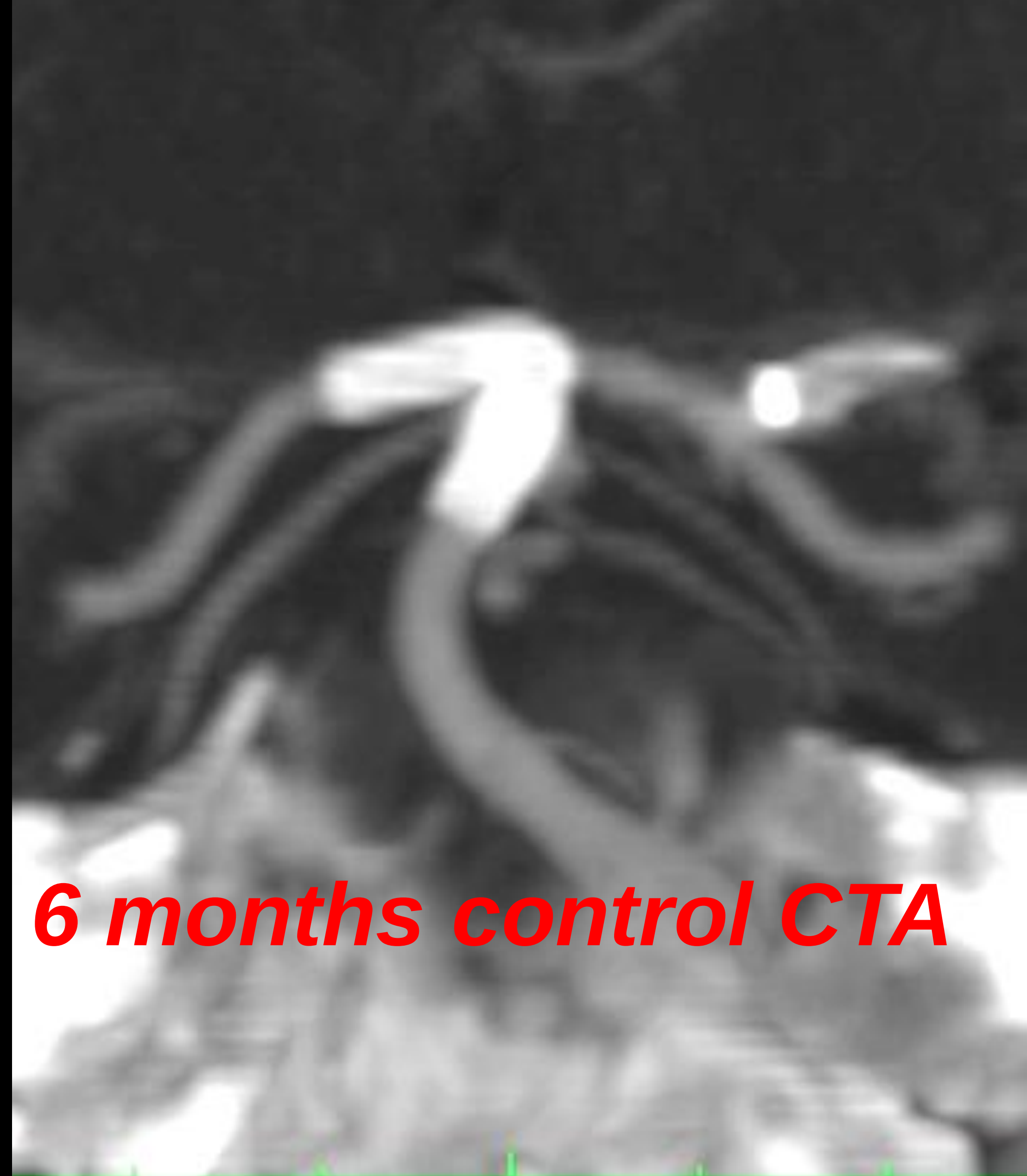


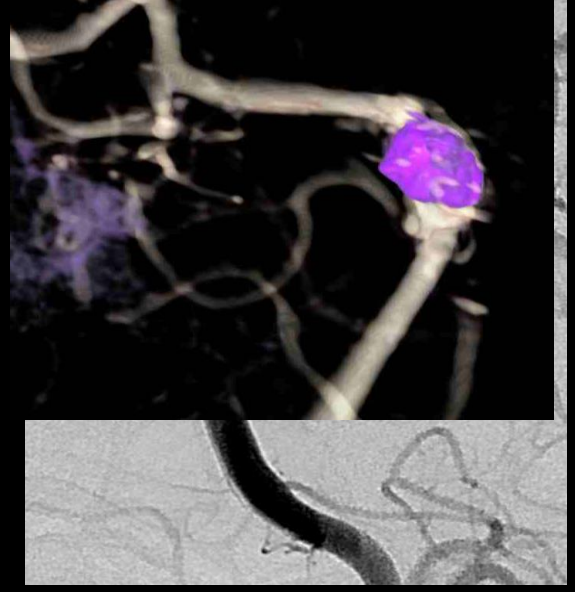
1 YEAR CONTROL STABLE FLOW REMODELLING

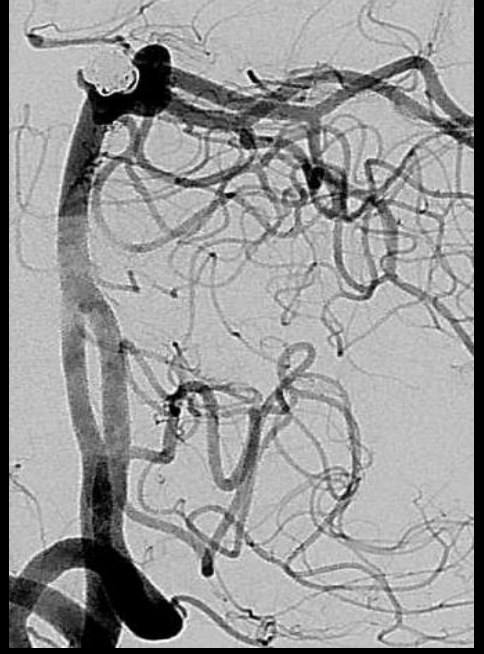




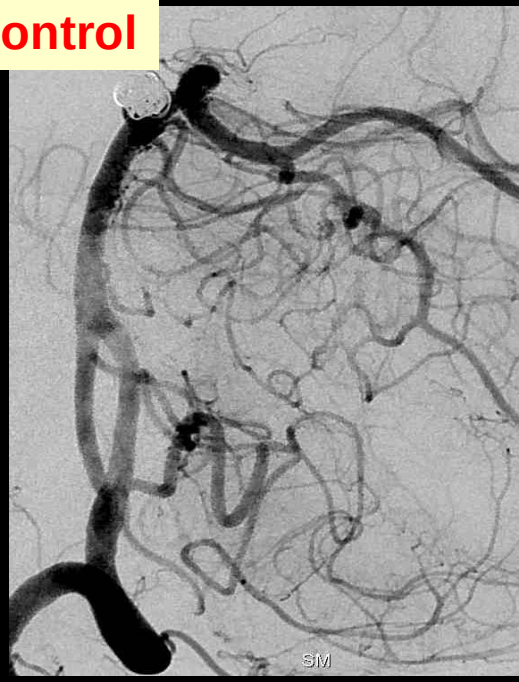
CLASS 5 OCCLUSİON

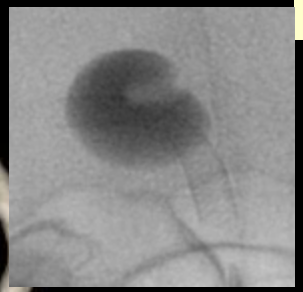

6 months control CTA



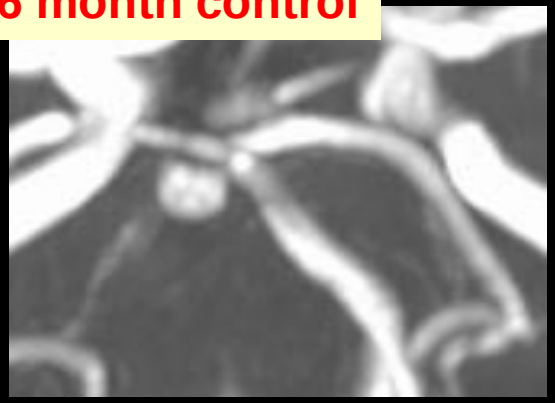


6 month control





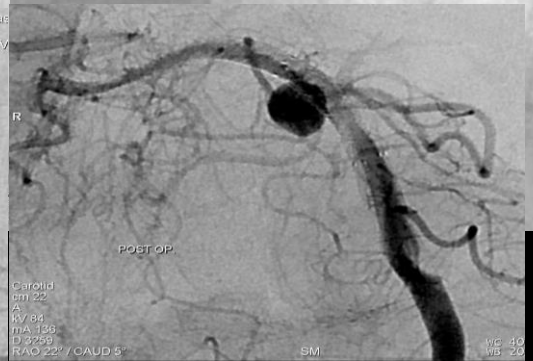
6 month control

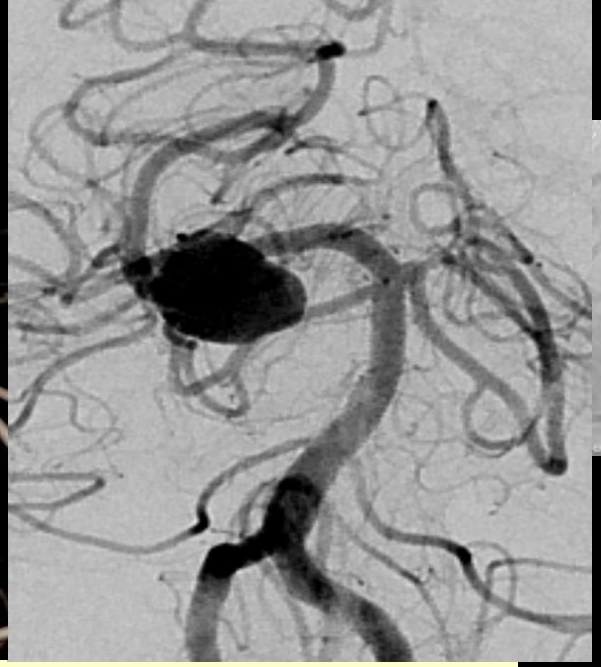


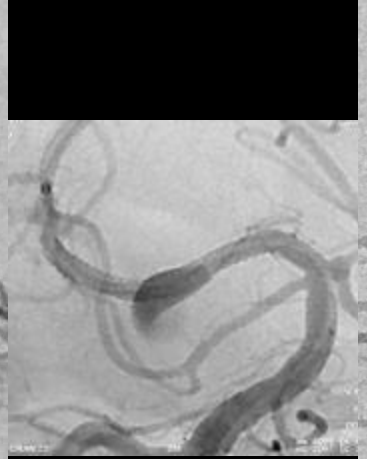
18th month control

3 years control

… and RETX

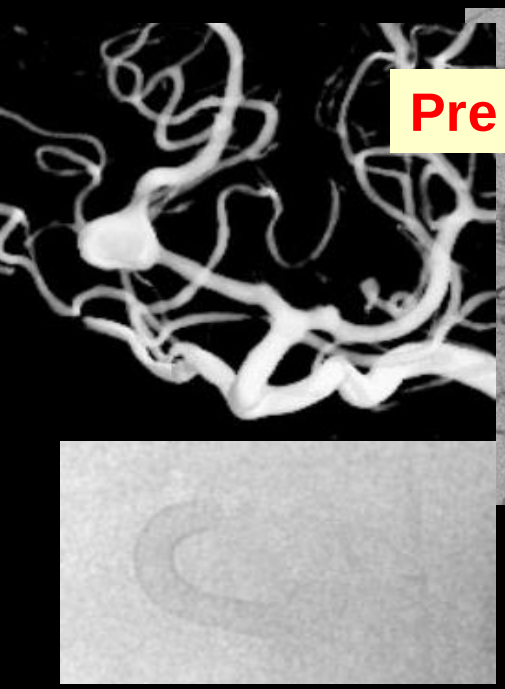






1 year control

1 year control

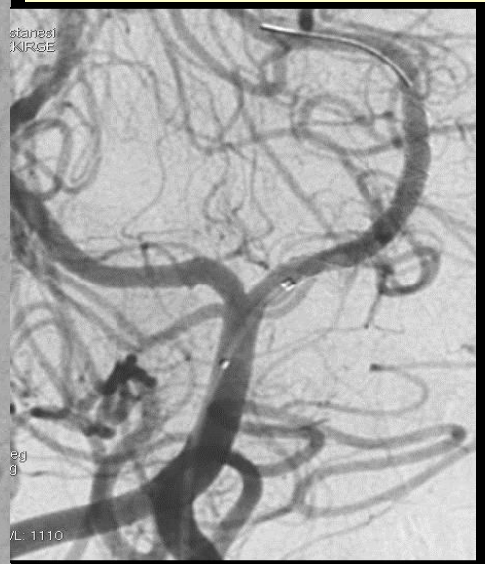


Pre tx

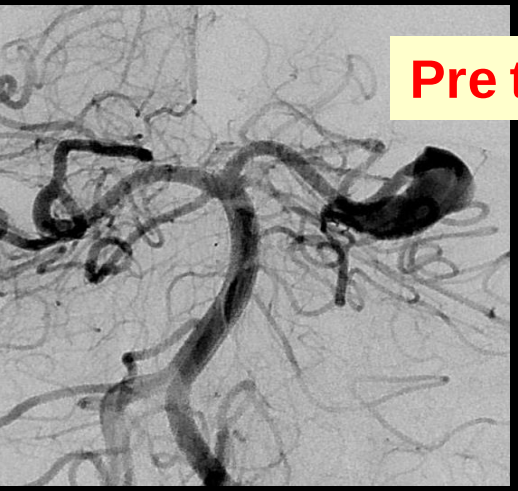
1 year cont

Ruptured dissec PCA aneu.

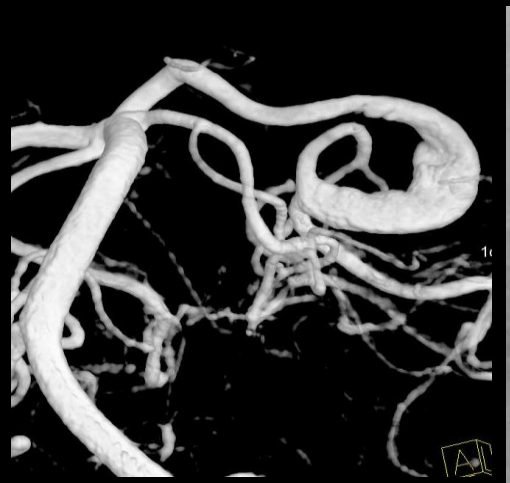
İmmediate post tx

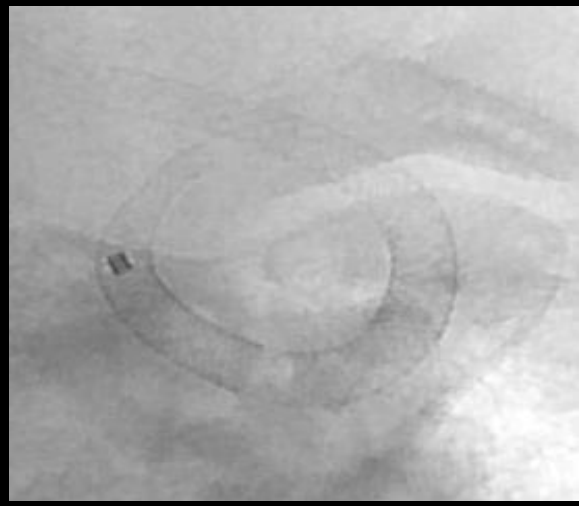


6 months cont

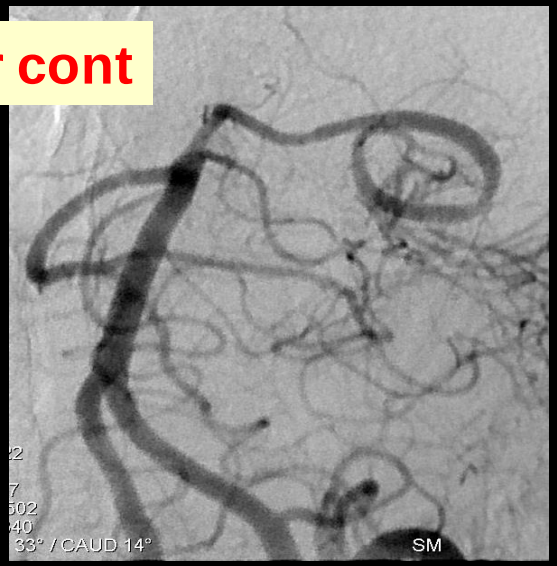

Pre tx

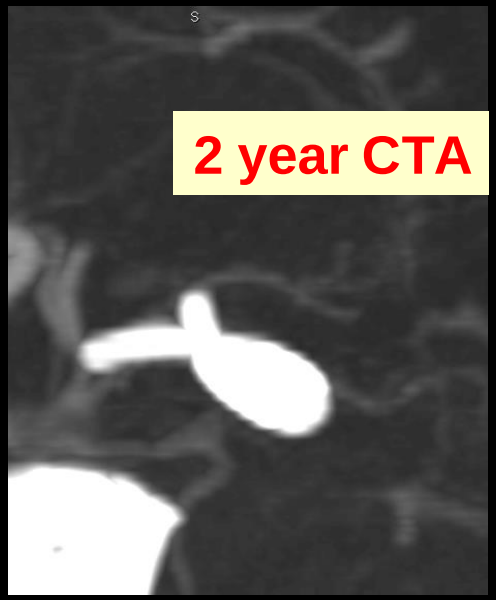

SM
WC
WB

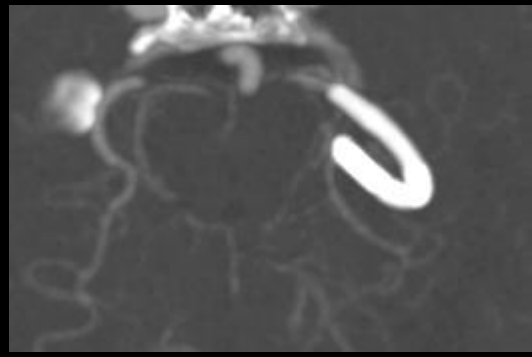


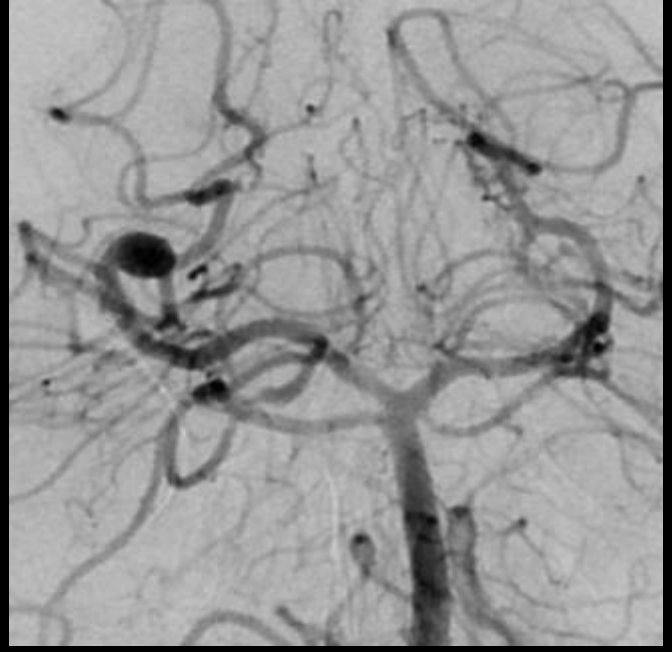



1 year cont


33° / CAUD 14°
SM


2 year CTA

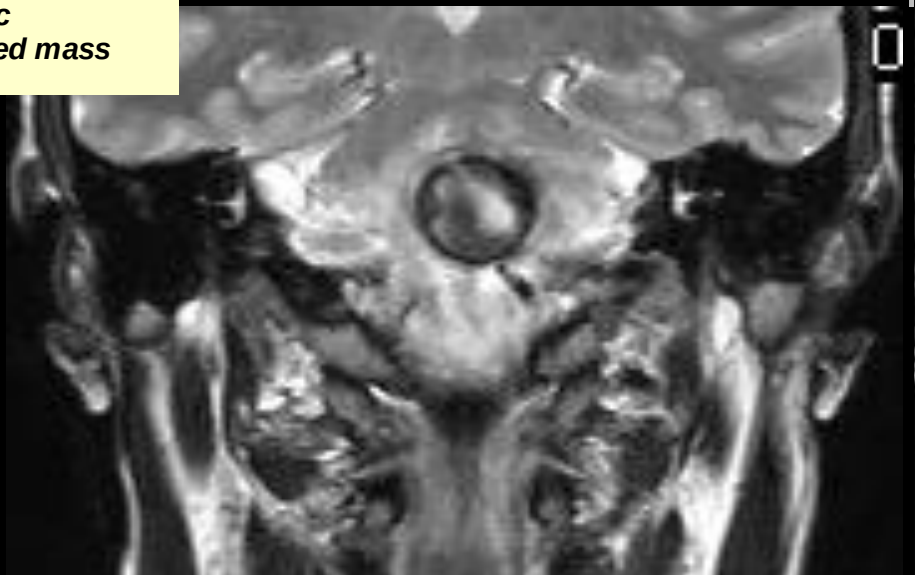


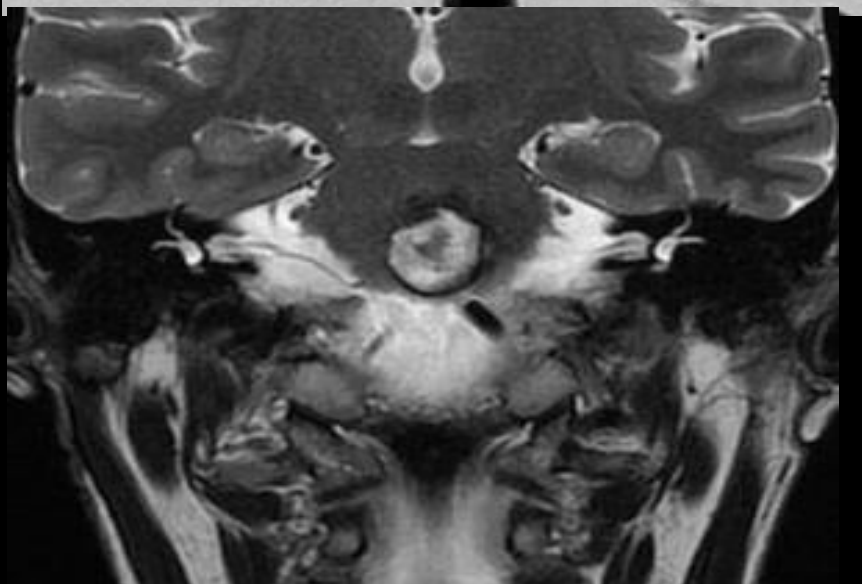


6 months control

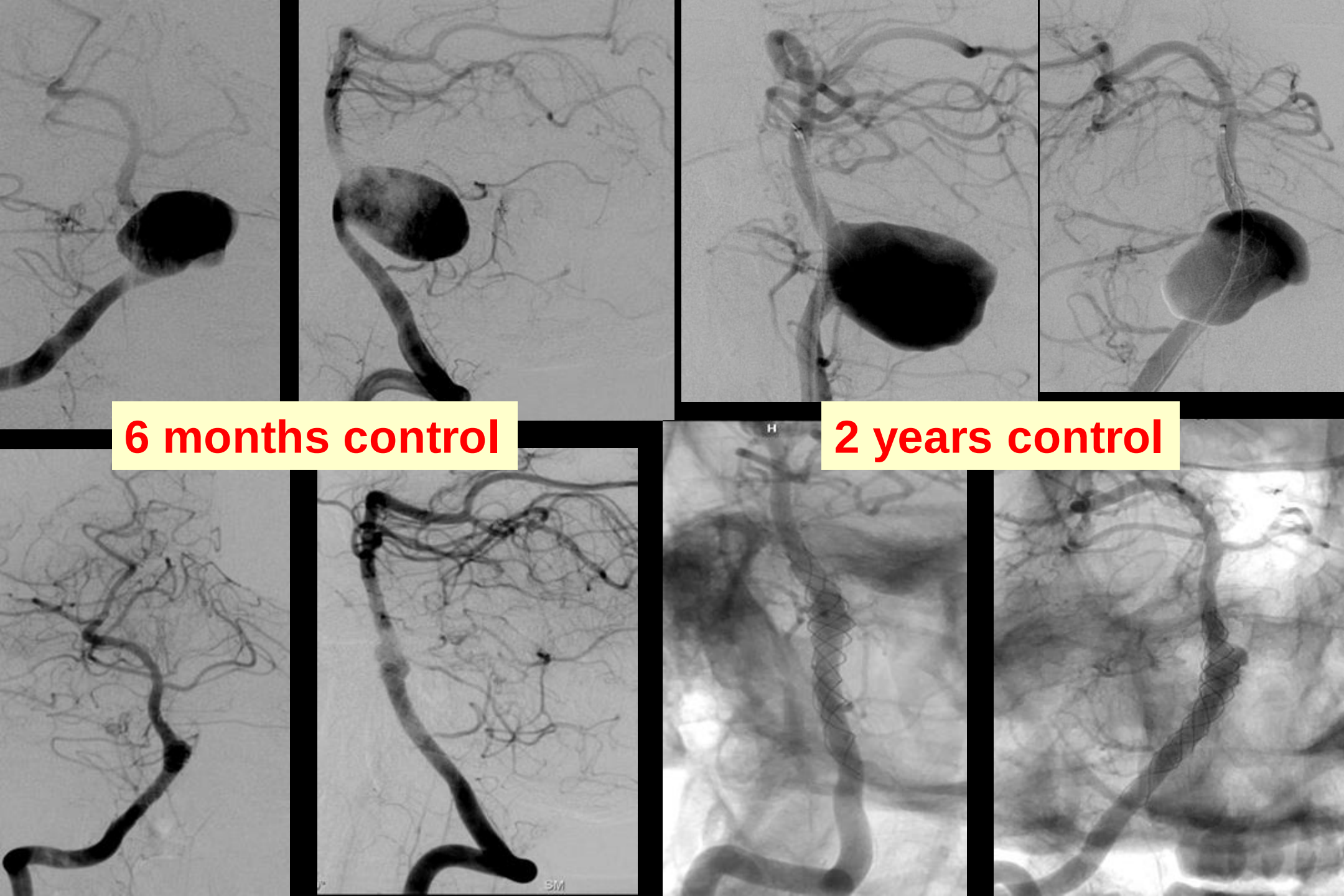
1 year control Class 5 occ

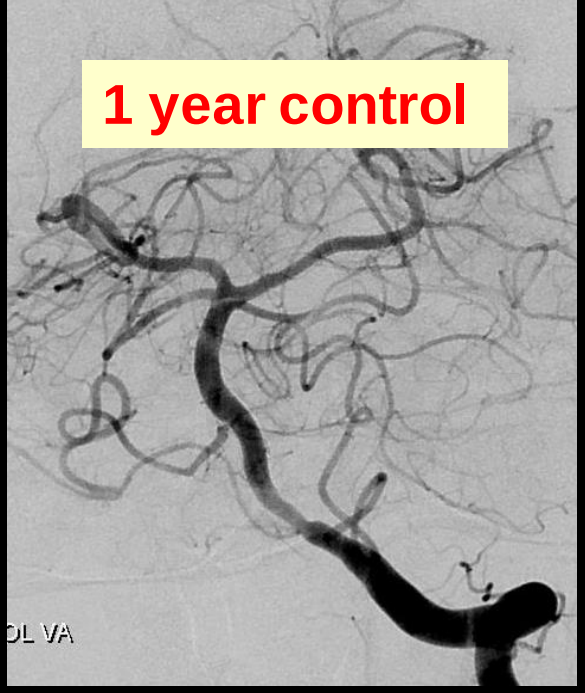
- *12 basilar artery trunk aneurysms (4 small, 3 large , 2 giant , 3 fusiform aneurysms)*
  2 distal basilar, 4 midbasilar and 6 prox basilar segment
- *6 SCA aneurysms*
- *4 AICA aneurysms*
- *11 PICA aneurysms*
- *9 PCA (P1-P3) aneurysms*
- *29 VA aneurysms (17 intradural, 12 extradural) 40% of PC aneurysms*
- *2 VB arteriosclerotic aneurysms with clotted mass*

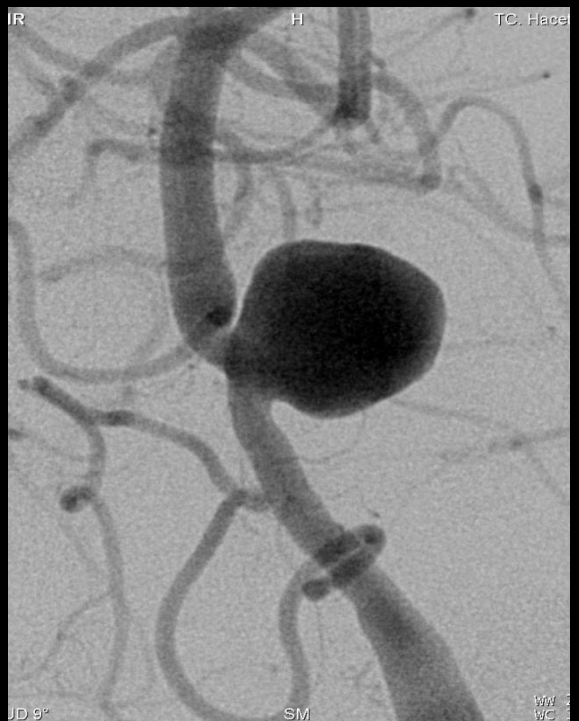


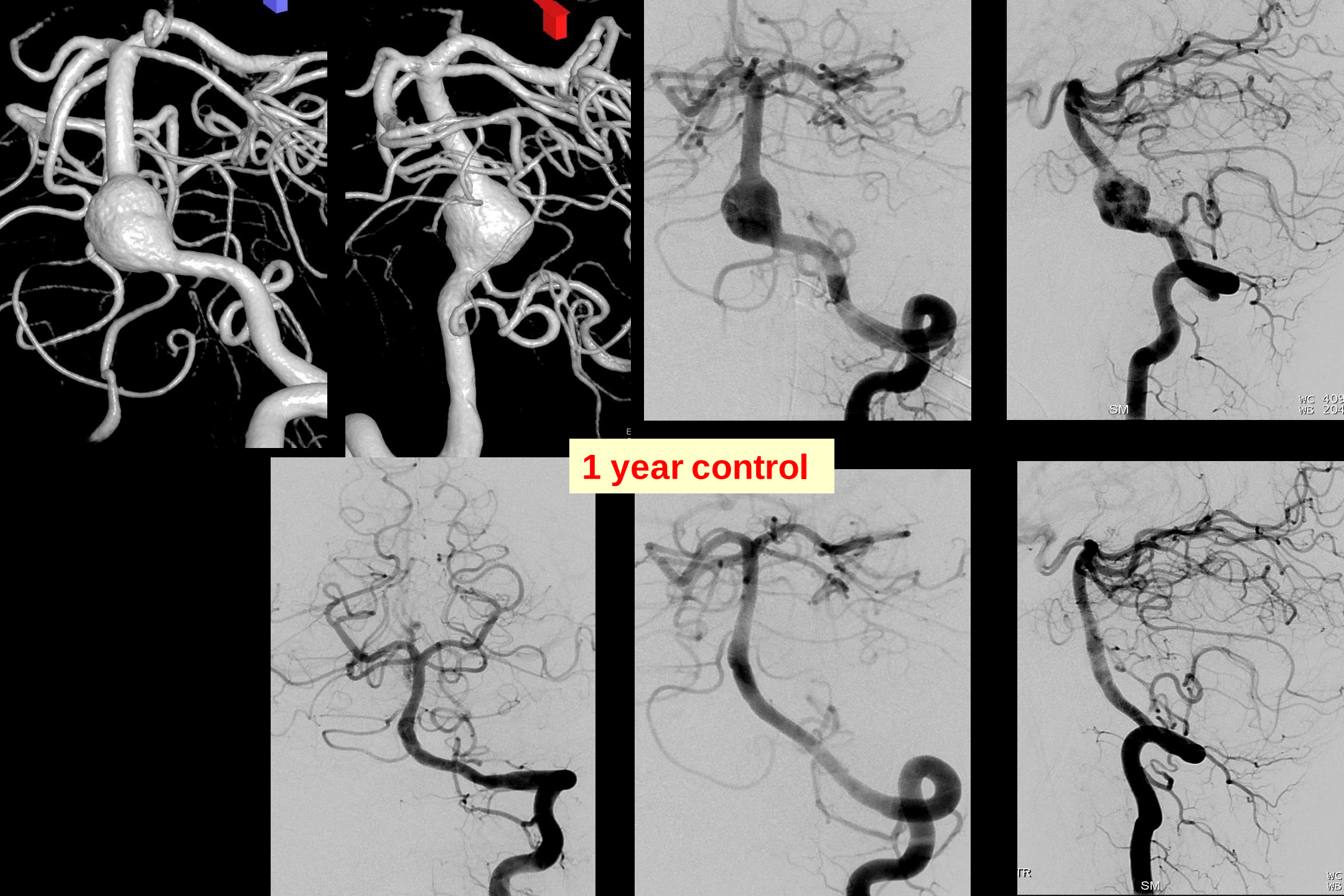


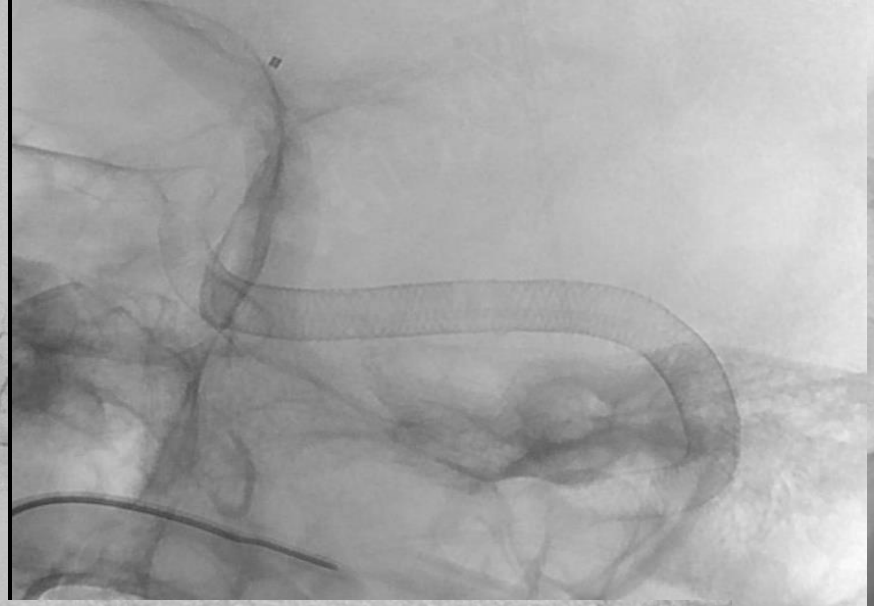

DUE TO FLOW DEMAND OF BASILAR TRUNK, WHILE ANEURYSM WAS BEING CLOSED W ONE ARM OF FENESTRATION, THE OTHER ARM OF FENESTRATION THAT FD PLACED, REMODELLED FORWARD IN ACTUAL BASILAR TRUNK SIZE…



6 months control
2 years control


1 year control



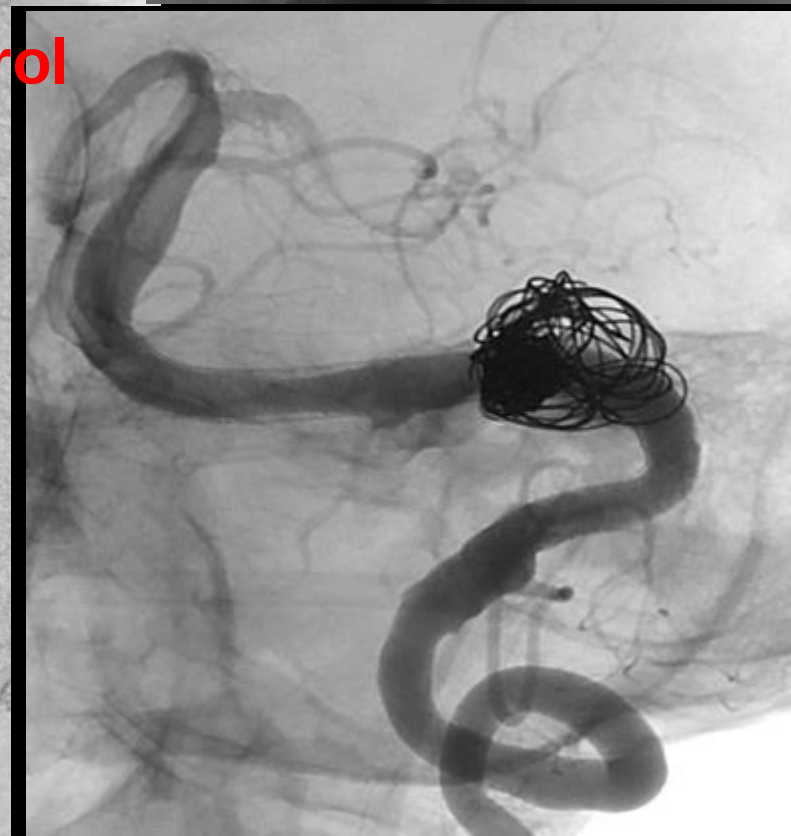

1 year control
SM
SM



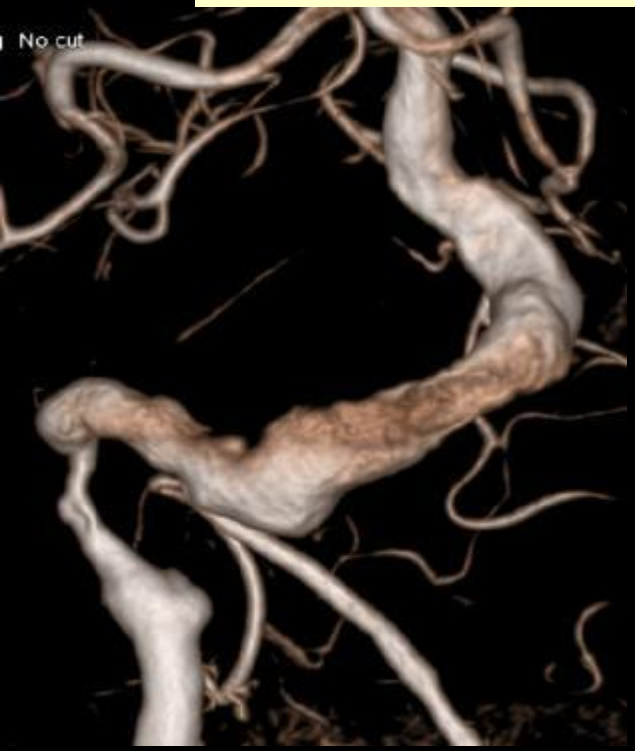
- *12 basilar artery trunk aneurysms (4 small, 3 large , 2 giant , 3 fusiform aneurysms)*

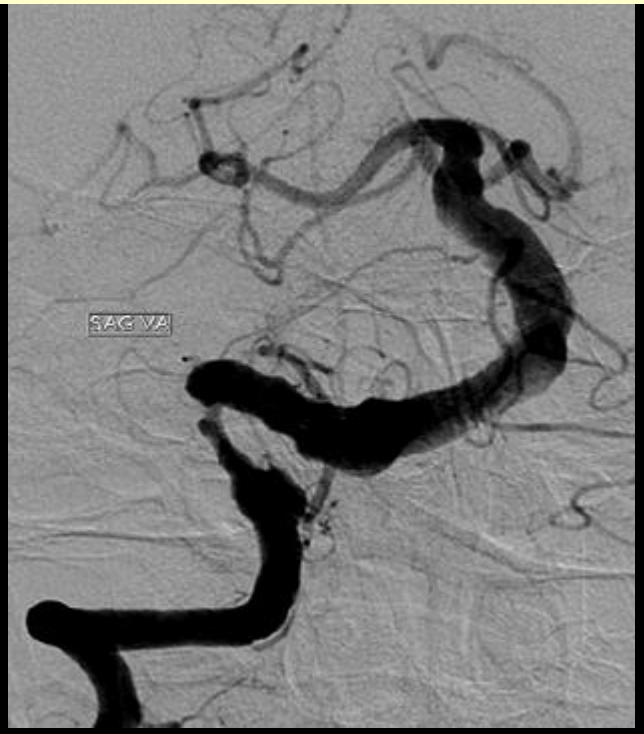
  2 distal basilar, 4 midbasilar and 6 prox basilar segment
- *6 SCA aneurysms*
- *4 AICA aneurysms*
- *11 PICA aneurysms*
- *9 PCA (P1-P3) aneurysms*
- *29 VA aneurysms (17 intradural, 12 extradural) 40% of PC aneurysms*
- ***2 VB arteriosclerotic aneurysms with clotted mass ???!!...***

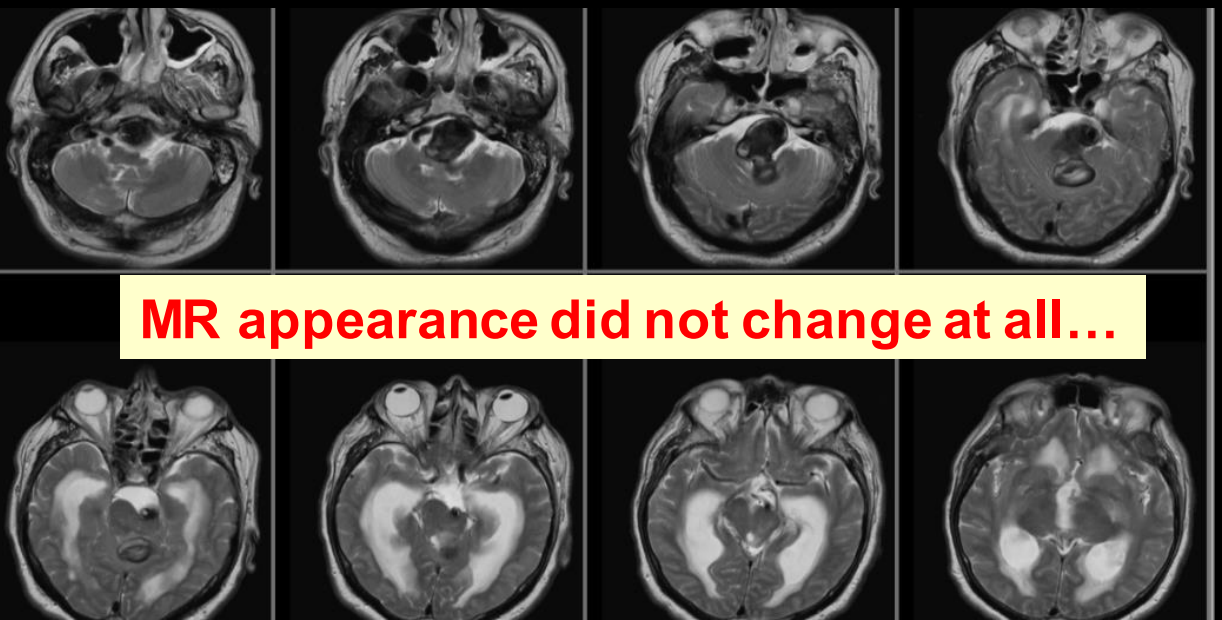
2 months control



72 year old male admitted w severe lethargy/aspiration pnomonia







MR appearance did not change at all…

At 3 months CTA , he was off gastrostomy .can normally get oral and intact except slight gait disturbance!!..however, 1 month later he got worsened and passed away w progresssive ischemic event..

All of mortalities and morbidities but one developed after tx of mid-distal basilar trunk aneuryms and VB arteriosclerotic aneurysms..

- ***Mortality: 5 pts (7.3%)***

  ischemic event resulting from occl of jailed P1 in 1 pt, spontaneous par hematoma in 1 pt, post tx SAH in 1, and in 2 pts after tx of giant VB arterioscle aneurysms i

  Permanent morbidity at discharge: 2 pts (2.9%) ***due to ischemic event in both due to brain stem ischemic lesions after midbasilar and upper basilar trunk aneurysm tx. One showed full recovery, the other was mRS 2 at 1 year FU.***

- ***12 basilar artery trunk aneurysms (4 small, 3 large , 2 giant , 3 fusiform aneurysms)***

  2 distal basilar, 4 midbasilar and 6 prox basilar segment
- ***6 SCA aneurysms***
- ***4 AICA aneurysms***
- ***11 PICA aneurysms***
- ***9 PCA (P1-P3) aneurysms***
- ***29 VA aneurysms (17 intradural, 12 extradural) 40% of PC aneurysms***
- ***2 VB arteriosclerotic aneurysms with clotted mass***

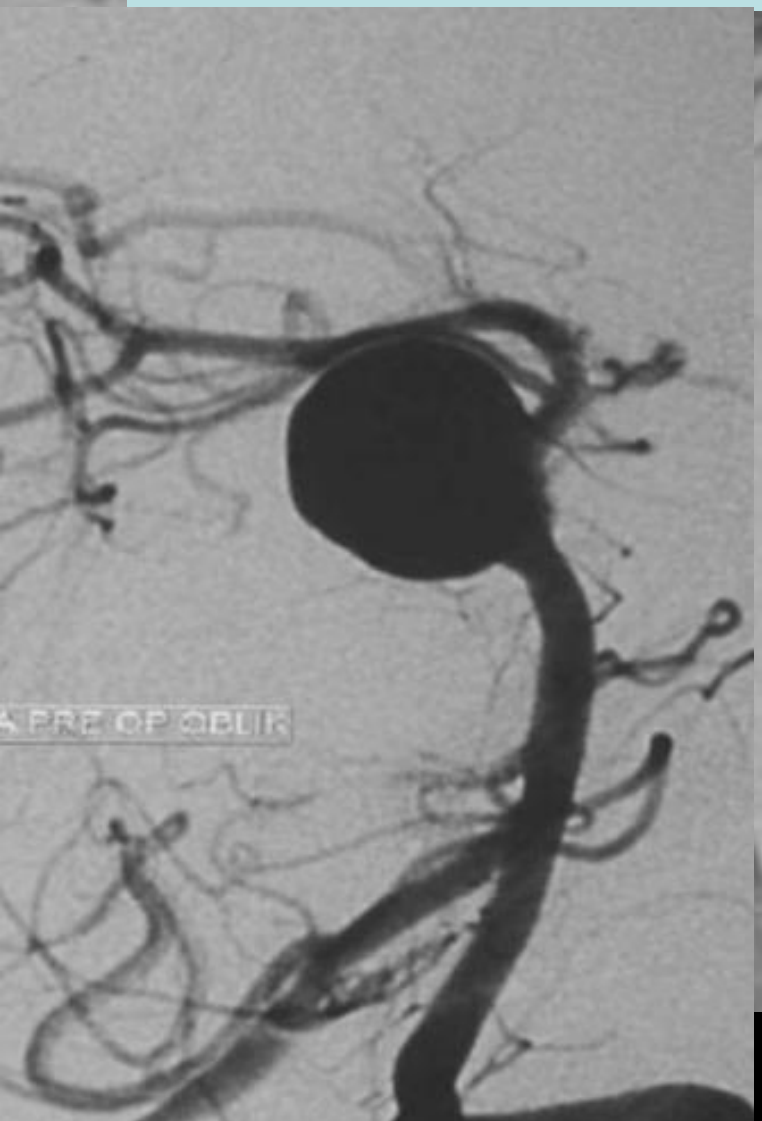
54 aneurysms treated w telescopic stenting between 2005-2016, 37/54 in post circulation (68,5%) and 26/54, 48% for basilar artery aneurysms…

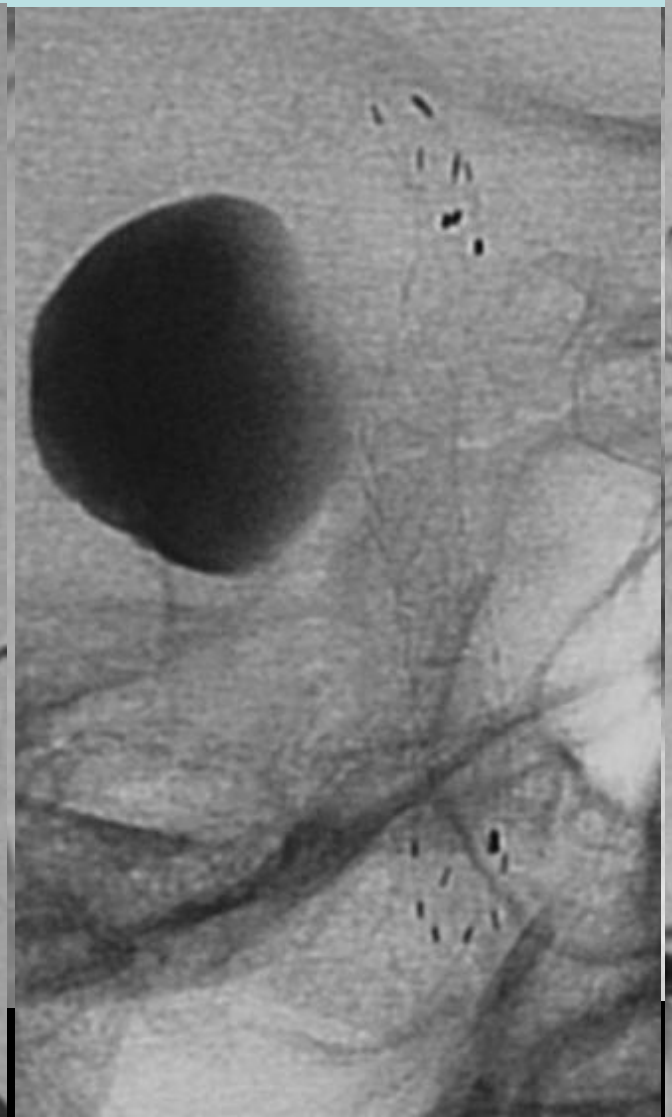
- 54 pts 38 male, 16 female
- 26 basilar, 5 vertebral, 11 ICA (cervical-extra-intradural) and ICA-antch, 4 M1/MCA, 6 VA-PICA, 1 A1 aneurysm
- 17 giant (10/17 PT), 24 large (2/22 PT), and 13 small aneurysms
- 24 saccular, 30 fusiform
- Telescopic placement of BES (2 stents) in 3, Leo in 23 (2 stents in 21 and 3 stents in 2) , Wingspan in 3 (2 stents) and enterprise and/or Solitaire in 21 pts (3 stents in 19 and 2 stents in 2), LVIS stent in 1 pt, telescopic wallstent or protege in 3 pts

- All pts kept on clopidogrel or Ticlopidine 6 months and resistance to antiaggregation was diligently doublechecked.

- 25/ 54 pts presented w mass effect.
- 9/ 54 pts presented w SAH. Only 1 of 9 was treated in acute phase.
- In 20 pts, incidental, headache, neuroradiological mass effect

HOWEVER, TELESCOPED STENTS,HAVING ONLY 10% OF FLOW DIVERTOR'S MESH DENSITY, MODIFY THE FLOW WITH VESSEL WALL PULSATILITY AND GEOMETRY CHANGES

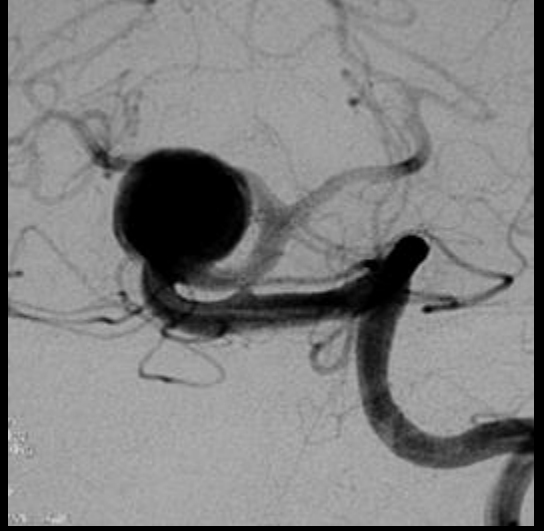


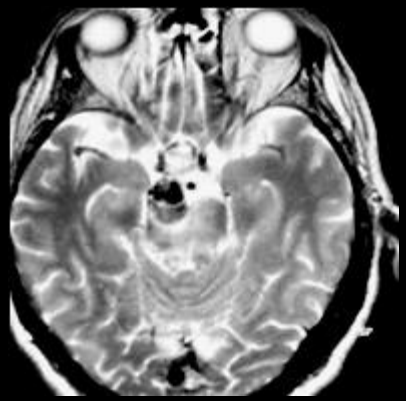


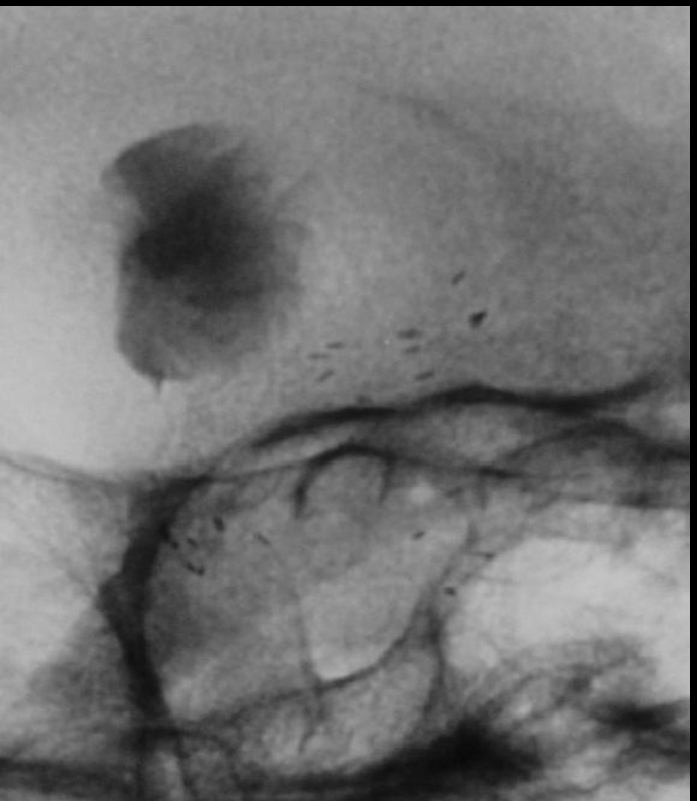
2 Years CTA

Parent artery geometry and pulsatility change….

Doing flow modification without too much mesh density could be very good advantage in particular locations....

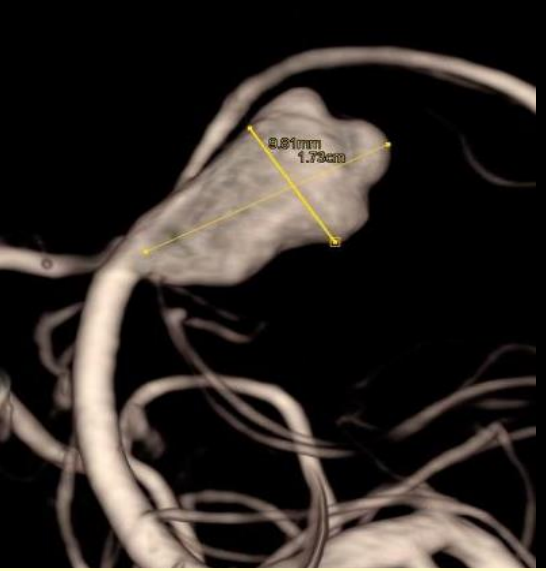


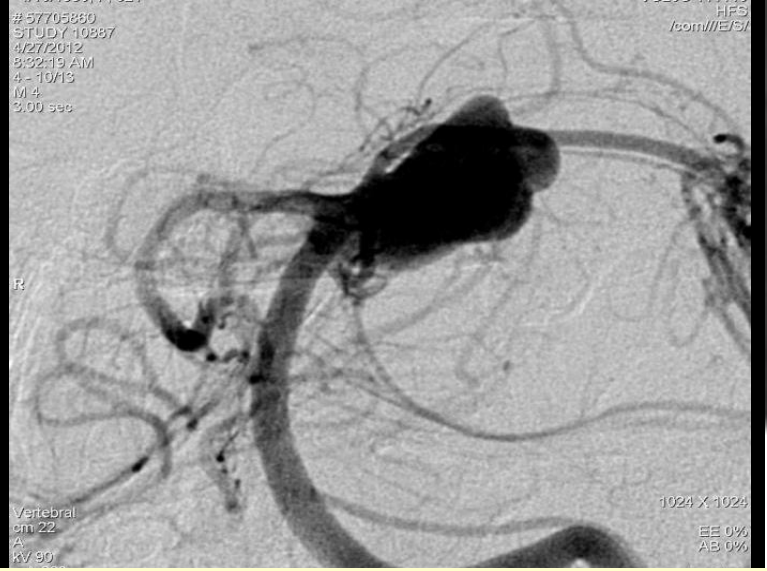




2 years CTA

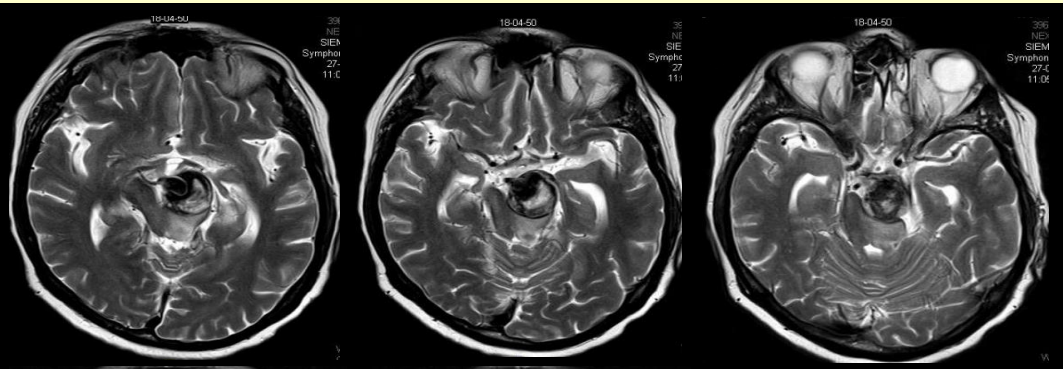

kv 140
mA 535
Rot 0.40s/HE• 20.6mm/rot
0.6mm 0.516:1/0.4sp 0.4 MIP
Tilt: 0.0



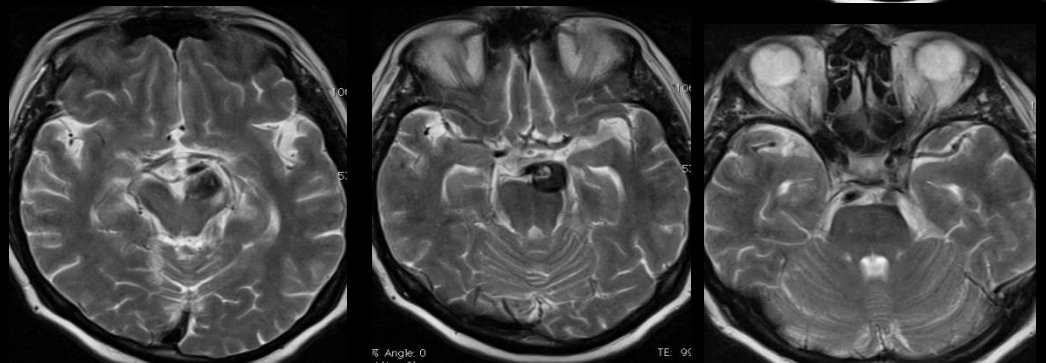


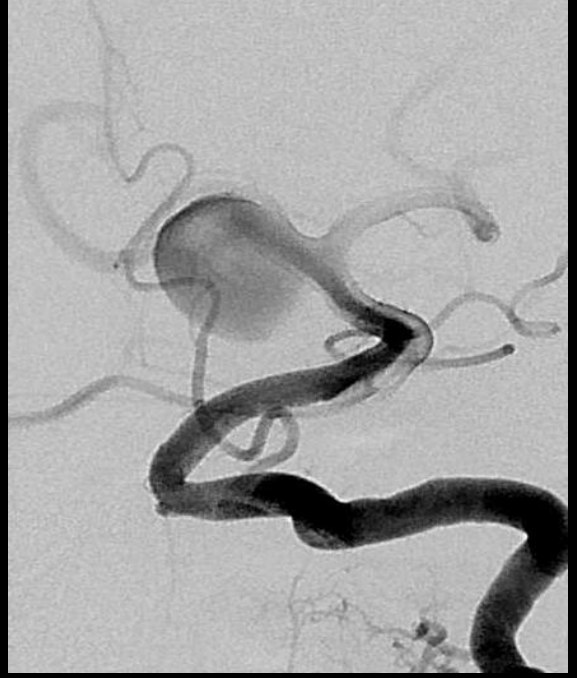
- ***The flow modification causing remodelling of the aneurysm sac should not always end with perfect reconstruction..The target of the treatment here is to reduce mass effect …..***

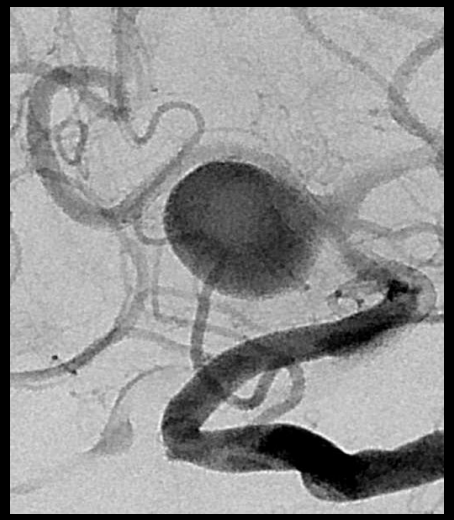
PRE TREATMENT MR

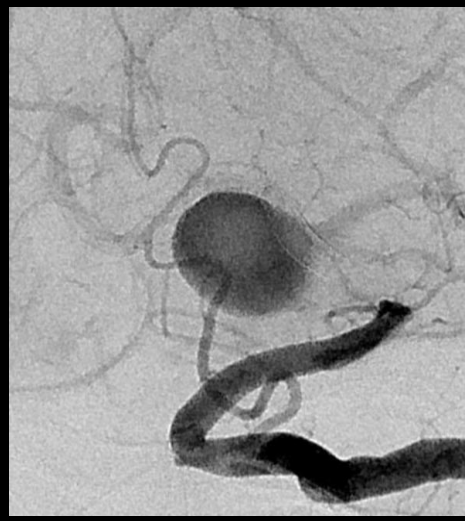


POST TREATMENT
9 months control MR revealing shrunken aneurysm w resolved edema

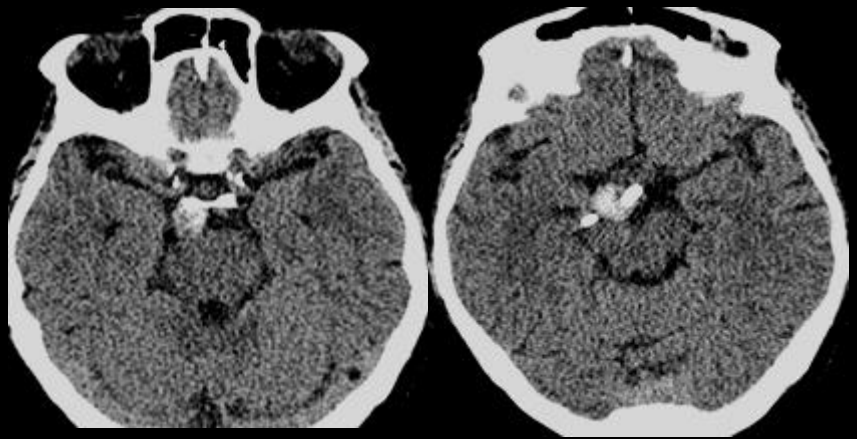




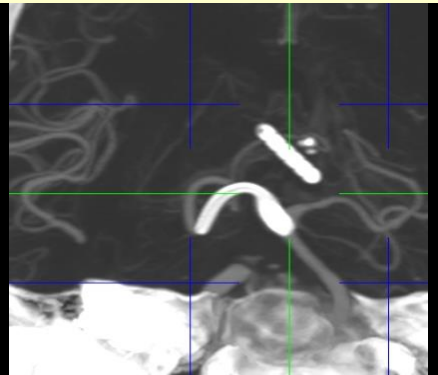


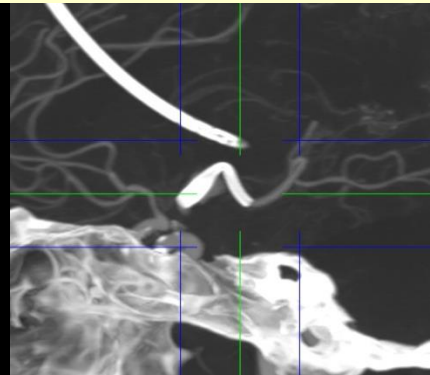


Post op 7th day , severe headache

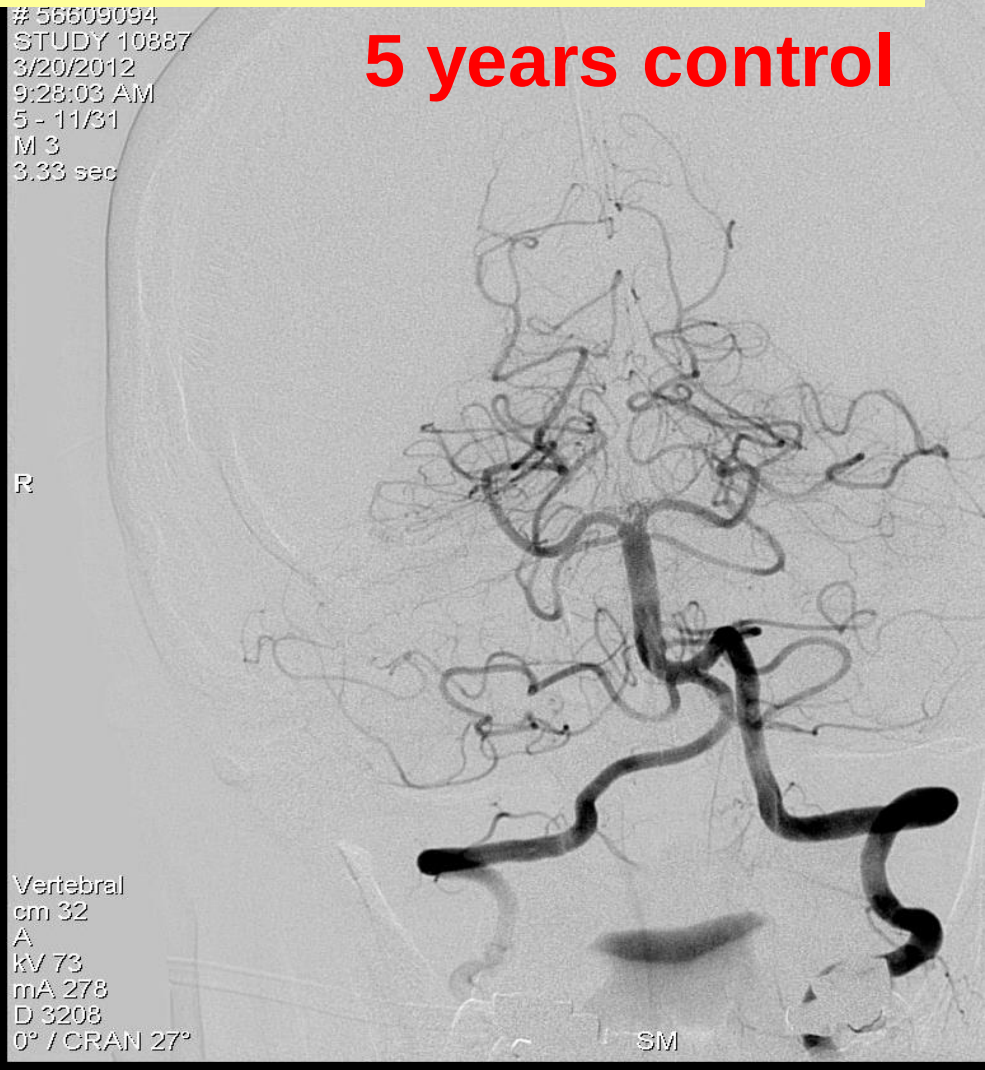


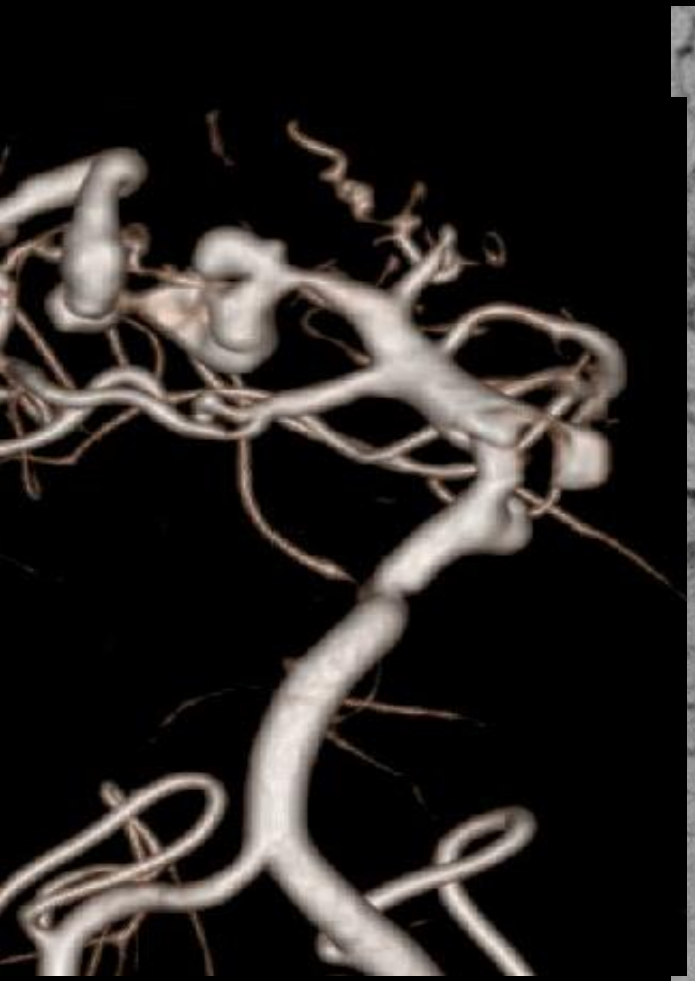
Post op 10 th day , she had a severe SAH and then died…

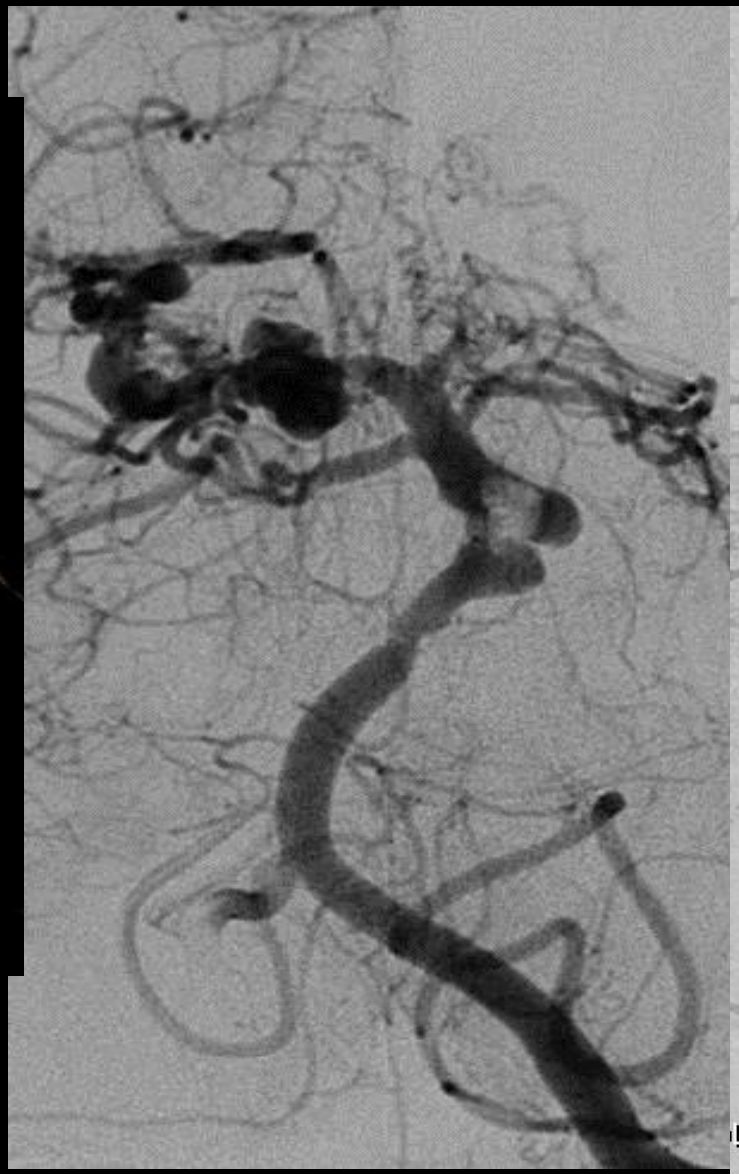




WE CONSİDER THAT TELESCOPIC STENTING IS A VERY SERİOUS TX ALTERNATIVE IN MID/UPPER BASILAR TRUNK ANEURYSMS TO GET AWAY FROM ISCHEMIC EVENTS OR EVEN FOR EALY SAH….








2 YEARS CONTROL

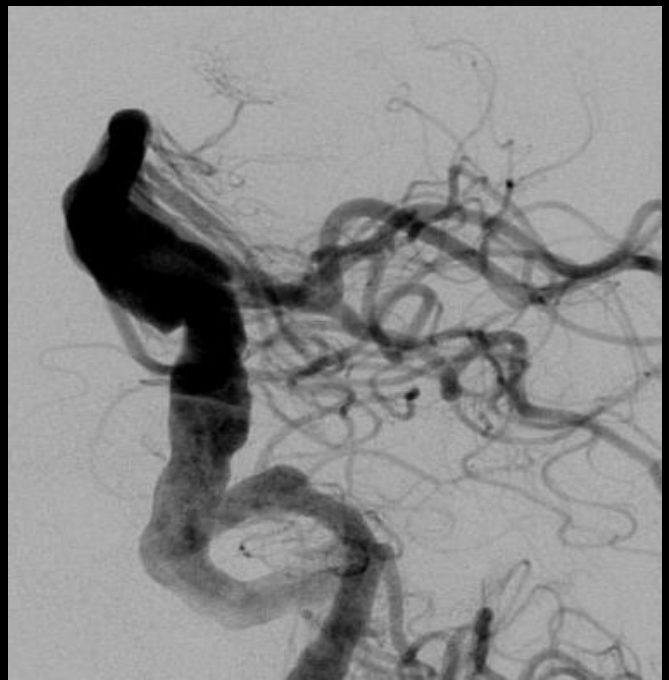
Clinical results of 54 aneurysms treated w telescopic stenting

- *16.6% Morbi-Mortality*
- *In 8 pts Mortality (all but one were giant fusiform VB aneurysms) , developed not during the post op period , in 5 at the first 4 weeks , in other two at the first 12 weeks.*
- *In 1 pt procedural neurologic morbidity due to technical complication resulted in mRS 1 (SAH due to distal stent wire perforation).*
- **No perforating artery injury in post circ aneurysms.**
- **No immediate post op mortality due to procedure**
- **No early or late SAH**

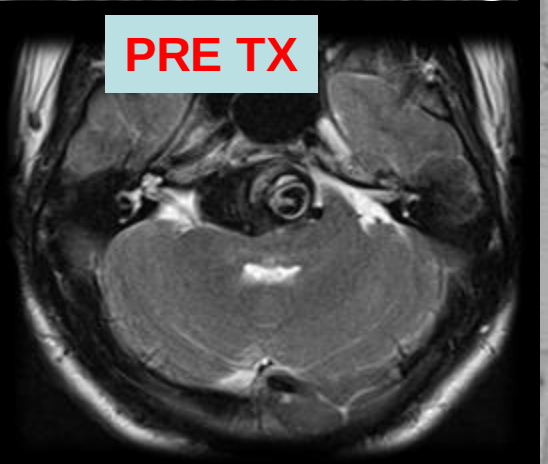
- **In 42/52 aneurysms/pts, complete aneurysm occlusion w complete PA reconstruction (76%)**
- **In 8 aneurysms/pts, partial aneurysm occlusion w incomplete PA reconstruction.**
- **In 1 aneurysm (giant petrocav ICA) tx w LEO-SOLITARIE ,no change was seen..had to be coiled**
- **In 1 aneurysm (midbaz) tx w telesc LEO stents, asymptomatic PAO developed**

55 yo male with severe headache and diplopia/R 6th nerve palsy and slight paresis

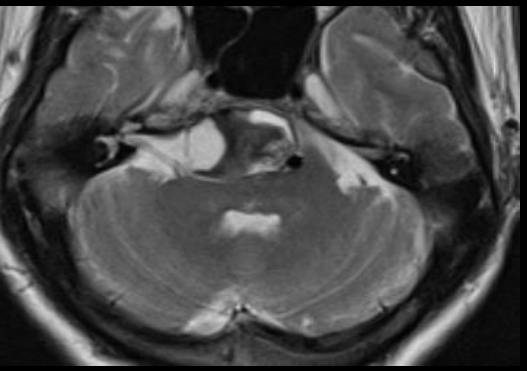
6 months control

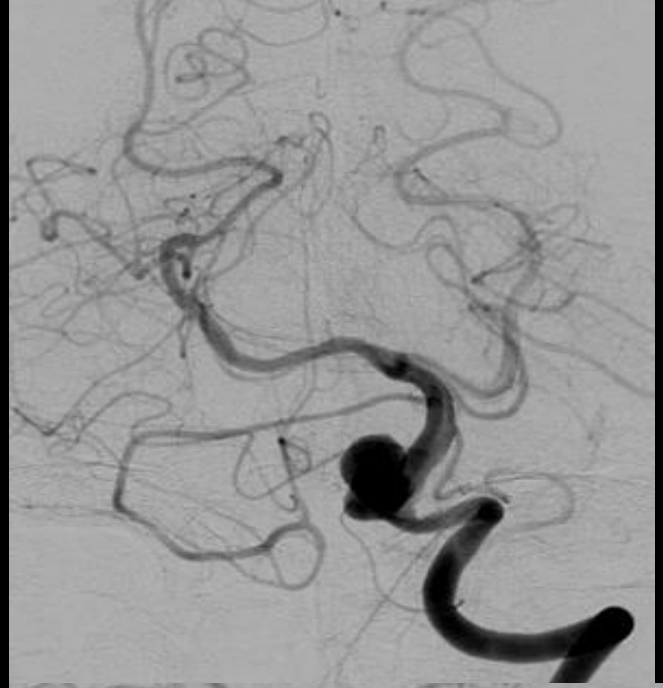


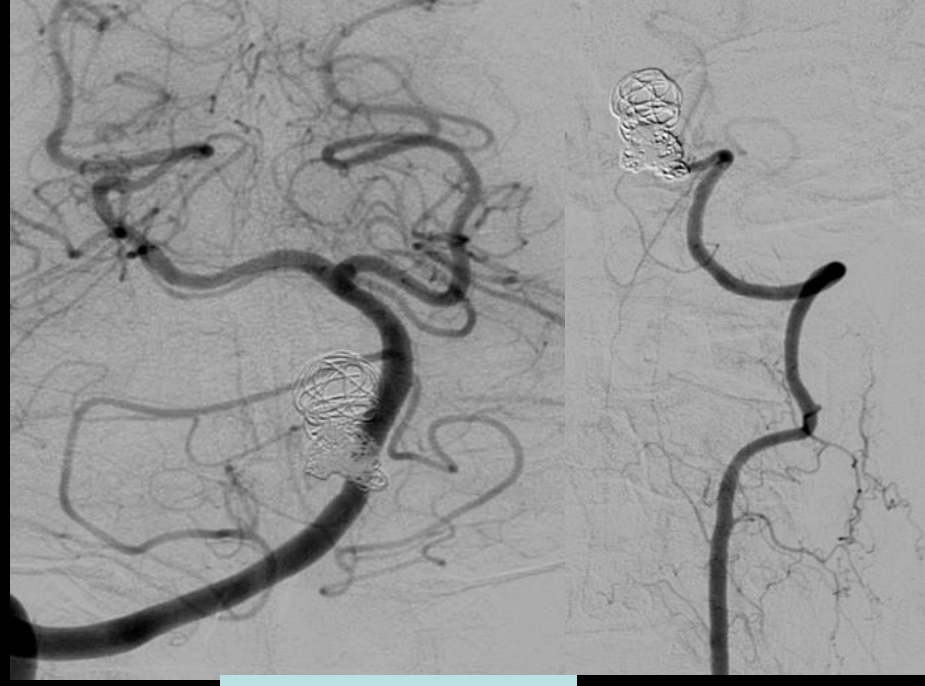
PRE TX



1 YEAR CONTROL

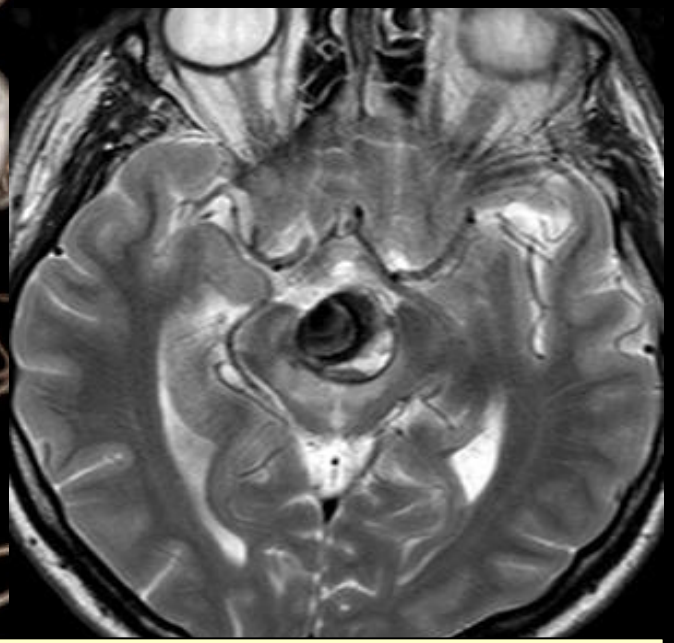


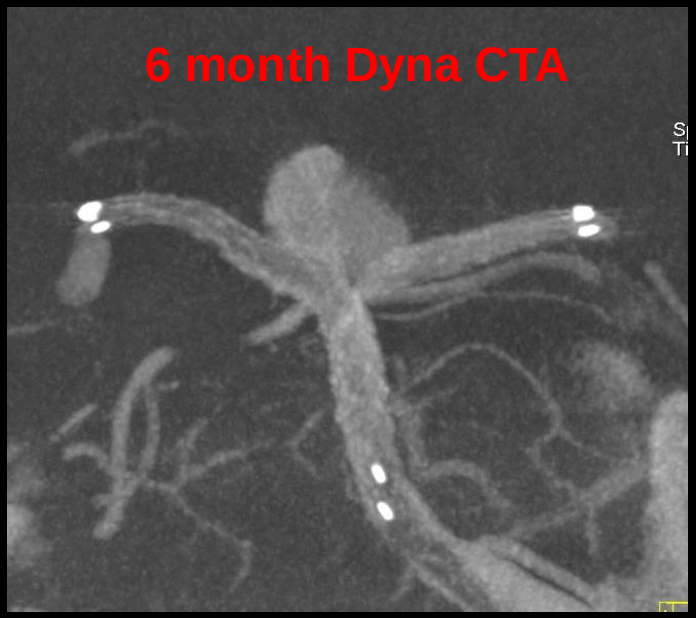




1 year control

- *Homemade Flow diversion for specific settings using stents (Y stent flow diversion)*



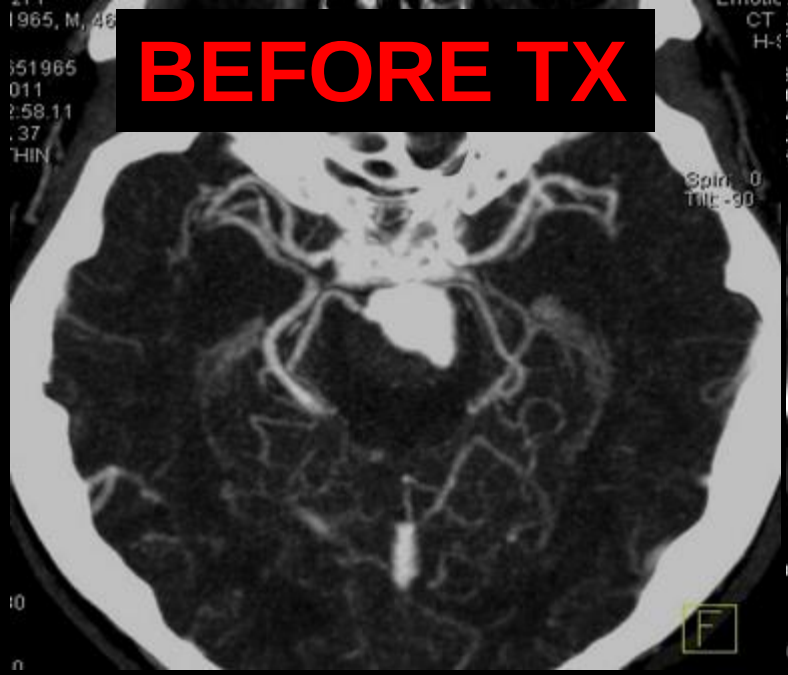


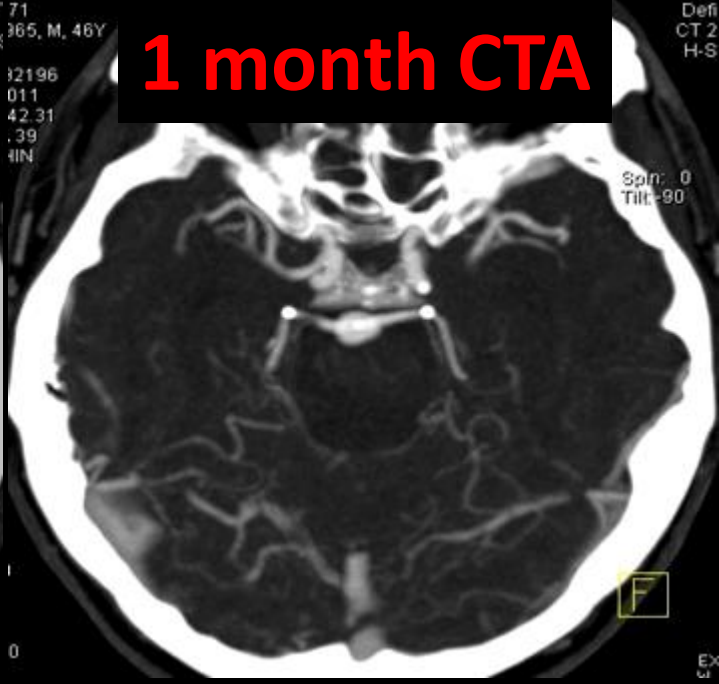
SHRINKED / REMODELLED ANEURYSM W Y STENT FLOW DIVERSION

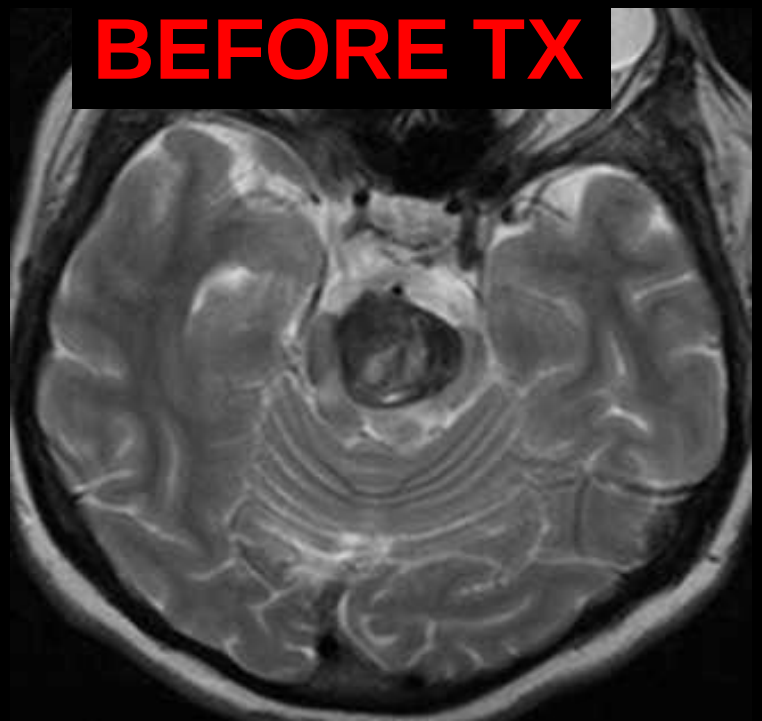
.

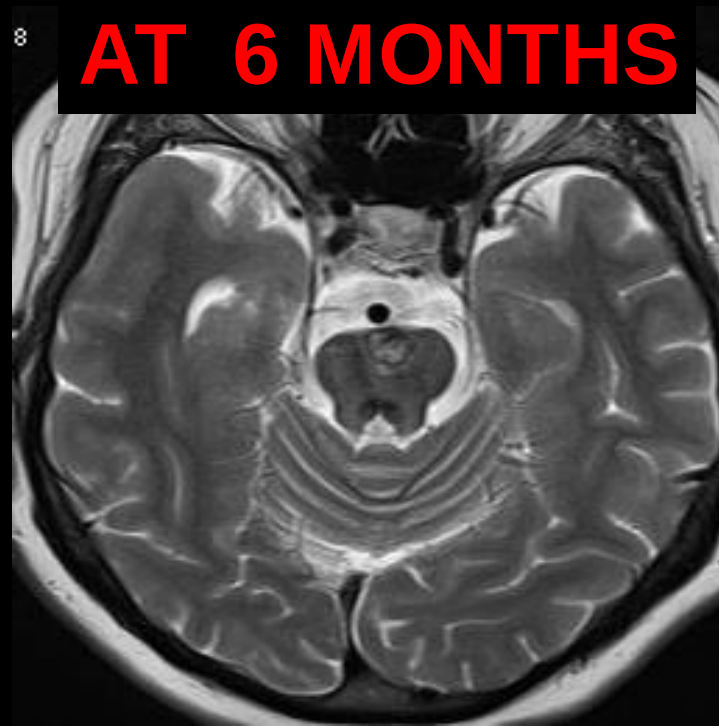
A novel "Y" stent flow diversion technique for the endovascular treatment of bifurcation aneurysms without endosaccular coiling.
Cekirge HS, Yavuz K, Geyik S, Saatci I.
AJNR Am J Neuroradiol 201 Aug;32(7):1262-8


6 month Dyna CTA


BEFORE TX


1 month CTA

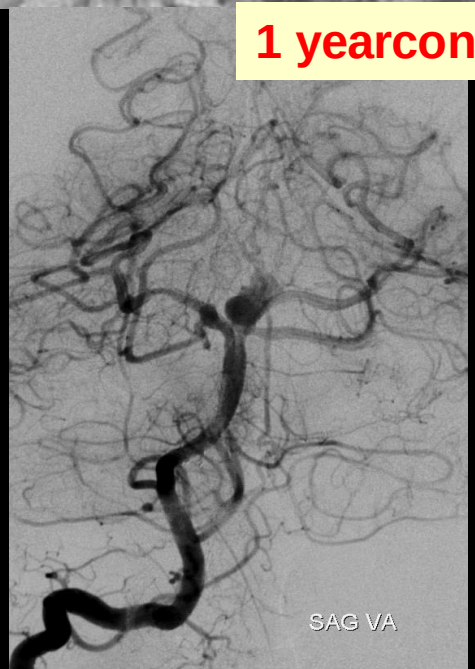

BEFORE TX

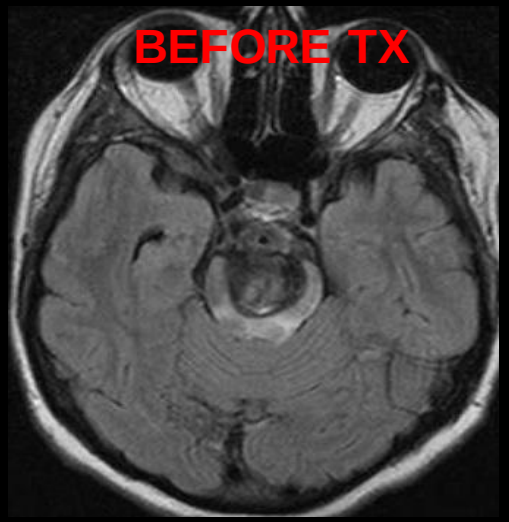

AT 6 MONTHS

Post op DYNA CTA

1 month CTA

1 yearcontrol



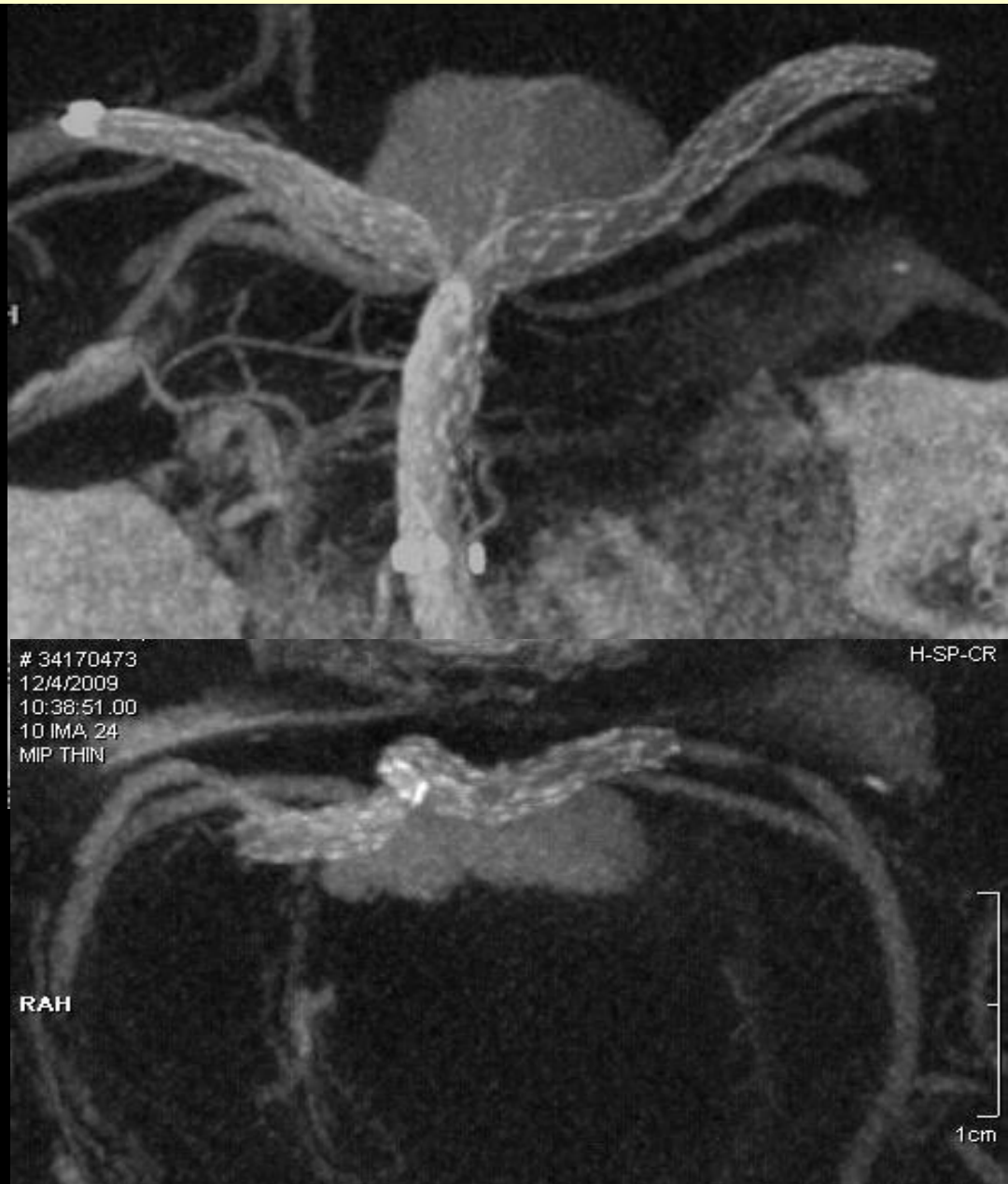


BEFORE TX

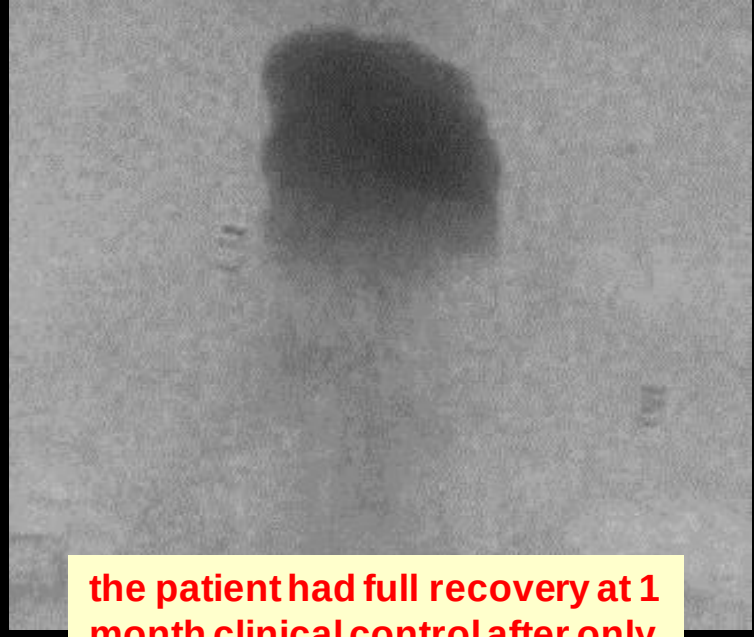
AT TWO YEAR

44 yo female with severe headache and lethargy

6 weeks later, she had full recovery and is intact neurologically




3 years control



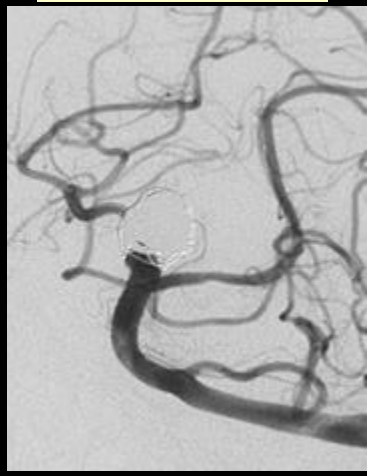
the patient had full recovery at 1 month clinical control after only Y stent flow diversion

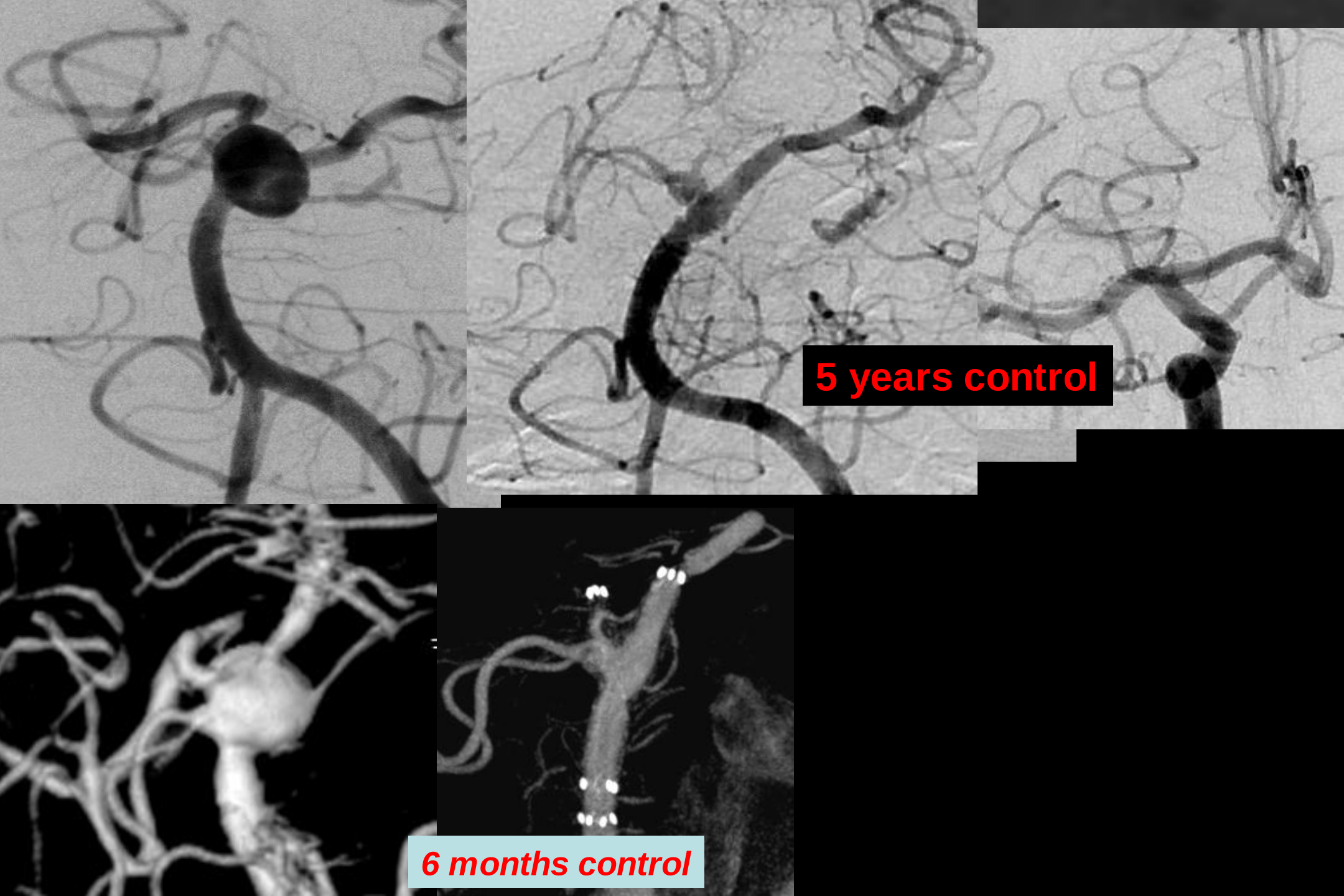
46 yo female with severe headache, lethargy, hemiparesis and facial palsy

3 months control

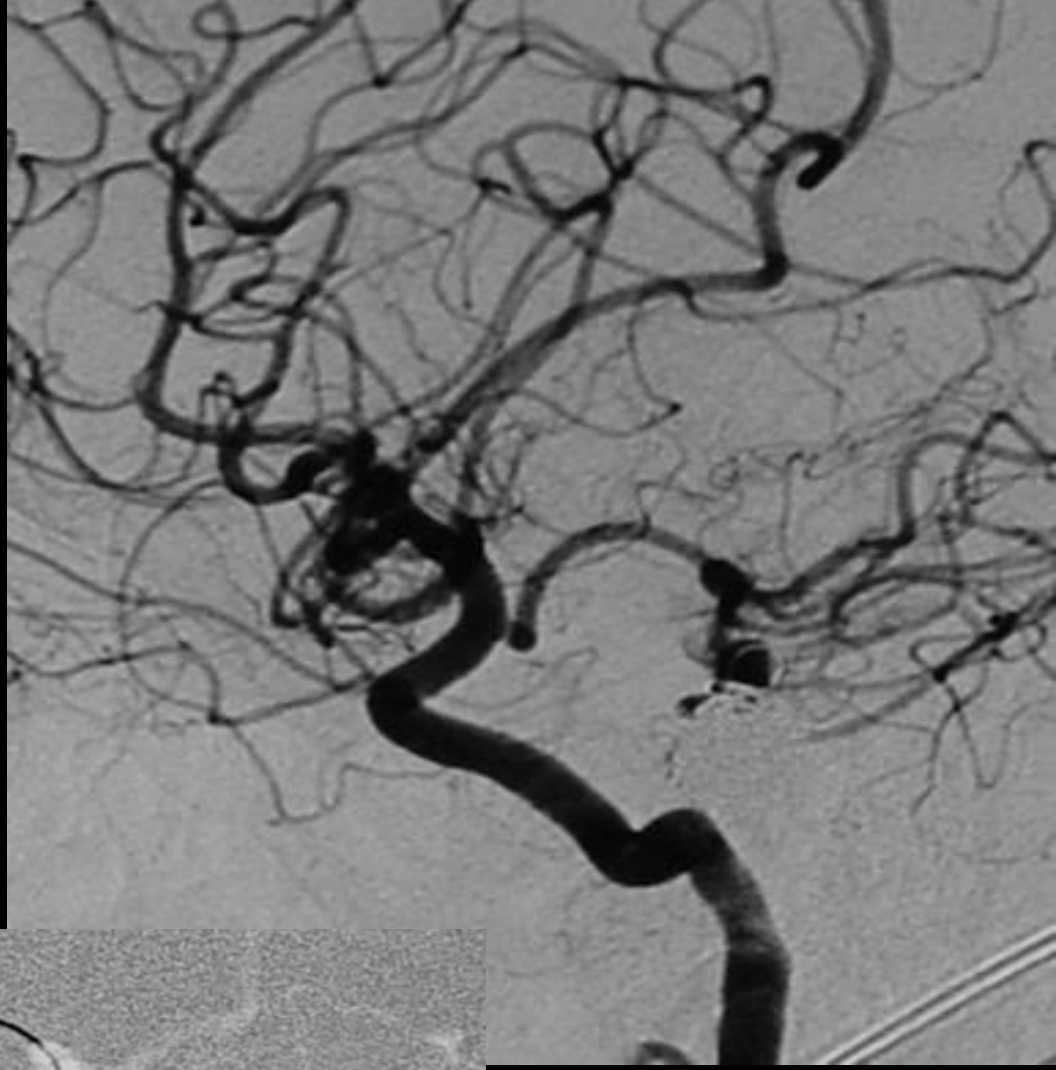
Than coiling

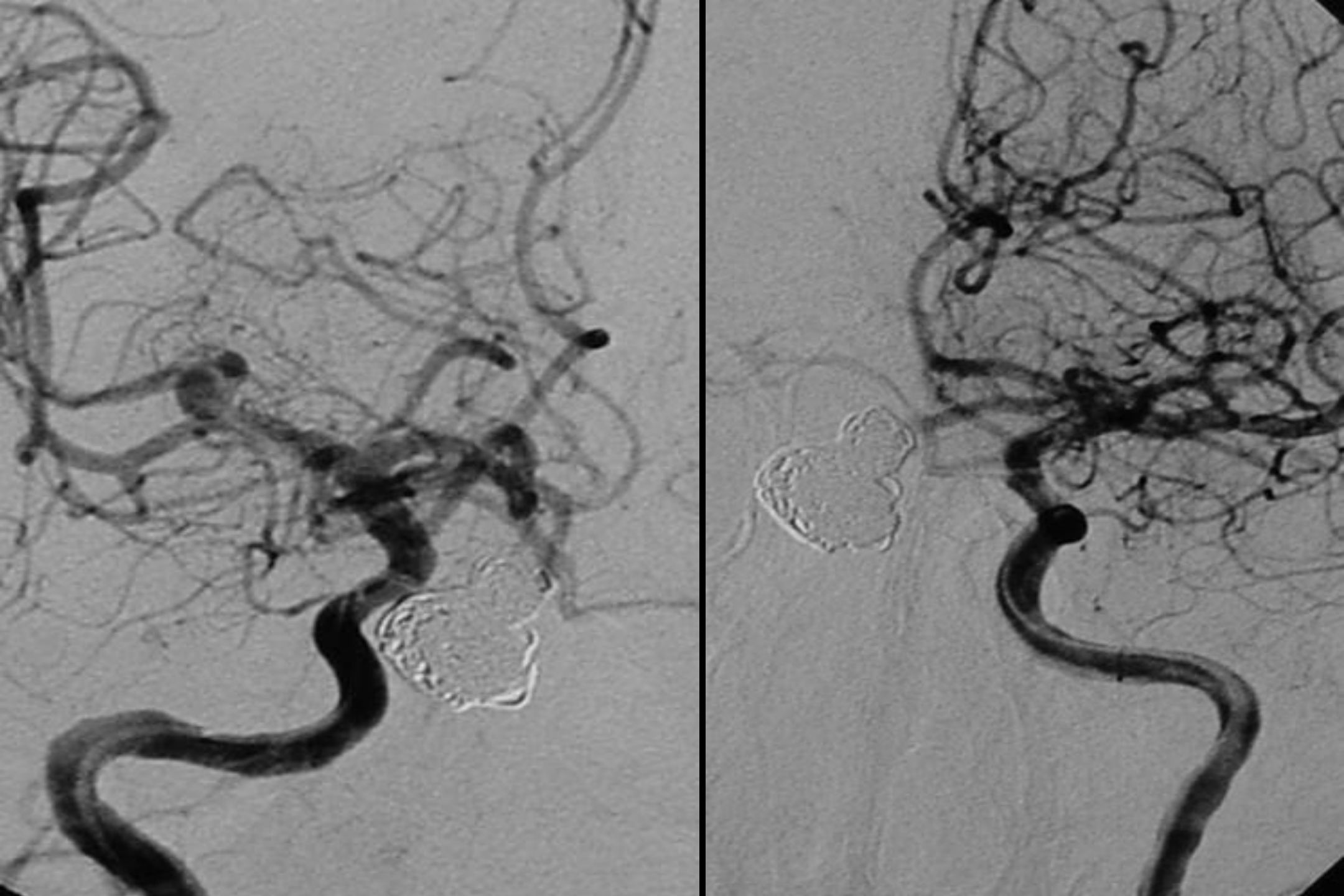
2 years cont



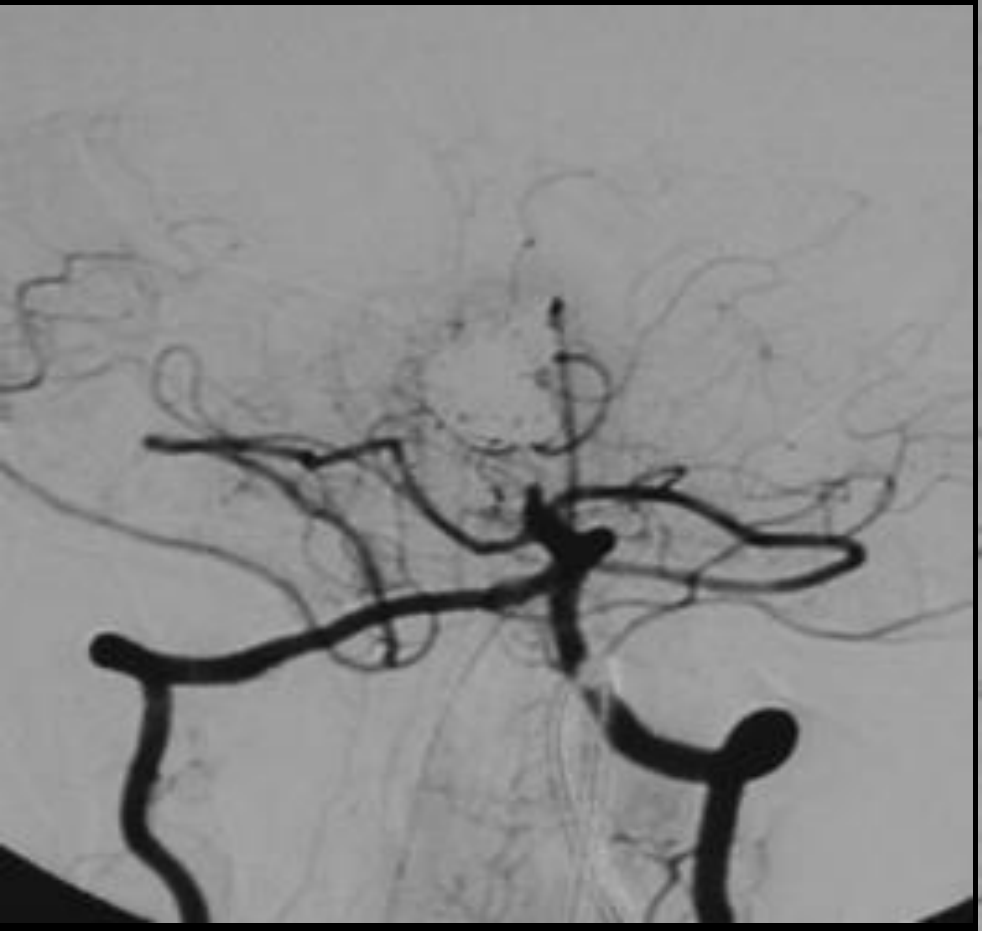

5 years control
6 months control

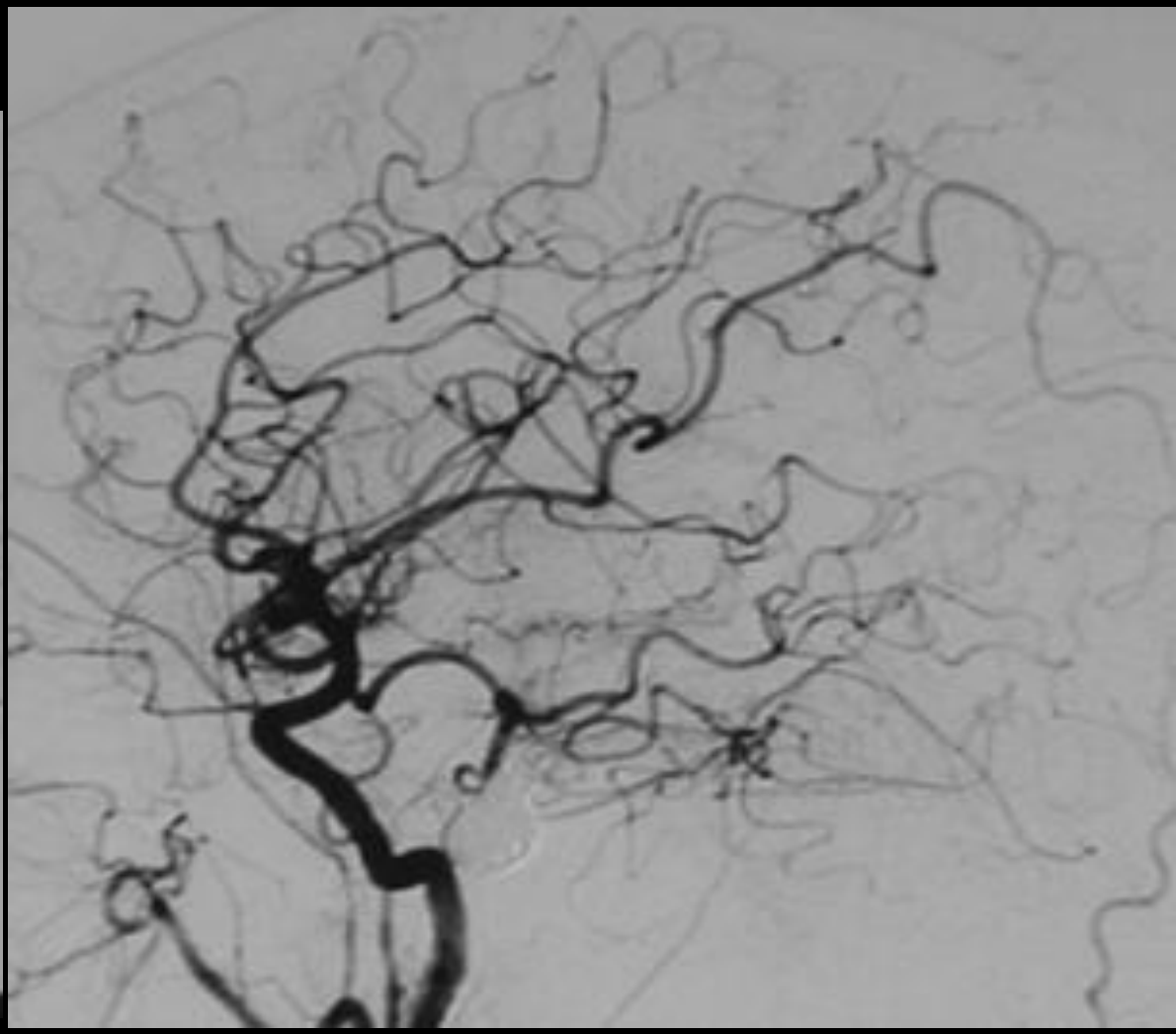
PARENT ARTERY OCCLUSION

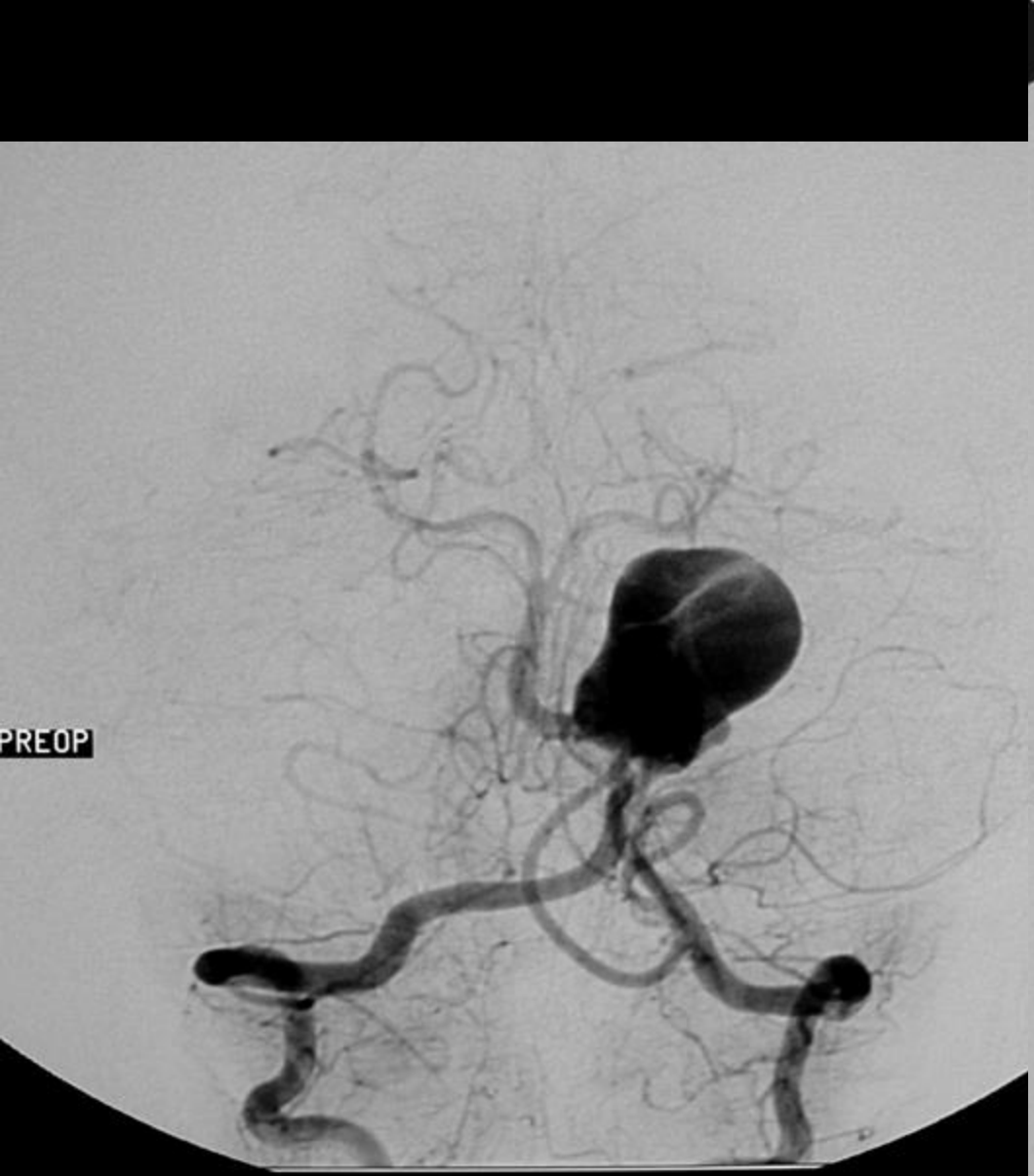



6 ay kontrol



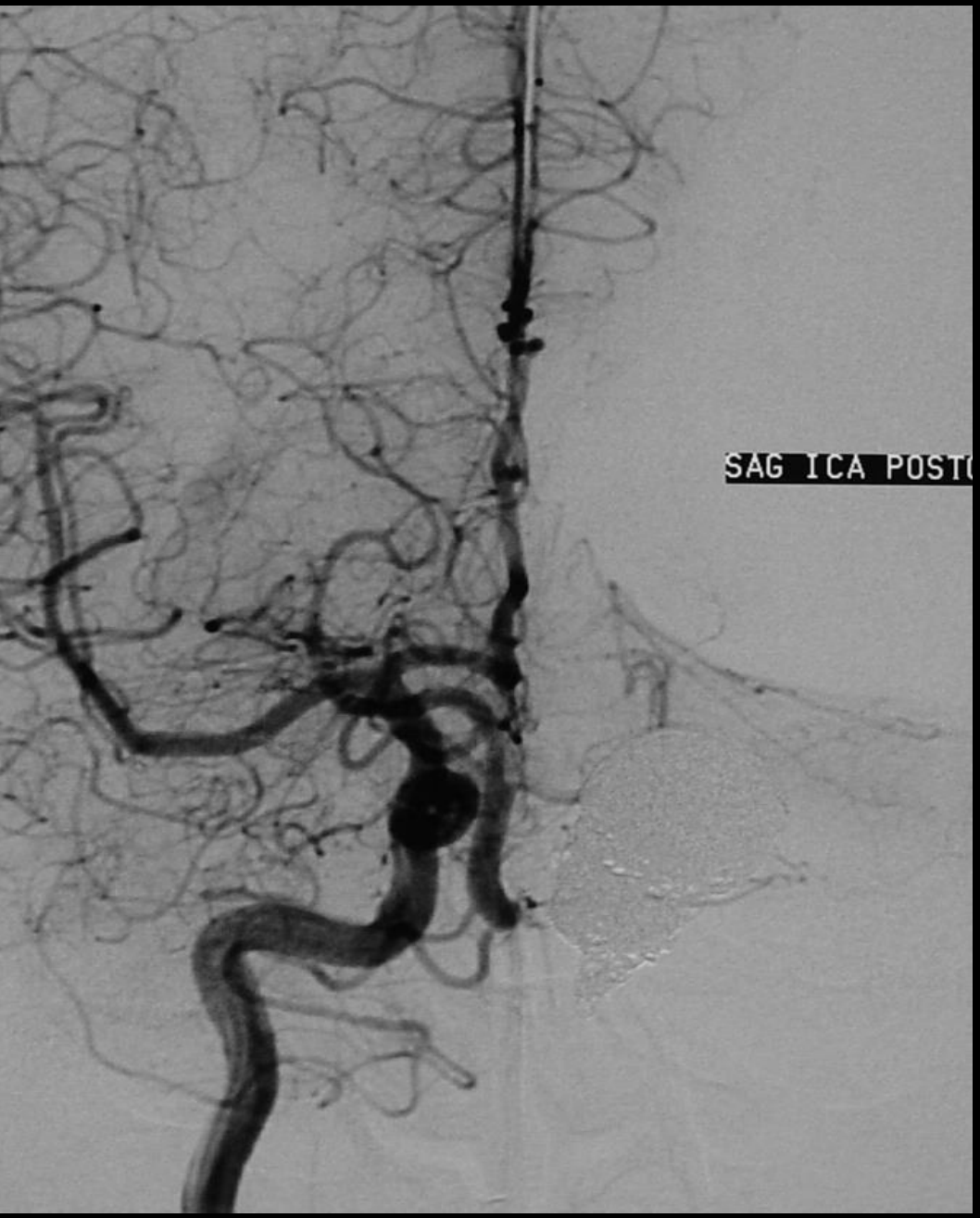



PREOP

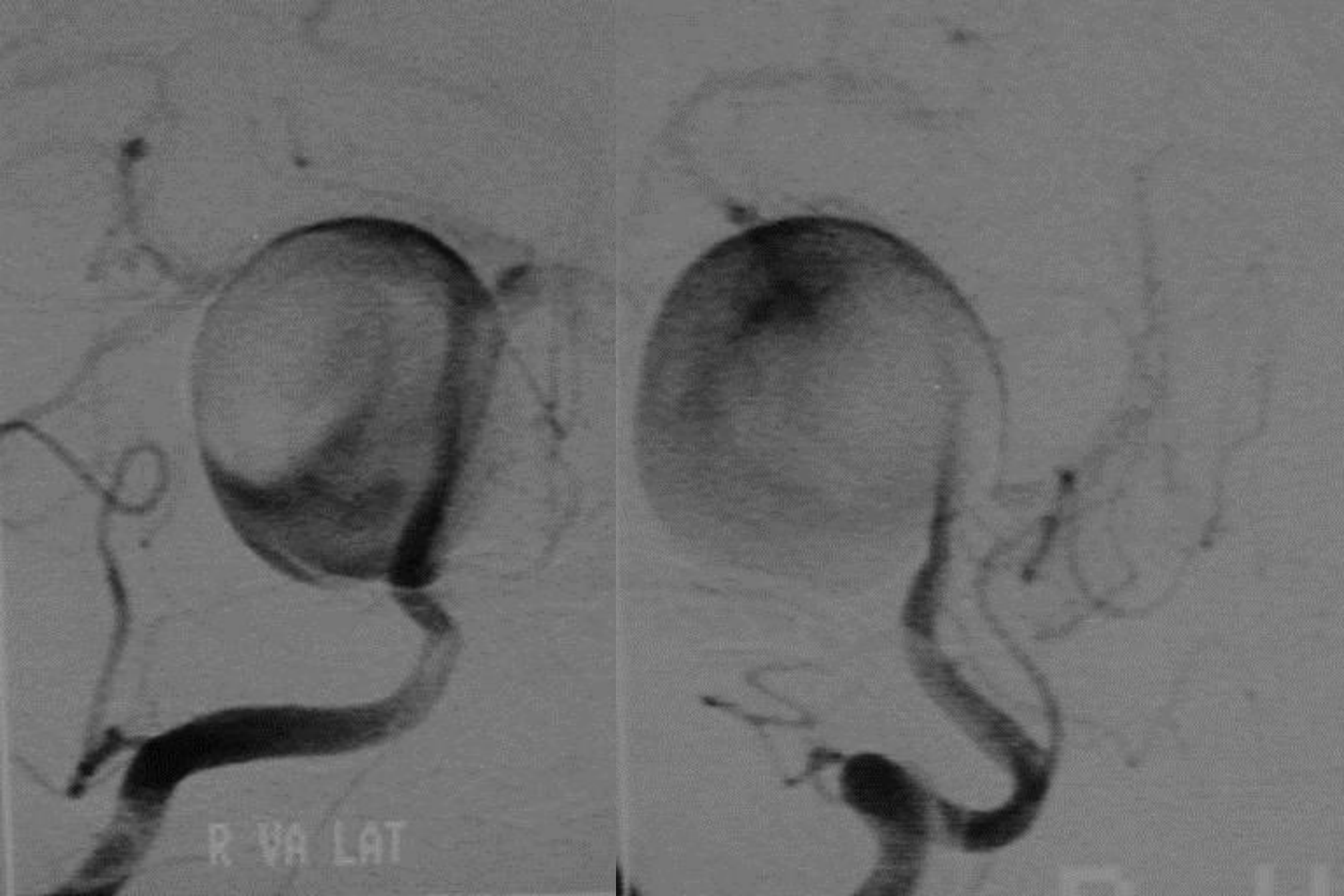

PREOP

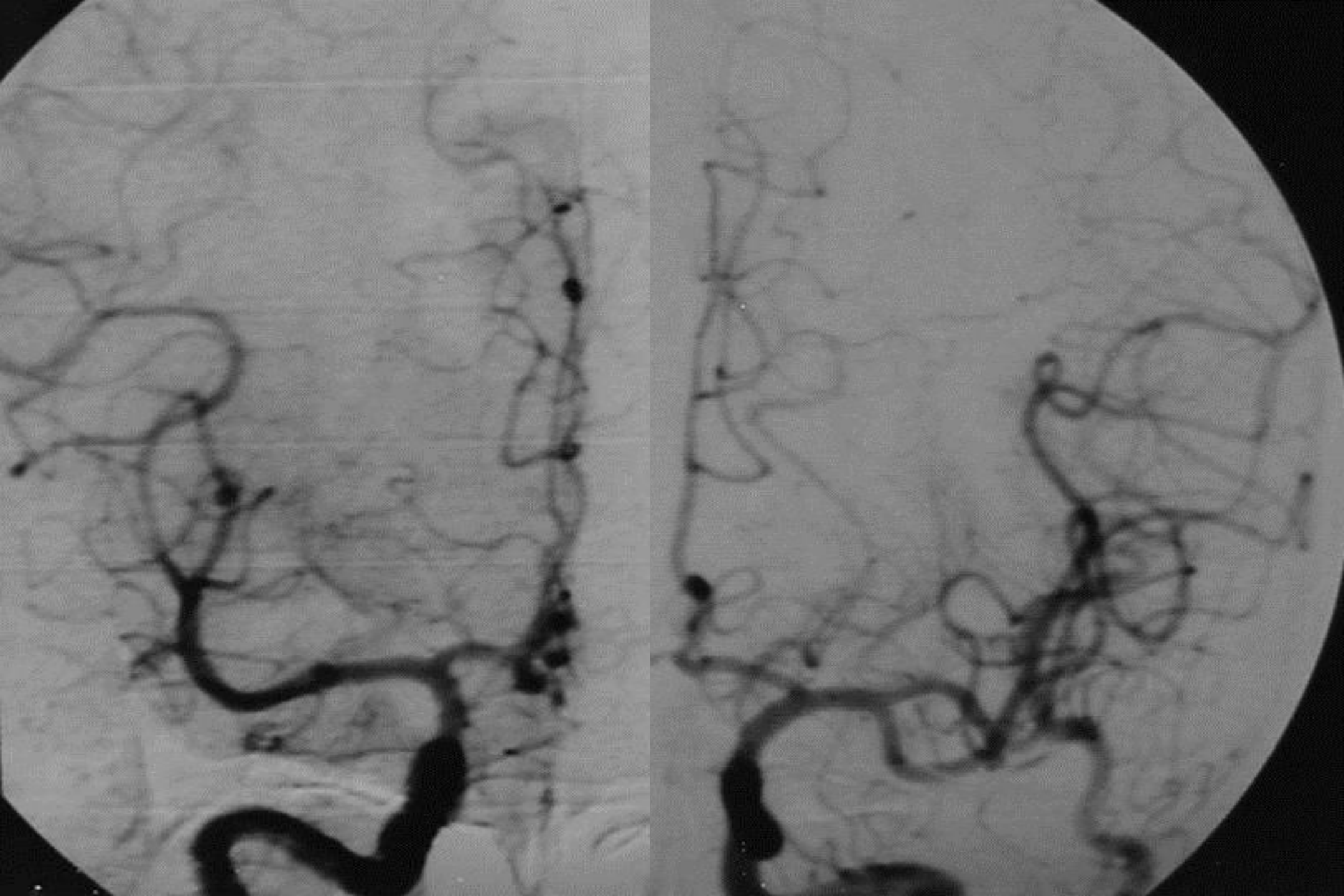

POSTOP

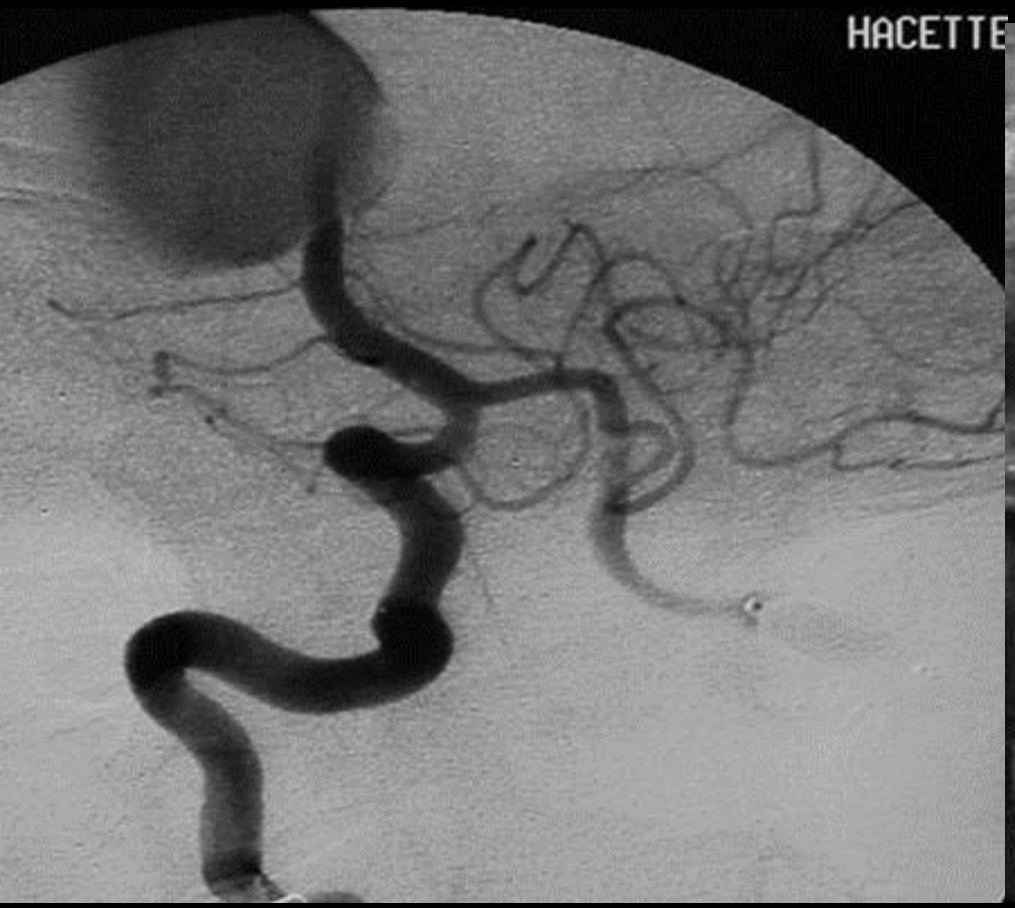

POSTOP
LAO: 1


SAG ICA POST

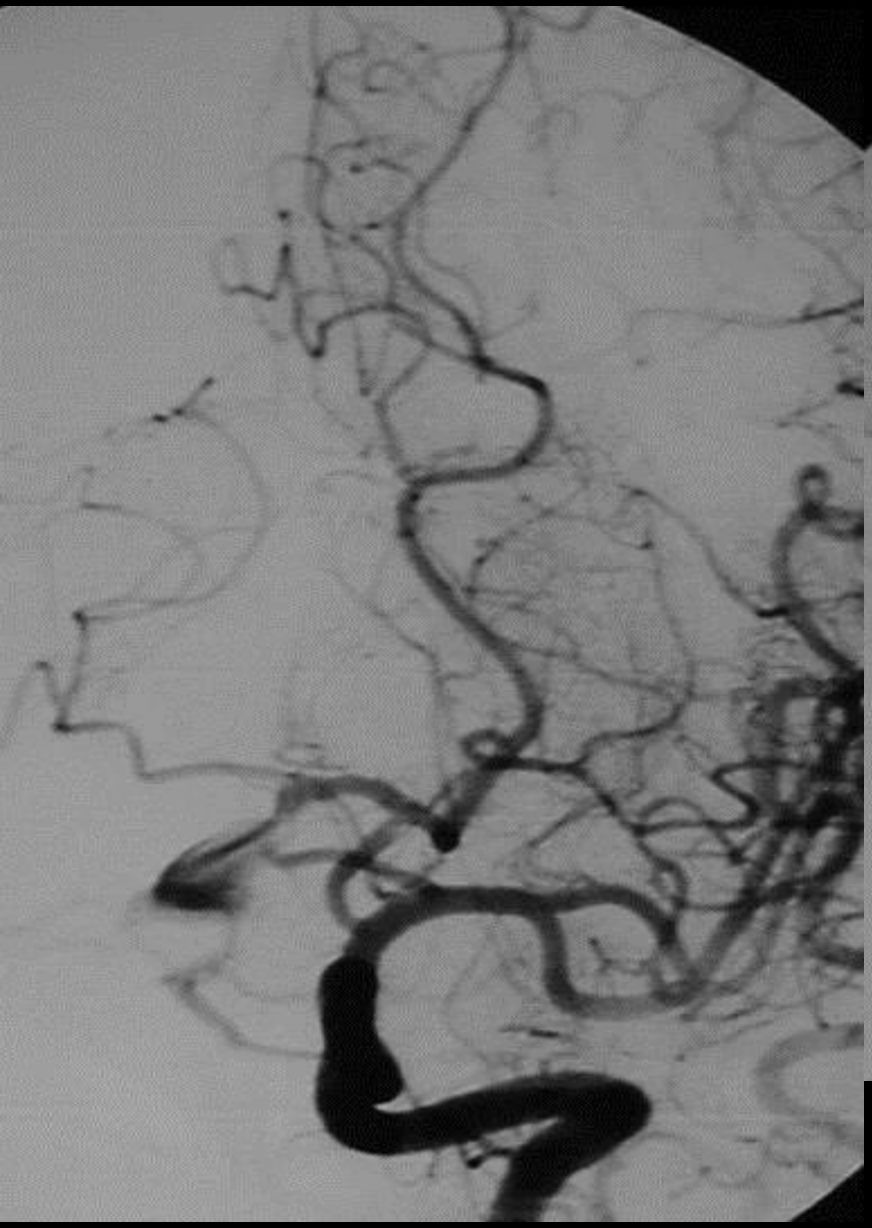

CA POSTOP


R VA LAT

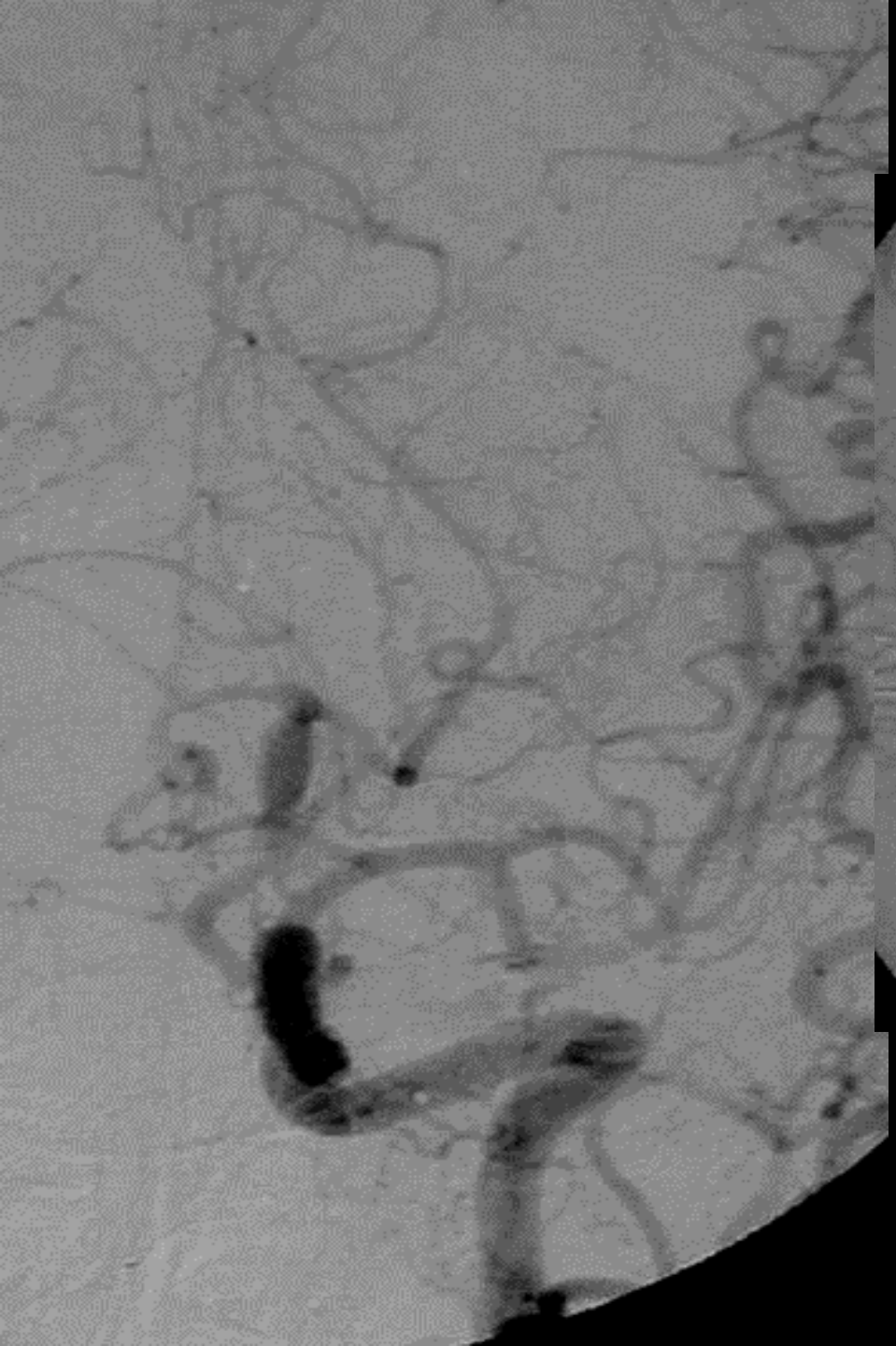


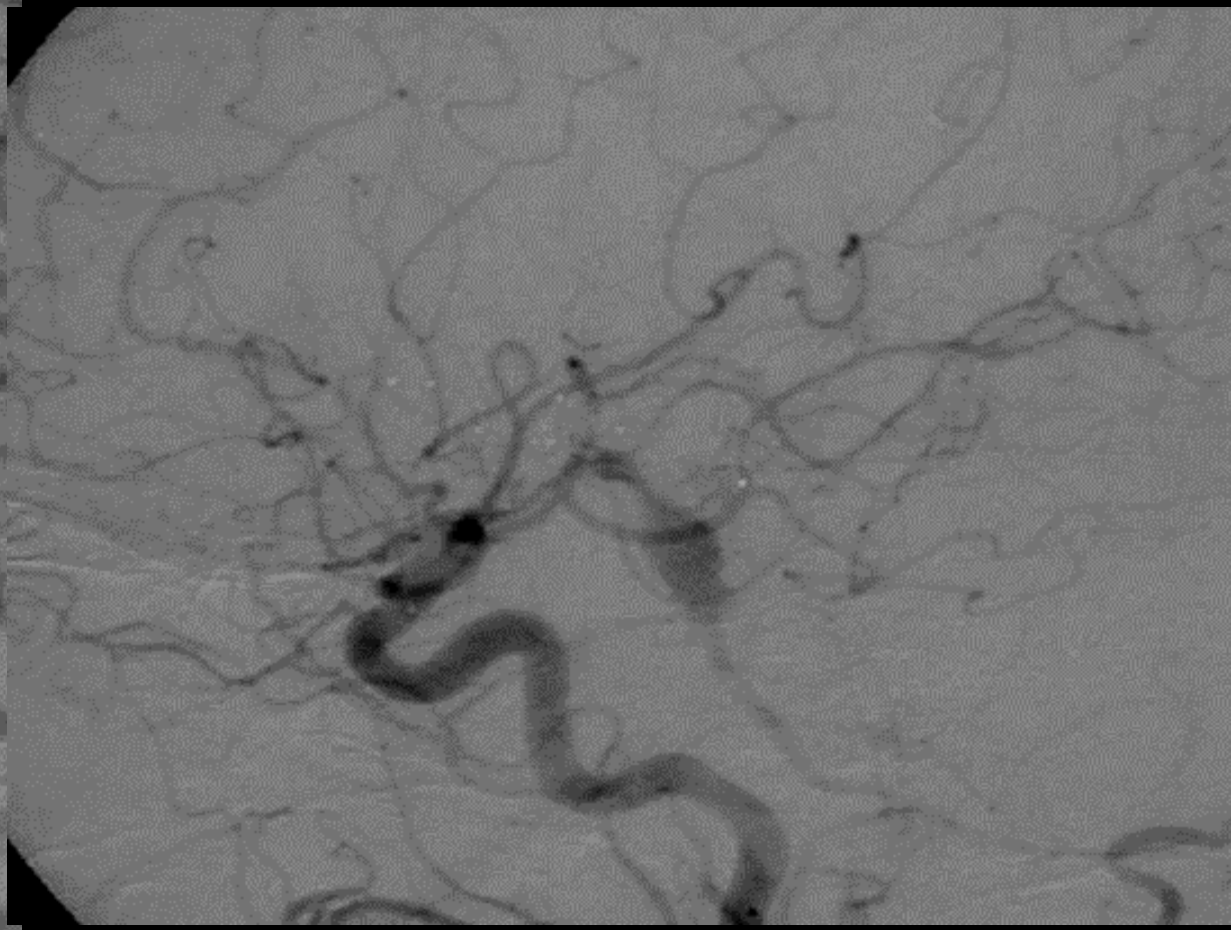

HACETTE


bicar inj



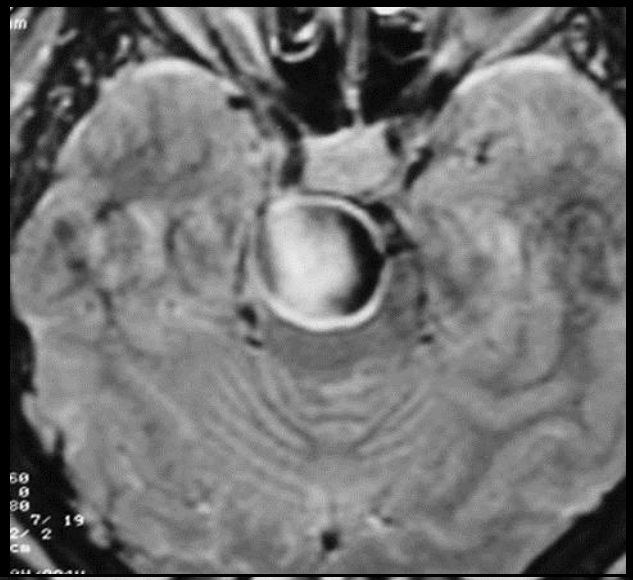
6 month control

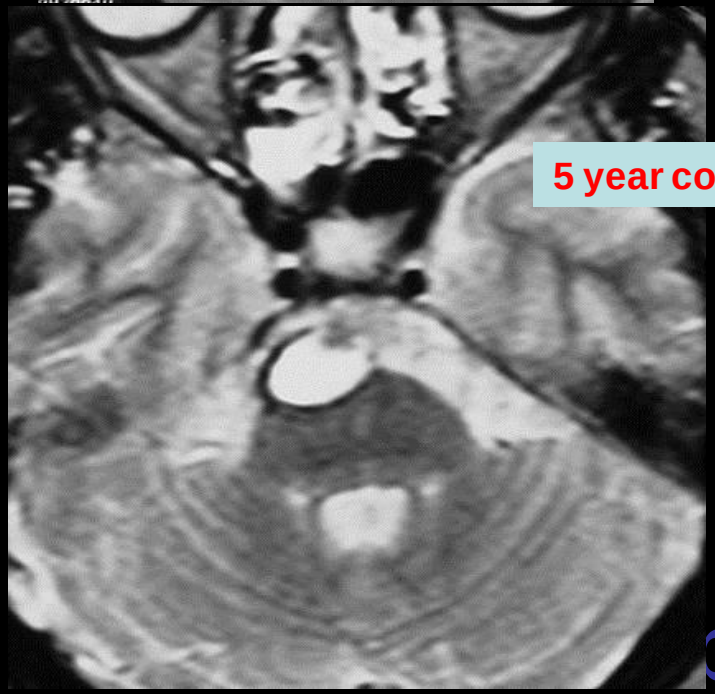




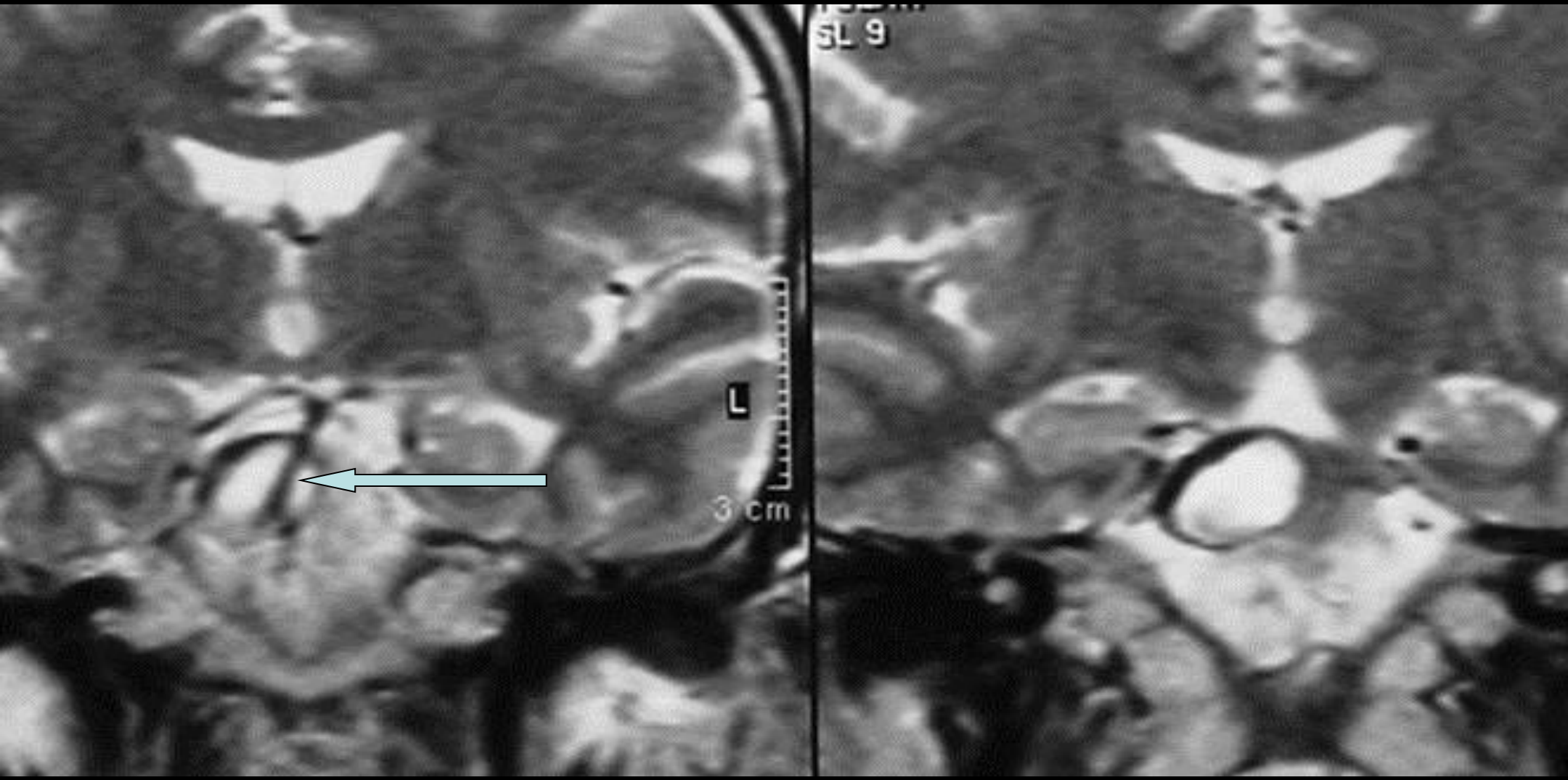
18th month control

3 year control

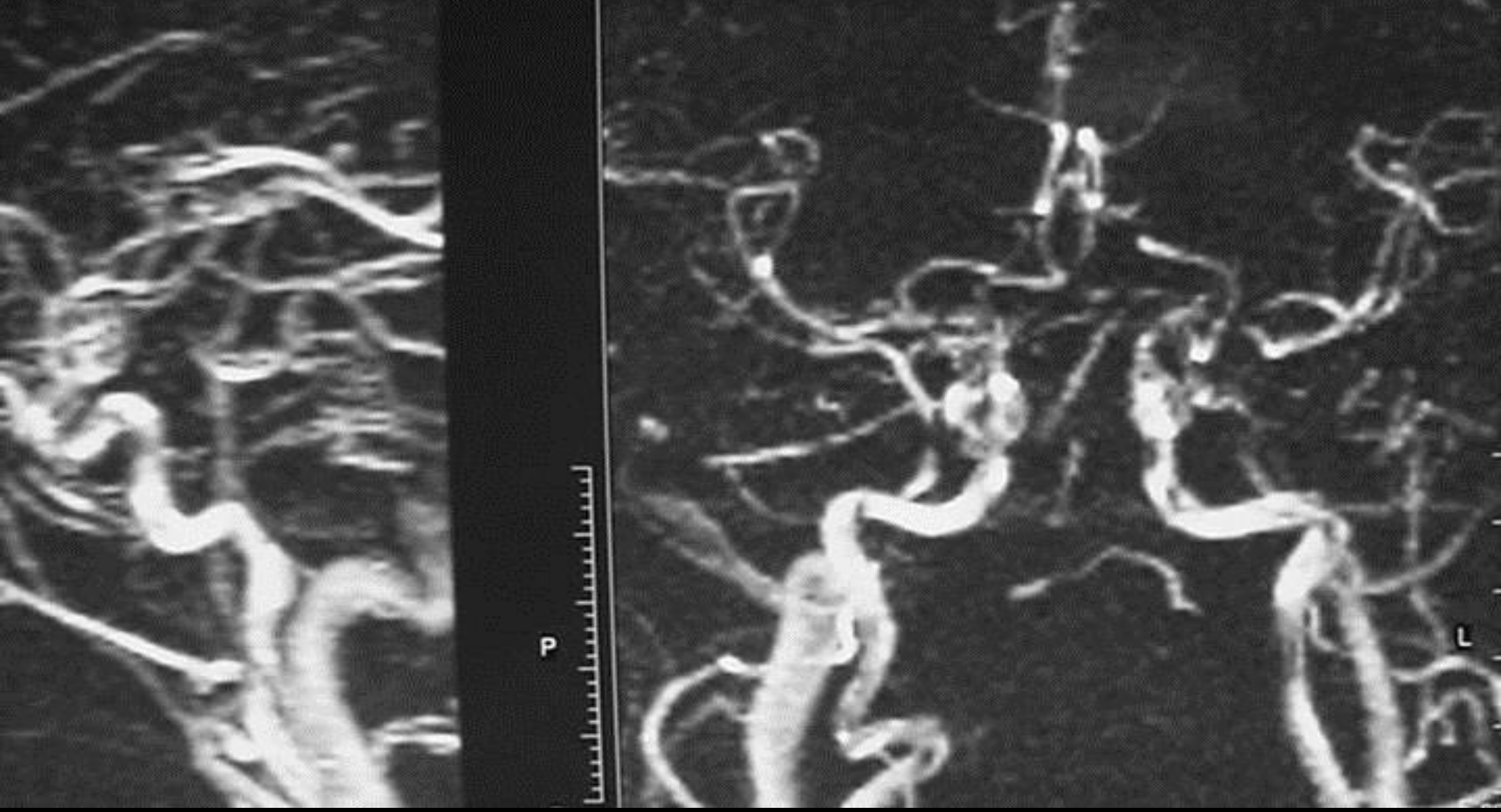




5 year control MR



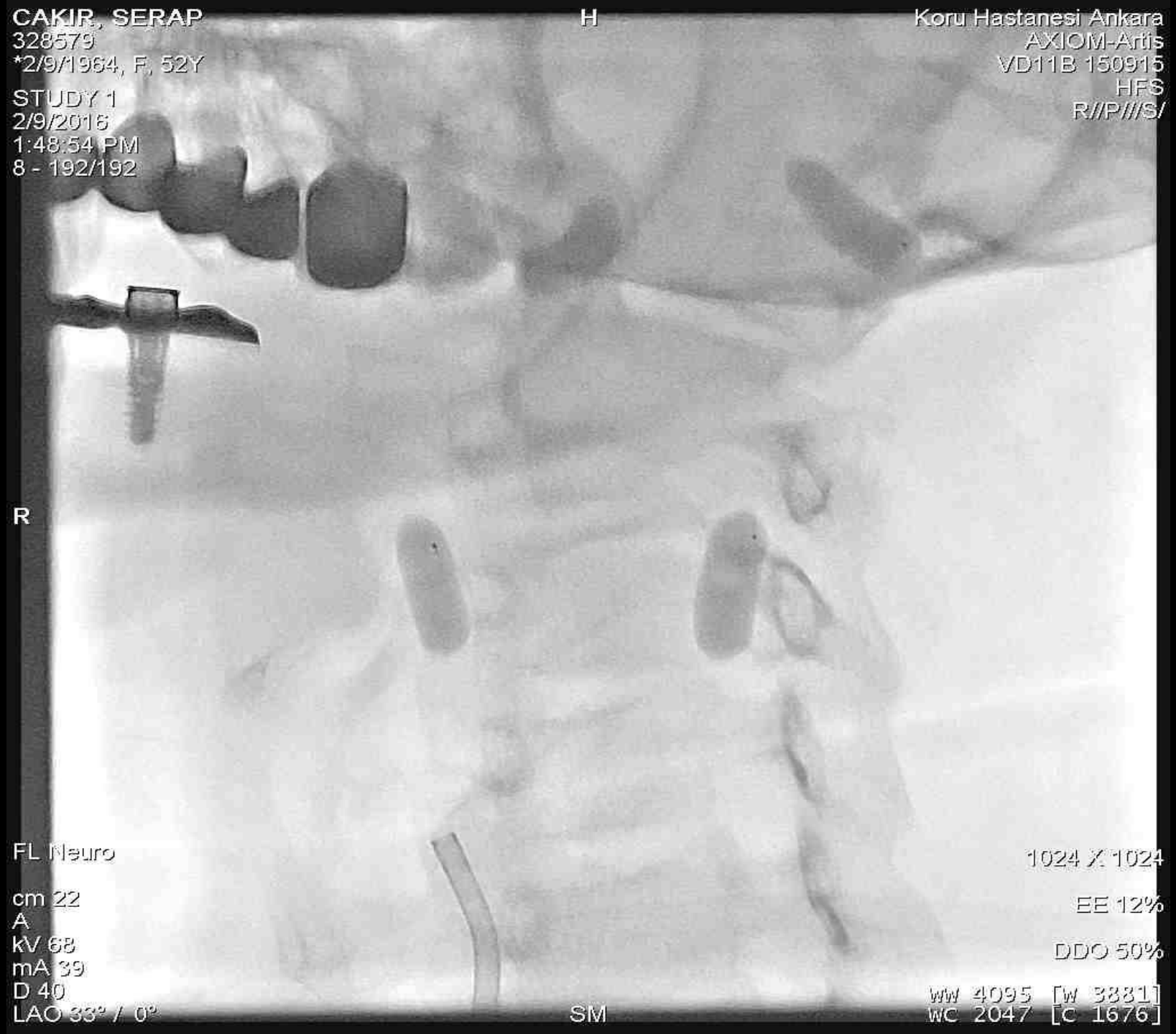
5 year control MR



5 year control MRA


3.92 sec
R
Carotid
cm 42
A
kV 74
mA 155
D 3403
0° / CRAN 21°
SM
1024 X 1024
EE 0%
AB 0%
x/y 0.0/0.0
WC 4095 [W 4095]
WB 2047 [C 2047]


M 1
4.57 sec
A
Carotid
cm 42
B
kV 69
1024 X 1024
EE 0%
AB 0%


CAKIR, SERAP
328579
*2/9/1964, F, 52Y
STUDY 1
2/9/2016
1:48:54 PM
8 - 192/192
H
Koru Hastanesi Ankara
AXIOM-Artis
VD11B 150915
HFS
R//P///S/
R
FL Neuro
cm 22
A
kV 68
mA 39
D 40
LAO 33° / 0°
SM
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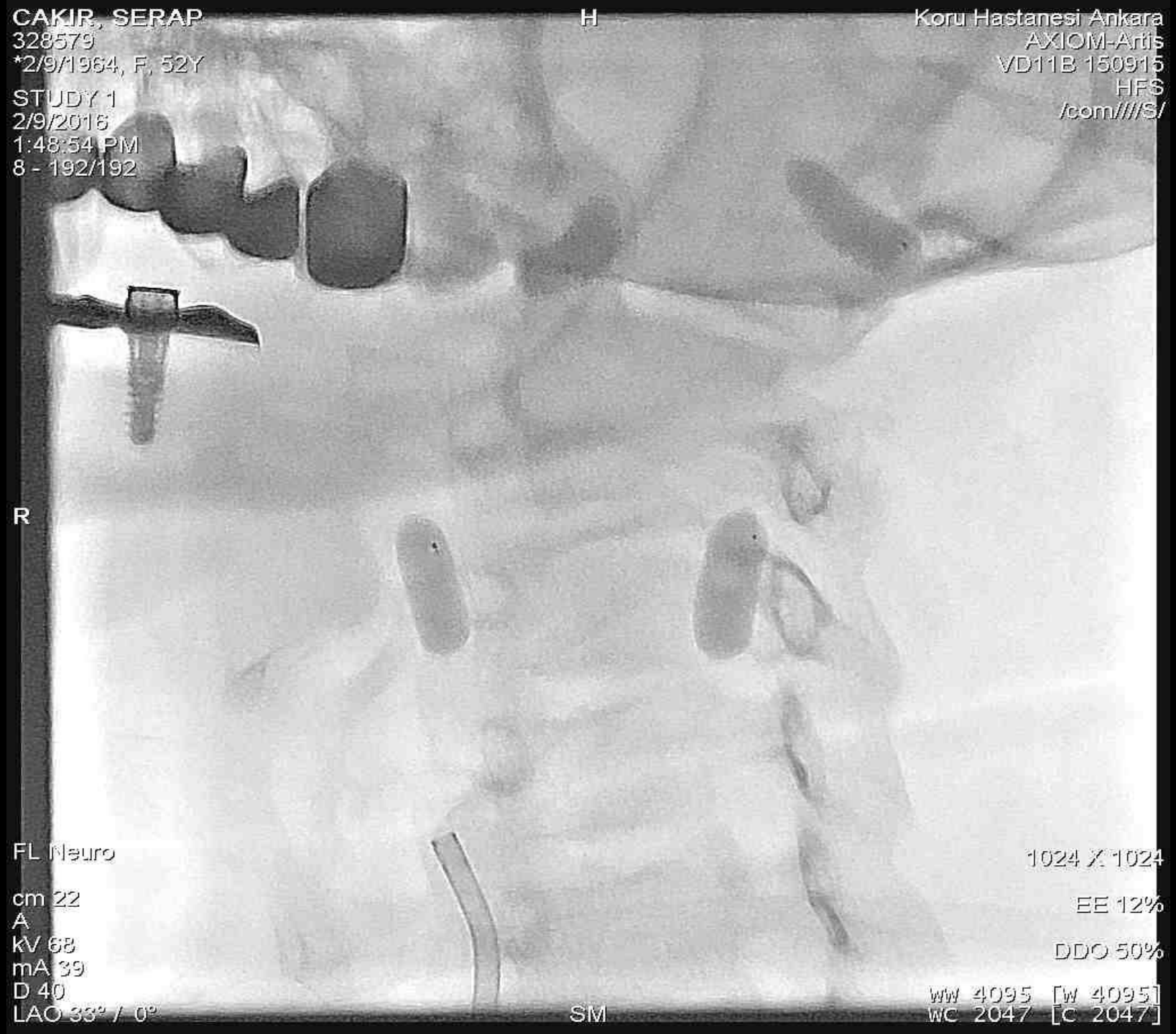
DDO 50%
ww 4095 [w 3881]
wc 2047 [c 1676]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VD11B 150915
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FL Neuro
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mA 39
D 40
LAO 33° / 0°
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1024 X 1024
EE 12%
DDO 50%
ww 4095 [w 4095]
wc 2047 [c 2047]


CAKIR, SERAP
328579
*2/9/1964, F, 52Y
STUDY 1
2/9/2016
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M 1
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VD11B 150915
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cm 42
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kV 74
mA 155
D 3380
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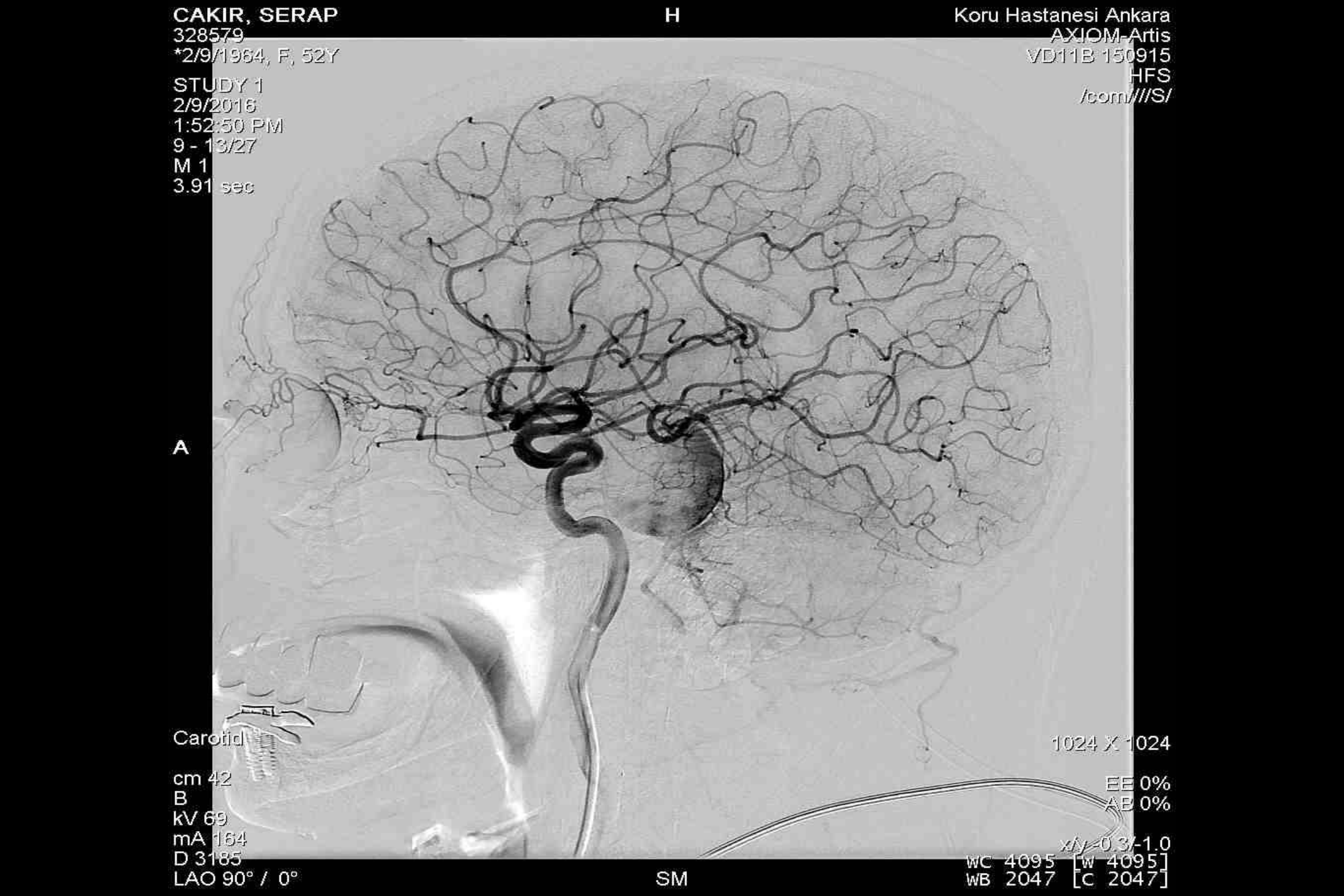
WB 2047 [C 2047]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2/9/2016
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Koru Hastanesi Ankara
AXIOM-Artis
VD11B 150915
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Carotid
1024 X 1024
cm 42
B
kV 69
mA 164
D 3185
EE 0%
AB 0%
x/y -0.3/-1.0
WC 4095 [W 4095]
WB 2047 [C 2047]
LAO 90° / 0°
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CAKIR, SERAP
328579
*2/9/1964, F, 52Y
STUDY 1
2/9/2016
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M 1
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VD11B 150915
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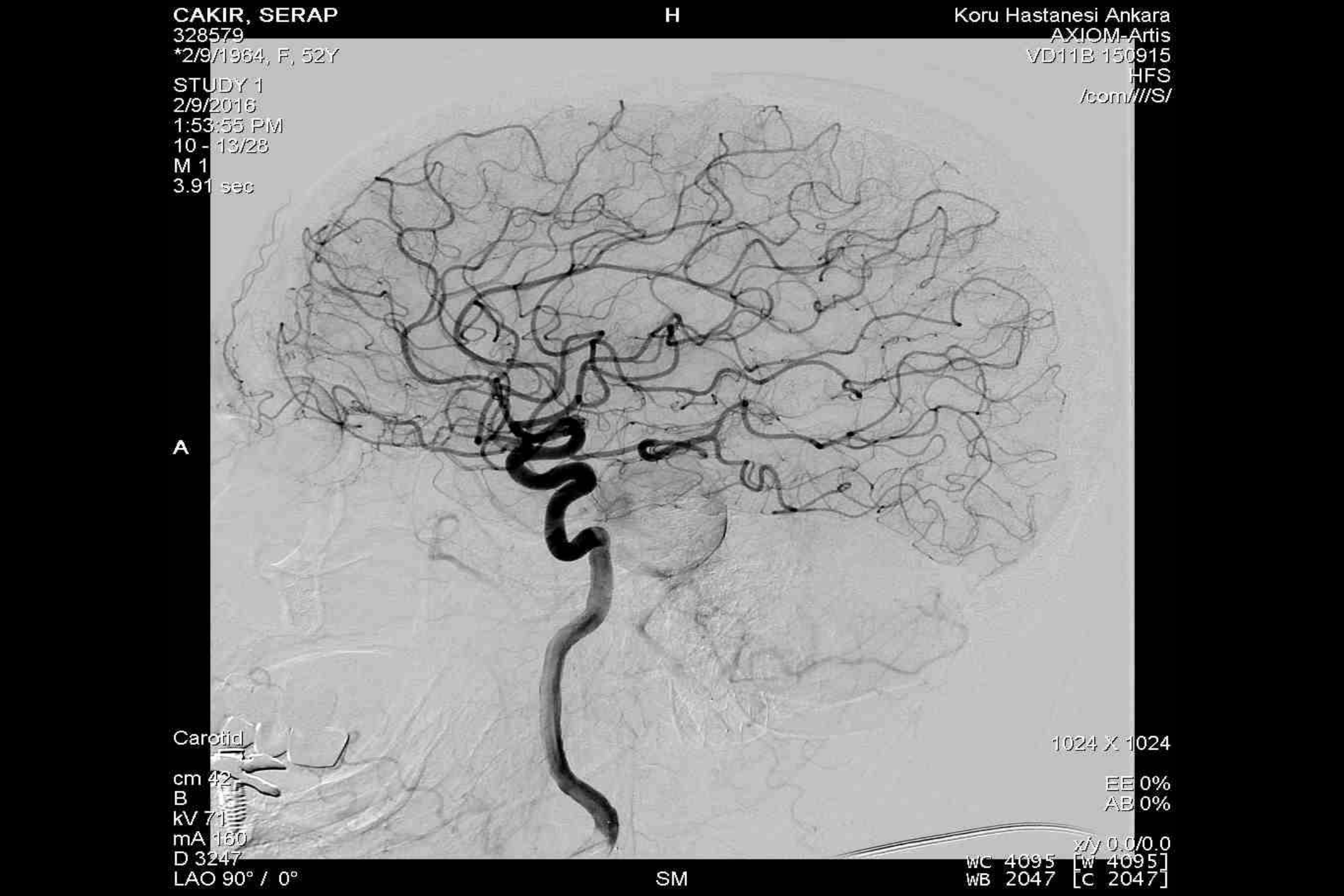
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B
kV 71
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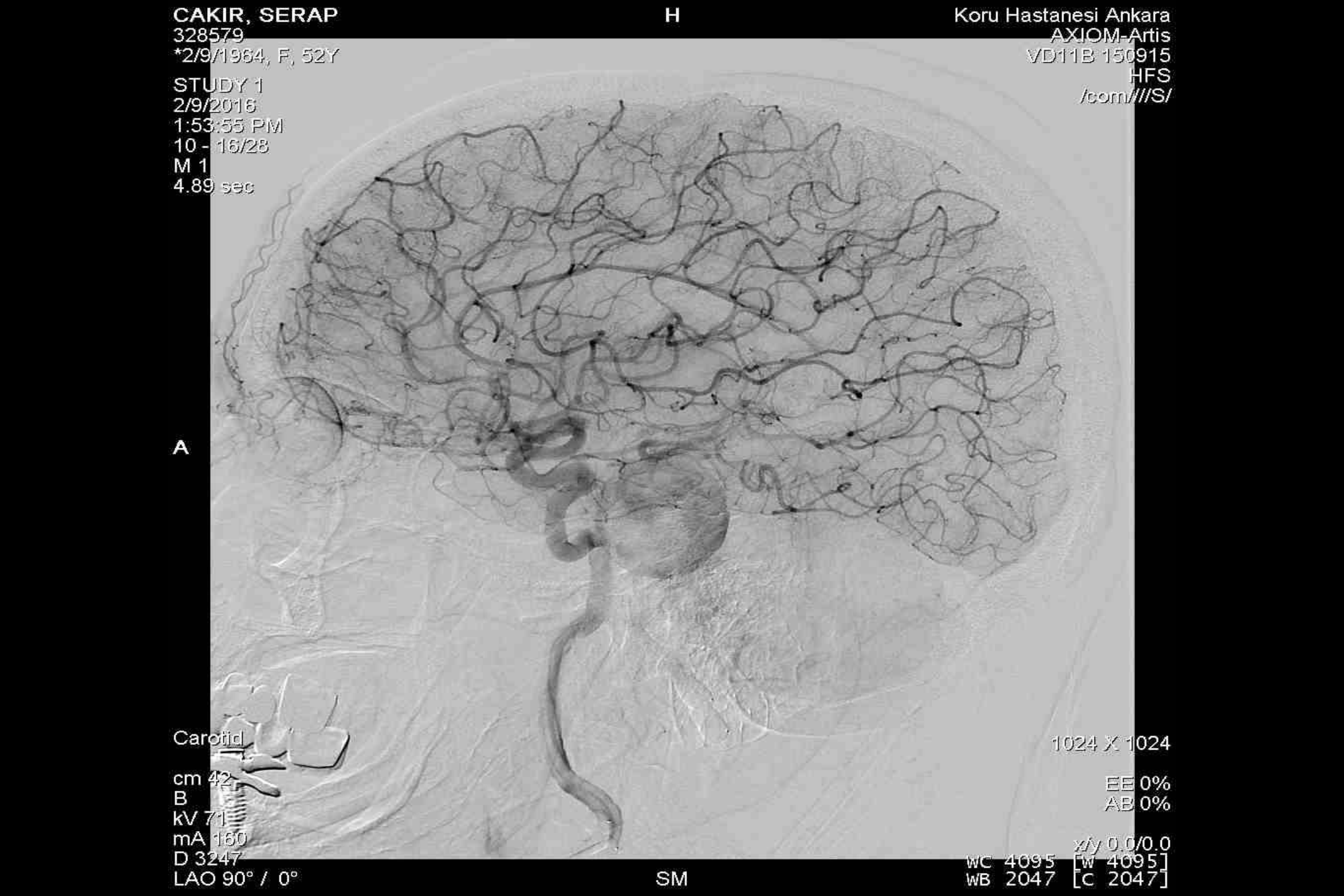
WB 2047 [C 2047]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VD11B 150915
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Carotid
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kV 71
mA 160
D 3247
LAO 90° / 0°
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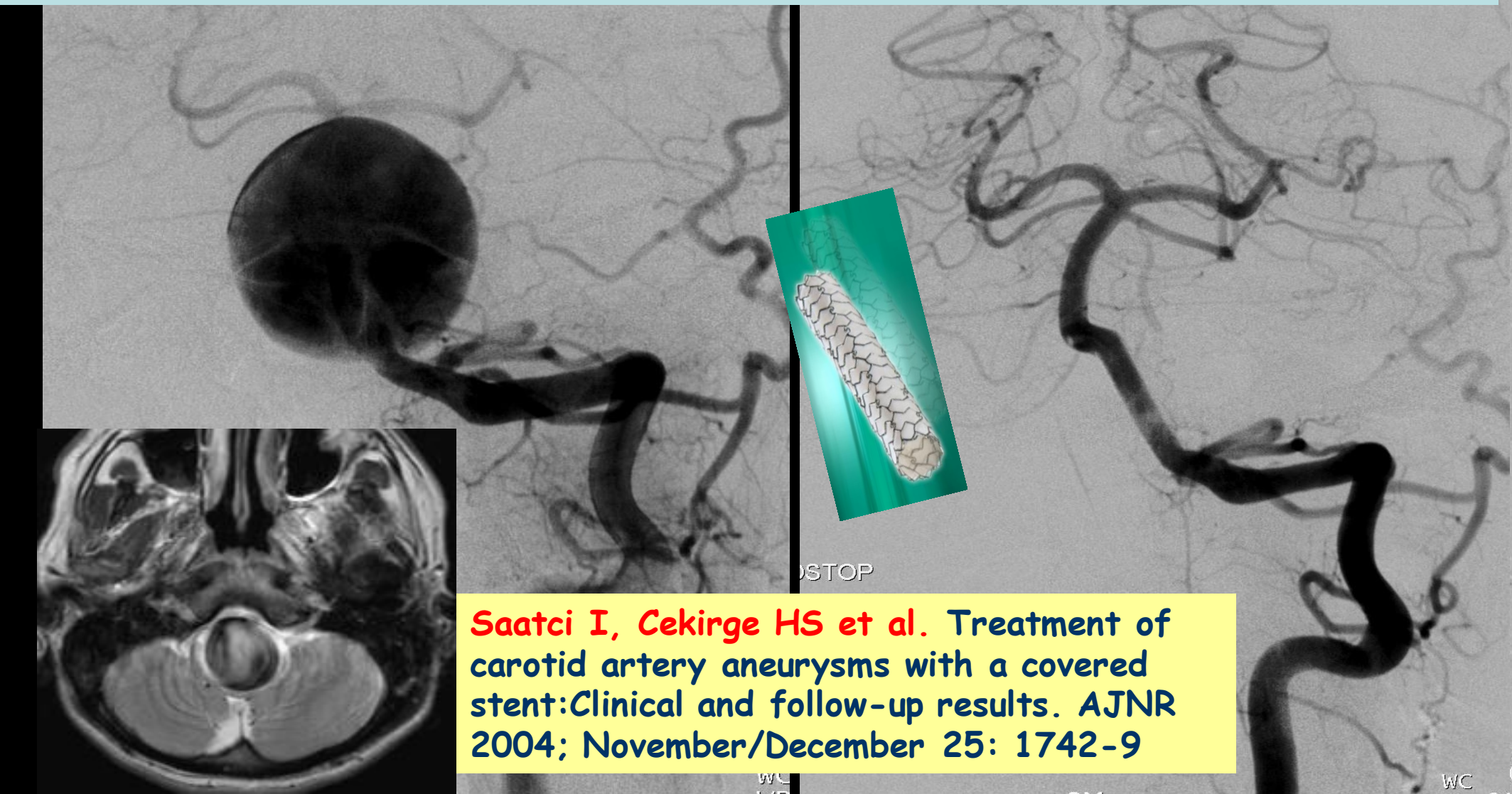
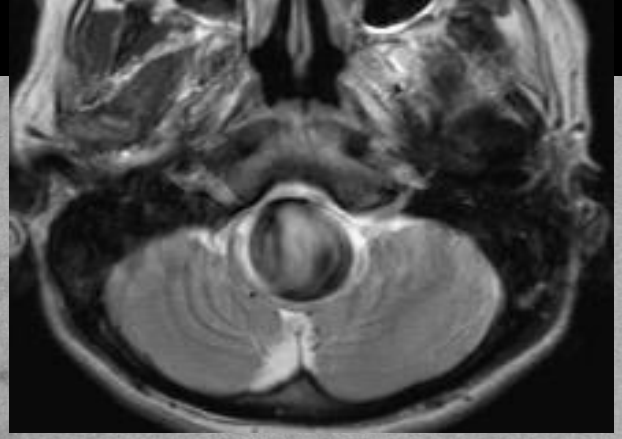
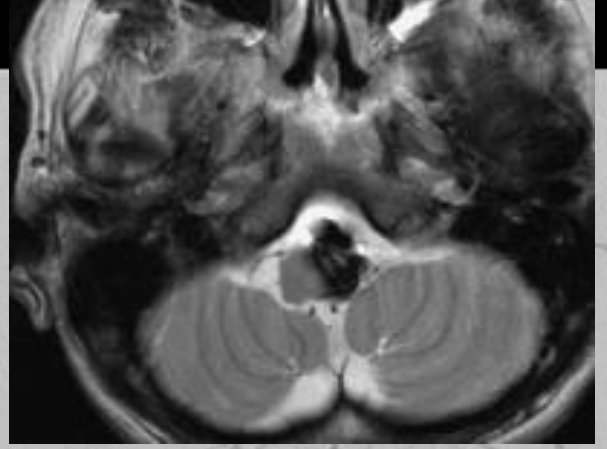
AB 0%
x/y 0.0/0.0
WC 4095 [W 4095]
WB 2047 [C 2047]

Endovasc tx of aneurysms with focusing only parent artery without dealing w aneurysm sac using stentgrafts was the starting point of a new avenue in cerebral aneurysm tx called ''flow modification/diversion''



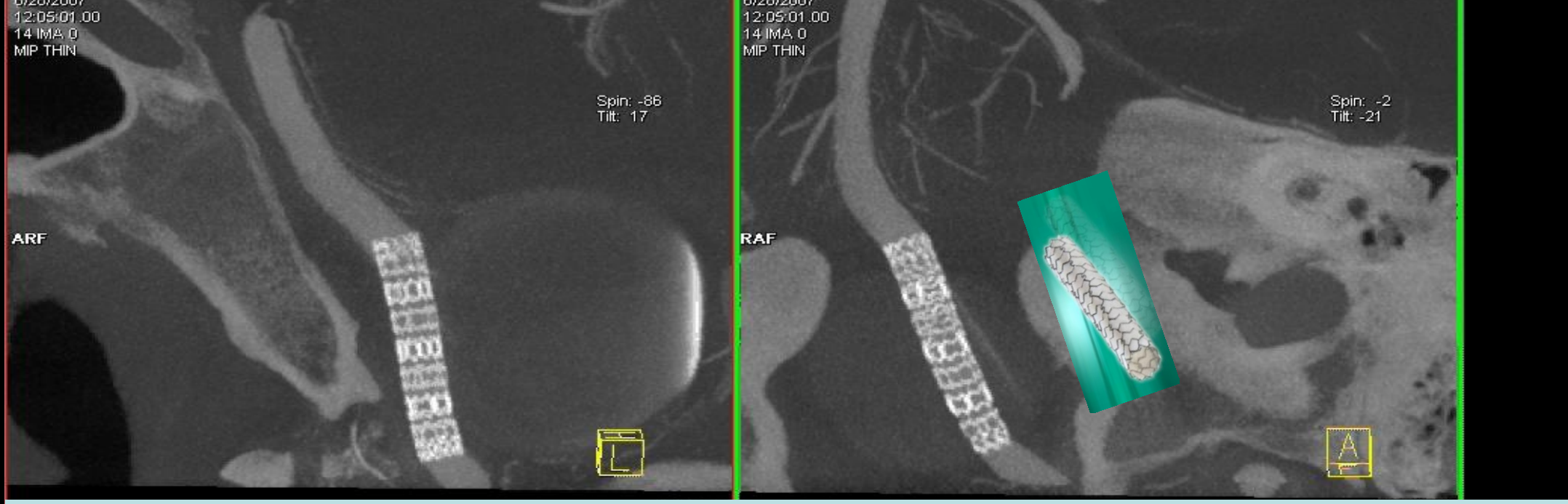
Saatci I, Cekirge HS et al. Treatment of carotid artery aneurysms with a covered stent:Clinical and follow-up results. AJNR 2004; November/December 25: 1742-9





1 year control

REOP



Changing the parent artery w a graft could not be applied all aneurysm location due to side branches/perforators. So, The concept of treating the cerebral aneurysm without touching the aneurysm sac but reconstructing the parent artery which aneurysm originates has been matter of the technology. Instead of endografts excluding the aneurysm, flow modifiers modifiying the flow from in and out of aneurysm sac has been started to be used…

In Conclusion

- **Flow Divertors have definitely created a big impact in the endovasc tx of post circulation aneurysms. However, especially in mid and upper basilar artery, Homemade flow diversion should be still considered as a very good tx alternative creating a flow modification with other parameters than metallic mesh density offering a different flow diversion/modification mechanism that is equally effective in closing/reconstructing with much lower ischemic event risk due to perforators , except the giant fusiform atherosclerotic aneurysms involving very long VB artery segment which has not much treatment alternatives now…**

THANKS….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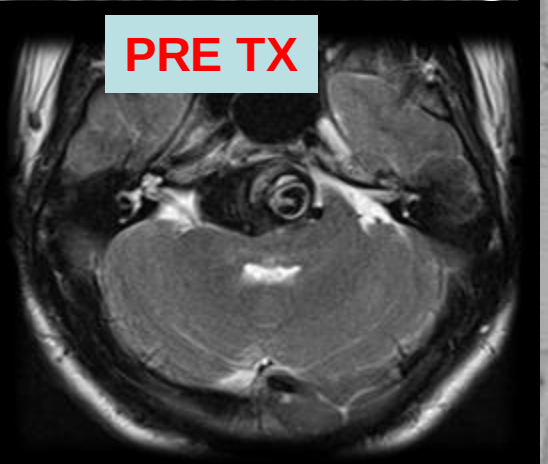
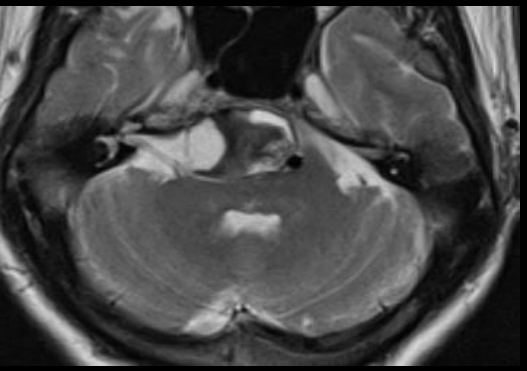
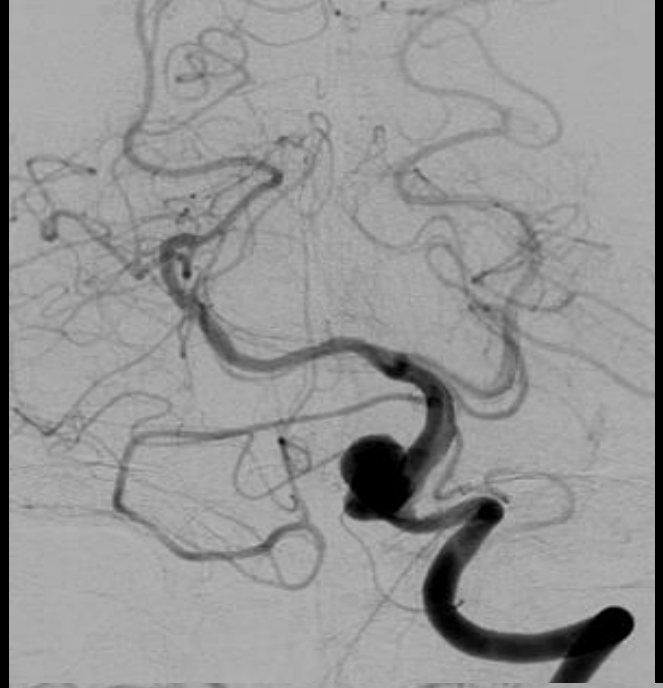
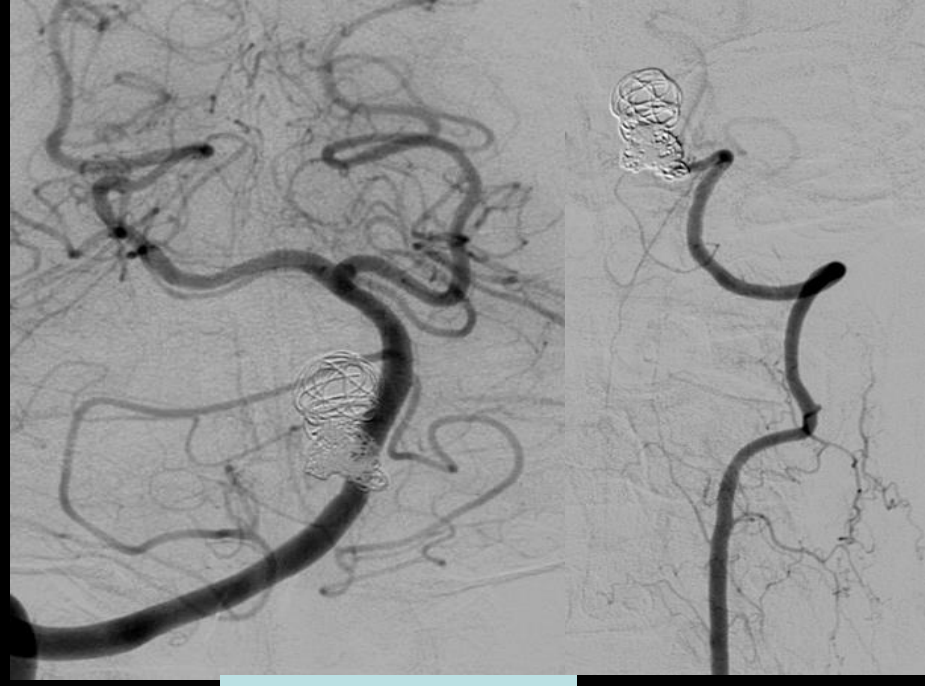
PRE TX



1 YEAR CONTROL





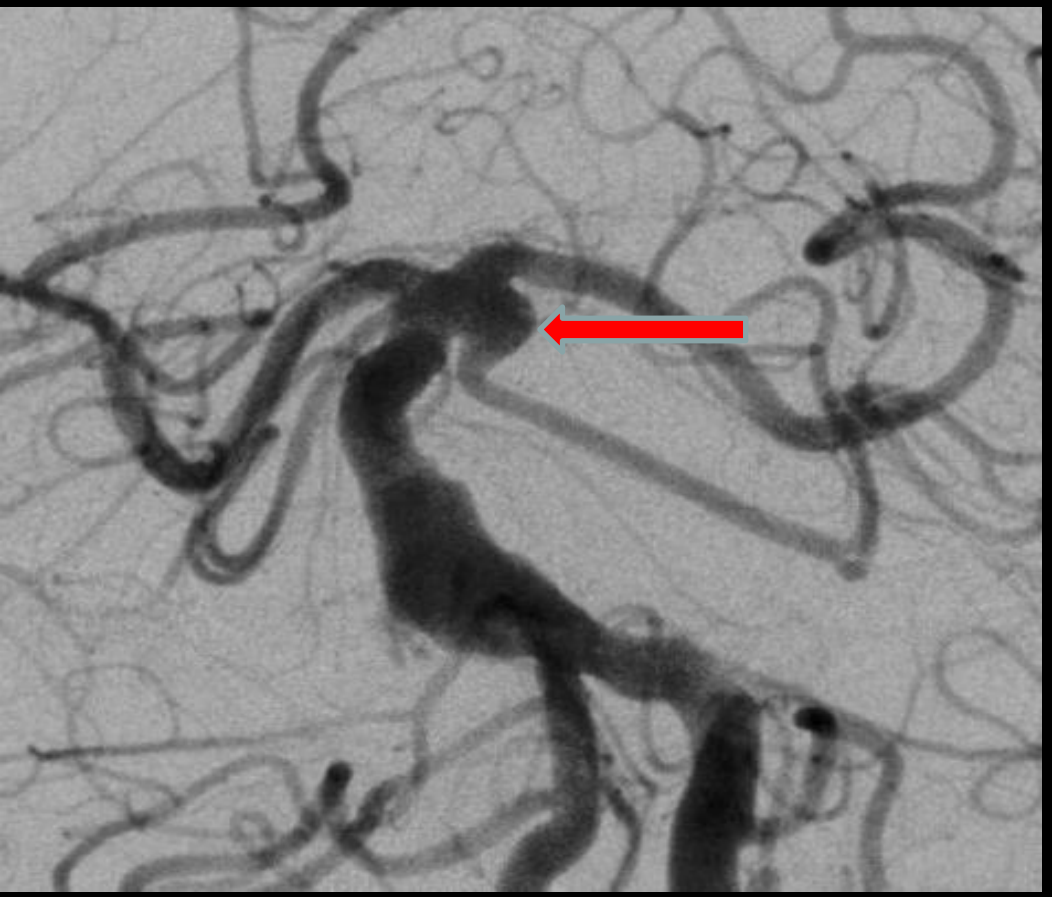


1 year control

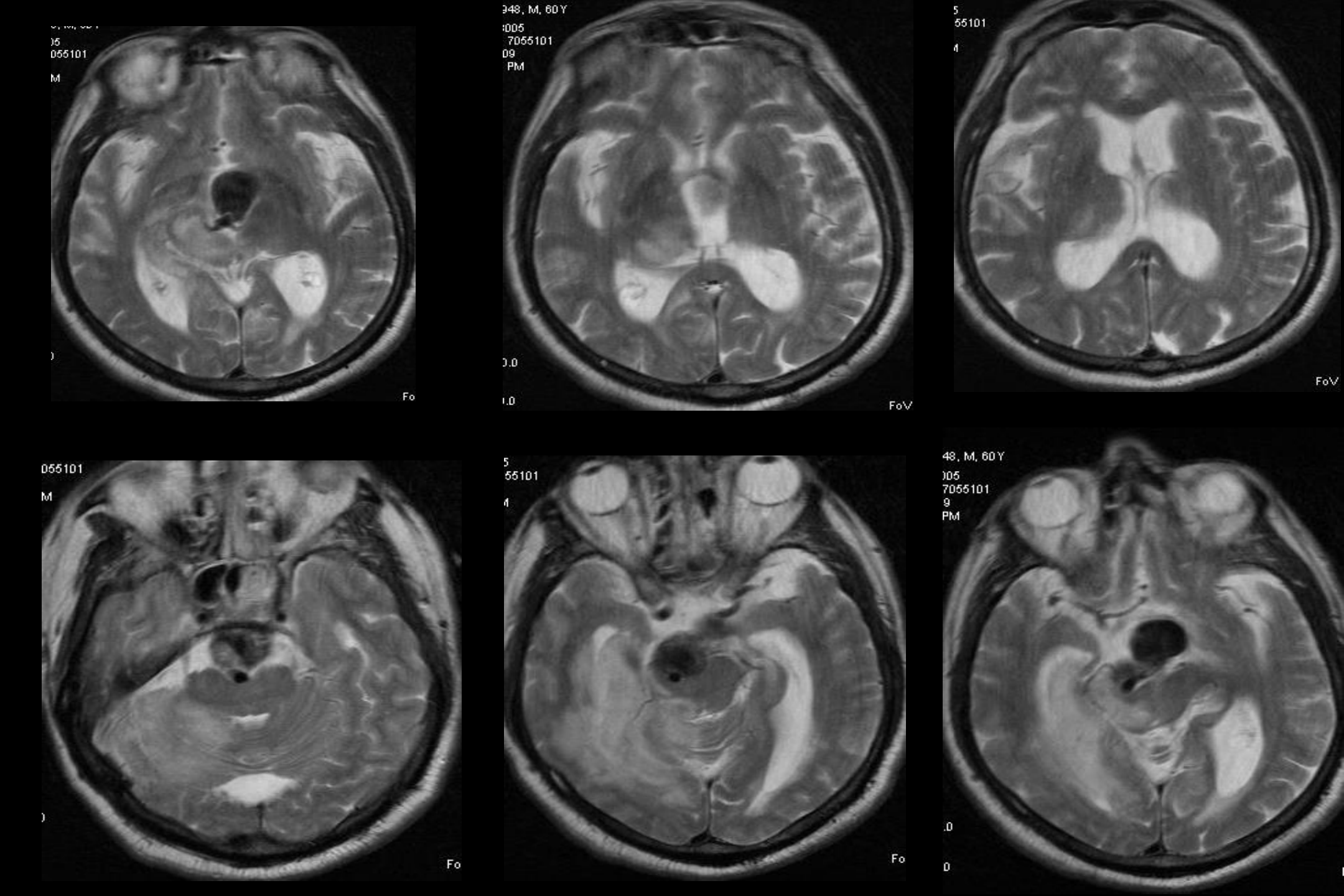

SOL VA
PREOP


LIH
H
T.C. Hacettepe
6 months control
SM
ww 2500
wc 2050

6 months control

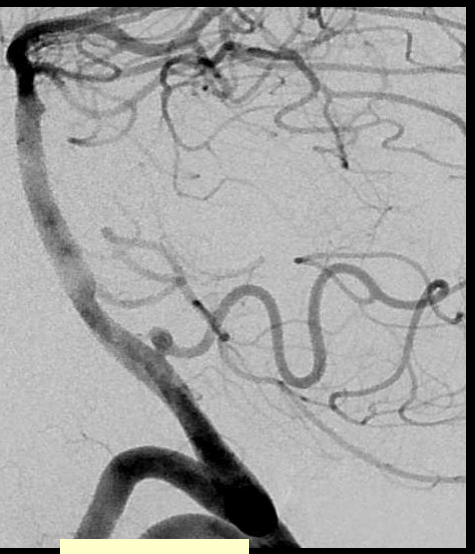


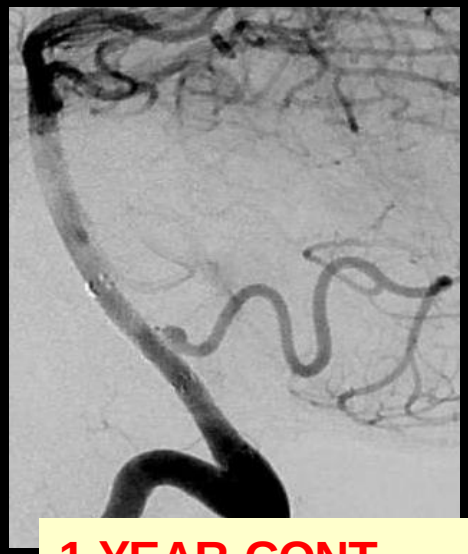

01



Pre tx

6 months cont



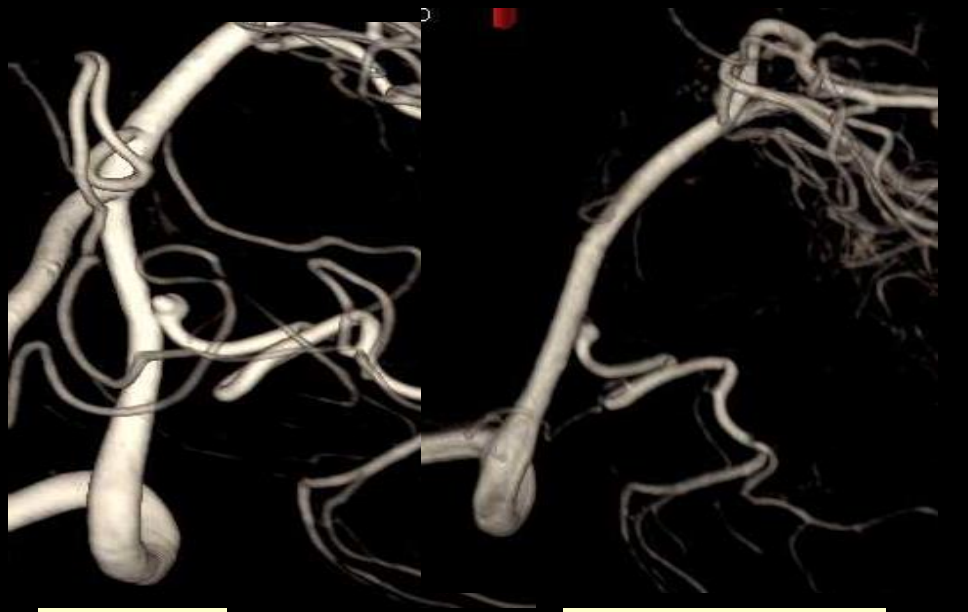


Pre tx

1 YEAR CONT
CLASS 5 OCC

Pre tx

1 year cont



Pre tx

1 year cont